STOCKHOLM SCHOOL OF ECONOMICS
Department of Accounting
Master Thesis in Accounting and Financial Management
Tutor: Assistant Professor Martin Carlsson-Wall
Fall 2015

Sports merited CEOs and firm performance

- An empirical study of sports merited CEO characteristics and firm performance

Adrian Strömberg[a] **Victor Wänerfjord**[b]

This thesis examines whether personal characteristics of chief executive officers (CEOs) - sports merits from endurance challenges - influence accounting firm performance. The linkage between executive traits and firm outcomes is well established and recognized in academia. Furthermore, adult sports engagement in long distance races has increased and individuals who successfully cope with endurance performance are considered to possess a cocktail of traits cherished by executive recruiters. For the years 2003-2012, we have defined Swedish CEOs for small and medium-sized enterprises (SMEs) as sports merited if they have completed demanding endurance challenges. Using data on accounting firm performance for SMEs matched with data on sports merited CEOs we quantitatively analyze whether firms run by sports merited CEOs tend to perform better than firms whose CEOs are not defined as sports merited. Notably, the insignificant results found speak in favour of problematizing the current literature. Further, as executive recruiters considers experienced based CEO personal characteristics to be of importance, this study adds complexity and facilitates a progress toward a comprehensive understanding of the characteristics of CEOs and firm performance.

Keywords: *Firm Performance, SMEs, Sweden, CEO Characteristics, Upper Echelons, Sports*
Date: 7th December, 2015

[a]22127@student.hhs.se
[b]22120@student.hhs.se

Authors' note

We would like to express our deepest gratitude to our tutor, Assistant Professor Martin Carlsson-Wall, for helping us receiving access to data, his enthusiasm and invaluable guidance throughout the writing process. We also wish to thank Acting Professor Henrik Nilsson for his help with data composition and support in the method process. Furthermore, we would like to thank Associate Professor Per-Olov Edlund for his fruitful insights in statistical matters.

Lastly, we want to thank friends and family for their support throughout the writing process.

Adrian Strömberg Victor Wänerfjord

7th December, 2015
Stockholm School of Economics
Stockholm

Table of contents

1 Introduction

"…staying trim is now virtually required for anyone on track for the corner office"
– Executive recruiters discuss CEO traits and leadership ability, Wall Street Journal[1]

Job demands and responsibilities of top managers are increasing (Hambrick et al., 2005; Neck et al., 2000), and staying fit is argued to be crucial for corporate leaders in order to manage their mission successfully (Kwoh, 2013). In addition to being beneficial for the health, people who engage in sports activities are often associated with certain characteristics, which are considered valuable in business life and sports merits are often looked upon favourably by recruiters (Kniffin et al., 2015). In Sweden and many other countries, the popularity of long distance training has increased remarkably over the last decade and there are more and more corporate leaders engaging in endurance challenges (Limbach & Sonnenburg, 2015; Palmgren, 2014).

The effect of top management and their characteristics on firm outcome is a research area which has received considerable attention over the years by scholars in accounting, finance and management (Hambrick, 2007; Kaplan et al., 2012; Hiebl, 2014). Previous studies have covered a wide range of top management and CEO characteristics from observable ones such as age, tenure and education, to more unobservable characteristics as general ability and self-efficacy (Kaplan et al., 2012; Westerberg et al., 1997). Most of this research is anchored in the upper echelons[2] theory introduced by Hambrick and Mason in 1984, which argues that firm strategy and performance are reflected in corporate leaders' psychological and observable characteristics. This area of research is interesting as ever as it has been found that corporate leaders' impact on firm performance has become more significant over the years (Quigley & Hambrick, 2015). Considering the development of the fitness movement, the popularity of endurance races and the presumed positive effects of sports involvement, there have been surprisingly few empirical studies on sports related CEO characteristics. Nevertheless, a recent study concerning this field is written by Limbach and Sonnenburg (2015), and they found that firms managed by physically fit CEOs are higher valued and are more profitable than firms managed by CEOs considered not to be fit. They looked at CEOs in S&P 1 500 companies who have run a marathon in a certain year and used that as an indicator of fitness. The trait, physical fitness, is argued to be a temporal characteristic, which quickly can disappear if not being actively maintained.

However, there is a gap in the field of covering persistent characteristics, associated with sports merited CEOs who have a track record of successfully performing physical endurance challenges, and their effect on firm performance. Additionally, although small and medium-sized enterprises (SMEs) have a greater propensity of being dependent upon their CEO (Lubatkin et al., 2006), the existing research on CEO characteristics is primarily focused on large companies (Benmlech & Frydman, 2015; Limbach & Sonnenburg, 2015). The present state of knowledge implies a large unexplored area within this field even though long-term effects of sports participation and training have been well documented on a personal level.

[1] (Kwoh, 2013).
[2] Upper echelons are the individuals in the top of an organization.

Several studies have found that people active in sports during their youth on average earn a wage premium and demonstrate higher leadership ability than people not active in sports (Kniffin et al., 2015; Henderson et al., 2006b; Barron et al., 2000). Furthermore, it has been established that apart from having a positive impact on health, adult sport participation also has positive long-term effect on earnings (Lechner, 2009).

In light of the increased impact of CEOs on firm performance and the positive perception of athletes, it is meaningful to investigate if characteristics prescribed to athletic people with merits from performing demanding endurance challenges make them successful as corporate leaders. Among leadership experts, executive recruiters and media it is considered beneficial for individuals in top management positions to have merits from sports and possess physical fitness. There are although still unexplored fields within this area and hence a need for additional empirical research to determine whether this notion is reflected in reality or not.

With this study, we seek to contribute to the field of organizational research and more specifically, sports in business. We investigate whether characteristics of CEOs with sports merits from endurance challenges have a significant impact on firm accounting performance. This will help researchers and practitioners to better understand the economic value of having a sports merited chief executive. The study is conducted on Swedish SMEs as the CEO impact is argued to be more pronounced in smaller companies, hence the effect of different CEO characteristics should be easier to detect in smaller firms. In addition, given the extensive data used in this study and the large number of variables included in the analysis, this research will contribute to a better understanding of SMEs in the Swedish market. We add to the knowledge of which factors that are affecting SME accounting performance and how managerial characteristics affect firm outcome.

We will use a quantitative method, based on data on CEOs who have performed a demanding endurance challenge. To complete the challenge a considerable personal investment is required in terms of time, practice and motivation. This information is matched with company accounting data and cleansing techniques are applied to detect and ameliorate errors. First, in order to get a better understanding of the dataset, we present descriptive statistics and perform a correlation analysis between different variables. Then, ordinary least squares (OLS) regressions are applied, using a model controlling for observable heterogeneity in CEO and firm characteristics. The regression analysis allows us to examine which variables that affect SME performance and most importantly, if the sports merits variable has any significant explanatory power. In addition to OLS regressions, we also apply two-stage least squares (2SLS) regressions to handle endogeneity issues. Two different metrics are used to measure accounting firm performance, one profitability based, return on assets (ROA), and one market based, growth in sales (GIS). Standard errors are clustered on firm level and fixed effects on year and industry are used to control for variations over time and industries. In addition to analysing the full sample a matched sample method has been applied in order to validate the results and mitigate the risk of model dependence. Matching is based upon year, industry, firm size, firm age and CEO age, and the matched sample is analyzed using both difference in means as well as the regression models used on the full dataset. Also, a number of robustness tests have been applied to the models used in the analysis.

The paper will start with a review of the previous literature in the fields of the upper echelons theory, prosperity of athletes and the effects of CEO characteristics on firm accounting performance. Secondly, based on the previous research, hypotheses are developed. Thirdly, data compilation and selection are described. Fourthly, we will discuss the model development process and the methodology used for analysis. Fifthly, the initial results are presented based on descriptive statistics univariate analysis. Sixthly, results from the regressions are analyzed. Seventhly, a discussion and analysis of the findings in the study in relation to the previous literature. Finally, conclusions, limitations and suggestions for future research will be presented.

2 Previous research

2.1 Upper echelons theory and CEO impact on firm performance

A key question within organizational theory is why organizations act as they do. The managerial impact on firm performance is a field that have received considerable attention over the past decades. The well-established agency theory implicitly assumes that managers have a considerable ability to influence firms' strategic decisions and subsequently their performance. However, the fact that managers have a significant impact on firm performance has not always been the general conviction. In one of the early and most cited studies in the field of managerial impact on firm outcome by Lieberson and O'Conner's (1972), the results indicate that corporate leaders explain only a small portion of the variance in firm performance. In the study, the authors discuss the subject of a leader's ability to implement goals, and argue that this ability is not only dependent upon the persons' distinctive qualities, but also by environmental and social limits.

In 1984, Hambrick and Mason released one of the most influential papers on top management and firm performance in which they synthesized previous research around the upper echelons perspective. According to the upper echelons theory, organizational outcomes – strategic choices and performance levels – are partially predicted by managerial background characteristics. Hambrick and Mason argue that the emphasis in organizational research should be on top managers, since the organizational outcomes are viewed as reflections of the values and cognitive bases of the powerful actors in the organization. The business press has for a long time cited relationships between the background of the manager and firm strategy. However, up to the point of the paper by Hambrick and Mason (1984), this perspective had not been tested in a comprehensive or systematic manner.

When a strategic decision maker must handle a complex situation, made up by a plethora of phenomena exceeding the amount possible to comprehend, the manager's cognitive base and values will create a screen between her eventual perception of the situation and the actual one. Managerial characteristics such as age, tenure in organization, functional background, education, socioeconomic roots, and financial position are emphasised in this paper as factors that can influence firm outcome. However, Hambrick and Mason (1984) also argue that psychological measures may contain less noise than demographic indicators and hence be better predictors of firm outcome. See *Figure 1.* in the end of this section for an illustration of Hambrick and Mason's (1984) upper echelons perspective of organizations. The upper echelons

model has been argued to work both as a theoretical framework and as a research methodology (Carpenter et al., 2004).

2.1.1 Factors affecting CEO impact

Since the paper by Hambrick and Mason, upper echelons and their impact on company behaviour and performance have been a popular research area among scholars in accounting, finance and management (Hambrick, 2007; Kaplan et al., 2012; Hiebl, 2014). Several of the studies performed have looked specifically at CEOs and their influence on firms' outcome in different aspects. Many results show how CEOs single handedly have a considerable impact on firm strategy and performance, but that the magnitude of their influence and how much their personal characteristics are reflected in the decision making are conditional on environmental factors.

One aspect influencing the CEO's effect on organizational outcome is CEO discretion. (Hambrick, 2007). Discretion stems from organizational factors, environmental conditions, and from the executives themselves. How well the upper echelons theory predicts organizational outcomes stands in direct proportion to managerial discretion. Internal and external constrains can cause executives to be very limited in the choices they can make (Crossland & Hambrick, 2007).

Institutional and cultural differences lead to variations across countries in CEO power and impact on firm performance. Crossland and Hambrick have done two studies examining the variations in CEO effects between different markets. According to their findings in a three nation comparative study from 2007, CEOs in the US affected their organizations the most, followed by CEOs in Germany and Japan respectively. In 2011, they conducted a similar study but this time 15 countries were analyzed, including Sweden. The results in study indicate that the effect of Swedish CEOs on firm performance is not as high as in the U.S., but in parity with many other European countries and noticeably higher than the effect of CEOs in Asian countries such as Japan. This suggests that CEO characteristics should be reflected in firm strategy and performance also in a Swedish setting.

Just as Hambrick (2007), several other studies have concluded that the effect of CEO characteristics on firm performance is conditional. Examples of environmental conditions affecting CEO impact on firm outcome are stability of the market and if the CEO is internally or externally hired (Biggerstaff et al., 2015; Waldman et al., 2001). The level of job demands faced by executives is another important aspect. If job demands are slight, moderate or high are of significant importance when evaluating the actions of the managers (Hambrick et al., 2005). Executives under heavy job demands are forced to take mental shortcuts and fall back more on experience, resulting in that CEO characteristics will be more reflected in strategy and performance. Strategic rationality is expected when executive job demands are slight or moderate, in comparison to bounded rationality[3], which is more likely when executive job demands are high (Hambrick, 2007). Today, most top managers are considered to be under heavy demands due to a current business environment characterised by fast changes and internationalisation.

[3] Bounded rationality is the type of rationality that individuals use in situations in which the environment is too complex in relation to their mental abilities (Dequech, 2001).

Furthermore, as institutions and cultures are altered over time, so is CEO impact. In a study by Quigley and Hambrick (2015) they isolate the proportion of variance in company performance attributable to CEOs, called the "the CEO effect". The findings indicate that the CEO effect has increased over time, which is in line with increasing perception of importance reflected in the press and media, in which some CEOs even have managed to achieve celebrity status. This indicates that studying CEO impact on firm performance is relevant as ever.

2.1.2 CEO impact on SME performance

Firm size is another important determinant for the level of CEO impact. Large firms often have complex structures with many hierarchical levels while smaller firms are less complex and the CEO is one of few, or even the sole decision maker, which makes the impact of the CEO on firm outcome more apparent in smaller companies (Lubatkin et al., 2006). Ling et al. (2008) managed to establish a relationship between CEO transformational leadership and firm performance in SMEs, a linkage that most studies on large companies have failed to prove. Furthermore, the authors found that transformational CEOs have a more pronounced impact on outcome in smaller SMEs than in bigger ones, giving further support to the claim that CEOs have a more significant influence on performance in smaller companies. These findings indicates that the propensity of establishing a relation between a certain CEO characteristic and firm performance should be higher in SMEs than in larger companies.

Previous literature studying the relation between CEO characteristics and SME outcomes have used different measures of performance. Westerberg et al. (1997), who found a significant impact of CEO characteristics on firm performance in small Swedish firms, used two categories of performance measures. Financial performance, which is measured as profitability and productivity; and market performance, measured in sales growth, market share and customer satisfaction. It is argued that SMEs tend to be profit- or growth-oriented but rarely both at the same time and that constant growth is not the main goal in many small companies. Further, it is argued that profitability and growth are distinct dimensions of firm performance, meaning that both metrics should be used in studies on small companies in order to gain a richer understanding. In the field of organizational research, the growth profitability nexus has received substantial attention over the years, particularly in SME studies, but no conclusive agreement has been reached regarding the association between the two (Yazdanfar & Öhman, 2015). This support the notion that both measures should be used to assess SME performance. To include one profitability measure and one market measure is also common practice in many SME studies, especially as financial market measures are not available since most firms categorised as SMEs are non-public (Aragón-Sánchez & Sánchez-Martin, 2005; Ling et al., 2006).

2.2 Sports merits and individual success

The medical and psychological literature has established the importance of regular training and its positive impact on both mental as well as physical health (Lechner, 2009). Today running and other types of training are very popular in Sweden and the number of participants in endurance challenges has been rising (Sandberg, 2011; Palmgren, 2014). Furthermore, individual endurance training such as running is a form of exercise argued to be very suitable for corporate leaders with a tight schedule due to its extreme flexibility (Limbach & Sonnenburg, 2015). Apart from having positive impact on personal health, recruiters often look upon training and

sports merits favourably when screening candidates for various positions (Kniffin et al., 2015). Furthermore, people engaging in sports activities are assumed to develop certain traits considered valuable also in business life for instance leadership ability and purposefulness (Williams, 2013; Kniffin et al., 2015).

2.2.1 Selection into sports

In Sweden, the organized sports movement is a force that engages and activates millions of people and the government has a long history of supporting the sport community. Some of the purported positive effects of sports participation are improved public health, creation of joy and providing people of all ages with a meaningful recreation (Norberg, 2014). Even though the governments in Sweden and many other countries, through financial support, try to engage people from different backgrounds to participate in sports, research show that selection into sports is not random. Household income and education level for example, are two factors positively related with sport participation (Farrell & Shields, 2002). Scheerder et al. (2005) studied adult sports involvement in Belgium and established that age, gender and social class are the most important factors influencing whether an adult is involved in sports or not. Men are more active than women, even though the gap was significantly reduced during the studied time period. Moreover, younger people and people from higher social classes are also more likely to participate in sports.

Motives for adult sport participation are diverse and varies from person to person. However, the overall sport psychology literature supports the notion that mastery of task orientation and intrinsic motivation is what encourages participation and achievement, rather than win orientation and emphasis on extrinsic rewards (Gill et al., 1996). Further, it has been found that runners and ultra-marathoners are very goal oriented and competitive, but that they score low on win orientation. Summers et al. (1982) studied reasons for running a marathon among first time runners and found that personal challenge was the main reason for attempting a marathon, and successful completion was associated with feelings of deep personal awareness and satisfaction. These findings indicate existence of heterogeneity in underlying characteristics across individuals engaging in physical endurance challenges and those who are not, as selection into sports is not random. In addition, successful execution of endurance challenges can affect self-regulation positively.

2.2.2 Success of athletes

Sports participation and outcome in other aspects of life is a well-studied area. Most of the research within the field is based on U.S. data where former high school and college athletes have been studied and compared to people who did not engage in competitive sports during their education. There are numerous studies showing that high school and college athletes do better in both business life and education (Barron et al., 2000; Henderson et al., 2006b; Lipscomb, 2007; Long & Caudill, 1991). However, not all results indicate a linear positive relation between sports participation and labour market outcome. Henderson et al. (2006b) found that even though college athletes on average earn a wage premium, the premium is skewed and more than half of the former athletes actually earn less than non-athletes. What they also could see was that college athletes earn more in the fields of business, military and manual labour, which indicates that athletes might possess characteristics that are better suited

in certain environments. Nevertheless, there are also findings suggesting that sports participation have no, or even negative impact on earnings and educational attainments (Howell et al., 1984; Maloney and Cormick, 1993). However, in the study by Maloney and Cormick, the negative relation could be explained by the students' background for most sports.

Common for all studies mentioned above, is that they have only looked at the outcome of people participating in sports during their teenage and early twenties. But there are also studies looking at the effects of adult sport participation. Lechner (2009) used German data in order to analyze the effects of adult sports participation and found that leisure sports participation has a sizeable positive long-term effect on earnings as well as health and subjective well-being. Intuitively Lechner argues that one might expect that the positive association between sports participation and earnings could be due to one or several channels. The three channels he brings up are: direct productivity effects due to improved health, social networking effects that are particularly relevant for sports performed in group and lastly that sports involvement might signal employers that an individual enjoys good health and is motivated. Lechner made a similar study on the effects of sports and exercise on labour market outcome in Canada (Lechner & Sari, 2015), and also in this study positive income effects were found. However, to reap the full long-term benefits, an activity level above the minimum requirements recommended by the World Health Organization (WHO), is needed. To conclude this section, previous research has looked at fitness and athletic involvement in different stages of life and, even though not all studies are conclusive, the overall results indicate that sports participation has positive effects on the individuals' success in the labour market.

2.3 CEO characteristics, merits and firm performance

As noted in section 2.1 a large body of literature indicates a significant impact of CEOs and their characteristics on firm outcomes. Furthermore, many studies have found that people with sports merits seem to be successful in many aspects of life on the individual level. Numerous studies have been conducted in which different CEO characteristics have been investigated and how they affect firm performance. However, up until today no study has empirically tested the relation between CEO sports merits and firm performance. In the below sections we will first outline a selection of previous literature looking at the impact of different CEO characteristics on firm outcome. Then, an insight into characteristics that could be prescribed to athletes, which might explain the good individual performance and positive perception of people with sports merits, will be presented.

2.3.1 CEO characteristics affecting firm outcome

A vast variety of CEO characteristics have been covered in previous research and most frequently studied are observable ones such as age, tenure, education and financial position (Benmelech & Frydman, 2015; Elsilä et al., 2013; Karami et al., 2005). However, the model developed by Hambrick and Mason in 1984 (see *Figure 1.*), shows that the upper echelons perspective is just as much about psychological characteristics as observable ones, making it a study field bordering to both psychology and business research.

Over the years, the interest for how CEO psychological characteristics affect firm strategy and performance has increased and several studies have been made within this area (Papadakis &

Barwise, 2002; Bertrand & Schoar, 2003; Herrmann & Datta, 2002; Hayward & Hambrick, 1997; Carmeli et al., 2011; Chatterjee & Hambrick, 2007; Kaplan et al., 2012). Examples of CEO attributes that have been studied in upper echelon's research are: hubris (Hayward & Hambrick, 1997), narcissism (Chatterjee & Hambrick, 2007), cognitive ability (Adams et al., 2014) and general ability (Kaplan et al., 2012).

Westerberg et al. (1997) is one of the few studies which has looked at the impact of CEO characteristics on firm performance in a Swedish setting. They analyze the impact of CEO characteristics on financial and market performance in small Swedish firms operating in turbulent environments. Three enduring characteristics of CEOs are considered; tolerance for ambiguity, self-efficacy and need for cognition. The results presented by Westerberg et al. show that the studied characteristics have a considerable impact on firms' financial- and market performance. In particular, the results show that perceived self-efficacy has a significant impact on market performance, while the relation with financial performance was insignificant.

Execution skills is a CEO characteristic studied by Kaplan et al. in 2012. They looked at companies involved in buyouts and venture capital transactions and how individual CEO characteristics relate to firm performance in such events. The results indicate that firm performance is positively related to the CEO's general ability and execution skills. The authors use factor analysis to capture variations in CEO characteristics and the two main factors capture peoples' general ability and peoples' interpersonal skills. However, the second factor also has negative loadings for characteristics such as fast, aggressive, persistent, proactive, high standard and accountable; characteristics that reflect executive skills. For venture capital backed firms the results indicate that the interpersonal-team factor is negatively related with performance. This is consistent with findings by Bolton et al. (2008), who show that communication- and coordination-related abilities are less important for venture capital transactions since venture capital funded companies tend to be smaller and hence requires less coordination. Both of these studies confirm that small companies are affected by the CEO's underlying ability, executive skills and perceived self-efficacy.

A study looking at experienced based characteristics of CEOs, is one by Benmelech and Frydman (2015). They analyze the linkage between CEOs in publicly traded companies with military service experience and corporate outcomes, financial policies and managerial decisions. The authors provide evidence that firms, with a CEO who has done military service, are associated with ethical behaviour and conservative corporate outcomes. For example, the likelihood for fraud is reduced with 70% if the CEO has military experience, and CEOs with military background pursue lower corporate investments, use lower leverage, and perform better in times of industry downturns. The results thereby indicate that experiences and merits from the past can have a sizable impact on underlying characteristics, which in turn are reflected in CEO decision making and firm outcome.

In the field of fitness and CEOs, Limbach and Sonnenburg (2015) presented a study in which they provide evidence for a positive impact of CEO fitness on firm profitability. Physically fit CEOs are further positively associated with firm value and M&A announcement returns. The effects are strongest for CEOs above median age, above median tenure and with high workload.

In this study, they look at CEOs in S&P 1 500 firms who have finished a marathon and use that as a proxy for fitness. The risk that fit CEOs might be in the reference group in the form of CEOs who perform other sports or participate in marathons is not covered in the study. According to the authors, it only means that the true effects of CEO fitness are underestimated. The study by Limbach and Sonnenburg is related to this one, but in contrast to their study, the main objective of this paper is to investigate more persistent characteristics of CEOs with sports merits rather than the fitness level in a certain year.

These two studies indicate that CEO experience and lifestyle can have a considerable effect on firm strategy and performance. However, Biggerstaff et al. (2014) show that CEOs who spend too much time on engagements outside office might shirk their responsibilities as corporate leaders. Looking at CEOs who play golf they found that firms with CEOs who consumed most leisure in the form of golf, were less profitable than other firms in the sample. The take away from this study is that even though some experiences and engagements outside of work can be good for firm performance, this might not be the case for all sports and that there could be a limit regarding how much time a CEO can spend on leisure sports without shirking other responsibilities.

2.3.2 Sports merits and CEO characteristics

Next, a more detailed look into characteristics associated with athletes and presumed beneficial for CEOs is provided. First, we will bring up research looking at more persistent personality characteristics of athletes that can help us explain their prosperity. Then, explanations linked to motivation, self-efficacy and locus of control, relating to the desire of facing new challenges and ability to overcome obstacles, are presented. Then, an outline of some literature which explain the success of athletes from a health and fitness point of view will be presented. Even though fitness is not the variable of interest in this study, it can help us to explain why athletes are expected to be successful in business. Furthermore, it is likely that people taking on a sports challenge of the magnitude studied in this paper maintains relatively good physical health also after completion of the challenge. Finally, this section will end with a review of selection into sports.

Personal traits of athletes

Traits often associated with athletes are purposefulness, hard work and exceptional teamwork skills (Williams, 2013). Sport psychologist Graham Jones argues, in a paper from 2008, that there are many similarities between star athletes and successful business people. He claims that both of these groups possess mental toughness, which he argues is the real key to achieve excellence in both business and sports (Jones, 2008).

Numerous empirical studies indicate that athletes possess or develop characteristics separating them from non-athletes. In a study from 2000, Barron et al. found evidence that much of the wage premium former high school athletes attained stemmed from their underlying characteristics. By identifying factors affecting sports participation they saw that ability and preference for leisure turned out to be the most influential parameters. When the authors controlled for ability, the relationship between athletic participation and educational and labour market outcomes became weaker. The reasoning behind this is that people with higher ability

and less preference for leisure are more likely to participate in athletic events. The results favour the interpretation of athletic participation as a proxy for heterogeneity in underlying characteristics of individuals in terms of ability and industriousness. These individuals would be more productive independent of prior participation in sports.

In addition, Kniffin et al. (2015) found that participation in competitive sports in high school, apart from being relevant for early job prospects and career status, is associated with higher levels of leadership later in life. Moreover, the authors found that ex-athletes exhibited more prosocial behaviour compared to non-athletes in the form of volunteering and donating to charity. Kniffin et al. argues that the results contribute to the understanding of traits possessed by former high school athletes and highlights the need for closer attention to the relevance of sports in the workplace. Findings in this section indicate that individuals with sports merits possess characteristics useful in a leadership position.

Motivation, self-efficacy and locus of control

In addition, individuals with sports merits are expected to display more leadership, self-confidence and self-respect compared to people who have not been active in sports (Kniffin et al., 2015). This notion can be related to the concept of self-efficacy, a frequently studied trait in the domain of self-regulation. Numerous studies over the years have established a positive relation between self-efficacy and performance through motivation, goal setting and firmer goal commitment (Sitzmann & Yeo, 2013; Judge & Bono, 2001; Mento et al., 1987; Phillips & Gully, 1997). Wood and Bandura (1989) say that "perceived self-efficacy concerns people's beliefs in their capabilities to mobilize the motivation, cognitive resources, and courses of action needed to exercise control over events in their lives" (Wood & Bandura, 1989, p. 364). The most efficient way to develop a strong self-efficacy is by performance success and the mastery of experiences. Other ways to build self-efficacy are through modeling[4], social persuasion and by enhancing physical status. Improved physical status reduces stress levels and strengthens perceived capability in activities involving strength and stamina (Wood & Bandura, 1989).

Much of the initial research on self-efficacy have focused on the strength of the measure and then taken a task-specific or state-like approach. However, Chen et al. (2001) tried to validate the trait-like generality dimension of self-efficacy, called general self-efficacy. General self-efficacy is defined as "individuals' perception of their ability to perform across a variety of different situations" (Judge et al., 1998, p. 170). Significant personal triumphs serve as transforming experiences and this generalizes the belief that one can mobilize the effort needed to succeed in various undertakings. Furthermore, Chen et al. (2001) argue, as many jobs are becoming more complex and the work environment can be characterised as stressful and fast changing, general self-efficacy is a valuable resource for organizations since it maintains motivation throughout rapid changes and high demands. However, the magnitude of the impact of self-efficacy has been questioned by Sitzmann and Yeo (2013). They argue that much of the relation between self-efficacy and performance can be explained by the fact that people with

[4] Modeling – Referred to in psychology as observational learning, a process of watching and imitating others.

high self-efficacy have been successful in the past and that self-efficacy, at best, has a moderate positive effect on future performance.

A concept closely related to self-efficacy is locus of control. Locus of control relates to whether a person believes that the outcome of an event is inside or outside of their control. The concept is therefore somewhat different from self-efficacy, which relates to a person's belief in her own ability to exercise control over an event. People with high internal locus of control believe that the outcome of an event is contingent on their own ability and characteristics, while people with an external locus of control believe that the outcome of events and peoples' actions are outside of their control (Rotter, 1966). Furthermore, a positive relation has been established between internal locus of control and likelihood of regular physical exercise (Cobb-Clark et al., 2014). Wang et al. (2010) found that general locus of control has an explanatory power for work-related criteria such as job satisfaction and salary. In studies on small firms it has been found that firms with CEOs having an internal locus of control are more profitable and less likely to go bankrupt than firms with CEOs having an external locus of control (Boone et al., 1996; Boone et al., 2000). Overall, these findings illustrate that successful fulfilment of personal aspirations and abilities can affect an individual both psychologically and behaviourally, resulting in a better performance as a leader.

Consequences of physical training

Today's fast changing and globalized business environment adds pressure on leaders who in general are considered to have jobs with high demands and responsibilities (Lovelace et al., 2007). Stress is discussed as an issue at many work places today and most professional business people are used to handle stressful situations. Brown (1991) is one of many scholars who have looked at the relation between fitness and stress and his results indicate that objective fitness levels buffer stress and can moderate adverse effects of stressful life events. In addition to being good for stress handling, physical fitness is considered to lead to improved mood, self-concept and work behaviour (Folkins & Sime, 1981). Lovelace et al. (2007) studied the importance of fitness and health for individuals in leadership positions. They argue that physical fitness is fundamental in order to build physical, psychological and social resilience, and hence is essential for leaders to sustain healthful regeneration. On the same theme Neck et al. (2000) describe the importance of fitness for top executive leaders and their organizations. For example, they argue that fit leaders have better stamina, mental focus and ability to cope with stress. Further, there are researchers who have looked at cognitive effects of physical training. Even though the results are a bit ambiguous, the overall findings indicate that fitness training has robust but selective benefits for cognition with the most prominently effects found for executive control processes such as planning, scheduling, inhibition and working memory. (Colcombe & Kramer, 2003; Folkins & Sime, 1981; Kramer et al., 1999).

However, as a result of the current fitness trend in which normal people train more and harder, warnings have been raised that too much training could be harmful. Frequent high-intensity training over short periods exposes the body to stress and can result in overtraining (Gudiol, 2014; Seiler & Tønnessen, 2009). Moderate levels of physical activity have been found to reduce the risk of sudden health complications most efficiently (Schnohr et al., 2015).

Level of fitness can also, apart from befitting the health, affect how a person is perceived by other people. It has been found that overweight people tend to be perceived as less effective in the workplace, both in terms of performance and interpersonal relations (Kwoh, 2013). In addition, people in good physical shape are in general considered more attractive and a positive association has been found between facial attractiveness and physical health (Shackelford & Larsen, 1999). Facial attractiveness is in turn a trait argued to be of significance for CEO success. Halford and Hsu (2014) found that CEO appearance is positively related with shareholder value and argue that the additional value generated stems from two channels, negotiation and visibility.

Referring back to the quote at the beginning of this paper, the literature outlined provides context to the core domain of this research, namely the underlying causes of the association between engagement in sports and beneficial characteristics for executives.

The figure below displays how this study is positioned in the Hambrick and Mason 1984 upper echelons framework. As can be seen, it is expected that sports merited CEOs, apart from being influenced by the experience of performing the demanding endurance challenge (observable characteristics), also will possess psychological traits prescribed to people prone to engage in sports. These characteristics are in turn expected to affect firm performance, both directly and indirectly through strategic choices.

Figure 1.

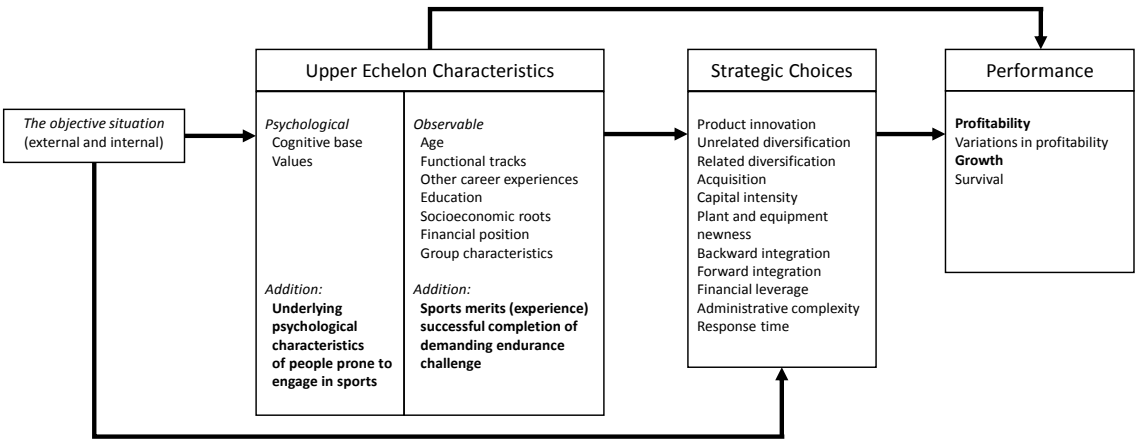

Figure 1. shows Hambrick & Mason's (1984) upper echelons perspective of organizations, with some additions. The text in bold in the "Upper Echelon Characteristics" box describes and points out how the executive characteristics studied in this paper are positioned in the framework. The performance variables in bold indicates which firm performance variables that are of interest in this study.

3 Development of hypotheses

A vast majority of the research anchored in the upper echelons theory regarding executive impact on firm outcome agree that the CEO has an unneglectable influence over firm strategy and performance. The magnitude of how much CEO characteristics are reflected in firms' policies and outcomes is conditional on many factors. In the current business environment in which top managers face considerable responsibilities and demands, it is argued that CEOs' impact on companies is even more evident than before. Furthermore, in smaller companies with less complex organizations and fewer managers the importance of the CEO is argued to be even more distinct than in bigger, more complex organizations.

Today it is well established that physical exercise is beneficial for both physical and mental health. In addition, people with sports merits are often associated with traits such as motivated, competitive and high self-efficacy. Additionally, sports merits are often looked upon favourably, not least by executive recruiters. Selection into sports participation is not random and it has been argued that athletic engagement is a proxy for heterogeneity in underlying characteristics. Research on people who have been engaged in sports and their outcome in other aspects in life such as education, income and health indicate that former athletes on average achieve more success than non-athletes within all these areas. These associations have further been found to hold true for leisure sport involvement among adults.

In previous research, it has been found that the experiences and lifestyle of CEOs can have a sizable impact on firms' strategic choices and performance. Firms with physically fit CEOs for example, are associated with better performance than firms having non-fit CEOs. The characteristics prescribed to athletes and the findings when it comes to prosperity of people involved in sports makes it reasonable to believe that characteristics of athletes are affecting the success of corporate leaders. Therefore, we expect CEOs with sports merits from performing demanding physical endurance challenges to be significantly associated with accounting firm performance in SMEs.

In order to measure accounting firm performance in SMEs previous literature suggest that more than one type of measure should be employed to gain a richer understanding (Westerberg et al., 1997). As most SMEs are non-public, financial market measures are not to consider. In most SME studies, a measure of profitability is used as the only, or one of the main performances metrics. Based on this we will test the following hypothesis:

H1: CEOs with sports merits from endurance challenges are positively associated with firm *profitability*.

Second to profitability, market performance measures are the most frequently used metrics used in SME studies. Market performance in the form of sales growth is argued to be a distinct dimension of firm performance, and it should be included together with profitability in SME studies in order to gain a better understanding of firm outcome. Based on this we will test the following hypothesis:

H2: CEOs with sports merits from endurance challenges are positively associated with firm *market performance*.

The figure below is an illustration of the hypotheses development and how sports merited CEOs' characteristics are expected to impact firm accounting performance.

Figure 2.

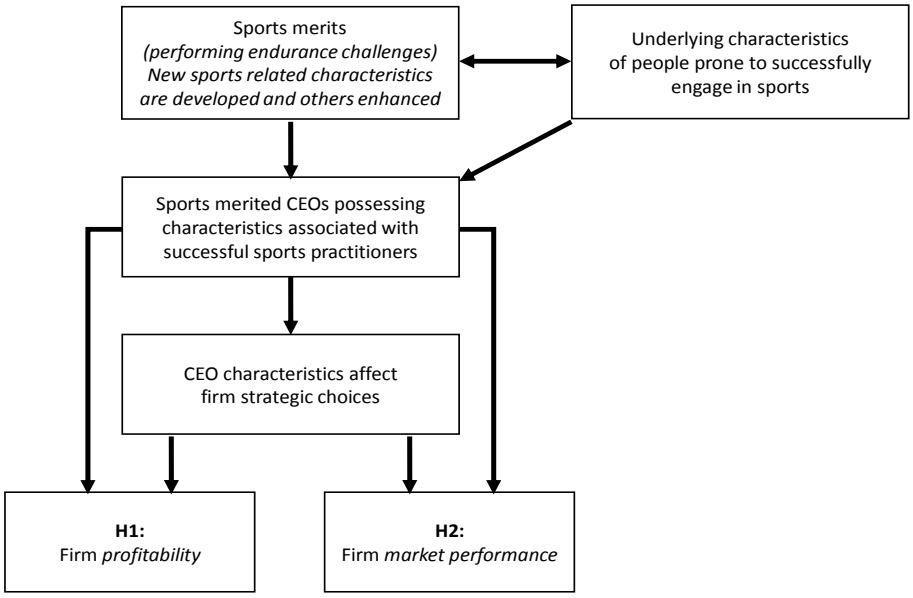

Figure 2. is an illustration of where characteristics of sports merited CEOs are expected to descend and how they directly and indirectly affect accounting performance in the two hypotheses.

4 Data sample and selection

4.1 Company information and accounting data

In the process of collecting data, we have used two sources. Company information, including accounting data, information about CEO and board members and company background information, was gathered from the Serrano Database. The Serrano Database contains comprehensive and aggregated information about Swedish companies of different sizes and legal forms, making it suitable for the purpose of this study since the focus will be on the performance of SMEs.

The Serrano Database contains financial history on the company level and is based on financial statement data from the Swedish Company Registrations Office (Bolagsverket). All limited companies (Aktiebolag) in Sweden have to be registered at the Swedish Company Registration Office and submit their annual report to the authority after the end of each fiscal year (Bolagsverket, 2015). In addition, the dataset contains general company information from

Statistics Sweden (Statistiska centralbyrån), bankruptcy information from Swedish Companies Registration Office, and group data from PAR's register[5].

An advantage with the Serrano Database is that it only contains one data entry per calendar year for every company making the values easily comparable. It is a controlled and quality assured database in which underlying register data for companies having broken fiscal year is transformed and modified into comparable calendar year values (PAR, 2015).

4.2 Sports merits data

In order to separate out CEOs with sports merits who are considered to possess the persistent characteristics of interest in this study, we used information on participants in a demanding endurance challenge. In order to successfully complete the challenge a considerable personal investment in terms of practice, time and motivation is required.

The endurance challenge will from now on be referred to as "the challenge" and a CEO who has completed the challenge is hereafter referred to as a "sports merited CEO". The data we have access to contain more than 30 years of information on individuals who have completed the challenge up until recently. In addition, the dataset contains information about gender, age, how many times the person has completed the challenge, the year they completed the challenge for the first time and the year for the latest completed challenge.

4.3 Data matching and selection

The original dataset from the Serrano Database contains personal identity numbers of all board members and top managers in each firm. In addition to the information listed above, the original data file of participants in the challenge contains information on personal identity numbers. In order to protect the integrity of the people and firms in the databases we (the authors) have not handled data files containing personal identity numbers nor corporate identity numbers. Before we were allowed access to the data files, a professional independent third party anonymised the sensitive information. In this process, personal identity numbers have been replaced with a unique random number for each anonymous person and corporate identity numbers have been replaced with a unique random number for each anonymous firm. By matching our data on a variable containing a unique number for each individual, we can expect a 100% correct matching. This is a strength of our study compared to some other studies in the field of CEO characteristics and firm performance, which use matching by name, age and other non-exclusive variables causing a considerable risk for miss match (Limbach & Sonnenburg, 2015). Anonymous data also mitigates the risk of bias in the data selection and screening process.

In order to secure quality and relevance of the data, a thorough data selection process has been applied in order to make sure that data is matched in the right way and that the final sample is suitable and representative for analysis. We started by matching the right CEO to the right firm year. In the Serrano Database, there is information of when CEOs were appointed and when they stepped down from their position as CEO. By using this information, we can see who held the CEO position in a certain company during a specific year. Since we will look at CEO

[5] PAR is one of Sweden's leading companies within business information (PAR, Bisnode, 2015).

impact on firm performance, we have chosen to exclude all firm years in which the company changed CEO. The reason for doing this is because it will be hard to determine which CEO who had the biggest impact on the total performance during years of CEO change. Even though a new CEO enters in the first half of the year, it could be that much of the planning and budgeting for the full year are already done, which would constrain the new CEO's discretion during the first year.

4.3.1 Data screening

Furthermore, in the data selection process we have chosen to exclude all firm year observations in which CEO information is missing. In cases when the data indicates that there are two or more CEOs in the same year we have chosen to exclude those firm year observations since we cannot with certainty tell which person had the most impact on firm performance. The number of female sports merited CEOs in our sample is very small in comparison to the total number of sports merited CEOs. Therefore, in order to get a more homogenous group of CEOs, which is more suitable for comparative analysis, we have chosen to exclude female CEOs in this study.

In order to make the observations more easily comparable we have excluded all companies not classified as limited companies, such as public entities, municipalities and social insurance offices etcetera. Previous research has found that the performance varies between state owned compaines and privately owned companies (Megginson & Netter, 2001). In addition, different legal entities often have different purposes and goals, making it hard to compare them using the same accounting performance measures.

As a consequence of including all registered limited companies in the database, many years have observations for both the parent company and the subsidiaries. In those cases, we have excluded the observations for the subsidiaries and only kept the observation containing the consolidated financial statement for the group, or, in occasions when there is no consolidated statement, the financial statement of the parent company. The logic behind this choice is the common practice to use consolidated financial statements when analyzing firm accounting performance and in addition, many or all companies within a group often have the same CEO. Our accounting information is based on consolidated financial statements for company groups, the parent company's financial statement in company groups which do not prepare consolidated financial statements, and financial statements of independent limited companies.

As this is an SME study all companies not fitting within this definition are dropped. In this study we have chosen do define SMEs as companies with 10 to 250 employees, a definition often used in SME research on the European market (Aragón-Sánchez & Sánchez-Marín, 2005). Furthermore, this is also how the European Commission is defining SMEs (European Commission, 2015). This demarcation results in a generous sample of firms from various industries. In line with much previous accounting performance research, we choose to exclude financial- and insurance companies since their performance is argued to be weakly related to their operations, which could lead to divergent values (Benmelech & Frydman, 2015; Penman & Zhang, 2002).

To make sure that the sample does not include inactive companies or companies that do not get their income from their core operations we have excluded all companies with a net turnover less

than 3 million SEK.[6] We have also excluded observations where the industry variable is classified as others or left unclassified.

4.3.2 Outliers

The Swedish Company Registrations Office only controls that the annual reports fulfil the form requirements before they are registered. The company's board is responsible for the financial information in the annual reports meaning that the Swedish Company Registrations Office does not control the financial information before publication. Since the financial information in the Serrano Database is not controlled by any authority there is a risk of values in the data which might be very deviating and are poor reflections of certain companies' true financial performance.

Accounting ratios are commonly used for performance evaluation in both accounting research and practice (Frecka & Hopwood, 1983). Deviations from normal distributions in accounting ratios often occurs when a sample contains extreme observations. Such outliers have been found to have a sizeable impact on sample variations and precision (Frecka & Hopwood, 1983).

In an article by Lev and Sunder (1979), they raised the issue of reliability and validity of accounting data in quantitative research. The doubt whether errors exists in the data often arises when there are extreme and unreasonable values in the dataset. The most common method argued for in the statistical literature is plotting the data and take a closer look into the observations that deviate significantly to detect obvious errors (Newbold et al., 2010; Wooldridge, 2009). The reasoning behind this logic is that there could be values substantially larger than other values, although still correct. Using a mechanical statistical method for manipulating the dataset could therefore result in erroneous data. However, to exclude data manually through graphical analysis is only manageable in cases where the dataset consists of a modest number of observations. In our dataset, the number of observations makes it practically impossible to exclude the erroneous observations based on graphical analysis by plotting the data.

Lev and Sunder further discuss the methodological issues in the use of financial ratios. They describe two different mechanical techniques to handle outliers, trimming and winsorizing. Trimming is a technique in which the tails are dropped e.g. on the 1% or 5% level. Winsorizing on the other hand, replaces the outlier with the nearest observation, and the tails are determined in the same way as trimming.

According to Hellerstein (2008), the trimming technique handles skewed datasets with long tails more safely, whereas winsorizing puts more weight on the edges of the distribution and is therefore more suitable for normally distributed datasets. When observing the distributions of the dependent variables in our dataset we see that they are not normally distributed, and we have therefore chosen to use the trimming technique, and trimmed the dataset by excluding 1% from each tail of the dependent variables[7]. Additionally, in order to ensure the quality of the

[6] According to SCB, female blue-collar employees, which is the lowest paid group within the private sector, had an average monthly salary of approximately 20 thousand SEK before tax, during the examined period. When aggregating the total gross salary plus the payroll taxes (31.42% since 2009 and higher before) we end up at total personnel costs of slightly above 3 million SEK. This means that in order for the company's operation to finance 10 fulltime employees, it would have to generate revenues of a bit more than 3 million SEK, given no other costs.

[7] Trimming is not applicable for the sports merited CEO variable as it is a dummy (which will be introduced later).

data and securing that outliers do not drive the results, we have excluded values considered unreasonable in the independent variables. The time period of 10 years from 2003 to 2012 is consciously chosen to capture both periods of recession and recovery in the economy as well as allowing us controlling for as many variables as possible.

In *Table i.* the number of observations dropped in each screening step is found. The final data is an unbalanced panel data[8] set consisting of 93 261 observations. The number of CEOs in the sample is 21 779 of which 359 are classified as sports merited CEOs, and a total of 1 418 observations in which CEOs are characterised as sport merited. The number of CEOs goes from being fewer to more than the number of firms after dropping based on number of employees. This might be because it is more common in micro companies (fewer than 10 employees) that the same person is CEO in more than one company, than in larger firms. In the final dataset, we have more CEOs than firms, which indicate that some firms have switched CEO during the examined period.

Table i. Observations dropped in the data screening process

Description of observations lost	Δ Observations	# Observations	# Firms	# CEOs
Initial accounting data observations		4 525 512		
Match with CEO data observations	-3 592 982	932 530		
Dropping for missing accounting values	-424 520	508 010	94 629	88 976
Dropping for financial industry and missing industry classification	-53 136	454 874	84 341	82 279
Dropping if no. employees >250, or <10	-315 514	139 360	27 608	30 095
Drop if turnover <3.000.000	-2 288	137 072	26 936	29 727
Drop all women	-11 638	125 434	24 739	26 434
Drop all years before 2003	-28 498	96 936	21 336	22 413
Drop 1 % tails ROA and GIS (some observations are overlapping)	-3 675	93 261	20 659	21 779
Final sample		93 261	20 659	21 779

5 Method

To get a better understanding of our data and the characteristics of sports merited CEOs we will start our analysis by examining descriptive statistics of our data and perform univariate correlation analysis. The results from this will be presented in section 6 and 7. Thereafter, in order to study if there is any significant difference in performance between sports merited CEOs and CEOs not defined as sports merited, we will develop two models based on previous research on firm performance and CEO characteristics. The models are used on both the full

[8] Unbalanced panel data is time serial data where observations are missing for a number of companies in certain years. The reason for why observations are missing is because of our exclusion in the screening process, new firms that did not exist in the beginning of the time period, firms that have grown in our out of the SME definition and firms which have ended their operations during the studied time period.

sample and a matched sample of observations. The statistical program used for data analysis is Stata.

5.1 Model development

In order to study the effect of characteristics associated with sports merited CEOs and firm accounting performance, we have developed a model inspired by previous research on SMEs and the effect of CEO characteristics on firm outcome. The model developed is estimated by running ordinary least squares (OLS) regressions, which is a method commonly used in previous studies on CEO characteristics and firm performance (Limbach & Sonnenburg, 2015; Benmelech & Frydman, 2015; Biggerstaff et al. 2014). In addition, two stage least squares (2SLS) regressions will be used to overcome problems with endogeneity. How the 2SLS test is conducted will be described in detail in section 5.4.1. In the next sections the model development and the chosen variables are discussed.

5.1.1 Dependent variables

In previous research on CEO characteristics, firm performance has been measured using different types of metrics (Limbach & Sonnenburg, 2015; Kaplan et al., 2012; Richard et al., 2009). There is no set of standard metrics used universally throughout all studies and there is no consensus on how to evaluate performance of SMEs in empirical research. Various studies use different measures often without any further justification (Rosenbusch, 2011). Organizational performance comprises three distinct areas of firm outcome: (i) financial performance (profits, return on assets etc.); (ii) product market performance (sales, market share etc.); and (iii) shareholder return (total shareholder return etc.) (Richard et al., 2009). Which measures to use depends on the study and authors have chosen to use different combinatons of metrics.

While often being correlated over time, various types of performance measures are argued to capture different aspects of firm performance and therefore it is reasonable to include more than one type of measure in SME studies in order to yield a better understaning of organizational perfromance (Westerberg et al., 1997). Examples of this can be found in the study by Westerberg et al. (1997), in which the authors destiguish between financial performance and market performance, and in Daily and Dalton's study from 1992, in which measures are devided into investor- and accoutning returns.

Access to objective accounting data has been a problem in many previous SME studies, resulting in that numerous papers in the field have relied on subjective performance measures based on questionnaires answered by the firms' management team (Aragón-Sánchez & Sánchez-Martin, 2005; Wolff & Pett, 2006; Westerberg et al., 1997). A strength of this study is that more objective performance measures will be assesed through the use of accounting data. Accounting measures are the most commonly used measures for organizational performance and has proven to be higly correlated with economic rates of return[9]. However, it has to be kept

[9] Economic earnings can be measured in how much cash flow the firm can pay out to shareholders without impairing the productive capacity of the firm, while accounting earnings are affected by accounting choices such as valuation of assets and capitalization of expenditures (Bodie et al., 2011, p. 812).

in mind that accounting measures can be disorted by accounting policies[10], human errors and deception (Richard et al., 2009).

In this study we have chosen two performance measures: one profitability measure and one market performance measure. Since our sample consists of mainly unlisted companies, financial market returns are not to consider in this study. Below, the dependent variables used in this study are described in more detail.

ROA (return on total assets), is the most commonly used profitability measure within the category of accounting returns (Rosenbusch et al., 2011). This is also the performance measure we have found to be most frequently used in SME studies (Rosenbusch et al., 2011; Arosa et al., 2013; Wolf & Pett, 2006; Christensen et al., 2010). *ROA* measures the profitability of a company's operations and mixes aspects of operating and financing activities (Penman, 2013). The measure shows the capacity of the firm's assets to generate profits. In contrast to return on equity, which is another commonly used performance measure, *ROA* is not affected by the firm's debt policies and has been argued to be a better measure of the firms' fundamental performance (Hagel et al., 2010).

Furthermore, it has been argued that the best measure of company performance is how effectively the firm's assets are used. Income measures such as return on sales does not indicate how efficiently the firm uses its assets. Asset heavy companies need a high sales margin to generate reasonable return on assets while asset light companies can generate generous asset return even with thin sales margins. Managers today often have the choice to outsource management of certain assets and processes in the value chain. This results in that differences in outsourcing policies can cause big variations in return on sales levels also within industries (Hagel et al., 2010).

GIS (growth in sales), is one of the most commonly used accounting based market performance metrics, measuring firm growth (Rosenbusch et al., 2011). In line with suggestions in previous literature we choose to use one measure for market performance since growth can sometimes be accomplished on the expense of profitability and vice versa (Wolff & Pett, 2006; Westerberg et al., 1997). To get a more comprehensive understanding of the SMEs' performance it is reasonable to look at both profitability and market performance.

5.1.2 Sports merits variable

The variable of interest in this study, sport merited CEO, is a dummy variable taking the value of one if the CEO is characterized as sports merited and otherwise zero. This means that the dummy indicates if the CEO has sports merits from performing endurance challenges, regardless if the merit is newly acquired or several years old. This dummy is a proxy for the persistent personal characteristics that athletic people with merits from successfully performing the challenge are expected to possess. Important to point out here is that the variable of interest in this study is considered to be a proxy and not an event for which a causal relation will be established. The demanding character of the challenge makes us argue that CEOs who have performed the challenge are expected to exhibit a number of distinguishing and persistent characteristics separating them from the average CEO. These characteristics do not necessarily

[10] Since we look primarily at non-listed companies we do not take into consideration the shift in accounting standards that took place in 2005 for listed companies when IFRS was introduced (PWC, 2015).

suddenly appear as the challenge is completed but might have been exhibited already before the CEO completed the challenge. With this said, we also acknowledge that the challenge can act as a transformational event during which new characteristics are developed and others are enhanced. See *Figure 2.* for an illustration of where the characteristics of sports merited CEOs are expected to descend and how they relate to firm accounting performance.

Within social, medical and economic science, the common procedure in experimental or observational studies is to try to establish a causal relationship between an observed event and some outcome. To be able to prove a causal relation between an event and a subsequent outcome a number of conditions have to be fulfilled and *ceteris paribus* meaning "other relevant factors being equal", plays an important role (Wooldridge, 2009, p.12). When the propensity of treatment or, in this case, performing the challenge is considered to be affected by unobserved characteristics the variable is said to be endogenous. This is problematic when attempting to establish causal relationships and researchers try to control for this in different ways (Frölich, 2008). An approach used in previous papers on CEO characteristics and firm performance, is to use an instrumental variable (IV) approach, to control for endogeneity in the variable for which a causal relationship will be investigated (Benmelech & Frydman, 2015[11]; Biggerstaff et al., 2014[12]). This method isolates the covariance of the variable of interest and the outcome variable through the use of an exogenous variable, an instrument.

However, in this study the main objective is not to establish a causal relationship between the challenge *per se* and firm performance, but we expect the sports merits variable to be an observational proxy for unobserved characteristics (see *Figure 2.*), and it is the effect of these characteristics on firm performance which we seek to investigate.

As described in the literature review, selection into adult sports participation is not random and there are several background variables affecting the likelihood of being active in sports as an adult. In addition, sports participation is also argued to lead to the development and enhancement of characteristics (see *Figure 2).* Based on previous research, sports merited CEOs who have completed the endurance challenge are, to a high extent, expected to possess the following characteristics:

- *Motivation, competitiveness and execution skills*. CEOs with sports merits from successfully completing endurance challenges are considered to possess high levels of motivation and discipline. In addition, it has been found that runners and ultra-marathoners are goal oriented and competitive. Furthermore, persistence and execution skills could also be expected by people who are successful in their athletic undertakings. Therefore, we expected the individuals who have successfully completed the challenge to be highly motivated, competitive and possess execution skills.

- *High general self-efficacy and internal locus of control*. We expect CEOs who have been successful in physical endurance challenges to have a belief in themselves and their innate ability and capability to affect the outcome of events. Even though accomplishments within sports might not have a direct impact of people's job self-efficacy and

[11] Benmelech and Frydman (2015) used birth cohort as an instrument for military service as the likelihood of being drafted to the military was higher for some cohorts than others.
[12] Biggerstaff et al. (2014) used the number of non-cloudy days in the states where the firms are headquartered is argued to affect how much golf the CEO plays but not the performance of the firm.

locus of control, we expect completion of challenges of this magnitude to serve as transformational events, increasing general self-efficacy and internal locus of control, which in turn can affect performance in the workplace. Furthermore, people engaging in regular physical training have been found to demonstrate higher self-efficacy and internal locus of control (Inouea et al., 2015; Cobb-Clark et al., 2014).

- *Physically healthy and perceived as competent.* Fitness is a trait that has been found to be temporal and can both be built up and lost in relatively short periods of time (Coyle et al., 1984). However, given the amount of training and physical status needed in order to complete the challenge successfully, we believe that most people who decide to take on the challenge have some basic interest for physical training and will maintain a good physical health even after the challenge is completed. In addition, physically active individuals are found to be perceived as more attractive and efficient, making us argue that sport merited CEOs are perceived are credible by people in their surroundings.

The list of characteristics above is exhaustive but not exclusive.

There are two main reasons for choosing the sports merits variable as a dummy variable. Firstly, we argue that the presence or strength of the personal characteristics this variable represents does not increase linearly with the number of times a person complete the challenge. Secondly, a majority of the CEOs who have completed the challenge have only done it once meaning that using a continuous variable would only have an effect on a limited number of observations.

5.1.3 Control variables

In the model, two categories of control variables are used. The first category consists of observable CEO characteristics, which have been found to influence firm strategy and performance. The second one relates to company specific variables that have been argued to influence firm accounting performance. When possible, we have written the effect we expect the variables to have on performance. Observe that the expected sign of the variables can be the same or different for the respective dependent variables. In order to obtain distributions close to normal distribution some of the variables are adjusted to natural logarithms. The variables are described and discussed below and in appendix *Table 6.* a description of how all variables in the models are estimated can be found.

CEO control variables

As we study the impact of a certain category CEO characteristics on firm accounting performance it is of interest to control for other heterogeneous characteristics among CEOs which have proven to affect firm performance in previous research, in order to make sure that the results do not depend on observable heterogeneity among the CEOs.

CEO age, is an indication of a person's life- and work life experience. CEO age has been found to be associated with risk taking and managerial style (Bertrand & Schoar, 2003). In addition, it is suggested that a person's cognitive and physical ability will decline with age (Verhaegen & Salthouse, 1997).The sign of the variable is hard to predict for both GIS and ROA, and no clear direction of the relation has been established in previous studies (Limbach & Sonnenburg, 2015; Hayes & Schaefer, 1999).

CEO tenure, is a variable that indicates the experience a manager has in a certain company and industry. A long tenure also shows a long-term commitment to the firm, which can facilitate long-term investments (Arosa et al., 2013). At the same time it has been argued that long CEO tenure can lead to mental and physical exhaustion as well as resitance to change (Limbach & Sonnenburg, 2015; Arosa et al., 2013). The impact of tenure has been found to be different across industries. In the slow moving food industry, tenure has poved to have a positive impact on firm performance, in comparison to the fast moving IT industry where tenure has a negative relation with company performance (Henderson et al., 2006a). Thus, the expected sign is hard to predict for both performanc measures.

CEO gender, has been argued to influence firm performance and in a study by Watson and Robinson (2003) it was found that profits in male-controlled SMEs were larger than for female-controlled SMEs. These findings are in line with prior research within the area. However, after adjusting for risk they found no significant difference in performance. As discussed earlier, we have chosen to exclude all women CEOs due to the very low number of observations and will not control for gender.

CEO education, is a variable that controls for how long, or which type of education a person has. Educational background might affect how people think, act and solve different types of situations and hence will affect firm strategy and performance. For example, managers holding an MBA have been found to pursue more aggressive strategies (Bertrand & Schoar, 2003). Education has not been controlled for in this study due to inaccessibility.

CEO duality, indicates if the CEO also is chairman of the board. Small firms are different from large companies in many ways, including ownership concentration and role integration, which makes CEO duality more common (Arosa et al., 2013). If the CEO also is chairman, the information gap between CEO and the board is mitigated. Furthermore, the risk of conflict between the CEO and the chairman is eliminated, which should lead to more effective and consistent strategic decision-making. However, the agency theory implies that the two positions better be separated since the board of directors are expected to monitor top management, and CEO duality increase the risk that the CEO will undertake self-serving activities (Arosa et al., 2013). Therefore, it is hard say in advance which sign the variable will have in the GIS- and ROA regressions.

CEO founder, is a variable indicating if the CEO of the company also is the founder. This variable has been included in previous studies as an indication of the power the CEO has over the board and other managers (Adams et al., 2005; Limbach & Sonnenburg, 2015). Adams et al. (2005) found that the CEO founder variable had a significant positive impact on firm performance. However, in this study we have not controlled for this due to inaccessibility of information.

Firm control variables

Companies have different characteristics that affect their market- and financial performance. It is common practice to control for firm characteristics but which and how many variables to control for varies between different studies. In order to mitigate the risk that our results will be

driven by observable firm heterogeneity we have chosen to control for the variables described below which all, in previous research, have been argued to impact firm performance.

Firm size, is a measure of how large the operations of a firm are. In line with the arguing by Sing et al. (2010) we use sales to control for size[13]. Bigger firms often have the benefit of having larger economies of scale, better routines and control systems. At the same time, large firms can be argued to be less flexible than smaller ones. However, overall the literature suggests that there should be a positive impact of size for both profitability and growth in SMEs (Aragón-Sánchez & Sánchez-Marín, 2005; Yazdanfar & Öhman, 2015).

Firm age, indicates which stage of the lifecycle a company is in. Companies might have different strategic goals depending on which stage of the lifecycle they are in. For young companies, growth might be more important than profitability, while more mature companies possibly have the opposite goal. There are also aspects of experience, routines and flexibility that are reflected in a firm's age. The effect of firm age on firm performance has been ambiguous in studies on larger firms (Limbach & Sonnenburg, 2015; Rosenbusch et al., 2011). However, in SME studies the effect of firm age on performance has been found to be negative on both growth and profitability (Yazdanfar & Öhman, 2015).

Board size, is a measure of how many members there are in the company board. The size of the board is a well-studied phenomenon within the field of corporate governance, but the effect board size has on firm performance is not clear (Arosa et al., 2013). Some benefits associated with larger boards are better access to various recourses, better ability to monitor managers and a deeper level of intellectual capital in the boardroom (Arosa et al., 2013). Although at the same time, large boards lead to increased costs associated with coordination, flexibility and communication. No optimal board size has been recommended in the corporate governance literature (Christensen et al., 2010). However, recent studies have found a negative association between board size and firm profitability and therefore we expect the sign of the variable to be negative in the ROA model (Christensen et al., 2010; Arosa et al., 2013). The effect of board size on SME growth is beforehand uncertain.

Ownership structure, is an indication of how concentrated the ownership in the company is and impact on how the company is managed and governed. A concentrated ownership structure provides the owners with the means to influence manager decisions while dispersed ownership shifts the capacity to influence firm strategy and decisions towards its managers. Concentrated ownership also leads to reduced agency problems. The effect of ownership concentration on firm performance has not been conclusive in previous studies (Christensen et al., 2010; Lappalainen & Niskanen, 2012). In this study, the variable is not considered due to inaccessibility.

Leverage, is an indication of how the operations of the firm are financed. Leverage levels can vary much between industries and also across firms. Higher leverage is often associated with higher risk, and due to loan terms from debt providers high leverage can result in constraints on management discretion, as managers have to avoid covenant violations and prevent adverse

[13] Firm size measures are normally based on sales, assets or number of employees. In line with previous SME studies we choose to measure size through total sales (Yazdanfar & Öhman, 2015; Aragón-Sánchez & Sánchez-Marín, 2005).

effects of debt ratings (Bowen et al., 2008). High leverage levels might also reduce the recourses a firm can put into new investments and hence result in dysfunctional decision making when it comes to investments (Christensen et al., 2010). In line with previous SME studies, we expect the effect of leverage on ROA to be negative, while the effect on growth is expected to be positive (Arosa et al., 2013; Lappalainen & Niskanen, 2012).

CAPEX (capital expenditures), is a measure of how much a firm invests in fixed assets and is a proxy for growth. It has previously been found that CAPEX have a significant positive impact on firm performance in SMEs (Haniffa & Hudaib, 2006). However, due to inaccessibility of CAPEX numbers this variable has not been controlled for.

R&D (research & development) investments, is a variable that controls for the firm's technological complexity and risk (Limbach & Sonnenburg, 2015). Investments in R&D are associated with risk but can also over time result in higher returns. The effect of R&D expenditures on firm performance have been different in previous studies (Limbach & Sonnenburg, 2015). However, in this study we have not included this variable due to inaccessibility.

Working capital management efficiency, is a measure of how well the company's working capital is managed. Efficient management leads to shorter cash conversion cycles while bad management leads to longer time between outlay and cash recovery. García-Teruel and Martínez-Solano (2007) found that working capital management and shorter cash conversion cycles had a positive impact on profitability in SMEs. In this study we have used number of days accounts receivable as a proxy for working capital management efficiency, which is one of the working capital measures which have been found to have a significant impact on firm performance (Deloof, 2003; García-Teruel & Martínez-Solano, 2007). The sign of the variable is expected to be negative for profitability. However, for growth we expect a positive effect since growth in accounts receivable means more products and services delivered and hence growth in sales.

Liquidity, indicates the firm's ability to meet its obligations and invest in new projects and has been frequently used in previous studies (Limbach & Sonnenburg, 2015; Benmelech & Frydman, 2015). In this paper, we have used the common liquidity metric *Quick ratio*, which measures firm's most current assets in relation to current liabilities (Penman, 2013). Firms with low liquidity might not be able to seize profitable business opportunities and might also lead to increased financing costs (Kim et al., 1998). High liquidity on the other hand facilitates investments in new projects and is a signal to external financiers that the firm can cover its obligations. However, high liquidity can also be seen as an indication of inefficient asset management as liquid assets often generate lower returns than fixed assets invested in the operations (Kim et al., 1998). Furthermore, it has been argued that too much liquid assets increases the risk of suboptimal decision-making and value destroying investments (Rappaport, 2006). In line with the findings from Mikkelson and Partch (2003), we expect the effect of liquidity to be positive for profitability, while the effect on growth is hard to predict beforehand.

ROA and *GIS*, are expected to be correlated over time and due to the argued explanatory power two variables have on one another (Yazdanfar & Öhman, 2015; Delmar et al., 2013), we will in

the ROA model include GIS as a control variable and the other way around. The expected signs of these variables are positive.

5.2 Model specifications

When trying to establish the impact a CEO has on firm performance a straightforward approach would be to control for all relevant observable firm characteristics and then see if CEO fixed effects have any impact on firm strategy and performance. However, a problem with this approach is that it might be persistent differences between firms and unobservable factors that might correlate with CEO fixed effects (Bertrand & Schoar, 2003). In previous studies on the impact of CEO characteristics on firm performance using time-series panel data, authors have tried to control for this underlying heterogeneity by using either one or a combination of time, industry- and firm-fixed effects (Benmelech & Frydman, 2015; Limbach & Sonnenburg, 2015; Kaplan et al., 2012; Bertrand & Schoar, 2003). Just as the names indicate, time fixed effects control for underlying time variations, industry fixed effects for variations across industries and firm fixed effects for variations across firms.

In this study, we will control for time- and industry fixed effects but not firm fixed effects. By controlling for time- and industry fixed effects we can rule out that our findings are driven by specific time trends or trends in specific industries. However, since we do not control for firm fixed effects we cannot completely rule out the sorting of sport merited CEOs into firms with higher performance (Benmelech & Frydman, 2015). The reason for why we cannot control for firm fixed effects is that this would limit our sample substantially and only include firms which have changed from a sports merited CEO to a CEO not classified as sports merited, or the other way around, during the studied period (Benmelech & Frydman, 2015). Industry fixed effects are measured based on a grouping of branches into eleven overall sectors.

Based on the discussion above we have choose to use the following regression models:

Model 1 (financial performance)

$$\begin{aligned} ROA_{i,t} = \ & \beta_0 + \beta_1 Sports\_merited\_CEO_i + \beta_2 GIS_{i,t} + \beta_3 CEO\_age_{i,t} + \beta_4 CEO\_tenure_{i,t} \\ & + \beta_5 CEO\_duality_{i,t} + \beta_6 Firm\_size_{i,t-1} + \beta_7 Firm\_age_{i,t} \\ & + \beta_8 Book\_leverage_{i,t-1} + \beta_9 WC\_efficiency_{i,t-1} + \beta_{10} Quick\_ratio_{i,t-1} \\ & + \beta_{11} Board\_size_{i,t} + fixed\ effects_{time} + fixed\ effects_{industry} + \varepsilon_{i,t} \end{aligned}$$

Model 2 (market performance)

$$\begin{aligned} GIS_{i,t} = \ & \beta_0 + \beta_1 Sports\_merited\_CEO_i + \beta_2 ROA_{i,t} + \beta_3 CEO\_age_{i,t} + \beta_4 CEO\_tenure_{i,t} \\ & + \beta_5 CEO\_duality_{i,t} + \beta_6 Firm\_size_{i,t-1} + \beta_7 Firm\_age_{i,t} \\ & + \beta_8 Book\_leverage_{i,t-1} + \beta_9 WC\_efficiency_{i,t-1} + \beta_{10} Quick\_ratio_{i,t-1} \\ & + \beta_{11} Board\_size_{i,t} + fixed\ effects_{time} + fixed\ effects_{industry} + \varepsilon_{i,t} \end{aligned}$$

The dependent variables are calculated as follows: ROA is defined as net income through average total assets year *t* and *t-1*. *GIS* is estimated as percentage growth in net sales year *t.*

Sports merits variable: Sports_merited_CEO takes the value 1 if the CEO has performed the challenge, otherwise 0.

Independent variables are estimated as follows: CEO_age is measured as the natural logarithm of the number of years since the CEO was born. *CEO_tenure* a dummy variable taking the value 1 if the CEO has a tenure of more than five years, otherwise 0[14]. *CEO_duality* takes the value of 1 if the CEO also is chairman of the board, otherwise 0. *Firm_size,* is measured as the natural logarithm of lagged net sales. *Firm_age* is measured as the natural logarithm of the number of years since the firm was incorporated. *Book_leverage* is estimated as lagged total debt through lagged total assets. *WC_efficiency,* working capital management efficiency is measured as the natural logarithm lagged days accounts receivable. *Quick_ratio,* has been measured as the natural logarithm of lagged Quick ratio[15]. *Board_size,* is measured as the natural logarithm of the number of board members in the firm in year *t*. All regressions include industry and time fixed effects in order to control for differences across industries and time trends in the outcome variables. A detailed description of all variables can be found in appendix *Table 6*.

The control variables based on accounting data are all, except *GIS* and *ROA,* based on lagged numbers. We consider that the year's opening metrics will best predict the firm profitability and growth in a certain year in line with Limbach and Sonnenburg (2015) and Biggerstaff et al. (2015). However, *ROA* in year *t* is presumed to be a better predictor of *GIS* year *t* than lagged *ROA* (Yazdanfar & Öhman, 2015), and the other way around. CEO and firm background variables not based on accounting data are measured in year *t*.

When performing White's test we have detected heteroscedasticity in our data meaning that the variance in the error term is not constant, which is a violation of one of the assumptions in least squares regressions (White, 1980; Newbold et al., 2010). In the presence of heteroscedasticity in the model the estimated variables are unbiased but the variance of the coefficients is biased.

Furthermore, as we use time series panel data there is a considerable risk that the behavior of the independent variables is similar over different periods, resulting in that the error terms are correlated across time. This phenomenon is called serial correlation or autocorrelation, and leads to bias in the estimated standard errors in the regression (Wooldridge, 2009, p. 350; Newbold et al., 2010, p. 619). We have chosen to use the Breusch-Godfrey test to detect autocorrelation. The Breusch-Godfrey is used instead of the commonly used Durbin-Watson since the Durbin-Watson require normality of the error terms (Wooldridge, 2009, p. 415), and when performing a Jarque-Bera test for normality (Newbold et al., 2010, p. 646), it shows that the error terms are not completely normally distributed. The results from the Breusch-Godfrey test show strong evidence that there is autocorrelation in the data. In order to control for both of these problems we have, in line with Limbach and Sonnenburg (2015) and Benmelech and Frydman (2015), performed all regressions using robust t-values for the coefficients in which we cluster standard errors on firm level. This method is referred to as Rogers or clustered standard errors, and are heteroscedasticity and autocorrelation consistent (Hoechle, 2007).

[14] If the CEO entered the position before 1997, our data does not display in which year and therefore we have chosen a dummy- instead of a continuous variable.
[15] (Penman, 2013, p. 685).

5.3 Matched sample

Regression analysis is the most commonly used method in observational studies when trying to establish a relation between the observed treatment and an outcome. However, a potential problem with this method is model misspecification. The specification of the model is based on assumptions made by the researcher, which often can be hard to verify and as a result it will be difficult for the reader to know if the study is not merely a demonstration that it is possible to find results in line with the authors' hypothesis (Ho et al., 2007). Furthermore, as we have a sample with very few sports merited CEO observations, in relation to the number of control observations our results could be very model dependent. A key problem causing model dependence is the presence of control observations far outside the range of the treated observations (Ho et al., 2007).

Matching can remedy this problem and is another commonly used method in observational studies. It has been argued that the best results in observational studies are achieved when a combination of matched sampling and regression analysis is applied (Rubin, 1979; Ho et al., 2007). The goal of matching is to prune observations from the full dataset so that the remaining data have better balance between the treated and the control group, meaning that there is a more similar distribution of the covariates in the treated and control groups (Iacus et al., 2012). Data can be exactly balanced, in which case further controlling for other variables is unnecessary and a test of difference in means on the matched sample will be enough to determine the effect of a treatment. Approximately balanced data on the other hand, will require controlling for more variables with a model similar to one that would have been used without matching. The difference being less dependence on the model and reduced statistical bias than without matching (Ho et al., 2007).

Standard approaches within matching like nearest neighbour propensity score matching, matches each treatment unit with the closest control. The matching is based on a propensity score estimated from a vector of covariates using a logit model. However, when good matches for each unit does not exist this could lead to poorly balanced data. Most published applications of standard matching do not take this into consideration, which leads to highly model dependent interfaces (Iacus et al., 2012). The best practice solution to this is to exclude treated units without good matches, which is argued to be a reasonable approach as long as being transparent about it and the consequences in terms of the new set of treatment units created (Iacus et al., 2012).

In order to reduce the imbalance between the treatment group and control group we use Coarsened Exact Matching (CEM), a powerful matching approach used and advocated in multiple studies (Blackwell et al., 2010; Singh & Agrawal, 2011; Aggarwal & Hsu, 2014). CEM is a method easy to comprehend and implement and at the same time it possesses a wide range of statistical properties not available in many other matching methods. This is a relatively new matching method, which has started to become more frequently used in research (Singh & Agrawal, 2011; Aggarwal & Hsu, 2014). The idea of CEM is to coarsen each variable by recoding to create groups of substantively indistinguishable values. Thereafter an exact matching is applied to the coarsened data to determine the matches and a set of strata with the same coarsened values of the chosen variables are generated. Imbalances are thus eliminated beyond

the chosen level defined by coarsening, and the data can be analyzed with less risk of model dependence (Iacus et al., 2012). The possibility to choose the coarsening level rather than relying on an automated algorithm makes CEM easy to understand and allows the user to set the maximum level of imbalance. In addition, through this it is simple to make sure that variables such as year and industry are appropriately coarsened (Iacus et al., 2012).

A matched sample is generated based on year, industry, firm size, firm age and CEO age. For each treatment observation, control observations are selected in which the continuous variables, CEO age and sales (size), is within ± 5 years and ± 25% respectively. The variable firm age has been coarsened into young firms, defined as five year or younger, and older firms, with more than five years since inception. For the continuous variable year, and the categorical variable industry, control observations with the exact same values are selected. The approach of matching particular continuous observations with respect to ranges are in line with previous research (Farber, 2005). Requiring exact matches for all variables may result in exclusion of a substantial amount of observations, which could lead to larger bias than if the matches are less exact and more observations remain in the sample (Stuart, 2010).

In line with the argumentation above, we have chosen to exclude observations for which no good match was found based on the matching criteria. At the same time, we have not included excessively many variables in the matching process and not defined the groups too narrowly in order not to lose too many observations. As a result, the matched sample contains 126 less sports merited CEO observations than the full sample. The number of matches for each sports merited CEO observation varies, and since we have a large control sample we have chosen to use more than one control for each sports merited CEO observation as it is argued to result in better efficiency in the procedure and further reduce the bias (Smith, 1997). As a robustness test, we have also used one-to-one matching in which the statistics program randomly drops observations when more than one match is found for each sports merited CEO observation.

Through the matching the balance in the data has improved but we do not expect it to be perfectly matched. Therefore, both difference in means comparisons as well as regressions using our models developed in the previous section are used to analyse the matched sample.

5.4 Robustness checks

In order to make sure that the results are reliable and robust a number of robustness tests have been performed on the models. However, the results presented are not adjusted for the robustness tests described below. The outcomes of the robustness tests are commented upon in the results section and tables of interest will be presented in the appendix.

5.4.1 Two-stage least squares

Earlier we discussed endogeneity in the sports merits variable, which is not considered a problem in this study in its traditional sense. However, endogeneity in the control variables also exists when a control variable actually is a function of the outcome, and can result in bias and that the model parameters estimated with OLS are inconsistent (Frölich, 2008). *ROA* and *GIS*, have in previous studies been found to have a mutual dependence (Yazdanfar & Öhman, 2015; Wolff & Pett, 2006; Delmar et al., 2013), which indicates that there might be an endogeneity problem when including the variables as controls for the one another.

One approach to control for this is by including the lagged version of the endogenous variable. If the error term is uncorrelated with current exogenous variables, a lagged endogenous variable added to the equation will act like a pre-determined variable and can be treated as an exogenous variable (Wooldridge, 2009, p. 562). However, this solution is only viable if there is no serial correlation in the data (Nagler, 2011).

Another commonly used method to tackle the problem with endogenous control variables is the two stage least squares (2SLS) regressions (Yazdanfar & Öhman, 2015; Lappalainen & Niskanen, 2012). In this method the endogenous variable is estimated using the other control variables in the model and one or several instrumental variables. This means that in 2SLS the model used in the first stage to estimate the endogenous variable cannot be the exact same as the model used in the second stage of the regression, but they have to differ on at least one variable. In order for a variable to be a good instrument, it has to be significantly correlated with the endogenous variable but uncorrelated with the error term. However, finding plausible instrumentals for endogenous variables is often difficult (Frölich, 2008) and there is a risk that the use of poor instruments can lead to worse estimations than OLS (Nelson & Startz, 1990).

To ensure that our results are not significantly affected by potential endogeneity in the control variable we have performed 2SLS regressions. In order to find plausible instruments for *GIS* and *ROA*, which satisfy the necessary identification requirements we have, with inspiration from Lappalainen and Niskanen (2012), dropped one of the variables in each model with low explanatory value for one of the performance measures but with high for the other. Which variables to drop have been determined based on the OLS regressions on the full sample. Only continuous variables were considered, as these type of variables can be argued to be more suitable to use for estimation of the two continuous variables that are to be estimated, *ROA* and *GIS*, than dummy variables. This results in the exclusion of *Book leverage* from the GIS equation and *Firm age* from the ROA equation. Book leverage has been used as an instrument for *ROA* in previous studies (Yazdanfar & Öhman, 2015) and *Firm age* can be expected to be a good predictor for *GIS* as young firms are, in line with the business life cycle, expected to grow faster than older firms. In line with the OLS regressions, the 2SLS regressions will also be performed controlling for fixed effects on year and industry as well as robust standard errors clustered on firm level. The outputs from the 2SLS regressions can be found in appendix *Table 2*.

5.4.2 Data selection robustness tests

In order to control for multicollinearity among the independent variables, we have conducted an analysis of the Variance Inflation Factor (VIF). Multicollinearity can lead to high variance in the coefficients and results hard to interpret (Wooldridge, 2009).

To rule out that our results are not highly affected by our choice of screening method we have tried alternative data cleansing techniques. In the base case scenario the dependent variables have been trimmed on the 1% level. Additionally, we have also done the trimming on the 5% level and used the winsorizing technique on the 1% and 5% levels to see if the results differ significantly from the outcome with the trimming technique.

Furthermore, we want to see if the results are dependent upon the chosen time period. Previous literature suggest that the international and fast changing business environment today puts more

pressure on CEOs now than before. Could it be that the characteristics of sports merited CEOs are more important for firm performance today than 10 years ago? Therefore, we have performed the same regressions but with data limited to the time periods 2008-2012 and 2010-2012.

Another concern is that our results are distorted by CEOs who spend the most time on personal fitness activities and have performed the challenge more than once. People whose lifestyle is largely influenced by endurance training might have different characteristics than CEOs who are satisfied with the accomplishment of completing the challenge once. In addition, CEOs who spend the most time on endurance activities might also be restricted in the amount of time they can devote to their engagements as CEOs. In order to examine this, we run the regressions on the full sample but exclude all CEOs who have performed the challenge more than once.

Furthermore, as there are systematic differences between industries one could also wonder if the characteristics of sports merited CEOs are more beneficial in certain industries. As can be seen in the descriptive statistics, sports merited CEOs are more frequently found in some industries than others. To examine this, we have run the same regressions, excluding the control for industry fixed effects, for each industry separately.

Another notion is that the characteristics associated with sports merited CEOs are more or less important for people of different ages. In order to test this, we separated the sample into quartiles based on CEO age and run the regression on the first quartile consisting of the youngest CEOs and the forth quartile consisting of the oldest CEOs.

As firm performance varies systematically by industry, we have controlled for industry fixed effects based on groupings into 11 different industries. We believe that this level of detail will be enough to capture the main industry variations. However, to ensure that the results are not affected by our industry grouping we have also tried to use a more detailed industry grouping based on two-digit SNI-codes. In this second test, the data was segmented into 76 different industries.

Finally, to control for potential persistent profitability and growth patterns we include the lagged versions of *ROA* and *GIS* as independent variables (Elsilä et al., 2013; Biggerstaff et al., 2014). Past performance is argued to be a good predictor for future performance and through this test we also reduce the risk of omitted variable bias. However, there is a risk that fixed effect estimations may produce bias results if an explanatory variable is related to past values of the dependent variable (Wooldridge, 2009, p. 411) and hence results from this test should be interpreted with caution.

6 Descriptive statistics and data analysis

Table ii. Summary statistics

	# Firm-year obs.	Mean	Median	Std. dev.	p10	p90
ROA	93 261	7,31%	5,98%	0,095	-0,33%	19,17%
GIS	93 261	8,34%	5,24%	0,216	-13,38%	32,56%
CEO age	93 261	50,072	50	9,183	38	62
Firm age	93 261	23,591	19	18,026	6	47
Firm size	93 261	84 387	35 239	289 673	10 860	176 811
Book leverage	93 261	0,730	0,757	0,197	0,475	0,940
Working capital efficiency	93 261	43,182	41,714	44,373	4,220	75,082
Quick ratio	93 261	1,337	1,109	1,716	0,517	2,203
Board size	93 261	3,299	3	1,456	2	5

Firm size is measured in total sales thousands of SEK. Working capital efficiency is measured as number of days accounts receivable. This table displays non-logarithmic values of all variables.

When looking at *ROA* for the whole population, it can easily be spotted that there are large deviations between observations with the highest and the lowest profitability. However, the median and the mean are rather close implying that the bulk of the data is within the context of reasonable levels. Concerning *GIS*, the spread between the observations is larger than in the case of *ROA*. This is in line with previous studies finding similar results (Yazdanfar & Öhman, 2015).

Although the companies with unreasonable low turnover are excluded from the dataset (see section 4.3.1 for more details), there are still substantial differences between the companies with the largest and the smallest turnover.

The variable *Quick ratio* measures the amount of liquid assets available to cover the amount of short-term liabilities. A high value implies that the company has good liquidity and will have good chances of handling its debt. Implied by the data, it is possible to recognize a large deviation between the most liquid and least liquid companies in the sample, however, the mean and the median is reasonably close implying that even though there are long tails, the vast majority of the observations are relatively concentrated.

The statistics regarding the working capital management efficiency variable (days accounts receivable) implies that some companies are very efficient in managing their working capital whereas other companies have very much capital tied up in relation to total sales. Although, the statistics do also imply that the data are rather homogenous since the median value is very close to the mean, with exception of the extreme values.

Interpreting the mean and median value of age, it seems like the CEOs are in general around 50 years old while the firms are around 20 years old. Board size is in the range between 2 to 5 with the median and mean centered around 3.

Table iii. Industry statistics, full population

Industry	Frequency	% of total data
Energy and environment	695	0,75%
Materials	2 568	2,75%
Industrial goods	25 214	27,04%
Construction industry	11 419	12,24%
Shopping goods	17 916	19,21%
Convenience goods	7 835	8,40%
Health and education	3 380	3,62%
IT Electronics	5 812	6,23%
Telecom and media	1 389	1,49%
Corporate services	17 033	18,26%
Total	93 261	100%

As we can see in the table above, companies within certain industries occur more frequently in the data. *Industrial goods*, *Shopping goods* and *Corporate services* are the most common industries, while *Energy and environment*, *Telecom and media*, and *Materials* are the least common industries.

Table iv. Industry Statistics, Full Population

	Share of full population
More than 5 years of tenure	77,83%
CEO duality	14,84%
Sports merited CEO	1,52%

The dummies included in the regression except for the variable *Sports merited CEO*, and fixed effects on industry and year are *CEO duality* and *tenure*. The data implies that in a large share of the population (roughly 78%) has a longer tenure than 5 years. *CEO duality*, where the CEO is the chairman of the board at the same time, is a lower share of the population, roughly 15%. However, sports merited CEO variable is the dummy for which the least amount of observations are present in the data sample, only around 1,5%.

Table v. Comparison between treatment and control group

	Firms *without* sports merited CEO			Firms *with* sports merited CEOs		
	Mean	Std. dev.	# Firm-year obs.	Mean	Std. dev.	# Firm-year obs.
CEO and firm characteristics						
ROA	7,30%	0,094	91 843	7,80%	0,098	1 418
GIS	8,34%	0,216	91 843	8,40%	0,218	1 418
CEO age	50,112	9,194	91 843	47,535	8,078	1 418
Firm age	23,583	18,011	91 843	24,142	19,007	1 418
Firm size	84 206	290 961	91 843	96 125	188 007	1 418
Book leverage	0,730	0,197	91 843	0,725	0,181	1 418
Working capital efficiency	43,112	44,367	91 843	47,678	44,555	1 418
Quick ratio	1,337	1,726	91 843	1,290	0,735	1 418
Board size	3,298	1,455	91 843	3,401	1,485	1 418

Firm size is measured in total sales thousands of SEK. Working capital efficiency is measured as number of days accounts receivable. This table displays non-logarithmic values of all variables.

When comparing sports merited CEOs to the CEOs not defined as sports merited, one can see that the sports merited CEOs in general have a slightly higher *ROA* and *GIS*. As we can see in the data, the sports merited CEOs are in general a bit younger than the CEOs in the population as a whole. In the companies with a sports merited CEO, the firm age and board size are very similar in the distribution compared to the population as a whole. The largest difference is the size, in which the sports merited CEOs' companies on average are larger than the firms in the rest of the sample. However, the standard deviation for the *Firm size* variable is very large, and the statistics should therefore be interpreted with caution.

Table vi. Comparison between treatment and control group grouped by industry

Industry	% Sports merited CEOs	ROA	GIS
Energy and environment	2,59%	6,31%	10,31%
Materials	1,71%	6,27%	8,06%
Industrial goods	1,48%	6,71%	7,13%
Construction industry	1,65%	7,58%	10,41%
Shopping goods	1,18%	6,01%	6,40%
Convenience goods	1,48%	8,48%	5,74%
Health and education	1,24%	9,04%	10,58%
IT Electronics	2,58%	9,07%	13,34%
Telecom and media	0,94%	5,98%	6,70%
Corporate services	1,55%	8,17%	9,95%
Total	1,52%	7,31%	8,34%

From the table above it is possible to see that sports merited CEOs are overrepresented in the most profitable industry *IT Electronics*, and underrepresented in industries with lower profitability such as *Telecom and media*, and *Shopping goods*. *IT Electronics* is also the industry with the highest growth.

Table vii.

Year	Frequency	% of total data
2003	9 346	10,02%
2004	9 136	9,80%
2005	9 289	9,96%
2006	9 263	9,93%
2007	9 408	10,09%
2008	9 552	10,24%
2009	9 331	10,01%
2010	9 595	10,29%
2011	9 751	10,46%
2012	8 590	9,21%
Total	93 261	100%

Table vii. indicates an even distribution of the observations between the years. This is in line with our expectations and the small deviations are anticipated due to modest variations in the number of registered SMEs and the data cleansing process.

viii. Matching of observations

Number of strata:	19 348		
Number of matched strata:	1 153		
	Firms *without* sports merited CEOs	Firms *with* sports merited CEOs	No. obs.
Matched	14 947	1 292	16 239
Unmatched	76 896	126	77 022
All	91 843	1 418	93 261

In *Table viii*. it can be seen that 126 sports merited CEO observations and 76 896 control observations are dropped when matching the data using CEM based on the variables: year, industry, firm size, firm age and CEO age, resulting in a matched sample consisting of 16 239 observations.

Table ix. Comparison between treatment and control group, matched sample

	Firms *without* sports merited CEO			Firms *with* sports merited CEOs		
	Mean	Std. dev.	# Firm-year obs.	Mean	Std. dev.	# Firm-year obs.
CEO and firm characteristics						
ROA	7,45%	0,092	14 947	7,72%	0,098	1 292
GIS	6,97%	0,204	14 947	8,21%	0,214	1 292
CEO age	48,335	7,004	14 947	47,494	7,856	1 292
Firm age	24,827	17,187	14 947	24,829	18,846	1 292
Firm size	57 666	65 515	14 947	80 946	125 442	1 292
Book leverage	0,721	0,182	14 947	0,725	0,179	1 292
Working capital efficiency	45,711	45,935	14 947	46,659	38,547	1 292
Quick ratio	1,320	1,024	14 947	1,281	0,723	1 292
Board size	3,301	1,367	14 947	3,386	1,481	1 292

Firm size is measured in total sales thousands of SEK. Working capital efficiency is measured as number of days accounts receivable. This table displays non-logarithmic values of all variables.

When comparing *Table ix.* to *Table v.* it is easy to see that the numbers in the matched sample are in general less disparate with lower standard deviations than in the full sample. In particular, the *Firm size* have considerably lower standard deviation, both for the firms with sports merited CEOs and the control firms.

7 Univariate Results

Pearson correlation matrix (in appendix *Table 1.*) displays all pairwise correlation coefficients. The correlations between the control variables, *ROA* and *GIS* are all highly significant.

ROA is highly correlated with *GIS* (0,205), *CEO* a*ge* (-0,049), *CEO tenure* (0,052), *CEO duality* (0,009), *Firm age* (-0,066), *Firm size* (0,018), *Book leverage* (-0,132), *Working capital efficiency* (-0,022), *Quick ratio* (0,202), *Board size* (-0,030) at the 1% significance level. *GIS* is highly correlated with *ROA* (0,205), *CEO* a*ge* (-0,113), *CEO tenure* (-0,036), *CEO duality* (-0,013), *Firm age* (-0,175), *Firm size* (-0,132), *Firm leverage* (0,044), *Working capital efficiency* (0,075), *Quick ratio* (-0,009), *Board size* (-0,008), on 1% significance level.

The variable *Sports merited CEO* has a positive correlation with *ROA* (0,007) with a significance at the 5% level. However, no significant correlation with *GIS*.

There is a negative significant correlation between *Sports merited CEO* and *CEO age* (-0,033), which is in line with our expectations. Since the challenge in recent years have become more popular and in combination with the fact that it requires a high level of physical fitness to succeed (which should benefit the young CEOs), the outcome seems reasonable.

The significant positive correlation between *Sports merited CEO* and *Firm size* (0,022) implies that the CEOs who have completed the challenge in general are CEOs for larger companies. There is a negative significant correlation between *CEO Tenure* (-0,017) and *Sports merited CEO*, which implies that the sports merited CEOs in general have been in office a shorter time

compared to the control group. However, this may be a consequence by the fact that sports merited CEOs on average are younger.

There is a significant positive correlation between *Working capital efficiency* variable (0,010) and *Sports merited CEO*. Since the *Working capital efficiency* variable is calculated as number of days accounts receivable, it is implied that the companies with sports merited CEOs are less working capital efficient. However, since the coefficient is rather small, we shall not draw too far-reaching conclusions. *Board size* (0,008) has a small positive correlation with *Sports merited CEO*, although with a lower significance level at 5%. The same applies for *Quick ratio* (0,006) which correlates with *Sports merited CEO*, although with a significance level of 10%.

From the descriptive statistics and univariate correlation analysis, we can see signs of a positive correlation between sports merited CEOs and firm performance in terms of *ROA*. However, there are no signs of a significant correlation between sports merited CEOs and *GIS*. Now we will see if the results hold when controlling for variations in observable CEO and firm characteristics.

8 Results

x. OLS regression output for full and matched sample

Dep. variable:	Exp. Sign	ROA		Exp. Sign	GIS	
		OLS Full	OLS Matched		OLS Full	OLS Matched
Intercept		0,0739***	0,0515**		0,6324***	0,4591***
		(6,59)	(2,03)		(31,92)	(9,49)
Sports merited CEO	**+**	**0,0021**	**-0,0018**	**+**	**-0,0043**	**0,0118***
		(0,54)	**(-0,43)**		**(-0,72)**	**(1,87)**
GIS	+	0,0892***	0,1087***		-	-
		(45,27)	(24,25)		-	-
ROA		-	-	+	0,4600***	0,5294***
		-	-		(45,57)	(25,51)
CEO Characteristics						
CEO age	+/–	-0,0169***	-0,0112*	+/–	-0,0760***	-0,0517***
		(-6,52)	(-1,94)		(-17,09)	(-4,65)
CEO tenure	+/–	0,0158***	0,0131***	+/–	-0,0188***	-0,0157***
		(13,26)	(5,63)		(-9,14)	(-3,70)
CEO duality	+/–	0,0038***	0,0028	+/–	-0,0050**	-0,0044
		(2,99)	(1,14)		(-2,39)	(-0,96)
Firm Characteristics						
Firm age	–	-0,0050***	-0,0066***	–	-0,0318***	-0,0180***
		(-7,17)	(-4,53)		(-27,64)	(-6,82)
Firm size	+	0,0080***	0,0087***	+	-0,0210***	-0,0183***
		(15,38)	(7,01)		(-24,05)	(-8,34)
Book leverage	–	-0,0101***	-0,0101**	+	0,0023	0,0091
		(-4,49)	(-2,45)		(0,67)	(1,41)
Working capital	–	-0,0054***	-0,0055***	+	0,0129***	0,0141***
efficiency		(-11,78)	(-5,64)		(16,63)	(7,39)
Quick ratio	+	0,0305***	0,0328***	+/–	-0,0260***	-0,0279***
		(30,97)	(16,78)		(-15,30)	(-7,61)
Board size	–	-0,0107***	-0,0094***	+/–	0,0185***	0,0182***
		(-8,81)	(-4,01)		(9,09)	(4,21)
Year fixed effects		Yes	Yes		Yes	Yes
Industry fixed effects		Yes	Yes		Yes	Yes
Clustered on firm		Yes	Yes		Yes	Yes
# Firm-year obs.		93 261	16 239		93 261	16 239
Within R-squared		0,1160	0,1338		0,1282	0,1325

****, ** and * denote statistical significance based on two-tailed tests at the 1%-, 5%- and 10%-level, respectively. In spite of directional hypotheses, two-tailed tests are applied in line with Zerni et al. (2010). t-values of the coefficients (in parentheses) are robust and based on standard errors clustered by firm. Results from fixed effects are omitted in the table. All variables are defined in appendix Table 6.*

8.1 Full sample analysis

Table x. shows the output for the full sample and the matched sample analysis using OLS regressions. The following section presents the results from the OLS regressions based on the full sample. In contradiction to our expectations, the regression on the full sample indicates no

significant relation between *Sports merited CEO* and *ROA*. This is surprising due to the results in the univariate correlation analysis, where we could see a positive significant relation between *Sports merited CEO* and *ROA*. No significant relation can be detected between *GIS* and *Sports merited CEO* either, which is inconsistent with hypothesis 2.

In the ROA regression, the R-squared is around 11,6% which is within the range of previous studies on CEO characteristics (Benmelech & Frydman, 2015; Limbach & Sonnenburg, 2015). However, in most studies in which higher R-squared are noted, the sample is based on large listed companies and more variables are included, such as CEO education and ownership structure (Benmelech & Frydman, 2015). A dataset consisting of large listed companies can be assumed to be more homogenous than the sample in this study consisting of small and medium sized firms.

In the GIS regression, the R-squared is around 12,8%, which is slightly higher compared to the R-squared for *ROA*. From other studies, it is known that R-squared differs between different dependent variables (Benmelech & Frydman, 2015; Limbach & Sonnenburg, 2015). However, the R-squared for *GIS* is within a reasonable range of what can be expected for the model.

In the ROA regression, we see that *GIS* has a positive coefficient (0,0892) and is significant on the 1% level confirming the association between *GIS* and *ROA*. Looking at the output from the GIS regression, we see that the *ROA* variable is positive (coefficient 0,4600) at the 1% level of significance, indicating that *ROA* has a stronger impact on *GIS* than the other way around. *ROA* has been proven to have a significant positive impact on *GIS* in previous research (Yazdanfar & Öhman, 2015), and the regression results from our sample are in line with their findings.

All of the other control variables for observable CEO- and firm characteristics are significant on the 1% level in the ROA regression using the full sample. Given the large sample we could expect to get significant results for most variables. The control variables are significant at the 1% level in the GIS regression as well when the full sample is used, with the exception of *CEO duality* which is significant at the 5% level and *Book leverage* which is not significant at all. Looking at the sign of the coefficients, we can see that all firm control variables have the same sign as expected in the ROA regression. *Firm age* is negatively related with profitability while *Firm size* has a positive impact on profitability. Negative impact of *Firm age* is in line with findings in previous SME studies (Yazdanfar & Öhman, 2015), and so is also the positive impact of *Firm size* on profitability (Aragón-Sánchez & Sánchez-Marín, 2005). For the other firm control variables, we see that *Book Leverage, Working capital efficiency* and *Board size*, all affect *ROA* in a negative direction while the impact of *Quick ratio* is positive.

Turning to the variables controlling for observable CEO heterogeneity it can be seen that *CEO age* has a negative impact on *ROA* while *CEO tenure* and *CEO duality* are positively related to *ROA*. The negative impact of *CEO age* on profitability indicates that having an old CEO is not good for return on assets. However, at the same time we can see that *CEO tenure* has a positive impact on profitability meaning that experience from the firm and the industry is good for company returns. The positive impact of *CEO duality* on *ROA* indicates that role integration with concentrated decision-making power is beneficial for profit oriented SMEs and that the efficiency gains in the form of less information gaps between board and management and short

decision paths outweighs the potential loss in monitoring ability. This finding is somewhat in line with the negative impact of *Board size* has on *ROA*.

Remarkably, many of the control variables in the GIS regression has the opposite sign as in the ROA regression, but not all. *Firm age* also has a negative impact on *GIS* and has an even higher t-value than in the ROA regression. This is logical, as young start up companies have a tendency to grow faster than older more mature companies. *Firm size* is negatively related to *GIS* which stands in contrast to findings by Yazdanfar and Öhman, (2015) who also studied Swedish SMEs. However, their sample included firms with 1 to 200 employees. Smaller firms might benefit more from size as larger firms have access to more resources, while larger companies could have a hard time to keep up the same growth rate as smaller firms. *Board size* exhibit a positive coefficient in contrast to the ROA regression indicating that larger boards can be good for growth but not profitability in SMEs. Also, *Book leverage, Working capital efficiency* and *Quick ratio* have the opposite signs in the GIS regression compared to the ROA regression. However, *Book leverage* is insignificant in the GIS regression, hence no conclusion can be drawn from that. The influence of *Quick ratio* on growth is negative, which could be seen as a indication that growth firms invest liquid assets to a higher extent, resulting in growth in the coming periods. The positive sign of *Working capital efficiency* in the GIS regression is in line with the expectations. This variable is a measure of days accounts receivable and firms growing continuously will have a constant increase in sales outstanding while firms that do not grow can be expected to have sales outstanding in a more constant proportion to annual sales.

The control variables for observable CEO characteristics have the opposite sign as in the ROA regression for *CEO tenure* and *CEO duality* while *CEO age* has the same sign. *CEO duality* is in the GIS regression significant at the 5% level and the effect of the variable on growth is negative. *CEO age* is negatively impacting growth in SMEs. The negative sign for *CEO tenure* in the GIS model indicates that a CEO with long tenure is good for firms with a profitability focus while growth firms benefit from CEOs with shorter tenure.

Performing the robustness checks discussed in section 5.4 on the full sample, we can see that there are no major changes in the output. From the 2SLS results in appendix *Table 2.*, we can see that the *Sports merited CEO* variable is still insignificant when ROA is the regressand, while all other control variables still are significant, with the exception for *CEO age* which is no longer significant. The significance for the other control variables are in parity with the ones found when the OLS model was used. However, the z-value for the estimated GIS in the 2SLS regression is lower than the t-value for the actual GIS used in the OLS regression.

The output when 2SLS is used with GIS as dependent variable on the full sample is in line with the findings in the OLS regression with the exception of ROA for which no significance is found. Estimated ROA is a poor predictor for GIS. As we saw a very strong significance for actual *ROA* is the GIS model when OLS regression was used, this could indicate that *Book leverage* is a weak instrument for *ROA*. No significance is found for the *Sports merited CEO* variable in the 2SLS while the other control variables have the same sign as in the OLS regression and are significant.

Concerning the robustness test described in section 5.4.2, no surprises can be reported. The VIF-test gives us values below 2 for all variables in both models, indicating that there is no issue of multicollinearity between the independent variables (Wooldridge, 2009, p. 99). The results when using other data cleansing methods are in line with the results from the base case OLS regression. The significance of some of the variables varies a little but no remarkable changes. This is the case for both the models and also holds true when only data from more recent time periods are used. Excluding CEOs with most sports merits, splitting the sample into age quartiles and using more detailed industry categorization do not change the outcome significantly. By splitting the sample into a more granular industry classification, the number of sports merited CEO observations turn out to be very small in many industries, making it hard to draw any strong conclusions based on these tests. Finally, when we include lagged versions of the dependent variables the R-squared increased markedly for the ROA model while only a small rise in R-squared occurred in the GIS model. Indicating that past profitability is a better predictor for future profitability than past growth is for future growth. The *Sports merited CEO* variable is still insignificant in both models.

8.2 Matched sample analysis

In *Table ix.* it is clear that the balance in the data is considerably better in the matched sample than in the full sample. This can be seen as the difference between the means for the different control variables are considerably lower when comparing firms with sports merited CEOs with the control group, than when the same comparison is made in the full sample. The same goes for the standard deviations, which are much lower in the matched sample, especially for the variables on which the matching is based upon.

8.2.1 Difference in means analysis

Table xi. Two-sample test of proportions, ROA

Variable	Mean	Std. Err.	Number of obs.
Firms *without* sports merited CEOs	7,45%	0,0021	14 947
Firms *with* sports merited CEOs	7,72%	0,0074	1 292
diff = prop(0) - prop(1)			Hypothesis: diff ≠ 0
			$Pr(Z < z) = 0{,}7255$

Table xii. Two-sample test of proportions, GIS

Variable	Mean	Std. Err.	Number of obs.
Firms *without* sports merited CEOs	6,97%	0,0021	14 947
Firms *with* sports merited CEOs	8,21%	0,0076	1 292
diff = prop(0) - prop(1)			Hypothesis: diff ≠ 0
			$Pr(Z < z) = 0{,}0943$

The *Tables xi.* and *xii.* present the results from the test of difference in means for the two dependent variables performed on the matched sample. We do not expect the sample to be

perfectly balanced as the matching was based on a limited number of variables, hence the difference in means tests should be interpreted with caution. The mean values for sports merited CEOs are higher for both *ROA* and *GIS* than for the control group. However, the z-tests indicates that the difference is not significant for *ROA*, while the difference is significant at the 10% level for *GIS*. Based on these tests, we can say that firms with sports merited CEOs do not have a higher profitability than firms in the control group, but their growth might be better. However, as the sample is not perfectly balanced the regression models have also been used on the matched sample and the results from these regressions are presented next.

8.2.2 Regression analysis matched sample

The *Sports merited CEO* variable influence on *ROA* is not significant in the matched sample either (see *Table x*.). The result is in line with the result from the ROA regression on the full sample, contradictory to hypothesis 1 and the univariate correlation analysis.

Using the GIS model at the matched sample we see that the *Sports merited CEO* variable is significant at the 10% level. This is in line with the findings in the difference in means analysis, but still a weak significance. In comparison to the full sample where the *Sports merited CEO* variable was insignificant the tests on the matched sample indicates a small positive relation between sports merited CEOs and sales growth.

The R-squared for the ROA regression in the matched sample is slightly higher than the R-squared in the full sample, but still within the ranges of other studies (Benmelech & Frydman, 2015; Limbach & Sonnenburg, 2015). This can be a consequence of the disparate observations which are dropped in the matched dataset but present in the full sample. A higher R-squared for the matched sample is therefore in line with our expectations. Also in the GIS regression, R-squared is slightly higher for the matched sample than for the full sample.

Results for the control variables in the matched sample regression on ROA are very similar to the outcome in the full sample regression. The signs of all the variables are the same in both regressions, however, the significance is worse for all variables in the matched sample regression. The result is that *CEO duality* is no longer significant, *CEO age* goes from being significant at the 1% level to being significant at the 10% level and *Book leverage* is now significant at the 5% level. The fact that the control variables loose in significance is not surprising as the marched sample is about a sixth of the size of the full sample.

The results from the regression using the matched sample and *GIS* as dependent measure, show that the control variables exhibit the exact same signs as in the full sample regression. Just as for the ROA regressions all control variables loose in significance with the exception of *Book leverage*, but this variable is still insignificant. The only real change is found in the variable *CEO duality*, which goes from being significant to insignificant.

Results from 2SLS regressions on the matched sample are found in appendix *Table 2.*, and show that *Sports merited CEO* is still insignificant in the ROA model and no longer significant at the 10% percent level in the GIS model. Furthermore, when we generate a one-to-one matched sample we can see that the positive relation between sports merited CEOs and *GIS* is not significant (see appendix *Table 4*. and *5*.). Neither in the difference in means test, nor when

the regression model is used. Even though it is argued to be better to match more than one observation to each treated unit, in this case the sports merited CEO observations (Smith, 1997), as done in the results presented section above, the relation between sports merited CEOs and GIS do not seem to be very robust.

9 Discussion and analysis

9.1 Discussion of results

Based upon the upper echelons theory and findings of the impact of CEO characteristics on firm performance (Hambrick & Mason, 1984), discoveries of the personal success of athletes (Barron et al., 2000) and how sports merits are favored in business (Kwoh, 2013), we expected to find a significant and positive relation between CEOs with sports merits from endurance challenges and accounting firm performance.

Drawing on previous research on upper echelons and performance in SMEs we choose to test the relation between sports merited CEOs and firm accounting performance using two types of measures, one profitability based and one market based. As a result, the following two hypotheses were formulated:

H1: CEOs with sports merits from endurance challenges are positively associated with firm *profitability*.

H2: CEOs with sports merits from endurance challenges are positively associated with firm *market performance*.

Surprisingly, the results from both the full sample and the matched sample indicate that the characteristics of CEOs with sports merits from endurance challenges are not associated with firm performance. Starting with the profitability measure *(ROA)*, a positive relation between sports merited CEOs and profitability could be anticipated after looking at the descriptive statistics and univariate correlation analysis. In these, it was found that firms with sports merited CEOs on average had a higher *ROA* than firms in the control group and the two variables were significantly correlated at the 5% level. However, we could here also see that sports merited CEOs were overrepresented in the industry with the highest profitability, *IT Electronics*. The fact that sports merited CEOs are frequently found within *IT Electronics*, which can be considered a knowledge intense industry, is not that surprising given findings in previous literature indicating that education and sports participation are positively related (Farrell & Shields, 2002). When using the model controlling for observable heterogeneity in CEO and firm characteristics we see that the positive association between sports merited CEOs and *ROA* is not significant anymore. This means that the positive relation between the two variables found in the univariate correlation analysis can be explained by other factors than the characteristics of sports merited CEOs and therefore, we reject Hypothesis 1.

Turning to the market performance measure *(GIS)*, no significant difference between firms with sports merited CEOs and the control group can be detected, based on the descriptive statistics and the univariate analysis, even though the mean value of sales growth is higher for sports merited CEOs. The association is not either significant when running the OLS regression on the full sample. However, the difference in means analysis on the matched sample indicates that firms with sports merited CEOs have higher *GIS* and the difference is significant at the 10% level. The positive relation between sports merited CEOs and *GIS* is also significant at the 10% level when the regression model is used on the matched sample. However, when robustness tests are performed on the matched sample the impact of the sports merited CEO variable is still positive but the significance falls outside of the 10% level. This indicates that the results are not very robust, especially since the significance for most of the control variables are consistent when performing the various robustness checks. Even though the results indicate that there might be a slight positive relation between sports merited CEOs and market performance, the impact of the variable is not robust, hence we choose to also reject Hypothesis 2.

Given our large sample and the variety of tests used we feel confident with the results indicating that CEOs with sports merits from endurance challenges are not strongly associated with better performance in SMEs in terms of profitability and sales growth. However, looking at the regressions, we see that most of the control variables are highly significant and exhibit consistent signs across the different regressions. The extensive data and the number of variables included in the analysis makes these results interesting on their own as they add knowledge to what factors affect accounting performance in SMEs. *Firm age* is negatively related to both performance measures while *Firm size* has positive impact on profitability while affecting growth in a negative direction. *Book leverage* is negatively associated with profitability but the impact of the variable on growth is insignificant. *Working capital efficiency*, measured as number of days accounts receivable, has a negative impact on *ROA* while the opposite association is noted with *GIS*. This could potentially be explained by the constant increase in sales outstanding in growth SMEs. High liquidity has a positive impact on firm profitability, but is negatively associated with growth, which indicates that firms investing more of their liquid assets achieve higher growth.

Board size is negatively associated with SME profitability but has a positive impact on growth. *CEO duality* has a positive impact on profitability but a weak negative influence on growth. These findings indicate that SMEs with a profit focus benefits from small information gaps, short decision paths and role integration rather than having large boards monitoring top management. While large boards, associated with more monitoring ability and access to more recourses, as well as role separation are better for SMEs with a growth objective. The other observable CEO characteristics controlled for are *CEO age* and *CEO tenure*. The variable *CEO age* has a negative impact on both profitability and growth while *CEO tenure* is found to influence profitability positively but the effect on growth is negative. These findings indicate that old CEOs are neither beneficial for growth nor profitability in SMEs, while experience from the industry and the company is good for profits but not growth. These findings show that some of the firm characteristics controlled for have an overlapping influence for both profitability and growth while others affect the two performance measures in different ways.

Returning to the main focus of this study and the results indicating no significant relation between sports merited CEOs and firm accounting performance. We find these results very surprising given the previous research on the impact of CEO characteristics on firm performance and the successes achieved by former athletes on a personal level. Especially as we conducted the analysis on SMEs, in which the CEO impact is expected to be even more pronounced than in larger firms.

Nonetheless, the majority of the previous research within this area has focused on individual outcomes, such as earnings and health, implying a positive relation between sports participation and success in other aspects of life. Further, physically fit CEOs have been found to be positively associated with both firm profitability and value (Limbach & Sonnenburg, 2015). Setting our results into context of the previous research pursued by Limbach and Sonnenberg, there is an indication that the CEOs' current level of fitness and not sports merits from the past is of the greatest importance when assessing firm performance. In the quote starting this paper the words "*staying trim*" are used, and this seem to be what truly matters for CEOs. The results in this study indicate that CEOs with sports merits from the past do not deliver better firm performance than CEOs in the control group, in contrast to the general prevailing belief among media and executive recruiters.

9.2 Analysis of findings

However, there might also be conditional factors affecting the insignificant results in this study and we will now discuss a number of potential explanations for the absent results.

One potential explanation might be that the fitness trend in Sweden is very widespread (Oldberg, 2015) and having merits from endurance challenges are not very distinguishing. Many people in Sweden prioritise physical training, and as education and sports involvement are argued to be positively related, it could be expected that a large proportion of people in CEO positions engage in sports. The demanding character of the sports merit observed in this study makes us strongly believe that the CEOs who successfully have completed the challenge, clearly distinguish themselves from the average CEO in terms of sports accomplishments. However, there is still a risk that a considerable number of CEOs in the control group might possess the same or similar underlying characteristics as the sports merited CEOs, which they have developed or demonstrated in other ways than by performing the challenge. This relates to a limitation of the data in this study, since it only includes one type of sports merit, which less than 2% of all CEOs in the sample possess. Even though we generate a matched sample in which the sports merited CEOs account for a higher proportion there is still a risk that many people in the control group also are sports merited through other accomplishments. If this is the case, the impact of the CEO characteristics of interest would be distorted by observations in the control group with the same characteristics.

Even though the CEO effect is argued to be more pronounced in smaller companies, the traits associated with successful completion of demanding endurance challenges might be of more importance when managing larger, more complex organizations. Limbach and Sonnenburg (2015) found that S&P 1 500 companies with physically fit CEOs are more profitable than firms with non-fit CEOs. Physical fitness is a trait found to be of importance when exposed to

demanding and stressful situations (Lovelace et al., 2007) and it could be argued that CEOs in large public companies are more exposed to these situations than CEOs of unlisted SMEs, making health related traits more important for CEOs in bigger firms. Furthermore, the study by Limbach and Sonnenburg was based on U.S. firms, where the CEO effect has been found to be more pronounced than in Swedish firms (Crossland & Hambrick, 2007), which could imply that CEO characteristics influence on firm performance is more evident in the American setting. In addition, physically fit CEOs might also be of greater importance for public companies as they are exposed to more intense media coverage in addition to being constantly watched by analysts and investors. Accordingly, CEO image becomes more important. Athletic people in good physically shape are often presumed to be more effective both in terms of performance and interpersonal relations (Kwoh, 2013). In addition, people enjoying a high level of physical shape are in general considered to be more attractive (Shackelford & Larsen, 1999), and CEO attractiveness is in turn positively associated with shareholder value (Halford & Hsu, 2014).

However, there is also literature indicating that not all CEO sports engagements outside the office are beneficial for firm performance, and too much time spent on leisure activities can results in CEO shirking (Biggerstaff et al., 2014). The demanding challenge, which the CEOs defined as sports merited have successfully completed, is very time consuming and requires a great deal of effort. Not only the challenge in itself, but the preparation in terms of extensive training. Even though the CEOs we study have completed the challenge, CEOs prone undertake a commitment, such as the challenge, can be expected to have training habits which involves working out frequently, with a risk of shirking their responsibilities as CEOs. This indicates that even though the challenge is a proxy for traits argued to be beneficial for individuals in leadership positions, there is a risk that the expected positive effects are counteracted by other parameters.

10 Conclusion

This study utilizes unique data on CEOs with sports merits from endurance challenges to explore the influence of personal characteristics on firm accounting performance. The data contains detailed information on CEOs who have performed endurance challenges and company level financial accounting information. The dataset allows us to examine whether personal characteristics of chief executive officers (CEOs) - sports merits from endurance challenges - influence accounting firm performance. Two types of performance measures have been applied: (1) ROA, a measure of profitability; and (2) GIS, a metric for market performance. In order to investigate these relations, two models have been developed in which observable CEO and firm characteristics previously found to influence firm performance have been controlled for. The analysis is performed on the full sample as well as a matched sample generated using Coarsened Exact Matching (CEM).

The main results can be summarized as follows. We find indicative support in the univariate correlation analysis for a positive relation between the sports merited CEOs and profitability at 5% significance level. However, this result does not hold when controlling for observable CEO and firm characteristics in the regression model. Nevertheless, the matched sample data demon-

strated a weak positive relation between CEOs with sports merits and sales growth, although the results did not hold for the robustness tests and hence no valid conclusions can be drawn.

This study contributes to the field of organizational research of CEO characteristics and more specifically, sports in business. This is done by providing results indicating that sports merited CEOs do not perform better as corporate leaders. These findings problematize and contradict current literature on sports in business as well as the general notion among media and executive recruiters regarding the anticipated beneficial traits associated with sports merited CEOs. In the context of previous research, these discoveries suggest that old sports merits from endurance challenges have no explanatory power for the expected prosperity of CEOs, while current fitness level, studied by Limbach and Sonneburg (2015), might be a better predictor for CEO performance.

Anchoring in the most recent research, this study expands the upper echelons framework by integrating characteristics associated with sports. Both psychological and observable characteristics related to sports are included, which are presumed to have a significant influence on the association between CEO characteristics and firm performance.

However, as a result of the extensive dataset and a wide range of variables controlled for in the analysis, this thesis also adds to research on organizational performance, and more specifically the understanding of variables affecting profitability and growth in SMEs. The overall findings indicate that older firms have both lower profitability and growth, while the firm size is positively related with SME profitability while having a negative effect on growth. Low book leverage is associated with profitability, but has no relation with growth, while high liquidity has a positive impact on profitability but the opposite impact on growth. The results also show that SMEs with profitability focus seem to benefit from smaller boards, role integration and CEOs with long tenure instead of large boards monitoring top managers. SMEs with growth ambitions; on the other hand, should have a CEO with short tenure, separate roles and appoint larger boards which could provide access to more resources. Old CEOs are found to neither be associated with profitability, nor with growth in SMEs.

10.1 Limitations

This study is comprehensive as it includes an extensive number of firm observations over a long time period, and numerous control variables are considered. Furthermore, a combination of various methods has been applied to analyze the data. This, in combination with the objective quality assured accounting data which the analysis is based upon, leads to results that are more objective and extensive than the ones found in many previous SME studies. Moreover, the unique data resulting in 100% correct matching between accounting and sports merits data, is a strength of this study compared to previous studies on CEO characteristics and firm performance. Still, this study has some limitation which are discussed below.

First, this study only covers Swedish SMEs and thus, the results might not be generalizable to other countries and companies of different sizes. In addition, the data on sports merited CEOs is quite restricted since it only includes one type of endurance challenge. Sports involvement in Sweden is among the highest in the world, meaning that even those who have not performed the

endurance challenge might still be very active when it comes to sporting and hence might possess many of the characteristics associated with CEOs who have performed the endurance challenge. Therefore, the difference between those who have performed the endurance challenge and those who have not, might not be as pronounced here as in other countries where sporting is not as common. Furthermore, CEOs in larger listed organizations are expected to face higher demands and responsibilities than chief executives in SMEs, meaning that the effect sports related CEO traits might be of higher importance in the context of large organizations.

Secondly, even though the dataset used in this study is comprehensive, the anonymous character of the data has eliminated the possibility to supplement the data with additional background information. As discussed in the model development section, there are a number of variables which have previously been found to influence firm performance that are not controlled for in this study. We can therefore not rule out that additional background- and accounting information could have affected our results if added as control variables in the regressions.

Lastly, consideration has not been taken to how old the sports merits are or at what age the CEO performed that endurance challenge. Even though the characteristics studied are considered to be persistent over time, we cannot completely ignore the notion that the characteristics prescribed to sports merited CEOs who have performed the challenge might become less pronounced as time passes from the point in time when the challenge was completed. Furthermore, at what age a person performs the endurance challenge could provide further insight about the persons underlying characteristics as events and experiences are argued to impregnate differently at various stages in life (Malmendier et al., 2011).

10.2 Suggestions for future research

There are many possibilities to broaden the knowledge within the research field of sports in business and how sports merits are reflected in corporate leaders' decision-making and organizational outcome.

Firstly, we suggest future research within this area to include broader data of sports participation. This could be done either through survey or by collecting records from a wider range of organized sports activities. Preferably, a study like this could be performed in a different country than Sweden, in which the expected difference between CEOs active in sports and the average CEO is more pronounced.

Of interest would also be to investigate the effects of sports participation when growing up and the propensity of succeeding as CEO later on in life. Experiences impregnate on people harder when they are younger (Malmendier et al., 2011), meaning that sports participation early on in life might be more important for a person's underlying characteristics than sports involvement later in life. Furthermore, we encourage future research to a greater extent consider potential heterogeneity in characteristics of people with background in various sports. Much of the empirical research in the field today only separates athletes from non-athletes and does not consider the notion that sports merits from certain types sports disciplines might be more suitable for people in business and CEO positions.

Further, we suggest future research to also include a wider range of firm outcomes in the analysis. In such a study a more extensive set of background variables could advantageously be included in order to yield a better understanding of people engaging in sports and the value of sports merits. In our univariate correlation analysis, we found for example that sports merited CEOs are significantly associated with larger firms while they are negatively correlated with CEO age and tenure. CEO experiences have previously been found to influence firm's strategic decisions, but not necessarily performance (Benmelech & Frydman, 2015). Sports merited CEOs' most apparent influence on firm outcome might not be seen in the performance, but rather in specific strategic choices.

12 Works cited

Adams, R. B., Almeida, H., & Ferreira, D. (2005). Powerful CEOs and Their Impact on Corporate Performance. *Review of Financial Studies*, 1403-1432.

Adams, R., Keloharju, M., & Knüpfer, S. (2014). Are CEOs Born Leaders? Lessons from Traits of a Million Individuals. *IFN Working Paper No. 1024*, 1-55.

Aggarwal, V. A., & Hsu, D. H. (2014). Entrepreneurial Exits and Innovation. *Management Science*, 867-887.

Aragón-Sánchez, A., & Sánchez-Marín, G. (2005). Strategic Orientation, Management Characteristics, and Performance: A Study of Spanish SMEs. *Journal of Small Business Management*, 287-308.

Arosa, B., Iturralde, T., & Maseda, A. (2013). The board structure and firm performance in SMEs: Evidence from Spain. *Investigaciones Europeas de Direccion y Economia se la Empresa*, 127-135.

Barron, J. M., Ewing, B. T., & Waddell, G. R. (2000). The effects of high school athletic participation on education and labor market outcomes. *Review of Economics and Statistics*, 409-421.

Benmelech, E., & Frydman, C. (2015). Military CEOs. *Journal of Financial Economics*, 43-59.

Bertrand, M., & Schoar, A. (2003). Managing with style: The effect of managers on firm policies. *Quarterly Journal of Economics*, 1169-1208.

Biggerstaff, L., Cicero, D. C., & Puckett, A. (2014). *FORE! An analysis of CEO shirking.* USA: Social Science Electronic Publishing, Inc.

Biggerstaff, L., Cicero, D. C., & Puckett, A. (2015). Suspect CEOs, unethical culture, and corporate misbehavior. *Journal of Financial Economics*, 98-121.

Blackwell, M., Iacus, S., King, G., & Porro, G. (2010). cem: Coarsened exact matching in Stata . *Stata Journal*, 524-546.

Bodie, Z., Kane, A., & Marcus, A. J. (2011). *Investments and Portfolio Management.* Singapore: McGraw-Hill/Irwin.

Bolagsverket. (2015). *Bolagsverket*. Retrieved from http://www.bolagsverket.se/ff/foretagsformer/aktiebolag/arsredovisning/aktiebolag-1.3083

Boone, C., De Brabander, B., & Hellemans, J. (2000). Research Note: CEO Locus of Control and Small Firm Performance. *Organization Studies*, 641-646.

Boone, C., De Brabander, B., & van Witteloostuijn, A. (1996). CEO Locus of Control and Small Firm Performance: An Integrative Framework and Empirical Test. *Journal of Management Studies*, 667-699.

Bowen, R. M., Rajgopal, S., & Venkatachalam, M. (2008). Accounting Discretion, Corporate Governance, and Firm Performance. *Contemporary Accounting Research* , 351-405.

Brown, J. (1991). Staying Fit and Staying Well: Physical Fitness as a Moderator of Life Stress. *Journal of Personality and Social Psychology*, 555-561.

Carmeli, A., Schaubroeck, J., & Tishler, A. (2011). How CEO empowering leadership shapes top management team processes: Implications for firm performance. *The Leadership Quarterly*, 399-411.

Carpenter, M. A., Geletkanycz, M. A., & Sanders, W. G. (2004). Upper Echelons Research Revisited: Antecedents, Elements, and Consequences of Top Management Team Composition. *Journal of Management*, 749-778.

Chatterjee, A., & Hambrick, D. C. (2007). It's all about me: Narcissistic chief executive officers and their effects on company strategy and performance. *Administrative Science Quarterly*, 351-386.

Chen, G., Gully, S. M., & Eden, D. (2001). Validation of a New General Self-Efficacy Scale. *Organizational Research Methods*, 62-83.

Christensen, J., Kent, P., & Stewart, J. (2010). Corporate Governance and Company Performance in Australia. *Australian Accounting Review* , 372-386.

Cobb-Clark, D. A., Kassenboehmer, S. C., & Schurer, S. (2014). Healthy Habits: The Connection between Diet, Exercise, and Locus of Control. *Journal of Economic Behavior & Organization*, 1-28.

Colcombe, S., & Kramer, A. F. (2003). Fitness effects on the cognitive function of older adults: A meta-analytic study. *Psychological Science*, 125-130.

Coyle, E. F., Wade H., M., Sinacore, D. R., Joyner, M. J., Hagberg, J. M., & Holloszy, J. O. (1984). Time course of loss of adaptations after stopping prolonged intense endurance training. *Journal of Applied Physiology Respiratory Environmental and Exercise Physiology*, 1857-1864.

Crossland, C., & Hambrick, D. C. (2007). How national systems differ in their constraints on corporate executives: A study of CEO effects in three countries. *Strategic Management Journal*, 767-789.

Daily, C. M., & Dalton, D. R. (1992). The relationship between governance structure and corporate performance in entrepreneurial firms. *Journal of Business Venturin*, 375-386.

Delmar, F., McKelvie, A., & Wennberg, K. (2013). Untangling the relationships among growth, profitability and survival in new firms. *Technovation*, 276-291.

Deloof, M. (2003). Does Working Capital Management Affect Profitability of Belgian Firms? *Journal of Business Finance & Accounting*, 573-587.

Dequech, D. (2001). Bounded Rationality, Institutions, and Uncertainty. *Journal of Economic Issues*, 911-929.

Elsilä, A., Kallunki, J.-P., Nilsson, H., & Sahlström, P. (2013). CEO Personal Wealth, Equity Incentives and Firm Performance. *Corporate Governance: An International Review*, 26-41.

European Commission. (2015, November 28). *ec.europa.eu*. Retrieved from http://ec.europa.eu/: http://ec.europa.eu/growth/smes/business-friendly-environment/sme-definition/index_en.htm

Farber, D. B. (2005). Restoring Trust after Fraud: Does Corporate Governance Matter? *The Accounting Review*, 539-561.

Farrell, L., & Shields, M. A. (2002). Investigating the economic and demographic determinants of sporting participation in England. *Journal of the Royal Statistical Society: Series A - Statistics in Society*, 335-348.

Folkins, C., & Sime, W. (1981). Physical fitness training and mental health. *American Psychologist*, 373-389.

Frecka, T. J., & Hopwood, W. S. (1983). The Effects of Outliers on the Cross-Sectional Distribution Properties of Financial Ratios. *The Accounting Review*, 115-128.

Frölich, M. (2008). Parametric and Nonparametric Regression in the Presence of Endogenous Control Variables. *International Statistical Review*, 214-227.

García-Teruel, P. J., & Martínez-Solano, P. (2007). Effects of working capital management on SME profitability. *International Journal of Managerial Finance*, 164-177.

Gill, D. L., Williams, L., Dowd, D. A., Beaudoin, C. M., & Martin, J. J. (1996). Competitive Orientations and Motives of Adult Sport and Exercise Participants. *Journal of Sport Behavior*, 307-318.

Gudiol, J. (2014, June 26). *Svd.se*. Retrieved from Svenska Dagbladet: http://www.svd.se/att-trana-optimalt--inte-maximalt

Hagel, J., Brown, J. S., & Davison, L. (2010, March 4). *Harvard Business Review*. Retrieved from hbr.org: https://hbr.org/2010/03/the-best-way-to-measure-compan.html

Halford, J. T., & Hsu, S. H. (2014). *Beauty is Wealth: CEO Appearance and Shareholder Value*. USA: Social Science Electronic Publishing, Inc.

Hambrick, D. C. (2007). Upper Echelons Theory: An Update. *Academy of Management Review*, 334-343.

Hambrick, D. C., & Mason, P. A. (1984). Upper Echelons: The Organization as a Reflection of Its Top Managers. *The Academy of Management Review*, 193-206.

Hambrick, D. C., Finkelstein, S., & Mooney, A. C. (2005). Executive job demands: New insights for explaining strategic decisions and leader behaviors. *Academy of Management Review*, 472-491.

Haniffa, R., & Hudaib, M. (2006). Corporate Governance Structure and Performance of Malaysian Listed Companies. *Journal of Business Finance and Accounting*, 1034-1062.

Hayes, R. M., & Schaefer, S. (1999). How much are differences in managerial ability worth? *Journal of Accounting and Economics*, 125-148.

Hayward, M. L., & Hambrick, D. C. (1997). Explaining the Premiums Paid for Large Acquisitions: Evidence of CEO Hubris. *Administrative Science Quarterly*, 103-127.

Hellerstein, J. M. (2008). *Quantitative Data Cleaning for Large Databases*. UC Berkeley: United Nations Economic Commission for Europe.

Henderson, A. D., Miller, D., & Hambrick, D. C. (2006a). How quickly do CEOs become obsolete? Industry dynamism, CEO tenure, and company performance. *Strategic Management Journal*, 447-460.

Henderson, D. J., Olbrecht, A., & Polachek, S. (2006b). Do Former College Athletes Earn More at Work? A Nonparametric Assessment. *Journal of Human Resources*, 558-577.

Hiebl, M. R. (2014). Upper echelons theory in management accounting and control research. *Journal of Management Control*, 223-240.

Ho, D. E., Imai, K., King, G., & Stuart, E. A. (2007). Matching as Nonparametric Preprocessing for Reducing Model Dependence in Parametric Causal Inference. *Political Analysis*, 199-236.

Hoechle, D. (2007). Robust standard errors for panel regressions with cross-sectional dependence. *The Stata Journal*, 281-312.

Howell, F. M., Miracle, A. W., & Rees, C. R. (1984). Do High School Athletics Pay?: The Effects of Varsity Participation on Socioeconomic Attainment. *Sociology of Sport Journal*, 15-25.

Iacus, S. M., King, G., & Porro, G. (2012). Causal Inference without Balance Checking: Coarsened Exact Matching. *Political Analysis*, 1-24.

Inouea, Y., Wegnerb, C. E., Jordanb, J. S., & Funkb, D. C. (2015). Relationships Between Self-Determined Motivation and Developmental Outcomes in Sport-Based Positive Youth Development. *Journal of Applied Sport Psychology*, 371-383.

Jones, G. J. (2008). How the best of the best get better and better. *Harvard Business Review*, 123-127.

Judge, T. A., & Bono, J. E. (2001). Relationship of core self-evaluations traits - Self-esteem, generalized self-efficacy, locus of control, and emotional stability - With job satisfaction and job performance: A meta-analysis. *Journal of Applied Psychology*, 80-92.

Judge, T. A., Erez, A., & Joyce, B. E. (1998). The Power of Being Positive: The Relation Between Positive Self-Concept and Job Performance. *Human Performance*, 167-187.

Kaplan, S. N., Klebanov, M. M., & Sorensen, M. (2012). Which CEO Characteristics and Abilities Matter? *The Journal Of Finance*, 973-1007.

Kim, C.-S., Mauer, D. C., & Sherman, A. E. (1998). The Determinants of Corporate Liquidity: Theory and Evidence. *The Journal of Financial and Quantitative Analysis*, 335-359.

Kniffin, K. M., Wansink, B., & Shimizu, M. (2015). Sports at Work: Anticipated and Persistent Correlates of Participation in High School Athletics. *Journal of Leadership and Organizational Studies*, 217-230.

Kramer, A. F., Hahn, S., Cohen, N. J., Banich, M. T., McAuley, E., Harrison, C. R., . . . Colcombe, A. (1999). Ageing, fitness and neurocognitive function. *Nature 400*, 418-419.

Kwoh, L. (2013, January 16). *The Wall Street Journal*. Retrieved October 08, 2015, from wsj.com: http://www.wsj.com/articles/SB10001424127887324595704578241573341483946

Lappalainen, J., & Niskanen, M. (2012). Financial performance of SMEs: impact of ownership structure and board composition. *Management Research Review*, 1088-1108.

Lechner, M. (2009). Long-run labour market and health effects of individual sports activities. *Journal of Health Economics*, 839-854.

Lechner, M., & Sari, N. (2015). Labor market effects of sports and exercise: Evidence from Canadian panel data. *Labour Economics*, 1-15.

Lev, B., & Sunder, S. (1979). Methodological Issues in the Use of Financial Ratios. *Journal of Accounting and Economics*, 187-210.

Lieberson, S., & O'Connor, J. F. (1972). Leadership and Organizational Performance: A Study of Large Corporations. *American Sociological Review*, 117-130.

Limbach, P., & Sonnenburg, F. (2015). CEO Fitness and Firm Value. *Social Science Research Network*, 1-53.

Ling, Y., Simsek, Z., Lubatkin, M., & Veiga, J. (2008). The Impact of Transformational CEOs on the Performance of Small- to Medium-Sized Firms: Does Organizational Context Matter? *Journal of Applied Psychology*, 923-934.

Lipscomb, S. (2007). Secondary school extracurricular involvement and academic achievement: a fixed effects approach. *Economics of Education Review*, 463-472.

Long, J. E., & Caudill, S. B. (1991). The Impact of Participation in Intercollegiate Athletics on Income and Graduation. *The Review of Economics and Statistics*, 525-531.

Lovelace, K. J., Manz, C. C., & Alves, J. C. (2007). Work stress and leadership development: The role of self-leadership, shared leadership, physical fitness and flow in managing demands and increasing job control. *Human Resource Management Review*, 374-387.

Lubatkin, M., Simsek, Z., Ling, Y., & Veiga, J. (2006). Ambidexterity and performance in small-to medium-sized firms: The pivotal role of top management team behavioral integration. *Journal of Management*, 646-672.

Malmendier, U., Tate, G., & Yan, J. O. (2011). Overconfidence and Early-Life Experiences: The Effect of Managerial Traits on Corporate Financial Policies. *The Journal of Finance*, 1687-1733.

Maloney, M. T., & McCormick, R. E. (1993). An Examination of the Role that Intercollegiate Athletic Participation Plays in Academic Achievement Athlete's Feats in the Classroom. *Journal of Human Resources*, 555-570.

Megginson, W. L., & Netter, J. M. (2001). From State to Market: A Survey of Empirical Studies on Privatization. *Journal of Economic Literature*, 321-389.

Mento, A. J., Steel, R. P., & Karren, R. J. (1987). A Meta-Analytic Study of the Effects of Goal Setting on Task Performance: 1966-1964. *Organizational Behavior and Human Decision Processes*, 52-83.

Mikkelson, W. H., & Partch, M. M. (2003). Do Persistent Large Cash Reserves Hinder Performance? *Journal of Financial and Quantitative Analysis*, 275-294.

Nagler, J. (2011). *Notes on Identification.* U.S.A.: New York University.

Neck, C. P., Mitchell, T., Manz, C. C., Cooper, K. H., & Thompson, E. C. (2000). Observations - Fit to lead: is fitness the key to effective executive leadership? *Journal of Managerial Psychology*, 833-841.

Nelson, C. R., & Startz, R. (1990). The Distribution of the Instrumental Variables Estimator and Its t-Ratio When the Instrument Is a Poor One. *The Journal of Business*, 125-140.

Newbold, P., Carlson, W. L., & Thorne, B. (2010). *Statistics for Business and Economics*. New Jersey: Pearson Education Inc.

Norberg, J. R. (2014). *Statens stöd till idrotten*. Centrum för idrottsforskning.

Oldberg, E. (2015, November 29). *DN.se*. Retrieved from http://www.dn.se/: http://www.dn.se/livsstil/svenskar-tranar-mest-i-eu/

Palmgren, N. (2014, April 25). *DN.se*. Retrieved October 08, 2015, from dn.se: http://www.dn.se/sport/langlopp-for-motionarer-slar-rekord/

Papadakis, V., & Barwise, P. (2002). How much do CEOs and top managers matter in strategic decision-making? *British Journal of Management*, 83-95.

PAR. (2015). *House of Finance*. Retrieved from http://houseoffinance.se/wp-content/uploads/2014/02/serrano120815engt_ny_v3.pdf

PAR, Bisnode. (2015, November 28). *PAR*. Retrieved from www.par.se: http://www.par.se/om-par/

Penman, S. H. (2013). *Financial Statement Analysis and Security Valuation* (Vol. Fifh Edition). New York: McGraw-Hill.

Penman, S. H., & Zhang, X.-J. (2002). Accounting Conservatism, the Quality of Earnings, and Stock Returns. *The Accounting Review*, 237-264.

Phillips, J. M., & Gully, S. M. (1997). Role of goal orientation, ability, need for achievement, and locus of control in the self-efficacy and goal-setting process. *Journal of Applied Psychology*, 792-802.

PWC. (2015). *PWC*. Retrieved from http://www.pwc.se/sv/ifrs.html

Quigley, T. J., & Hambrick, D. C. (2015). Has the "CEO effect" increased in recent decades? A new explanation for the great rise in America's attention to corporate leaders. *Strategic Management Journal*, 821-830.

Rappaport, A. (2006). Ten Ways to Create Shareholder Value. *Harvard Business Review*, 66-77.

Richard, P. J., Devinney, T. M., Yip, G. S., & Johnson, G. (2009). Measuring Organizational Perfromance: Towards Methodological Best Practice. *Journal of Management* , 718-804.

Rosenbusch, N., Brinckmann, J., & Bausch, A. (2011). Is innovation always beneficial? A meta-analysis of the relationship between innovation and performance in SMEs. *Journal of Business Venturing*, 441-457.

Rotter, J. B. (1966). Generalized Expectancies for Internal Versus External Control of Reinforcement. *Psychological Monographs: General and Applied*, 1-28.

Rubin, D. B. (1979). Using Multivariate Matched Sampling and Regression Adjustment to Control Bias in Observational Studies. *Journal of the American Statistical Association*, 318-328.

Sandberg, M. (2011, July 9). *Expressen*. Retrieved October 08, 2015, from expressen.se: http://www.expressen.se/nyheter/dokument/motionarer-och-kvinnor-bakom-succen-for-langloppen/

Scheerder, J., Vanreusel, B., & Taks, M. (2005). Stratification patterns of active sport involvement among adults: Social change and persistence. *International Review for the Sociology of Sport*, 139-162.

Schnohr, P., O'Keefe, J. H., Marott, J. L., Lange, P., & Jensen, G. B. (2015). Dose of jogging and long-term mortality: The Copenhagen City heart study. *Journal of the American College of Cardiology*, 411-419.

Seiler, S., & Tønnessen, E. (2009). Intervals, Thresholds, and Long Slow Distance: the Role of Intensity Intervals, Thresholds, and Long Slow Distance: the Role of Intensity. *Sportscience*, 32-53.

Shackelford, T. K., & Larsen, R. J. (1999). Facial Attractiveness and Physical Health. *Evolution and Human Behavior*, 71-76.

Singh, J., & Agrawal, A. (2011). Recruiting for Ideas: How Firms Exploit the Prior Inventions of New Hires. *Management Science*, 129-150.

Sitzmann, T., & Yeo, G. (2013). A Meta-Analytic Investigation Of The Within-Person Self-Efficacy Domain: Is Self-Efficacy A Product Of Past Performance Or A Driver Of Future Performance? *Personnel Psychology*, 531-568.

Smith, H. L. (1997). Matching With Multiple Controls to Estimate Treatment Effects in Observational Studies. *Sociological Methodology*, 325-353.

Stuart, E. A. (2010). Matching methods for causal inference: A review and a look forward. *Statistical Science*, 1-21.

Summers, J. J., Sargent, G. I., Levey, A. J., & Murray, K. D. (1982). Middle-aged, non-elite marathon runners: A profile. *Perceptual and Motor Skills*, 963-969.

Waldman, D. A., Ramírez, G. G., House, R. J., & Puranam, P. (2001). Does leadership matter? CEO leadership attributes and profitability under conditions of perceived environmental uncertainty. *Academy of Management Journal*, 134-143.

Wang, Q., Bowling, N. A., & Eschleman, K. J. (2010). A Meta-Analytic Examination of Work and General Locus of Control. *Journal of Applied Psychology*, 761-768.

Watson, J., & Robinson, S. (2003). Adjusting for risk in comparing the performances of male- and female-controlled SMEs. *Journal of Business Venturing*, 773-788.

Verhaegen, P., & Salthouse, T. A. (1997). Meta-Analyses of Age-Cognition Relations in Adulthood: Estimates of Linear an Nonlinear Age Effects and Structural Models. *Psychological Bulletin*, 231-249.

Westerberg, M., Singh, J., & Häckner, E. (1997). Does the CEO matter? An empirical study of small Swedish firms operating in turbulent environments. *Scandinavian Journal of Management*, 251-270.

White, H. (1980). A Heteroskedasticity-Consistent Covariance Matrix Estimator ans a Direct Test for Heteroskedasticity. *Econometrica*, 817-838.

Williams, D. K. (2013, October 2). *Forbes.com*. Retrieved September 20, 2015, from http://www.forbes.com/sites/davidkwilliams/2013/10/02/why-you-should-fill-your-company-with-athletes/

Wolff, J. A., & Pett, T. L. (2006). Small-Firm Performance: Modeling the Role of Product and Process Improvements. *Journal of Small Business Management*, 268-284.

Wood, R., & Bandura, A. (1989). Social Cognitive Theory of Organizational Management. *Academy of Management Review*, 361-384.

Wooldridge, J. M. (2009). *Introductory Econometrics*. Canada: South-Western Cengage Learning.

Yazdanfar, D., & Öhman, P. (2015). The growth-profitability nexus among Swedish SMEs. *International Journal of Managerial Finance*, 531-547.

Zerni, M., Kallunki, J.-P., & Nilsson, H. (2010). The Entrenchment Problem, Corporate Governance Mechanisms, and Firm Value. *Contemporary Accounting Research*, 1169-1206.

13 Appendix

Table 1.

Univariate correlation analysis of the full sample

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) ROA	1,000											
(2) GIS	0,205***	1,000										
(3) CEO age	-0,049***	-0,113***	1,000									
(4) CEO tenure	0,052***	-0,036***	0,147***	1,000								
(5) CEO duality	0,009***	-0,013***	0,111***	-0,061***	1,000							
(6) Firm age	-0,066***	-0,175***	0,231***	0,104***	0,000	1,000						
(7) Firm size	0,018***	-0,132***	0,038***	-0,080***	-0,034***	0,259***	1,000					
(8) Book leverage	-0,132***	0,044***	-0,075***	-0,061***	-0,006*	-0,154***	0,013***	1,000				
(9) Working capital efficiency	-0,022***	0,075***	0,020***	-0,031***	-0,029***	0,032***	-0,093***	0,024***	1,000			
(10) Quick ratio	0,202***	-0,009***	0,028***	0,018***	0,010	0,015***	-0,068***	-0,551***	0,256***	1,000		
(11) Board size	-0,030***	-0,008***	0,018***	-0,064***	-0,077***	0,113***	0,280***	-0,069***	0,114***	0,057**	1,000	
(12) Sports merited CEO	0,007**	0,000	-0,033***	-0,017***	-0,010	0,000	0,022***	0,000	0,010***	0,006*	0,008**	1,000

* p<0,10; ** p<0,05; *** p<0,01

Table 2.

2SLS regression output for full and matched sample

Dep. variable:	Exp. Sign	ROA		Exp. Sign	GIS	
		2SLS Full	2SLS Matched		2SLS Full	2SLS Matched
Intercept		-0,0236	-0,0968**		0,6628***	0,5612***
		(-1,25)	(-2,03)		(13,76)	(5,85)
Sports merited CEO	**+**	**0,0026**	**-0,0051**	**+**	**-0,0039**	**0,0113**
		(0,67)	**(-1,13)**		**(-0,65)**	**(1,60)**
GIS	+	0,2294***	0,3962***		-	-
		(11,43)	(5,57)		-	-
ROA		-	-	+	0,2366	-0,4198
		-	-		(0,73)	(-0,59)
CEO Characteristics						
CEO age	+/–	-0,0046	0,0064	+/–	-0,0815***	-0,0686***
		(-1,36)	(0,77)		(-9,21)	(-3,90)
CEO tenure	+/–	0,0175***	0,0158***	+/–	-0,0155***	-0,0042
		(13,73)	(5,78)		(-2,94)	(-0,42)
CEO duality	+/–	0,0043***	0,0037	+/–	-0,0042*	-0,0021
		(3,31)	(1,36)		(-1,78)	(-0,38)
Firm Characteristics						
Firm age		-	-	–	-0,0336***	-0,0266***
		-	-		(-12,47)	(-3,91)
Firm size	+	0,0106***	0,0129***	+	-0,0195***	-0,0115**
		(14,99)	(6,97)		(-8,72)	(-2,06)
Book leverage	–	-0,0098***	-0,0112**		-	-
		(-4,17)	(-2,45)		-	-
Working capital	–	-0,007***	-0,0089***	+	0,0119***	0,0102***
Efficiency		(-13,60)	(-6,27)		(6,82)	(2,67)
Quick ratio	+	0,0323***	0,0360***	+/–	-0,0194*	0,0020
		(31,16)	(15,47)		(-1,85)	(0,08)
Board size	–	-0,0107***	-0,0134***	+/–	0,0164***	0,0107
		(-10,04)	(-4,92)		(4,48)	(1,47)
Year fixed effects		Yes	Yes		Yes	Yes
Industry fixed effects		Yes	Yes		Yes	Yes
Clustered on firm		Yes	Yes		Yes	Yes
Instrumental variable		Firm age	Firm age		Book leverage	Book leverage
# Firm-year obs.		93.261	16.239		93.261	16.239

****, ** and * denote statistical significance based on two-tailed tests at the 1%-, 5%- and 10%-level, respectively. In spite of directional hypotheses two-tailed tests are applied in line with Zerni et al. (2010). z-values of the coefficients (in parentheses) are robust and based on standard errors clustered by firm. Results from fixed effects are omitted in the table. Firm leverage is used as an instrument for ROA and Firm age in applied as an instrument for GIS (see section 5.4.1 for more details on this). No R-squared are reported for the 2SLS regressions, as the usual way of computing F statistics is not appropriate when using 2SLS (Wooldridge, 2009, p.525). All variables are defined in appendix Table 6.*

Table 3.

Two-sample test of proportions, ROA – one-to-one matched sample

Variable	Mean	Std. Err.	Number of obs.
Firms *without* sports merited CEOs	7,68%	0,0074	1 292
Firms *with* sports merited CEOs	7,72%	0,0074	1 292
diff = prop(0) - prop(1)			Hypothesis: diff ≠ 0
			Pr(Z < z) = 0,9739

Table 4.

Two-sample test of proportions, GIS – one-to-one matched sample

Variable	Mean	Std. Err.	Number of obs.
Firms *without* sports merited CEOs	7,39%	0,0073	1 292
Firms *with* sports merited CEOs	8,21%	0,0076	1 292
diff = prop(0) - prop(1)			Hypothesis: diff ≠ 0
			Pr(Z < z) = 0,4368

Table 5.

OLS regression output for one-to-one matched sample

Dep. variable:	Exp. Sign	ROA OLS One-to-one matched sample	Exp. Sign	GIS OLS One-to-one matched sample
Intercept		0,0498		0,4613***
		(0,91)		(4,28)
Sports merited CEO	**+**	**-0,0004**	**+**	**0,0091**
		(-0,08)		**(1,12)**
GIS	+	0,0959***		-
		(7,84)		-
ROA		-	+	0,4656***
		-		(7,94)
CEO Characteristics				
CEO age	+/–	-0,0059	+/–	-0,0382
		(-0,46)		(-1,47)
CEO tenure	+/–	0,0140**	+/–	-0,1590
		(2,29)		(-1,44)
CEO duality	+/–	0,0072	+/–	-0,0110
		(0,93)		(-1,00)
Firm Characteristics				
Firm age	–	-0,0079**	–	-0,0289***
		(-2,43)		(-4,57)
Firm size	+	0,0077***	+	-0,0202***
		(2,82)		(-4,04)
Book leverage	–	-0,0097	+	0,0137
		(-0,87)		(0,88)
Working capital	–	-0,0062**	+	0,0134**
efficiency		(-2,32)		(2,35)
Quick ratio	+	0,0356***	+/–	-0,0290***
		(6,97)		(-3,05)
Board size	–	-0,0080	+/–	0,0159
		(-1,40)		(1,43)
Year fixed effects		Yes		Yes
Industry fixed effects		Yes		Yes
Clustered on firm		Yes		Yes
# Firm-year obs.		2 584		2 584
Within R-squared		0,1452		0,1319

****, ** and * denote statistical significance based on two-tailed tests at the 1%-, 5%- and 10%-level, respectively. In spite of directional hypotheses two-tailed tests are applied in line with Zerni et al. (2010). t-values of the coefficients (in parentheses) are robust and based on standard errors clustered by firm. Results from fixed effects are omitted in the table. All variables are defined in appendix Table 6.*

Table 6.

Variables	Definition
Dependent	
ROA	Return on assets: $((Net\ income_t + Interest\ expense\ (after\ tax)_t)/((Total\ assets_t + Total\ assets_{t-1})/2)$.
GIS	Growth in sales: $((Net\ sales_t/Net\ sales_{t-1}) - 1)$.
Independent	
CEO_age	Natural logarithm of the number of years since the CEO was born in year *t.*
CEO_tenure	A dummy variable taking the value 1 if the CEO has a tenure of more than five years, otherwise 0.
CEO_duality	A dummy variable taking the value of 1 if the CEO also is chairman of the board, otherwise 0.
Firm_size	Natural logarithm of $Net\ sales_{t-1}$.
Firm_age	Natural logarithm of the number of years since the firm was incorporated in year *t.*
Book_leverage	$Total\ debt_{t-1}/Total\ assets_{t-1}$.
WC_efficiency	Working capital efficiency measured as the natural logarithm of days accounts receivable: $(365 * Accounts\ recievable_{t-1}/Net\ sales_{t-1})$.
Quick_ratio	Natural logarithm of Quick ratio: $(Cash_{t-1} + Short\ term\ investments_{t-1})/Current\ liabilities_{t-1}$.
Board_size	Natural logarithm of the number of board members in firm i,in year *t.*
Sports merits	
Sports merited CEO	A dummy variable taking the value of 1 if the CEO has sports merits from performing the endurance challenge, otherwise 0.

Adrian Strömberg & Victor Wänerfjord