Revealing the life above the ceiling

A study of the glass cliff in Sweden

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Abstract

We study the correlation between company performance and the selection of gender in 236 CEOs appointments in Sweden over the years 2005-2016. We seek to investigate whether the "glass cliff" is prevalent in Sweden, a phenomenon which states that female leaders are appointed to leadership positions associated with higher risk of failure to a larger extent than men. We find that companies appointing female CEOs have performed better on average prior to the appointment than those that appoint male CEOs when using cumulative abnormal returns as a measure of performance. However, when controlling for general financial downturn or using change in return on assets as a measure of performance, we find tendencies supporting the glass cliff in CEO positions. No significant evidence for the glass cliff is found for female CEOs in Swedish firms but we cannot exclude that the glass cliff exists for other leadership positions. Whether the preconditions of previous employments differ between sexes needs to be examined in forthcoming research.

JEL classification codes: G14, G34, J71

Keywords: Gender equality, CEO appointments, company performance

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1 Introduction

> "*So the metaphor of the glass cliff really is to evoke this idea of women being very high up. So they're very senior — boards of FTSE 100 companies, boards of Fortune 500 companies, senior leadership roles in Parliament, for example. But their positions are precarious, because they're happening in difficult times. So the idea is to evoke this idea of women teetering on the edge, and that their fall, or their failure, might be imminent.*"
> (Michelle Ryan, 2018 as cited in Dubner, 2018)

The "glass ceiling" is a common metaphor that has been used for over thirty years to describe the invisible blocking barriers that prevent women from reaching the highest corporate positions (Barreto, Ryan & Schmitt, 2009). In recent years, more women have gradually started to break through the glass ceiling and find themselves in leading positions of corporations (Ryan & Haslam, 2005). However, it is found that women who break through the glass ceiling often face additional difficulties once they reach the top of organisations (Bruckmüller & Branscombe, 2010). In their article published in 2005, Michelle Ryan and Alexander Haslam (2005) introduce a new phenomenon called the "glass cliff" as a response to an article published in The Times in 2003 in which Judge (2003) argues that female company board members have a negative impact on company performance. What Ryan and Haslam (2005) find in their study is an opposite causality: In general financial downturn, female board members seem to be appointed to companies with a recent history of stock return decline to a larger extent than male board members. "The glass cliff refers to the phenomenon whereby women are overrepresented in leadership roles associated with high uncertainty and an increased risk of failure" (Ryan, Haslam, Hersby, Kulich & Atkins, 2007, p. 266). In other words, female CEOs are not the cause of poor company performance but rather, companies with bad performance prefer to appoint female CEOs. The underlying reason for this preference is multiply determined, meaning there is not a single reason for why it appears. There are both social psychological and social structural factors contributing to the phenomenon (Ryan et al., 2007). Previous research on the prevalence of the glass cliff present various underlying mechanisms contributing to the phenomenon. Examples of these mechanisms are the stereotypical perceptions of differing traits of female and male leaders, the signalling value of appointing a female CEO and also the unequal access to information and job vacancies between sexes

(Bruckmüller, Ryan, Rink & Haslam, 2014). Evidently, more gender equal corporations do not necessarily mean changes in attitudes and gender stereotypical prejudices.

Our objective is to examine whether the glass cliff is prevalent in Sweden. Is there a negative correlation between appointments of female CEOs in Sweden and the related stocks' performances preceding the appointment? The prevalence of the glass cliff is important to examine as an absence of the investigation might create a perception that women drive poor company results and are hence less fitted for the corporate world. This perception can in turn contribute to the societal structures that create unequal labour markets. To the best of our knowledge, no research of the prevalence of the glass cliff in the Swedish corporate environment has been carried out. Previous empirical studies on the glass cliff conducted in the UK and the US using stock-based measures of performance present conflicting results (Haslam & Ryan, 2005; Haslam, Ryan, Kulich, Trojanowski & Atkins, 2009; Adams, Gupta & Leeth, 2009). Therefore, applying a stock-based measure once again, this time in Sweden, would allow for comparable results. Furthermore, to our knowledge, only Adams et al. (2009) have studied the prevalence of the glass cliff in appointments of CEOs. People who have reached to the top of the operational part of an organisation are prone to share common characteristics regarding personal drive, competence and political know-how. The CEO is a company's public representative and can therefore reflect the company's general attitudes and beliefs (Adams et al., 2009). Just as appointing a CEO from outside the firm can be a way for a company to signal change, a change of gender could also fulfil this purpose. Thus, an explanation for why women are appointed in difficult times may be the signalling value it represents. When a company faces a crisis, a change in leadership could be a way of indicating that the board understands that drastic change is needed and, in those cases, going from a male CEO to a female one could be sufficient (Bruckmüller & Branscombe, 2010). Additionally, previous experimental studies show that attitudes supporting the prevalence of the glass cliff are extensive (Ashby, Ryan & Haslam, 2007; Brown, Diekman & Schneider, 2011; Bruckmüller & Branscombe, 2010; Rink, Ryan & Stoker, 2013; Haslam & Ryan, 2008). Therefore, a study based in Sweden, a country often described as being at the forefront of gender equality (Barbieri et al., 2017; World Economic Forum, 2017; The Economist, 2018), could further deepen the understanding of how the glass cliff phenomenon and stereotypical perceptions and attitudes are related.

As previous empirical studies on the prevalence of the glass cliff were made in the US and the UK (Ryan & Haslam, 2005; Adams, Gupta & Leeth, 2009; Haslam, Ryan, Kulich, Trojanowski & Atkins, 2009), comparing these countries' gender equality to that of Sweden can provide a foundation for our hypothesis regarding the prevalence of the glass cliff in Sweden. In 1980, Hofstede presents four dimensions used to describe national culture. These dimensions include; power distance, uncertainty avoidance, individualism – collectivism and masculinity. Particularly interesting for this research is the last dimension, the masculinity, and how it might affect the labour market in Sweden. A masculine society is one in which the dominant values are stereotypically masculine. Hofstede (1980) finds the US and the UK to be, of his definition, masculine countries and Sweden to be a feminine country. Even though investigated a long time ago, Hofstede's (1980) theory is still relevant in understanding national differences considering that Sweden is placed fifth in the World Economic Forum's "Global Gender Gap Index" in 2017 and that the UK and the US are placed on the 15th and 49th place respectively. The Global Gender Gap Index (World Economic Forum, 2017) and Hofstede's (1980) theory take every part of the society into account when determining gender equality. This general focus creates an important foundation for our analysis but is not always consistent with gender equality in the corporate environment, which is the focus of our research.

Since 1970, the number of women in the Swedish labour market has increased massively, mainly in part-time employment. The share of women working full-time has increased from the beginning of the 21st century (SCB, 2016). Also, the Swedish Discrimination Act enforces companies to become more gender equal through, for instance, requiring employers to make equality strategies every third year for how to encourage gender equality within the company (Numhauser-Henning, 2015).

Today, Sweden is often described as the best country to work in as a woman. The high female labour force participation and large share of female parliament politicians put Sweden in the top of many labour market gender equality indices (The Economist, 2018; Barbieri et al., 2009). Being the third most equal country when it comes to women in managerial positions (39.2%) and forth in female company board members (37.7%) in The Economist's (2018) "glass ceiling index", the same gender equality has not yet reached the CEO positions in Swedish listed companies. In 2017, there were 17 female CEOs in listed companies in Sweden, making up only 6% of all CEOs on the stock market (Lundeteg, Nord, Hemberg, Ajmal & Dahlgren, 2017). This inequality is also to be observed on a company board level, as only 6.3% of all board directors of Swedish stock-listed companies are women (SCB, 2017). In other words, it appears like the higher up in organisational hierarchy, the less women found. Furthermore, the Swedish labour market remains highly segregated in terms of gender, with women working mostly in the public sector, 85% of all publicly employed, and men dominating the private sector, 85% (Numhauser-Henning, 2015). This skewness demonstrates that a gender equal society does not necessarily imply equality in every aspect of it. Although the gender equality and masculinity dimension in a society can reveal the underlying beliefs and perseverance of stereotypes, it is apparent that the glass cliff phenomenon is too complex to be explained solely by a nation's general perceptions regarding gender equality.

One example of reasons for the glass cliff is historical leadership roles, affecting perceived stereotypes of what a leader should be like. As leadership has primarily been male, leadership roles will continue to be associated with stereotypical male traits such as competitiveness or self-confidence (Bruckmüller & Branscombe, 2010). This phenomenon is referred to as "think manager – think male" bias and is first described by Schein in 1973. Schein (1973 & 1975) proves that both men and women in the US associate managerial success with men to a greater extent than with women. Conversely, in a time of crisis, the stereotypical presumption of what a suitable leader looks like is prone to differ. Studies made by Ashby, Ryan and Haslam (2007) show that the previously mentioned bias emerges in successful companies but not in unsuccessful ones. For the unsuccessful companies, stereotypically perceived female attributes such as intuition and awareness of the feelings of others are often desired, resulting in a "think crisis – think female" bias (Bruckmüller & Branscombe, 2010).

Another explanation for choosing women as leaders in precarious situations might be sexism and in-group favouritism. As many board members and decision makers are men, it is possible that these men protect other in-group members from risky positions, leaving the glass cliff positions to women. Structural barriers prevent women to enter the already formed groups and networks of men. Not only does this leave women with a feeling of alienation, but it also inhibits them to access the same information as men (Bruckmüller, Ryan, Rink & Haslam, 2014). Also, as positions associated with crisis or turn-around are more likely to fail, people taking on such roles limit their opportunities for future CEO roles (Fitzsimmons & Callan, 2016). For occupational minorities, such as women, accepting an offer from a poorly performing company might be done out of fear that no other options will come up in the future (Cook & Glass, 2014).

We commence our study of the glass cliff by plotting Graph 1, presenting the development of the previous financial performance for companies that have appointed a CEO. It is possible to see differences between companies appointing male and female CEOs in the graph and the findings capture our attention and encourage us to investigate further. With the graph in mind, the knowledge of the inequality in Swedish CEO positions and the gender-segregated labour market as well as previous research demonstrating existing biases for stereotypically female traits in precarious leadership positions, our hypothesis is that there is evidence of the glass cliff in Sweden. Thus, there is a negative correlation between the selection of CEO gender and past company stock performance.

The causal relationship implied by our research focus is that the dependent variable is the gender of the appointed CEO and the company performance is the independent variable, tested for having an impact on the selection of gender of the CEO. An idealised experiment to identify this causal effect would in theory contain two identical groups of people, one containing men and the other women. In such an experiment, it would be possible to unbiasedly identify preconditioned differences between male and female CEOs. In practice, such an experiment is not feasible. Instead, we construct our study as follows.

To be able to investigate our research focus, we use a logistic regression, determining the probability of choosing a female CEO given the company performance preceding the appointment. If the glass cliff exists in the corporate environment in Sweden, companies with past stock price decline would be more likely to appoint female CEOs than male. The dataset we use in our analysis consists of 236 CEO successions in Swedish listed companies from the beginning of 2005 to the end of 2016, where female CEOs constitute 25 of the observed successions. To capture company performance, we use the cumulative abnormal return, CAR, for each stock, computed using the daily abnormal returns as defined by the "market model" (MacKinlay, 1997; Bodie, Kane & Marcus, 2014) and done by Adams, Gupta and Leeth (2009). Data concerning the background information and the experience of the appointed CEOs is added to the analysis and matched with stock prices stretching 250 trading days back from the day of appointment. The appointment date in this study is defined as the day on which it was publicly announced that the CEO was appointed to the position. Moreover, to be able to use the same measure of performance, only publicly traded Swedish companies are included in the study. That is, all Swedish based publicly tradable companies during the period of interest are included in the sample, regardless of size and Swedish stock exchange.

When analysing the descriptive statistics, it is found that women and men in general share similar characteristics in terms of experience, age and education. Both women and men are predominantly found within smaller companies, although the share of women is greater within the small segment. Another noticeable finding is that the share of women is about twice as large as the share of men in both the financial and healthcare sectors but only half of that of men in the industrials sector.

We find that company performance, or cumulative abnormal return, is positively correlated with the female CEO successions. This means that between 2005 and 2016, the overall probability of being appointed to a CEO position in a poorly performing company was higher for men than women. This finding implies that our hypothesis regarding the prevalence of the glass cliff for female CEOs in Sweden is not confirmed when using CAR as the baseline independent variable. On the other hand, when performing a robustness test on our regression using another measure of company performance, change in return on assets, we find tendencies for the occurrence of the glass cliff in Sweden. In other words, when using an accounting-based measure of performance, ROA, it is more likely that a woman is appointed as a CEO to a poorly performing company. Although not significant, these findings imply that there is a difference in results depending on which measure of company performance that is used. Without going any further into the underlying reasons for the deviating results, stock-based measures of performance are based on investors' perception of company prospects and that accounting-based measures capture the past performance of the company. Moreover, when controlling for CEO appointments made after a general financial downturn, we also find tendencies supporting the glass cliff. Just as with the other performance measures, this result is not significant. Important to take into consideration are the limitations imposed by our small sample. The scarcity of observations could be an underlying reason for the insignificance in our results and create inaccuracy in variable variance and estimation.

Our findings using the baseline stock-based measure of performance, CAR, are in line with those of Adams, Gupta and Leeth (2009) but contrary to Haslam, Ryan, Kulich, Trojanowski and Atkins (2009). Furthermore, our findings using change in return on assets as a measure of company performance are, to our knowledge, contrary to all archival research investigating the glass cliff. When controlling for general financial downturn, our results show tendencies that conform to those found by Ryan and Haslam (2005).

We contribute to research within Swedish gender equality in the labour market. Women are underrepresented in Swedish leadership positions, however, when investigating the glass cliff, we cannot find evidence that female CEOs start out in a more disadvantaged position than men. Instead, our main findings suggest the opposite. Although, we note that our research does not further examine the previous employments of the observed CEO appointments. It is possible that the preconditions of previous employments differ between sexes.

Our work also speaks to archival research that provides conflicting evidence of the glass cliff. Haslam, Ryan, Kulich, Trojanowski and Atkins (2009) find evidence for the glass cliff in the UK using stock-based measures, while Adams, Gupta and Leeth (2009) do not find evidence using the same measure in the US. Adams et al. (2009) study CEO appointments for firms in the S&P 500, the S&P mid-cap 400 and the S&P small-cap 600 in the US between the years 1992 and 2004, using three estimates of the cumulative daily return. That is cumulative raw return, cumulative market-adjusted return and cumulative risk adjusted return. The results show no evidence for the glass cliff in either study. Moreover, Haslam et al. (2009) study the tendency for women to be selected for and to be found in UK company boards, which is the presence of women on company boards rather than appointments thereof. The period studied spans between 2001 and 2005 and includes both a stock-based measure, “Tobin’s Q”, and two accounting-based measures, return on equity and return on assets. The result reveals no relationship using the accounting-based measures and a negative relationship between the presence of women on company boards and the stock-based measure (Haslam et al., 2009). Lastly, Ryan and Haslam (2005) investigate the share price performance before and after appointments of female board members for firms in the FTSE 100 in 2003 using monthly company return. No significant difference in stock-based performance between genders existed. On the other hand, Ryan and Haslam (2005) find that in a time of overall stock market decline, firms that appointed women had experienced poor performance the months preceding the appointment. Both of these findings are in line with the obtained results of our study.

There are two main reasons for why our findings deviate from those of Haslam, Ryan, Kulich, Trojanowski and Atkins (2009). Firstly, Haslam et al. (2009) focus on the tendency for women to be selected for and found in company boards whereas we examine appointments of CEOs. Secondly, different measures for stock performance are used. Haslam et al. (2009) use “Tobin’s Q” as their stock-based measure and we use the cumulative abnormal return, which takes the market return into consideration. In both these mentioned examples, we use the same area of focus as Adams et al. (2009), appointments of CEOs and a similar measure of company performance, which could also be a reason for why our results conform to those of Adams et al. (2009).

We also contribute to research in a broader sense. To begin with, we document and compute the company performance preceding the appointment of CEOs in 236 Swedish companies in the years 2005-2016. Our results provide insight for the general research on CEO appointments, when they occur and why. Secondly, we find tendencies of the glass cliff in CEO positions when using an accounting-based measure of performance. In that aspect, our research further contributes to the discussion of the difference between financial-based and accounting-based company performance measures, disclosing how subjective and objective measures may generate deviating results.

The rest of the paper is structured as follows. Section 2 describes the setting of the study, the data and the operationalisation of the study. In Section 3 we state the results. In

Section 4 we discuss the underlying mechanisms contributing to our result. In Section 5, we conclude our research.

2 Measuring the correlation between company performance and CEO gender

2.1 Context and setting

The Swedish labour market

In his study, Hofstede (1980) states that Sweden is the country, out of all studied, with the least masculine beliefs and values. It is explained that in feminine societies, such as Sweden and Norway, humanisation take form of feminisation as a way of generating more interpersonal relationships and thereby moving away from inter-individual competition (Hofstede, 1980). The fact that the Swedish society is described as feminine suggests that the attitude toward female leaders would be more welcoming compared to more masculine countries such as the US and the UK. Hofstede's (1980) classification of Sweden as a feminine society is still accurate today with a labour market described as being informal and often having a flat organisational structure (Göteborgs stad, 2017). As mentioned in the Introduction, the number of women with full-time employment has increased from the beginning of the 21st century. In 2015, 83.7% of Swedish women were employed and the corresponding share of men was 88.7%. However, the gender distribution within professions is not equal, only four of the largest professions were gender equal in 2014 (SCB, 2016).

Currently, one of the most important subjects regarding labour market equality in Sweden is the balance between family life and the professional life. Particularly in focus is a more gender equal parental leave (Numhauser-Henning, 2015). In 1974, Sweden was the first nation in the world to make paid parental leave available to fathers. Since then, policies have been continuously reformed throughout time to improve gender equality in the Swedish society (Duvander & Johansson, 2015). However, out of the total parental leave days and benefits offered to parents in 2015, women accounted for 74% of redeemed days and men only for the remaining 26%. Even tough Sweden promotes equal parental leave, the reality remains severely unequal (SCB, 2016). How this affects women's following career opportunities is analysed by Statistics Sweden, SCB, in a report in 2007. The report states that women taking longer parental leaves have half the chance to be promoted compared to women that take shorter parental leaves. The reasons for this inequality are explained as the signalling value the leaving sends out to the employer as well as the attitude of the mother (SCB, 2007). As a vast majority of mothers take out parental leave, one way for women to stand out and signal professional commitment is by shortening or concentrating the leave (Albrecht, Skogman Thoursie & Vroman, 2015).

Furthermore, in their article, Cabeza, Barger Johnson and Tyner (2011) discuss parental leave and the effect it has on the glass ceiling. They state that women often are exposed to and must deal with stereotypical preconceptions when becoming mothers. Stereotypes regarding domestic roles are reinforced by parallel stereotypes that presume a lack of responsibilities on the domestic side from men. The inequality of taking out parental leaves, with its implied stereotypical preconceptions, in combination with the effect parental leave has on women's chances to be promoted could contribute to the prevailing inequality in CEO positions in Sweden.

Identification intuition

What we attempt to study is the correlation between past company performance and the selection of the gender of a newly appointed CEO. Plotting a simple correlation between company performance and gender would likely be afflicted by omitted variable bias.[1] Instead, an ideal experiment to identify this relationship would include two identical groups with the one difference being that one contains men and the other women. The groups would contain all candidates that were considered in the recruitment process for the CEO role. The fact that the groups are identical would remove differences in characteristics and experience. In such an experiment, it would be possible to unbiasedly identify preconditioned differences between male and female CEOs.

In our empirical setting, we add dummy variables to hold for differences regarding, for instance, age, education and experience between CEOs. Even though these variables do not take employer preferences and personal relationships between employer and employee into consideration, they assist in limiting differences in characteristics and allow us to approximate the ideal experiment.

Another possible sampling strategy is to compare CEO appointments for companies in which both a male and a female CEO have been appointed. This to hold for differences in company characteristics. Since very few appointments of female CEOs have been carried out

[1] It is probable that other characteristics have great impact on the selection of CEO such as education, experience and personal fit

during the period of interest, 2005-2016, choosing this strategy would further limit our sample. Analysing a longer period of interest would also not be ideal as companies' characteristics are likely to change over a longer time. Rather, we include dummy variables holding for differences in company characteristics such as the size of the company and the industry in which it is active.

An alternative research focus could be on the prevalence of the glass cliff in appointments of company board members, which probably would allow for a larger sample as more board members than CEOs exist. However, to be able to further approximate our ideal experiment, a focus on CEO appointments implies that the observations are similar in characteristics compared to board members whose goals and intentions may not converge (Adams, Gupta & Leeth, 2009). Additionally, research suggests that CEOs often are replaced following financial misrepresentation as a way of re-establishing investor relations, an act often called scapegoating (Gangloff, Connelly & Shook, 2016). This reason for dismissal also implies that a fair share of CEOs must have been appointed to take over these precarious positions. Therefore, using CEO appointments to investigate the glass cliff could potentially be beneficial in our study in the sense that we know that many CEOs are appointed when companies have performed poorly.

2.2 Data

The primary dataset containing background information about the CEO, appointment date and company names and size has generously been provided by Linnea Åkerling from her and Hansson's (2017) paper on investors' reactions to appointments of female CEOs.[2] The dataset contains 709 unique CEO successions where observations that potentially could bias our analysis are excluded. See Table 1 for the reasons for removals and the development of the sample. Where needed, we gathered more background information about the CEOs using Retriever's database for news articles and company press releases.

Other primary data are daily stock closing prices, adjusted for dividends to match the index, gathered from Thomson Reuters Eikon. To be able to determine the development of stock prices, we collected data from 250 days preceding the date of appointment. Companies' market capitalisation, which determines the size of a company, is also retrieved from Thomson Reuters Eikon. The market index used to receive market returns is the SIX Return Index,

[2] Hansson and Åkerling (2017) have received the data of the CEO successions from Modular Holdings AB (previously SIS Ägarservice AB) and the background information has been collected from Retriever, Thomson One Analytics and companies' press releases

adjusted for dividends, collected through downloading the Fama-French factors from the Swedish House of Finance's webpage.

2.3 Implementation of empirical strategy

To apply our empirical strategy, we need to set some restrictions to our sample. Firstly, the CEO successions included must occur within the defined time frame, from the beginning of 2005 to the end of 2016, and have been announced after the firm's stock market introduction, the initial public offering, for it to be possible to make the desired analysis using stock data. Secondly, interim CEOs, founders and CEO appointments made at the same time as releasing of other firm essential information such as mergers, are excluded as such events may affect the market expectations of those companies, which in turn can affect the company stock price. Thirdly, companies based in or primary listed in another country than Sweden are removed.[3] After excluding observations, 236 unique observations remain where 25 of these are female.

To examine whether there is a negative correlation between appointments of female CEOs in Sweden and the related stocks' performances preceding the appointment, it is needed to define the causal link between gender and firm performance. What we seek to examine is whether companies performing poorly are more likely to appoint a female CEO than a male one. The measure used to capture financial health is the cumulative abnormal return. This causality implies that the dependent variable is the gender of the appointed CEO and the cumulative abnormal return is the baseline independent variable, tested for having an impact on the selection of gender of the CEO. Further investigation of the prevalence of the glass cliff is executed using multiple regressions. If we were to perform an OLS regression using a binary dependent variable, it would be conducted through a linear probability model. However, implementing this model entails some problems for our sample.[4] Therefore, a logistic multivariate regression is performed, a linear regression presenting results in terms of odds ratios.[5]

The dependent variable we are using in regression model 1 is the gender of the CEO ($gender_i$). As all appointments of CEOs, to our knowledge, are definable as either male

[3] We are aware that restricting our sample in this way may create sample selection bias. Though we consider it to be necessary to be able to implement our empirical approach

[4] For instance, the OLS model has no boundaries and can therefore predict probabilities larger than 1 and smaller than 0. We tested to regress our sample using a linear probability model. As many of our coefficients were close to 0 or outside the defined range, it is difficult to interpret the results

[5] In our case the odds ratios show the probability of choosing a female CEO over the probability of choosing a male CEO

or female, the dependent variable is binary and included as a dummy variable in our regression. The binary variable takes on value 1 if the appointed CEO is a woman and 0 for a man.

The baseline independent variable used in our regression is the cumulative abnormal return for the last day of the event window (CAR_i), which is the daily abnormal stock return for each company, cumulated over the period of interest.

$$CAR_{i(t_1T)} = \sum_{t=t_1}^{T} AR_{i,t}$$

Where the abnormal return ($AR_{i,t}$) is defined as the actual stock return less the normal return (Bodie, Kane & Marcus, 2014).

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

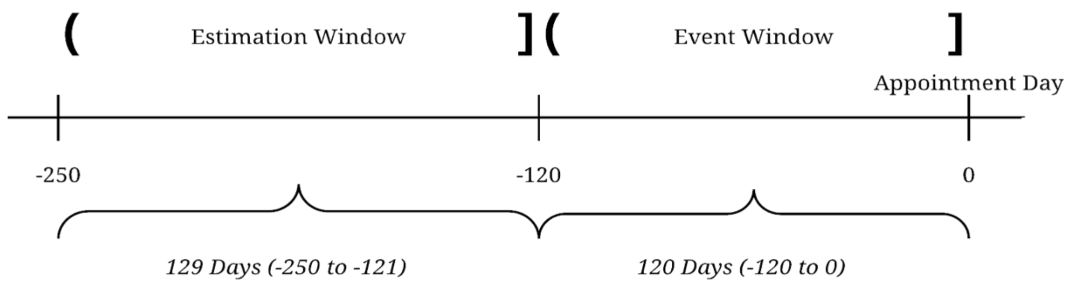
The actual stock return ($R_{i,t}$) is defined as the change of the stock price from one day to the next.

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

Even if our analysis is not an event study as defined by MacKinlay (1997), which is to measure how a specific event affects the value of firms, we construct the cumulative abnormal return using an estimation and an event window, as proposed by MacKinlay (1997). Following the study made by Adams, Gupta & Lee (2009) and as suggested by MacKinlay (1997) and Bodie et al. (2014), the normal return $E(R_{i,t})$ is calculated using the "market model" which assumes that stock returns are linearly related to fluctuations in the market index. By using this measure, which includes company specific betas, we adjust for the diverse risk profiles of the included companies. Using this assumption, it is possible to compute the normal return.

$$E(R_{i,t}) = \alpha_i + \beta_i R_{m_t} + \varepsilon_i$$

The company individual alpha (α_i) and beta (β_i) used to compute the normal return are calculated using an estimation window of 129 days stretching from day -250 to day -121, where day 0 is the day of the appointment of the CEO. Thus, the 120 days up to the appointment date are used as the event window and are the days on which the cumulative abnormal returns are



based. Bodie et al. (2014) comment that it is necessary that the estimation and event window be separated so that the estimates are not affected by the abnormal return in the event period.

On a purely practical level, the calculation of the alpha and the beta is carried out using a function in Excel, which calculates the linear relationship between the stock's actual return and the index market return, where alpha is the intercept and beta is the slope of the line. This approach hence assumes that the stock return has a linear correlation to the market return, as done in the market model (Bodie, Kane & Marcus 2014). The alpha and the beta are then used to calculate the abnormal return for each day of the event window, which is from day -120 (t_1) to day 0 (T). By summing up these abnormal returns for each individual succession, we receive the cumulative abnormal return.

The main regression, including gender as the dependent variable and CAR as the independent variable, is thus defined as:

$$gender_i = \alpha + \beta_1 CAR_i + \varepsilon_i$$

In our extended regressions, several control variables are added holding constant for external factors that might have an impact on the effect of the regression, in other words the error term (ε_i). Holding for differences between industries, we categorised the industries to which the companies included in our sample belong. We identify 12 industries, as defined by Modular Holdings AB, which at a later stage are categorised into four industries, as several industries include very few or no women. The industry variable ($industry_i$) used in our regression includes the categories finance, services and goods, industrials and healthcare. Another categorical variable included in the regression is the size of companies ($size_i$). The size is based on the companies' market capitalisation on the day of the CEO appointment and is categorised into three size ranges, small, mid and large, as it turns out that this gives greater explanation value to our regression than adding market cap as a continuous variable. See Table 6 for the classification of firm size. Furthermore, we include variables that hold for differences between CEOs. To begin with, the age of the CEO at the time of appointment is included as a discrete variable (age_i). An independent variable controlling for differences in education is also included ($highed_i$) and takes on value 1 if the appointed CEO has a university degree or higher and 0 otherwise. Additionally, binary variables holding for the type of recruitment, inside or outside recruitment ($insiderec_i$), previous CEO experience ($prev.CEO_i$) and previous industry experience ($induins_i$), are included to hold for experience differences between CEOs often valued in the selection process. These experiences are described by Lee and James (2007) as important factors to consider when examining the success of a CEO appointment. The binary variables assume value 1 if the appointed CEO possesses those experiences and 0 otherwise. Since the data used for the logistic multivariate regressions is cross-sectional, we are not able to control for fixed effects.[6] In the regression models, only the CAR for the last day of the event window for each CEO observation is used. Instead, to hold for differences between years, a variable for time is created ($year_i$). The variable is included in the regressions as dummy variables, one for each calendar year. After including all of the control variables, our extended regression is as follows:

$$gender_i = \alpha + \beta_1 CAR_i + \beta_2 size_i + \beta_3 industry_i + \beta_4 age_i + \beta_5 highed_i + \beta_6 insiderec_i + \beta_7 prev.CEO_i + \beta_8 induins_i + \beta_9 year_i + \varepsilon_i$$

2.4 Summary Statistics

Descriptive statistics provide the reader with relevant information about the background of the CEOs included in this study. The data is presented by gender to show how the background information affects the decision-making process in the recruitment of a male and female CEO respectively.

The section is initiated by disclosing descriptive statistics of the control variables. Table 3 shows that the share of female CEOs with a higher educational degree is larger than for the male sample. In our female sample, 96% have a university degree or have finalised higher studies, compared to roughly 90% of the male CEOs. The difference is not particularly large, although noticeable and shows that education is an important factor in the selection of both female and male CEOs and possibly slightly more important for women than for men. An equal share of women and men have industry experience. The large shares of 88% and 87% for women and men respectively show that industry experience is important in the consideration of appointing a new CEO. On the other hand, for inside recruitment, meaning that the CEO is recruited internally within the company, the share is about 44% for both sexes, which indicates that company specific knowledge is less important than industry experience in recruitment processes. Additionally, less women have held CEO positions prior to the current one. In comparison to men, 40% of the female CEOs have held a similar position in the past, whilst the corresponding share for men is 57%. Finally, in Table 4, we can see that the appointed women have an average age of 48 years, which is close to the male average age of 47 years. The descriptive statistics disclosed up until now show that education and industry experience

[6] Fixed effects are only applicable to panel data, which is data on several entities, in which each entity is observed for two or more time periods

are important factors for both sexes and that CEOs appointed in Sweden are of about the same age.

Further control variables that are used in the logistic multiple variate regressions, are company industry and size. In Table 5 we can observe that almost 50% of the female CEOs run companies within finance or healthcare, which is the double fraction of the male CEOs, where approximately 25% run a company within one of those two sectors. The share of female CEOs running an industrial company is half of the male fraction. The largest share of CEOs, of both sexes, is found within the services and goods sector. This skewness probably exist as the services and goods sector is consolidated of a large number of sub sectors defined by Modular Holdings AB.

In terms of company size, roughly three out of four women run a company that is classified as small cap. See Table 6 for size segmentation. Only 8% of female CEOs run a mid-cap company and 16% run a large company, whilst roughly 50% of the male CEOs run a company within mid or large cap. The final independent variable examined within this section is the cumulative abnormal return. In Table 4 it is possible to observe that the CAR is positive on average for female CEOs and negative on average for male CEOs on the day of appointment.

3 Results

3.1 Graphical evidence

We continue by showing the development of the cumulative abnormal return from day -120 to day 0 in Graph 1. The graph presents the daily average CAR per gender ($\overline{CAR}_{gender(t_1,T)}$).

$$\overline{CAR}_{gender(t_1,T)} = \frac{1}{N}\sum_{i=1}^{N} CAR_{i(t_1,T)}$$

We observe that the CAR for female CEOs fluctuates to a greater degree than the CAR for male CEOs which gradually decreases in a stable rate. It is important to stress that the female sample is only 11.8% of the size of the male sample, implying that every change in observations or added observation may have a large impact on CAR. Furthermore, both the average daily CAR for male and female CEOs are mainly negative during the event window, with the CAR for females experiencing a greater decline before it increases again preceding the appointment day (day 0). Thus, the CAR of female CEOs is on average positive, 0.042%, and higher than the CAR of male CEOs, -3.673%, on the appointment day. It is important to stress that the graph is only performed for illustrative purposes and the variations in the financial performance prior the appointment date do not statistically assess the probability of appointing a female CEO. Therefore, the multivariate logistic regression is performed.

The difference between the means of the CAR for day 0 is tested using a two-sample t test and is not significant (*p* = 0.6656).

3.2 Main results

This section covers our regression results. Multiple regression models are run, based on regression model 1, until a final regression model is presented consisting of all variables. See Table 7 and 8 for the regression results.

To test the research question defined in the introduction, a logistic regression is used. The answer to the question mainly relies on the value of the odds ratio of the CAR variable. An odds ratio above 1 indicates that the probability of appointing a female CEO is higher than for a male CEO given an increase in CAR.

The regression model 1 hence consists of gender as the dependent variable and CAR as the independent variable. Subsequently other categorical groups of variables are added to determine how the model's explanatory strength is improved, meaning whether the other variables may help to reduce the omitted variable bias. The categorical groups of variables are added one at a time, allowing us to see each group's effect on the regression, meaning how the odd ratios change when additional variables are added. The extended model contains all categorical variables, excluding the dummy variables that are omitted due to multicollinearity and the year variables that are omitted due to perfect failure prediction or multicollinearity.

When running regression model 1, it is possible to observe that CAR has an odds ratio above 1. The odds ratio is not significant though and the regression only manages to perform a "pseudo-R^2" of 0.0012.[7] The regression model 6, experiences an increase of pseudo-R^2 to 0.1673. We observe that in regression model 6, the firm size small has a high predicting power with an odds ratio of about 13.2 and a significance level of 0.002, meaning that it is more probable that a woman is appointed to a small company compared to a mid-sized company. Furthermore, the other variable included for company size, large, has an odds ratio of about 1.3, meaning that there is not much higher probability that a large company appoints a woman than a mid-sized company. Unlike small, large is not significant. In addition, compared to the omitted industry variable, services and goods, it is more likely that a company within the financial sector appoints a female CEO than that to a services and goods company. The finance

[7] The "pseudo-R^2" is an estimated goodness-of-fit measure for logistic regressions

category has an odds ratio of 11.2 and a significance level of 0.013. Education has a positive odds ratio, meaning that it has a positive correlation with appointments of female CEOs. Age does not really provide any predicting power as the odds ratio is close to 1. The similarity in probabilities in age is probably due to the fact that both male and female CEOs in this data set are of about the same age. Furthermore, the binary variables for previous CEO roles and industry experience both present odds ratios below 1, meaning that it is less probable for a female CEO to possess this type of experience compared to a male CEO. We can also observe that it is more likely that a company recruits a female CEO from within the company. Lastly, observing CAR in regression model 6, the independent variable is still larger than 1, with an odds ratio of 1.17. This implies that an increase in CAR slightly increases the probability of recruiting a female CEO. As observed in both regression model 1 and model 6, there is a positive correlation between CEO appointments of women and previous financial company performance. As the empirics contradict the hypothesis of this study, it is not possible to reject the null-hypothesis, meaning that we cannot conclude a negative correlation.

3.3 Robustness Test

Robustness tests of our study are conducted to establish how accurate and stable the regression models are. The objective of the tests is to determine how large the change in the coefficients of the independent variables is when the model is altered by either adding, removing or changing variables. Small changes in the coefficients indicate structural validity of the regression model 1.

To begin with, we observe the changes in CAR when adding other independent variables. In regression model 1, CAR has an odds ratio of 1.25. This ratio fluctuates in the ranges of 1.13 to 1.25 throughout the construction of the extended regression, where we see a final CAR odds ratio of 1.17. In other words, the change in CAR is modest. The company size small increases however largely from around 4.5 to almost 14 in odds ratio when adding the sectors, making it a lot more predicting compared to the mid-size in this combination. The regression model 6 features an odds ratio for small of roughly 13.17 and finance of 11.25, indicating a relatively stable progression after adding the categorical industry variables throughout the construction of the model. The large fluctuations in variable coefficients could indicate that our regression model has flaws and that independent variables are correlated.

Additionally, another robustness test is performed using change in return on assets as an alternative performance measure, allowing us to look for structural validity and to use an objective performance measure. The new performance measure used, ROA, is an accounting-based measure that explains the profitability of a company in relation to its total assets. The measure gives investors an understanding of how well a company transforms invested capital, total assets, into profit. Given that the measure takes both debt and equity financing into account, it provides investors with an indication of the company's performance regardless of its capital structure. The variable used in this robustness check is defined as the percentage change in ROA between 250 trading days before the appointment to the day of the appointment $(dROA_i)$. Unlike the CAR variable which is based on time series data, the ROA variable is simply the change between two reported accounting values. This allows us to see the development of the return on assets and keeps the variable in relative terms to the company and sector, as ROA may differ significantly across various industries. The underlying data to construct this variable is only available for 23 women (two missing) and 201 men (ten missing). The loss of observations is not ideal given our already small sample. On the other hand, as the amount of omitted observations is low, the results should still be able to provide explanatory value. Thus, regression model 7 is built on the same foundation as regression model 6, meaning that it contains size, industry, experience and year variables, only with CAR being replaced by change in ROA.

$$gender_i = \alpha + \beta_1 dROA_i + \beta_2 size_i + \beta_3 industry_i + \beta_4 age_i + \beta_5 highed_i + \beta_6 insiderec_i + \beta_7 prev.CEO_i + \beta_8 induins_i + \beta_9 year_i + \varepsilon_i$$

The regression results differ from the original regression yet feature certain similarities. Most coefficients remain similar, although the variables with prominent odds ratios, small, finance and year 2005, drop somewhat, whilst other slightly increase. In terms of the performance variable, the difference becomes more noticeable. The odds ratio of the ROA variable is around 0.98, implying that it is less probable that a woman would be appointed as a CEO given a positive increase in ROA. In other words, in this case, we find a negative correlation between the performance of the company and the appointment of a female CEO. The coefficient of the accounting variable is not statistically significant (p = 0.744), but still allows us to make interpretations. In terms of testing the robustness of the logistic regression, it is difficult to interpret the structural validity. The changes are not large in terms of absolute values, neither for the performance variable nor for the other control variables. However, the interpretation of the results and the outcome of this study change drastically given the minor change in terms of absolute values.

3.4 Other Results: Interaction Variable

Ryan and Haslam (2005) observe a correlation between the overall stock market performance and the appointment of female leaders. In their study, they conclude that "...women are particularly likely to be placed in positions of leadership in circumstances of general financial downturn and downturn in company performance" (Ryan & Haslam, 2005, p.7*)*, meaning that when the stock market performs badly, it is more likely that a female CEO is appointed rather than a male one. To test this, we calculate the average market return for each CEO for the 120 days prior to the appointment date and create a dummy variable that assumes 1 if the stock market has been negative on average (below 0) during the observed period. This variable allows us to take general financial performance as a controlling factor into consideration when running the regression. An interaction variable is created by multiplying the CAR variable with the market return dummy variable ($(Rmneg * CAR)_i$). The new regression model hence only features the cumulative abnormal returns of CEOs that were appointed prior to a general financial downturn.

$$gender_i = \alpha + \beta_1 (Rmneg * CAR)_i + \beta_2 size_i + \beta_3 industry_i + \beta_4 age_i + \beta_5 highed_i + \beta_6 insiderec_i + \beta_7 prev.CEO_i + \beta_8 induins_i + \beta_9 year_i + \varepsilon_i$$

The new regression model has an insignificant odds ratio slightly below 1 indicating that women are less likely to be appointed to CEO roles in times of financial downturn given an increase in CAR and thus shows tendencies for the glass cliff.

3.5 Regression Prediction

Classification Matrix

In order to understand of how well the regression models perform in terms of predicting the gender of the CEO given the incorporated variables in the regressions, the classification rate of regression model 6 is determined. When using the standard cut-off rate, which is 0.5, we get 8.00% in sensitivity rate, meaning two out of 25 women are correctly classified as women. Given the highly skewed data sample in terms of gender ratio, we calculate the cut-off rate for the classification, meaning that every observation that has a prediction rate above of cut-off rate is classified as a female. Our objective is hence to determine a cut-off point that allows us to optimise classification by maximising both sensitivity and specificity rates (Hosmer & Lemeshow, 2000). By using the Youden Index to determine the optimal cut-off rate of 12.91%, we get an overall classification rate of 73.73%. The sensitivity rate is 76.00%, meaning that 19 women are correctly classified. The specificity rate for this model is 73.46%, meaning that 155 men were correctly classified. See Table 11 for results regarding the Classification Matrix. Given the small sample of women, every additional correctly classified woman increases the sensitivity rate by 4.00%, whilst the specificity rate only increases by 0.47% for each additional correct classification of a man.

The AUC, the area under the Receiver Operating Characteristic curve, is also helpful in determining the accuracy of how the models separate between the two genders. Here we focus on how the distinction between genders is improved from regression model 1 to 6. In Table 12 we can observe that the regression model 1 has an area of 0.5416, meaning that the model poorly distinguishes between the two genders and that the model does not discriminate between genders. Hosmer and Lemeshow (2000) claim that an AUC of 0.5 does not discriminate between genders, 0.7 to 0.8 provides acceptable discrimination, 0.8 to 0.9 is considered excellent and an AUC over 0.9 provides outstanding discrimination. Regression model 6 manages to deliver an AUC score of 0.7943, which is higher than regression model 1 and is almost to be considered excellent discrimination. This result shows that the additional variables, and not only company performance, play an important role in determining the sex of the appointed CEO.

Variance Inflation Factor

A Variance Inflation Factor, VIF, test is conducted to determine the multicollinearity of the regression model 6 to further determine how stable the model is.[8] Multicollinearity can be determined either with Pearson's Correlation Matrix or a VIF test. Since our data is not solely continuous, Pearson's Correlation Matrix is therefore not considered a suitable measure, thus only the VIF test is performed (Coolidge, 2000). Acceptable maximum VIF levels have been widely speculated by different scholars with some insisting ten as a recommended level (Hair, Anderson, Tatham, & Black, 1995; Kennedy, 1992; Marquardt, 1970), whilst other arguing for a more conservative level of five (Rogerson, 2001).

When performing the VIF test, presented in Table 13, we observe three very high VIF values. Age has a VIF value of 19.51, which is very high in this context implying that movements in the other independent variables explain up to 94.87% of age and that the age variable might be considered redundant. This could be due to the fact that most CEOs are about the same age regardless of gender. Continuing, we notice that higher education has a VIF of

[8] Multicollinearity implies a high degree of linear correlation between an independent variable and another. This may allow small changes in data to cause large changes in the predicted coefficients and likewise inflate the standard errors of the coefficients

10.56. This VIF is also considered high according to the levels presented by the different scholars. Most CEOs in the data are highly educated, 96.00% of the female CEOs and 90.52% of the male CEOs, indicating low variation. As with age, this implies that the variable is redundant. Industry insider has a high VIF value of 8.92. The same logic is to be applied here as 88.00% of female CEOs and 86.73% of the male CEOs have industry experience. The remaining variables have VIF values ranging from 1.09 to 3.98, which is considered acceptable even on a more conservative level. We also observe that the VIFs are higher for variables where a larger share of the sample possesses that trait or has similar values. Overall, the regression model 6 has an acceptable VIF of 4.05. Some variables may be considered redundant but are included as they are considered to pose economic significance.

4 Results review and mechanisms

4.1 Commentary of results

Company performance

When conducting the robustness test on our regression using return on assets or controlling for general financial downturn, we find conflicting results to what is found when using CAR as the main independent variable. None of the odds ratios of the previously mentioned variables are significant nor do they present particularly large differences in probabilities between genders. The odds ratio of the variables for CAR, ROA and CAR in general financial downturn are 1.17, 0.98 and 0.98 respectively, implying that the probability of selecting a female CEO is around 50% in all three cases. In other words, neither of the variables present particularly strong cases for their findings, that is a positive or a negative correlation between gender and company performance.

Implications of sample sizes

Observing the line chart in Graph 1 displaying the average cumulative abnormal returns over time before the appointments of women and men respectively, we notice that the line for women is fluctuating more than that of men. This difference is also found by Ryan and Haslam in 2005 and they consequently suggest that the volatility is caused by real differences between the companies that select women and those that select men. However, also impacting the deviating volatility between genders could be the difference in sample sizes. As the female sample is about one tenth of the male one, it is possible that the average female CAR is more volatile due to the few attainable observations of female CEOs. This bias is called sample size neglect or representativeness bias and occurs when inferring too much from a small sample and ignoring the difference in variances that depends on sample size (Bodie, Kane & Marcus, 2014). The difference in volatility is confirmed when observing the standard deviations of the average CAR for each day in Table 4.[9]

For us, our small sample size imposes further implications for the inference of our results. The estimators are less precisely computed than they would have been if we had used a larger sample. Also, small samples can lead to larger critical values. Both of these factors make it difficult to obtain significant results (Wooldridge, 2016). In other words, the fact that our sample is small could explain why a multitude of our results are insignificant. More importantly though, the small sample impose implications in drawing accurate conclusions for the population. We are able to observe tendencies but cannot extrapolate them. In addition, it is possible that the estimated odds ratios are inaccurate as a result of the small sample. In their article, Nemes, Johansson, Genell and Steinbeck (2009) show that odds ratios in logistic regressions based on small samples are overestimated and shift away from one. We therefore need to be careful when drawing conclusions from the results and not put too much emphasis on the size of the odds ratios in our regression models.

Women and the Fama-French theory

A clear majority of women, 76.0%, work within the small company segment, in comparison to 50.7% of the male CEOs. According to the "Fama-French Three Factor Model", companies with smaller market capitalization have greater alphas. Greater returns hence indicate a premium on small companies (Bodie, Kane & Marcus, 2014). Given that a larger share of women work within this segment, it is possible that the higher average CARs could be explained by the presented theory. Hence, the inequality that reigns between the sexes in this case, could theoretically be the explanatory factor for the surpassing preceding financial performance among companies that later appoint female CEOs. In other words, the inequality in the distribution of genders in the size segments could actually counterwork the glass cliff in normal financial times.

[9] Even though the difference between genders is not large in absolute terms, put in perspective to the CAR they are more important

Effect of year

We document that few women are appointed during the early years of the selected time frame and that the number of appointed women gradually increases. When observing our obtained results, we note that the probability of appointing a female CEO in 2008 or 2015 is higher than for a male CEO candidate compared to the omitted years. This is especially true for 2015 where we find an odds ratio of 3.83. The higher odds ratio in 2015 is probably due to the relatively large number of seven women appointed that year, compared to the lower numbers in the other years. The reason for the large number of women appointed that year is difficult to determine and could be a coincidence. A possible explanation could be that there were intense debates in media about gender equality and enforcing gender quotas in company boards as a way of reducing the high inequalities between the genders in Sweden in 2014.[10] The underlying reason for the large interest in 2014 could be the fact that the Swedish General Election was held that year. Since there were discussions held on enforcing legal or monetary punishments towards companies that do not fulfil those possible quotas, it is likely that several companies hence chose a female CEO in 2015 to strive for greater gender equality at executive and board levels.

4.2 Difference in measures and mechanisms

Understanding conflicting results

In our study, we document conflicting results when using different measures of company performance. Two possible explanations for this disparity are identified. The correlation between accounting-based and stock-based performance measures has been greatly debated, arguing for a long-term correlation (Easton, Harris & Ohlson, 1992) and against it (Gentry & Shen, 2010).

Firstly, in their report, Easton, Harris and Ohlson (1992) present the phenomenon of accounting-based measures and stock-based measures correlating over long-term periods. This in turn implies that there might be short term deviations between measures. Based on that theory, it is possible that our conflicting results are due to a too narrow time frame for both measures and that uniform results can be obtained using longer time frame. Nonetheless, a longer period could also be unfavourable as some firms may switch CEOs multiple times during that period, making it hard to isolate the preceding performance relating to the correct appointment.

[10] This is to be seen by the large number of media articles published about gender quotas in 2014 and by the surge in popularity of the search term "könskvotering" (gender quota) in Google Trends, where we can observe a peak in that year

Secondly, another explanation for the inconsistent results using the two performance measures could be that the accounting and stock-based measures are fundamentally different in what part of an organisation that they reflect. According to the semi-strong efficient market hypothesis, on which the theory of event studies is based, stock prices should reflect all public market and company specific information (Bodie, Kane & Marcus, 2014). Also, stock-based measures reflect shareholders' and investors' perception of a company's future cash flows and its possibility to achieve business plans and expectations. Accounting-based measures on the other hand only provide an objective perspective of the company's actual performance up to the accounting date. Gentry and Shen (2010) argue that it is difficult to see a strong correlation between the two different measures as accounting-based measures are based on historical performance, whilst stock-based are based on future expectations. Therefore, a difference in the outcome of those different measures is hence expected.

Presence of mechanisms

Whether the results are linked to any mechanisms contributing to the glass cliff is difficult to determine. For instance, taking the signalling theory into consideration, women would be appointed to CEO positions when companies need to signal change. Our deviating study results may therefore reflect how managers handle and act differently depending on accounting or stock-based performances or depending on the health of the financial market. Linking this to the theory of signalling change by appointing a woman, it would indicate that decreasing accounting-based measures of performance and a general financial downturn would be more alarming to managers or company boards than declining stock prices solely in the own company. Moreover, the same is true for the "think crisis – think female" theory. If existing, our findings would imply that managers see decreasing return on assets or a general market decline as a more important "crisis" than that of a decrease in the company's stock prices. However, as we find no significant evidence for out hypothesis, we cannot conclude that these mechanisms are the underlying reason for our results.

Reasons for insignificance

The conflicting results found when performing a robustness test on our regression, possibly imply that our model has flaws. On the other hand, seen from a societal perspective, it is encouraging to conclude that our findings do not show any significant evidence for the glass cliff for female CEOs in Sweden. Hence, it is possible that the Swedish labour market is just highly unequal in leadership positions, especially in CEO positions, and that underlying stereotypical perceptions contributing to the glass cliff are not present in Sweden. In other words, the findings imply that once Swedish women seeking to become leaders have come past the glass ceiling, there is no significant evidence that their positions are more precarious than that of the male leaders.

We find two possible explanations for why there is no significant evidence for the glass cliff for female CEOs in Sweden. To begin with, Sweden's feminine values, which it possesses according to Hofstede's (1980) classification in the dimensions of the national culture, may be an explanatory factor to the lack of robust evidence for a glass cliff in Swedish CEO positions. The classification indicates that Sweden has high distribution of feminine values among the two genders, meaning that there is minimum difference of the emotional and social roles between the genders. It is therefore possible that gender biases, especially the bias of preference for stereotypically female traits in precarious leadership positions, are more limited in Swedish society. In other words, people do not consider men and women to be noticeably different. It is also possible that sexism and in-group favouritism exist to a lower degree in Sweden compared to nations classified as masculine such as the UK.

Second, the lack of significance might be caused by the limited sample size of female CEOs, making it difficult to distinguish statistically viable differences. It hence indicates that the results of our study might be the way they are by coincidence or that they are inaccurate. To determine whether the documented results are correct, further studies with larger sample sizes would have to be performed. With a larger sample size, the law of large numbers would assure that the sample is reflecting the true population (Newbold, Carlson & Thorne, 2013). Our sample constitute a large part of the population as we merely have removed the observations that would bias our sample. Finding a larger sample without increasing the time frame, investigating more countries or including appointments such as of interim CEOs, would thus not be possible. However, going longer back in time to find a larger sample would probably not be particularly rewarding as few women were appointed CEOs in the beginning of our time frame. Including other countries would entail changing focus from being a study on Sweden and finally including all observations regardless of when or why the appointment was conducted could also affect the results of the regression as both the appointment rationale and the stock price could deviate when appointing for example interim CEOs.

5 Conclusion

We investigate the prevalence of a phenomenon called the glass cliff in Sweden by studying the correlation between company performance of Swedish listed companies with appointments of CEOs by primarily using cumulative abnormal return. Focusing on CEO appointments to investigate the glass cliff allows us to include observations more similar than what would have been possible focusing on board members in general. Also, using a stock-based measure of performance such as cumulative abnormal returns as our primary measure of company performance permits us to compare our results to those of archival research. Our work speaks to archival research that provides conflicting evidence of the glass cliff using stock-based measures. We find no significant evidence for the glass cliff when using the stock-based measure of performance. In other words, we find a positive correlation between cumulative abnormal returns and appointments of female CEOs and not a negative one as predicted in the hypothesis.

On the other hand, when controlling for general financial downturn and when conducting a robustness test on our regression replacing the cumulative abnormal returns with change in return on assets, opposite results to those found when using the baseline stock-based measure appear. Even if the regressions do not present significant results, we find tendencies that support the glass cliff in CEO positions. We provide a discussion on the reason for the deviating results presenting suggestions that accounting based measures of performance or a financial market decline would be more threatening to managers or company boards than a decline in the own company stock price.

Our findings contradict the study made by Haslam, Ryan, Kulich, Trojanowski and Atkins (2009) but are in line with those of Adams, Gupta and Leeth (2009) and Ryan and Haslam (2005).

The inconsistencies in our results using different measures of company performance suggest that there is no strong evidence for the prevalence of the glass cliff for female CEOs in Sweden, something that is further affirmed by the insignificance of the results. The contributing factors to the inexistence of evidence might be the overall progressive stance on gender equality that Sweden constitutes and the small female sample available.

Our study contributes to research within Swedish gender equality in the corporate environment. Women are underrepresented in Swedish leadership positions, however, when investigating the glass cliff, we do not find significant evidence that female CEOs start out in a more deprived position than men. Whether the previous positions held by the appointed CEOs differ in precariousness depending on the gender of the CEO needs to be investigated in future research.

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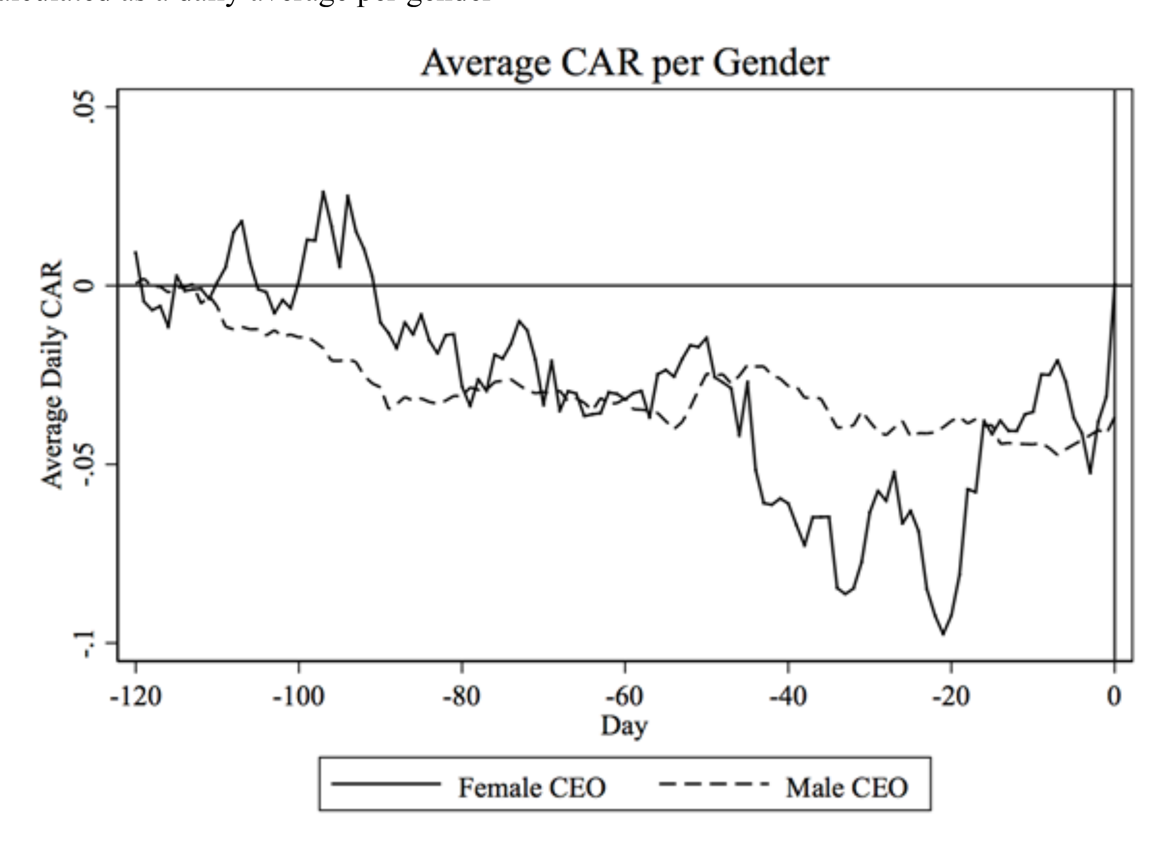
Appendix

Figures

Graph 1. Average CAR per Gender

The graph presents the development of the cumulative abnormal return per gender during the period of the 120 days preceding the appointment date. The cumulative abnormal is return is calculated as a daily average per gender



Tables

Table 1: Reasons for removals and development of sample

The table presents the total count of CEO observations in the original data sample and the reasons for removal. The count of observations per reason for removal is also specified. The sum of the removed and included observations equals the count of observations in the original dataset

Reasons for removal

	N
Original dataset	**709**
Before 2005	202
Before stock market introduction	88
Founder	28
Incorrectly gathered, only CEO for mother company	1
Interim CEO	80
Less than 250 days before stock market introduction	26
Less than 100 days until end of time frame	5
Less than 250 days from the start of time frame	1
Maternity leave	1
Not based in Sweden	16
CEO for short period of time	1
Part-time CEO	1
Same time as other company essential info	21
Two types of stocks on the market	2
Total removed observations	473
Total observations used in sample	236

Table 2: Definitions of variables

The table presents variable types and short descriptions for the dependent, independent and interaction variables used in all or some regression models presented in Tables 7, 8, 9 & 10. The type of the regression is disclosed prior the first comma sign

Dependent Variables	
gender	dummy, 1 if the CEO is a female.
Independent Variables	
CAR	continuous, cumulative abnormal return per CEO on appointment day based on the 120 preceding trading days
size	dummy for each category, 1 if CEO works in a small, mid or large-sized company
industry	dummy for each category, 1 if CEO works in a finance, healthcare, industrials or services & goods
age	discrete, age in years for the CEO on the appointment day
highed	dummy, 1 if CEO has university degree or higher
insiderec	dummy, 1 if CEO was recruited from within the company
induins	dummy, 1 if CEO has previous experience within the industry
dROA	continuous, percentage change in ROA based one the value closest to the appointment day divided by ROA 250 trading days back
prev.CEO	dummy, 1 if CEO has previously been CEO
Interaction Variables	
*(Rmneg*CAR)*	continuous, cumulative abnormal return per CEO on appointment day given that average market return was negative during the 120 preceding days

Table 3: Gender distribution in dummy variables

The table presents the distribution of the two sexes, as well as total, within the different dummy variables used in the regressions. If an observation possesses the quality implied by the dummy variable, it assumes the value 1 and 0 otherwise. The count of observations and the shares are expressed in percentage per each category are disclosed in the table

	Gender					
Variables	**Female**		**Male**		**Total**	
	N	(%)	N	(%)	N	(%)
Gender	25	10.6	211	89.4	236	100.0
University degree	24	96.0	191	90.5	215	91.1
Industry experience	22	88.0	183	86.7	205	86.9
Previous CEO experience	10	40.0	121	57.3	131	55.5
Recruited from inside firm	11	44.0	92	43.6	103	43.6

Table 4: Descriptive statistics for continuous and discrete variables

The table presents the distribution of the two sexes, as well as total, within the different continuous variables used in the regressions. The age disclosed is the age of the CEO at appointment date. Means and standard deviations are disclosed in the table and are calculated for the different sexes and total at a group level. Means for CAR for the time period of day -120 to 0 are not included as the only the means as of day 0 are relevant

	Gender					
Variables	**Female**		**Male**		**Total**	
	Mean	SD	Mean	SD	Mean	SD
Age	48	5.686	47	6.233	47	6.169
CAR (Day 0)	0.042%	0.406	-3.673%	0.406	-3.280%	0.405
CAR (Day -120 to 0)	-	0.373	-	0.330	-	0.335

Table 5: Gender distribution in categorical variables

The table presents the distribution of the two sexes, as well as total, within the different industries and company sizes. Company size is classified according to the different market capitalization ranges presented in Table 6. The count of observations and the shares are expressed in percentage per each category are disclosed in the table

	Gender					
Variables	**Female**		**Male**		**Total**	
	N	(%)	N	(%)	N	(%)
Industry						
Finance	6	24.0	27	12.8	33	14.0
Healthcare	6	24.0	29	13.7	35	14.8
Industrials	3	12.0	56	26.5	59	25.0
Services & goods	10	40.0	99	46.9	109	46.2
Total	25	100.0	211.0	100.0	236.0	100.0
Size						
Small	19	76.0	107	50.7	126	53.4
Mid	2	8.0	51	24.2	53	22.5
Large	4	16.0	53	25.1	57	24.2
Total	25	100.0	211	100.0	236	100.0

Table 6: Stock Market Segmentation

The table presents the ranges used for the stock market segmentation. The ranges are based on market capitalization and expressed in million Swedish Krona. The ranges are originally based on the Nordic Nasdaq stock market segmentation. assuming a 1 EUR to 10 SEK exchange rate

Market Capitalization Ranges

	M SEK
Small	Market Cap ≤ 1 500
Mid	1 500 < Market Cap ≤ 10 000
Large	Market Cap > 10 000

Table 7: Regression Models

The table presents the variables included in the regression models and their corresponding odds ratios. The p-value for each variable is presented in parentheses below the odds ratios. Furthermore. (*) symbols are disclosed next to the odd ratios. indicating if the variables are significant at a certain significance level. Finally. the total count of observations used in the regression and the pseudo-R^2 are presented. The pseudo-R^2 is a type of goodness-of-fit measure estimated for logistic regressions

	Model 1	**Model 2**	**Model 3**
gender			
CAR	1.253	1.149	1.214
	(0.658)	(0.763)	(0.729)
small		4.487^{+}	13.990**
		(0.050)	(0.003)
large		1.913	2.059
		(0.466)	(0.428)
finance			11.171**
			(0.009)
healthcare			1.872
			(0.290)
industrials			0.733
			(0.673)
constant	0.119**	0.040**	0.011**
	(0.000)	(0.000)	(0.000)
Observations	236	236	236
Pseudo R^2	0.001177	0.042085	0.113639

Exponentiated coefficients; *p*-values in parentheses
Omitted variables are excluded
$^{+}$ $p < 0.1$. * $p < 0.05$. ** $p < 0.01$

Table 8: Regression Models

The table presents the variables included in the regression models and their corresponding odds ratios. The p-value for each variable is presented in parentheses below the odds ratios. Furthermore. (*) symbols are disclosed next to the odd ratios. indicating if the variables are significant at a certain significance level. Finally. the total count of observations used in the regression and the pseudo-R^2 are presented. The pseudo-R^2 is a type of goodness-of-fit measure estimated for logistic regressions

	Model 4	Model 5	Model 6
gender			
car	1.226	1.129	1.169
	(0.708)	(0.823)	(0.768)
small	14.065**	11.893**	13.174**
	(0.003)	(0.003)	(0.002)
large	2.028	1.684	1.298
	(0.436)	(0.571)	(0.793)
finance	10.752*	9.144*	11.247**
	(0.011)	(0.022)	(0.013)
healthcare	1.777	1.840	2.078
	(0.339)	(0.328)	(0.248)
industrials	0.773	0.743	0.725
	(0.721)	(0.676)	(0.651)
highed	1.851	1.879	1.481
	(0.547)	(0.543)	(0.693)
age		1.030	1.018
		(0.382)	(0.618)
prev.CEO		0.533	0.534
		(0.174)	(0.211)
induins		1.101	0.812
		(0.899)	(0.794)
insiderec		1.053	1.199
		(0.915)	(0.714)
y2005			0.628
			(0.694)
y2008			1.066
			(0.956)
y2014			0.620
			(0.663)
y2015			3.828*
			(0.025)
Constant	0.006**	0.002**	0.004*
	(0.000)	(0.001)	(0.013)
Observations	236	236	236
Pseudo R^2	0.115946	0.130178	0.167285

Exponentiated coefficients; p-values in parentheses
Omitted variables are excluded
+ $p < 0.1$. * $p < 0.05$. ** $p < 0.01$

Table 9: Robustness Model

The table presents the variables included in the regression model and their corresponding odds ratios. The p-value for each variable is presented in parentheses below the odds ratios. Furthermore. (*) symbols are disclosed next to the odd ratios. indicating if the variables are significant at a certain significance level. Finally. the total count of observations used in the regression and the pseudo-R^2 are presented. The pseudo-R^2 is a type of goodness-of-fit measure estimated for logistic regressions. Observations are fewer here than in the original regression due to missing values

	Model 7 - Robustness
gender	
dROA	0.979
	(0.744)
small	12.225^{**}
	(0.003)
large	1.383
	(0.739)
finance	8.069^{*}
	(0.027)
healthcare	1.761
	(0.381)
industrials	0.510
	(0.411)
highed	1.000
	(.)
age	1.020
	(0.624)
prev.CEO	0.407^{+}
	(0.087)
induins	0.896
	(0.891)
insiderec	1.278
	(0.631)
y2005	0.617
	(0.681)
y2008	1.236
	(0.846)
y2014	0.888
	(0.917)
y2015	2.685
	(0.125)
Constant	0.008^{*}
	(0.022)
Observations	205
Pseudo R^2	0.159264

Exponentiated coefficients; p-values in parentheses
Omitted variables are excluded
$^{+}$ $p < 0.1$. * $p < 0.05$. ** $p < 0.01$

Table 10: Regression Models

The table presents the variables included in the regression model and their corresponding odds ratios. The p-value for each variable is presented in parentheses below the odds ratios. Furthermore. (*) symbols are disclosed next to the odd ratios. indicating if the variables are significant at a certain significance level. Finally. the total count of observations used in the regression and the pseudo-R^2 are presented. The pseudo-R^2 is a type of goodness-of-fit measure estimated for logistic regressions

	Model 8
gender	
Rmneg*car	0.984
	(0.982)
small	13.250**
	(0.002)
large	1.312
	(0.786)
finance	11.220*
	(0.013)
healthcare	2.091
	(0.241)
industrials	0.743
	(0.668)
highed	1.461
	(0.712)
age	1.019
	(0.607)
prev.CEO	0.531
	(0.209)
induins	0.824
	(0.808)
insiderec	1.191
	(0.726)
y2005	0.656
	(0.707)
y2008	1.099
	(0.935)
y2014	0.615
	(0.657)
y2015	3.834*
	(0.025)
Constant	0.004*
	(0.012)
Observations	236
Pseudo R^2	0.166823

Exponentiated coefficients; p-values in parentheses
Omitted variables are excluded
$^{+}$ $p < 0.1$. * $p < 0.05$. ** $p < 0.01$

Table 11: Classification Matrix for regression model 6

The table presents the classification matrix for the extended regression model. model 6. The cut-off rate used. 0.12907. is determined using the Youden Index. The counts and rates for the correctly and incorrectly classified observations are presented. Sensitivity tells the rate of correctly classified female CEOs and specificity tells the rate of the correctly classified male CEOs. Finally. a total classification rate is presented which is based on the total count of correctly classified women and men divided by the total number of observations

	True		
Classified	D	~D	Total
+	19	56	75
-	6	155	161
Total	25	211	236

Classified + if predicted Pr(D) >= .12907
True D defined as gender != 0

Sensitivity	Pr(+ | D)	76.00%
Specificity	Pr(- | ~D)	73.46%
Positive predictive value	Pr(D | +)	25.33%
Negative predictive value	Pr(~ D | -)	96.27%
False + rate for true ~D	Pr(+ | ~D)	26.54%
False - rate for true D	Pr(- | D)	24.00%
False + rate for classified +	Pr(~ D | +)	74.67%
False - rate for classified -	Pr(D | -)	3.73%
Correctly classified		73.73%

Table 12: Area Under Receiver Operating Characteristic Curve

The table presents the AUCs. Areas under Receiver Operating Characteristic Curves. for the regression model 1 and 6. Standard errors and confidence intervals for a 95% significance level for the AUC of each regression are also presented. Furthermore. the table includes a t-test for difference between the two AUC areas and discloses chi^2 and p-values for that test

		ROC		**Asymptotic Normal**	
	Obs	**Area**	**Std. Err.**	**[95% Conf. Interval]**	
Model 1	236	0.5416	0.0721	0.40029	0.68293
Model 6	236	0.7943	0.0397	0.71651	0.87212
Ho: area (Model 1) = area(Model 6)					
chi2(1) =	9.64	Prob>chi2 =	0.0019		

Table 13: Variance Inflation Test

The table presents the Variance Inflation Test values and tolerance values for each variable in extended regression model. model 6. Variance Inflation Test levels below 5 are considered acceptable even by conservative means

Variable	VIF	1/VIF
age	19.51	0.051259
highed	10.56	0.094737
induins	8.92	0.112147
small	3.98	0.251021
prev.CEO	2.54	0.393789
insiderec	2.22	0.449577
large	2.21	0.452473
industrials	1.84	0.544804
finance	1.63	0.611983
healthcare	1.51	0.662607
y2015	1.31	0.765316
y2014	1.20	0.830137
y2008	1.15	0.869889
y2005	1.12	0.889082
car	1.09	0.920491
Mean VIF	4.05	