What Determines a CEOs Impact on Financial Performance in the Swedish Commodity Industry?

A Quantitative Study on the Swedish Commodity Industry

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Abstract

Among the many factors shaping company financial performance, the CEO is arguably one of the most critical. But what is it that distinguishes one CEO's ability to produce performance from another? Being such a well-researched field, it still lacks consensus regarding which CEO factors that affect a CEO's ability to produce performance. We examined the impact of CEOs' education and tenure on financial performance measured by ROCE (return on capital employed) and EBITDA (earnings before interest, tax, depreciation and amortization) margin through the lens of Human Capital Theory. The context of the study are three sectors in the Swedish commodities industry: steel- and metal, lumber and wood, and paper. These sectors are seen as some of the most homogenous industries, therefore a good fit with the scope of the study in order to isolate CEO-factors as much as possible from other factors such as differentiated products. The study was conducted through gathering data by sending a survey to 126 CEOs of Swedish companies operating in these three industries. The survey responses were complemented with financial data collected from the respondents' companies' 2019 financial statements online. The results from the regression analysis were fruitful but mostly statistically insignificant, and therefore no conclusions were able to be drawn. Thus, we were unable to provide a definitive answer to the research question. However, the data did indicate that education may have a positive effect on financial performance, in line with Human Capital Theory's predictions, although lacking statistical significance on the 5% significance level.

Keywords:

CEO factors, financial performance, Human Capital Theory, homogenous industries, commodity industry

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1. Introduction

Many factors play a role in shaping company outcomes, such as a capable management team, a knowledgeable board, or changes to the external environment such as regulations, political movements, trends in customers' demand for specific products, and business cycles. Arguably, a key factor when it comes to producing performance is the CEO (Child, 1972), the individual setting the shape and direction of the strategy, vision, and mission of the company (Barnard, 1938; Woodward, 1965). What is it exactly that distinguishes one CEO's ability to produce performance from those of another? Why are some CEOs more successful than others in producing financial performance? When hiring executive officers, the employer mainly looks at certain types of experiences, knowledge, and skills that aligns with the organizational-specific needs, according to Kaiser, Sessa, and Taylor (1998). Therefore, what matters to fulfil certain organizational-specific goals and needs, in the aim of the CEO, are the CEO's abilities, knowledge and skills.

Which factors, and whether education matters for professional and organizational success is a widely debated subject and has been ever since at least the beginning of the 1960s, where several articles emerged touching upon the areas of different educational practices and their respective effects on its users. The notion that education only is one parameter of many is widely accepted, even though the ceteris paribus effect of aspects such as education, experience and e.g., IQ are studied individually, in many cases (Cairney & Young, 2006). There are plenty of studies in the field (e.g.: Bowers & Seashore, 1966; Lindorff & Prior Jonson, 2013; Shao, Zhao, Wang & Jiang, 2020; Garcia-Blandon, Argilés-Boch & Ravenda, 2019), despite this, there is a lack of consensus among previous researchers as to which factors among CEOs affect company financial performance, and what effect these factors have. Commonly researched factors are education, tenure, age, form of appointment, previous work experience, and whether or not the CEO has been a researcher at a research institute or a university. As the aforementioned states, there is significant ambiguity in the results from previous research, resulting in a lack of consensus regarding which factors among CEOs that affect company financial performance. In previous studies there is a great diversity in which financial KPIs that are measured and used as representations for financial performance (e.g.: shareholder returns & return on assets).

Additionally, the CEO factors examined have been approached in different ways. Some studies have used "education" as one, big, and wide variable accounting for all sorts of education and found no specific relationship between education and financial performance, others have distinguished between different fields of education and unsurprisingly, the results have differed. Furthermore, some studies have examined the effects that certain factors have on other factors, for example, Saidu (2019) who concluded that education had a positive impact on financial performance among CEOs who were appointed internally – suggesting that firm-specific experiences may influence one's ability to capitalize on one's more general knowledge and skills. Thus, whilst being a well-studied field, there exists a huge diversity and ambiguity in the results. This study aims to attempt to isolate CEO performance as much as possible, to further investigate and seek clarity as to which CEO factors affect financial performance by looking specifically at CEOs in homogeneous industries, to minimize other factors such as highly differentiated products.

It can be argued that one implication from using heterogeneous industries is that there is more that differs between firms than simply the CEO that could affect the financial performance of each

firm, and that a homogeneous industry would be better suitable in order to remove other firm-specific factors such as differentiated products to a higher extent. According to Cairney and Young's (2006) study on auditing specialization, auditors much rather specialize within industries that are inter-industry homogenous. Auditors are also more likely to standardize quality and improve the level of public knowledge about a homogenous industry and the assessment of quality control performed therefore can be seen as trustworthy (Cairney & Young 2006). In other words, to accomplish a ceteris paribus effect in order to properly conduct an assessment of CEO factors and abilities and their effect on company performance, a homogenous industry is the best fit.

Further, a homogenous industry can be identified as an industry that inter-industrially has similar cost structures and operational expenses. According to the study performed by Cairney and Young (2006), several metal production industries are amongst the most homogenous industries, e.g., blast furnacing which is used when melting and producing steel, together with the paper production industry and the wood and lumber industry. The commodity industry is therefore a relevant industry to narrow down our study, following the logic of quality assessment used by auditors.

To add to this field of research, this study will dig further into the area of CEOs' effect on performance in a homogenous industry, resulting in the research question being formulated as follows:

"Which are the factors among CEOs of Swedish firms in the commodities industry that are associated with company financial performance?"

1.1 Limitations to the Research Question

Due to the limitations proposed with what information that could be derived from the respondents, this study would not be able to cover all possible relevant factors with CEOs that might affect the companies' financial performance. Furthermore, the term financial performance is not a complete measurement due to the vast number of financial measurements that exist but rather an umbrella term for the measurements used to define financial performance in this study.

2. Theoretical and Literature Review

2.1 Commodity Industry Overview

This work considers three sectors of the commodities industry: steel- and metal, paper, and lumber- and wood.

Steel- and Metal
The iron and steel industry accounted for approximately 14% of the industrial energy usage in Sweden as of 2011, where the industrial energy usage accounted for approximately 38% of the overall energy usage (Johansson, 2015). At the same time, the iron and steel industries are some of the most important industries (after cement) in a modern country regarding infrastructural and economic development (Chisalita, Cobden, Cormos, van Dijk, Manzolini & Petrescu, 2019) and, together with the mining industry, represents approximately 7% of Sweden's gross exports (jernkontoret.se, 2019). Additionally, the industry in Sweden is heavily focused on efficiency in order to stay in business, due to its high exposure to international competition (Johansson, 2015), which is not a recent discovery but has been the case since the emergence of industrial operations in the end of the 19th century (Houpt, 2007), and the more recent environmental constraints imposed on the industry (Duan, Han, Li, Mu & Yang 2020). This further proves the importance of organizational effectiveness for the companies within the industry.

Paper
Sweden's paper industry produced around 9,3 million tons of paper during year 2020, of which approximately 90% was exported, making Sweden the fourth largest paper exporter in the world (SFI, 2021). The total production is dominated by two segments: graphic paper and packaging materials (SFI, 2021). As of 2019, the Swedish paper industry's annual energy usage of 21 TWh consisted of 96% fossil free fuels (SFI, 2020). Paper is distinguished as a heavily capital-intensive industry, requiring large investments in production capacity and machinery (Thollander et al., 2008), and a highly homogeneous industry (Cairney & Young, 2006).

Lumber and Wood
The Swedish lumber and wood industry produced 18,6 million cubic meters of goods 2019, among which approximately two thirds were exported (SFI, 2020). Europe is the most important market for Swedish lumber and wood companies, followed by the Northern African region and Asia (the fastest growing during the past years in terms of exported goods) (SFI, 2020). 60% of the total production comes from the ten largest companies, and since the 1970's the industry has seen an increased concentration (SFI, 2020). The lumber and wood industry are, in common with the aforementioned sectors, also characterized as being a highly homogeneous industry, according to Cairney and Young (2006).

2.2 Literature Review

Previous studies have been performed by various management practitioners regarding the effects on company performance that CEO's abilities, characteristics and e.g., networks have. For instance, several studies assessing the relationship between CEO compensation and company performance have been published (Mackey, 2021; Chang, Dasgupta & Hilary, 2010; Chen, Li, Wu

& Ying, 2018), as well as several studies covering the relationship between CEO attributes, behaviors and characteristics, and company performance (Mackey, 2021; Chang, Dasgupta & Hilary, 2010; Saidu, 2019; Pholphirul & Singhathep, 2015; Tsui, Wang & Xin, 2011), and the CEO's political networks' effect on company performance and CEO pay (Chen, Li, Wu & Ying, 2018). Further, the studies performed have been narrowed down in various aspects. For instance, several studies are limited to a certain geographical area but not by industry (Chen, Li, Wu & Ying, 2018; Tsui, Wang & Xin, 2011; Chang, Dasgupta & Hilary, 2010), whilst some studies also have been limited to assess certain industries, like the Nigerian finance industry (Saidu, 2019) or the business segment in the US (Mackey, 2021).

There are, additionally, some studies that have taken a more selective approach. One example is Pholphirul's and Singhathep's (2015) study on female CEOs, firm performance, and firm development, where the industrial and geographical limitations are Thai manufacturing firms, and more specifically manufacturing firms working with for example food processing and electronic components. These are, according to Cairney's and Young's (2006), some of the more homogenous industries.

Bertrand and Schoar (2003), Adams, Almeida, and Ferreira (2005), and Bennedsen, Pérez-González, and Wolfenzon (2008) assert that there is a lack of empirical and theoretical studies to give insight into which CEO factors are important for producing good company performance.
It has been shown in previous research, that the influence of CEOs on company outcomes and performance has increased over the past decades (Quigley & Hambrick, 2014). Partly due to shifts in macroeconomic trends, romanticization of leadership and the increase in demand towards leaders who can "make a change" (Quigley & Hambrick, 2014). Quigley and Hambrick found that the romanticization of leadership came from many sources. For example, the media gave attention, praise and encouragement to charismatic and colorful leadership which gave leaders more space and freedom to practice their charismatic and colorful leadership which further increased the influence of CEOs over company performance (Quigley & Hambrick, 2014). The authors explain their study and results in three "periodic shifts", or time periods: 1950 – 1969, 1970 – 1989 and 1990 – 2009. They connect the increased CEO influence with different phenomena occurring during these periods. E.g., 1959 – 1960 witnessed the rise of investor capitalism, increasing the focus on economic aspects to deliver shareholder value, i.e. a desire for CEOs to pursue riskier strategies that would provide economic value to shareholders (Quigley & Hambrick, 2014). According to the authors, CEOs received greater strategic influence during this period in order to pursue riskier strategies. 1970 – 1989, product life cycles became shorter, markets and technology developed further, giving rise to hypercompetition (a more fast-paced and complex marketplace) which caused for CEO skills and attributes to become almost like a recognition sign for businesses, and individual CEOs became a part of the company identity (Quigley & Hambrick, 2014). During the final period of examination in this study, 1990 – 2009, they noted that during the same time as CEOs were encouraged to make riskier choices there were also a wider range of paths and strategies to pursue, such as offshoring, and international markets grew – thus, CEOs could choose from a wider palette of strategies which in turn increased their impact on the company (Quigley & Hambrick, 2014). Furthermore, Child (1972) argues that the CEO is a key factor when it comes to producing performance, further substantiated by Barnard (1938) and Woodward (1965) who label the CEO as the individual setting the shape and direction of the company's strategy, vision and

mission. This has led to this study narrowing down to focus on analyzing CEO attributes, as the individuals possessing this position within a company have large effects on company performance.

2.2.1 Theoretical Framework

Human Capital Theory

Human capital theory is an old and well-known concept referring to productive capacities of human beings in regard to producing income with limited resources (Rosen, 2008). Human capital is defined as the knowledge and skills that the individual has acquired through education, training and experience (Becker, 1975), and that provides competitive advantage through value, rarity, inimitability, and non-substitutability (Barney, 1991). The human capital will according to theory increase the individual's productivity in the workplace (Marginson, 1989, 1993). The theory suggests that more is merrier, according to studies using education or experience as representatives of human capital (Dimov & Shepherd, 2005). Dimov and Shepherd continue by criticizing this, asserting that this previous research on human capital is limited to contexts in which human capital is lacking in amounts. As their study showed, certain aspects of human capital contribute differently to performance, and in different ways (Dimov & Shepherd, 2005).

Furthermore, the returns on human capital investments are enhancements of a person's skills, increased power and efficiency in making economic decisions (Rosen, 2008). The theory suggests that people make human capital investments up to a point at which the private benefits (such as a higher salary) equal the private cost of acquiring additional human capital improvements (Tan, 2014). Becker (1964) made a distinction between firm-specific human capital (i.e., human capital related to the employment at a specific firm), and more general human capital, able to be utilized in a wider range of employments and easily transmittable. Empirical evidence suggests that firm-specific human capital affects performance. For example, a study examining star investment analysts showed that they experienced a decline in performance after transferring to another firm (Groysberg & Lee, 2009; Groysberg, Lee & Nanda, 2008). Similarly, Campbell et al. (2014) found that professional basketball players performed worse after trades to new teams. Additionally, strong support for firm-specific human capital can be found in Bidwell's (2011) study where it was discovered that people hired internally from one position to another within an organization outperformed those who were hired from outside the organization – even if the external hires signaled high general human capital possession. This could suggest that tenure, and internal hiring would be an important factor in predicting an individual's performance.

Previous work with Human Capital Theory has concluded that human capital is a key factor in explaining organizational performance (Brüderl, Preseindörfer & Ziegler, 1992) and a significant explanation of variation in performance (Dimov & Shepherd, 2005). Particularly education, general work experience, and industry-specific experience have shown a strong effect on organizations' survival and success (Brüderl, Preisendörfer & Ziegler, 1992). Additionally, there are two types of knowledge. Tacit knowledge is what can only be learned through experience and is commonly referred to as "know-how" (Maravilhas & Martins, 2019). This relates to tenure and organization-specific human capital, acquired over time through practice and experience and may include things that one learned without thinking about it. It is often difficult to transfer to others through codes, text, or speech (Maravilhas & Martins, 2019). On the other side of the spectrum, there is explicit knowledge, easily transmittable, obtained through facts and most commonly

through education (Maravilhas & Martins, 2019). The two types complement each other, according to Maravilhas and Martins (2019). Despite that all knowledge has an explicit component, according to Dimov and Shepherd (2005) it is the tacit components of knowledge that make organizations' decisions harder to replicate. This, along with the complementary nature of the two, proposed by Maravilhas and Martins (2019) would go hand-in-hand with the part of Barney's (1991) definition of human capital referring to competitive advantage through value, rarity, inimitability, and non-substitutability. In other words, both "general" and "firm-specific" (explicit and tacit), knowledge would be required to create that sustainable competitive advantage.

2.2.2 CEO Educational Background

Education falls in under the category general human capital (Becker, 1975) and should show a strong effect on performance (Brüderl, Preisendörfer & Ziegler, 1992), as well as be able to explain variance in performance (Dimov & Shepherd, 2005). Despite that education is referred to as general human capital, and therefore explicit knowledge, it does affect both general and specific human capital (Dimov & Shepherd, 2005), suggesting that education should show a stronger effect in correlation with other organization-specific sources of human capital, such as tenure. Education should increase workplace productivity (Marginson, 1989, 1993) and performance, according to Human Capital Theory.

Earlier studies within this field have indicated that education has an important role to play when CEOs make corporate decisions. According to a study performed by Bowers and Seashore (1966), CEOs with higher levels of education exhibited better technical and managerial skills than those who did not. Furthermore, it has been shown that academic CEOs have a more advanced human capital, in terms of expansive networks consisting of intellectual and innovative resources and that they tend to build organizational cultures that supports innovation by using patent applications as a measurement for innovation output (Shao, Zhao, Wang & Jiang, 2020).

To contradict the aforementioned support of the positive effects that education among CEOs has on company performance, a study performed in Australia (Lindorff & Prior Jonson, 2013) indicated no relationship between CEOs with business, or other specific education, and the organization's financial performance. Lindorff and Prior Jonson (2013) mention several factors that could lie behind these findings. For one, they mention that a capable management team or knowledgeable board may have an important role in influencing organizational performance. Secondly, they bring up external factors such as luck or being at the right place at the right time. A third factor they bring up are CEO characteristics that are developed during one's life, such as intelligence or personality and other skills or knowledge that are not taught in business schools, which may have a large impact on a leader's capabilities to lead. Saidu (2019) criticizes Lindorff and Prior Jonson's study for using MBA degrees as the only measure of CEO education and for claiming that business education is over-emphasized. Saidu claims that MBA education is just a fragment of business education and cannot be seen as representative for all business education.

Furthermore, Garcia-Blandon, Argilés-Boch, and Ravenda (2019) separated between CEOs with an engineering degree and CEOs with other degrees and showed that in general, those with engineering degrees showed a stronger overall performance than those with other educational

backgrounds. This is further elaborated by Saidu (2019) who found that CEOs with an operations-based educational background such as engineering or management showcased higher performance.

Thus, regarding education there is currently a certain degree of ambiguity in previous research as to how and if a CEO's educational background affects their leadership and influence on company performance. Some studies have indicated a positive relationship between a CEO's educational background and performance, and others have not been able to come to that conclusion. According to human capital theory and its definition of human capital, education should increase one's workplace productivity, efficiency in decision making, and performance. Thus, theory is not completely in line with findings from previous research. With roots in Human Capital Theory and previous research, we believe that CEOs with higher levels of education will display a positive relationship between education and financial performance. Hence, the first hypothesis is formulated as:

H1a: The CEO's education will have a positive effect on financial performance in the commodities industry.

Furthermore, a flaw with Human Capital Theory is that it does not distinguish between different educational areas and thereby assumes that education, as a human capital investment, universally will improve your workplace productivity and decision making. When making distinctions between different types of education, Garcia-Blandon, Argilés-Boch, and Ravenda (2019) managed to show differences in the effects of human capital on financial performance depending on which type of education they had acquired. Their findings suggested that CEOs with engineering backgrounds performed better at their job. Saidu (2019) also concluded that CEOs with operations-based education (such as engineering and management) perform better than CEOs with other educational backgrounds. With this taken into account, our belief is that CEOs with operations-based educations will perform better than those with other types of education, our hypothesis is therefore extended as such:

H1b: CEOs educated in engineering will produce a higher financial performance in the commodities industry than CEOs educated in other fields.

2.2.3 CEO Tenure

As one's tenure increases, one's firm-specific human capital (tacit knowledge) increases. Thus, according to Human Capital Theory, tenure should increase performance.
Other researchers have brought up different factors that may influence a CEO's impact on company performance. CEO tenure can be seen from an experience-based human capital view, implying that as the tenure increases, the CEOs expands their knowledge and skillsets through firm-specific experiences (Wu, Levitas & Priem, 2005; Oh, Chang & Jung, 2018). Garcia-Blandon, Argilés-Boch, and Ravenda (2019) investigated different CEO-factors and their relationship to financial performance and found that the tenure of the CEO had a positive effect on financial performance. Furthermore, according to studies by Luo, Kanuri and Andrews (2014) and Skaggs and Youndt (2004), the CEO's tenure is important for human capital development, which in turn has implications for performance. Luo, Kanuri and Andrews continue by proposing that CEO tenure drives human capital relationships. By that they indicate that longer tenures may

increase trust, employee commitment, and identification to the firm, although varying depending on the industry uncertainty (Luo, Kanuri & Andrews, 2014).

However, longer tenures are not all good. There may occur negative effects, as the CEO with time loses touch with the external environment and becomes too inward facing, and thus make decisions that are not aligned with the current external environment (Luo, Kanuri & Andrews, 2014). Oh, Chang and Jung (2018) refer to CEO tenure as a double-edged sword due to a "fixed managerial paradigm" that detaches them from the changes in the external environment and makes them stick to what has been done in the past, i.e., cognitive inflexibility. This is supported by Belenzon, Shamshur, and Zarutskie (2019), who mentions the "fit-drift/shift-refit" situation. CEOs with longer tenures were often well-matched in their competencies with the external environment. But over time, as they start to become more detached with the surroundings, the fit grows poorer and poorer, a situation in which it could be beneficial to replace the CEO with a new one who's competencies are better matched with the current external environment, firm needs, and firm growth drivers to increase performance (Belenzon, Shamshur & Zarutskie, 2019).

Tenure aligns with what Becker (1964) defined as firm-specific human capital. As one's tenure increases, one's firm-specific human capital also increases. Thus, Human Capital Theory suggests that longer tenures will positively affect performance. Additionally, according to a study performed by Kaiser, Sessa, and Taylor (1998) employers seemed to be aware of the link between knowledge and skills of particular relevance to the firm and performance as they hired executives with skills and knowledge that aligned with organization-specific needs and goals rather than a generally good educational background. Furthermore, we acknowledge the emergence of cognitive inflexibility mentioned by Oh, Chang and Jung (2018). Therefore, we predict that CEOs with longer tenures as CEO at their current workplace, will produce worse financial performance than those with shorter tenures as CEOs at their firms, leading to the hypothesis being formulated as such:

H2a: CEOs with longer tenures as CEO at their current company will produce worse financial performance than those with shorter tenures as CEO.

However, relating to firm- and industry-specific knowledge, tenures are as mentioned by Oh, Chang and Jung (2018) and further substantiated by Belenzon, Shamshur, and Zarutskie (2019), a double-edged sword. Taking into account that longer tenures are not all bad, we therefore extend the hypothesis:

H2b: CEOs with longer tenures within the industry they are currently working in will produce better financial performance than those with shorter tenures in that industry.

2.2.4 CEO Age

In relation to tenure, Garcia-Blandon, Argilés-Boch, and Ravenda used age as a variable in their study. On its own, age showed no specific correlation with performance. This is partly contradicted by Belenzon, Shamshur, and Zarutskie (2019). Their study showcased that older CEOs are associated with lower investment, growth in sales and ROA (return on assets – which is what the authors used as a measurement for performance). This was particularly the case in industries where

human capital is a prominent resource such as the service and creative industries (Belenzon, Shamshur & Zarutskie, 2019). This could also be seen as contradictive to the aforementioned study by Luo, Kanuri, and Andrews (2014) where tenure, which is somewhat related to age, is seen as the driver of human capital. Therefore, should not older CEOs perform better in industries where human capital matters? Contrary to this assumption, Belenzon, Shamshur, and Zarutskie continue by stating that they assume that younger CEOs perform better as they are more prone to pursue riskier strategies, suitable for fast-paced industries whereas older CEOs are more likely to pursue slower and more sustainable strategies perhaps more suitable for slower moving industries.

2.2.5 Form of Appointment

Human Capital Theory brings up firm-specific human capital as a positive contributor to performance. Naturally, one's form of appointment will play a role in performance. An individual who is internally appointed to become CEO, i.e., one who already worked at the company at the form of appointment to become CEO should, according to theory, perform better due to the contribution of his or her firm-specific human capital. This relates back to the discussion on tenure above. It is also theorized that industry-specific experience, which will be controlled for, can relate to higher performance but is not to be mistaken for company-specific experience even though two companies may operate within the same industry.

Garcia-Blandon, Argilés-Boch, and Ravenda (2019) found that CEOs who were outsiders (i.e. employed at another company) to the firm at the moment of appointment to become CEO outperformed those CEOs, who were insiders at the time of appointment to become CEO, in overall performance. This is contradicted, in terms of financial performance measured by profitability and stock performance, in Saidu's (2019) study where she concluded that education improved financial performance when the CEO had previous experience of the firm at the time of appointment as CEO. This could suggest that education has a role to play in capitalizing on one's experience, or the other way around – firm-specific experience may play a role in being able to capitalize on one's education. In connection with this, Human Capital Theory suggests that firm-specific skills and knowledge influence performance output from individuals, thus the theory supports these previous findings. These findings also suggest a linkage between general human capital (education) and firm-specific human capital, suggesting that the ability to capitalize on one's generalist human capital such as education is affected by one's firm-specific human capital.

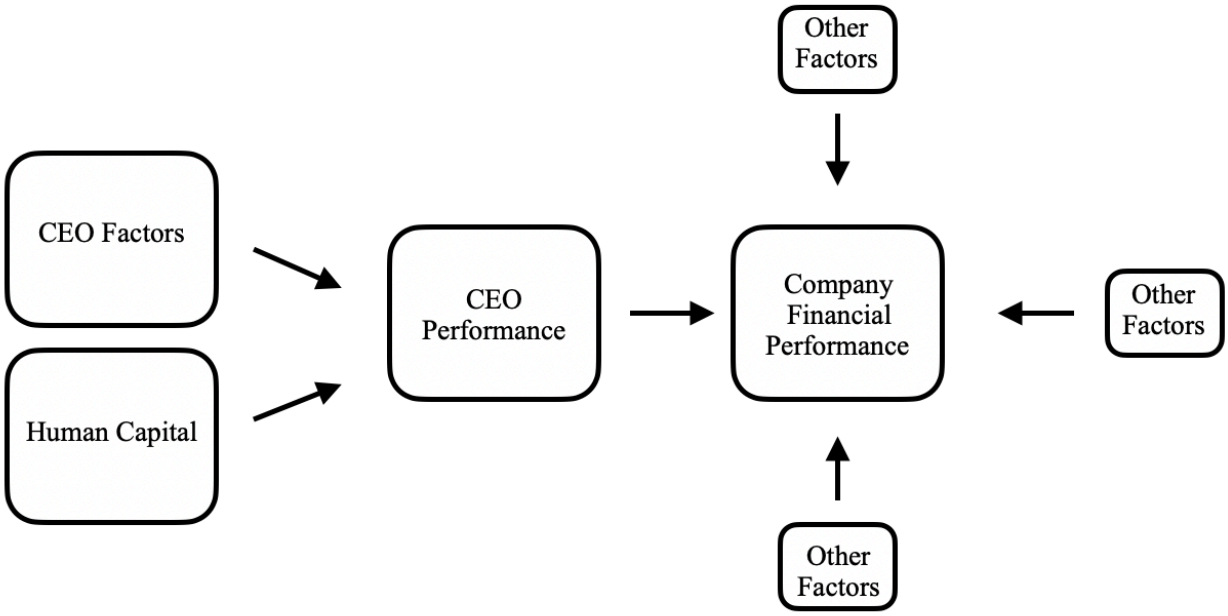
2.2.6 CEO Company Ownership

Saidu (2019) found CEO ownership in the company to be an important factor to examine, with the foundation of her argument in the well-known agency theory, which is further elaborated by Shao, Zhao, Wang, and Jiang (2020) who revealed that company ownership as a long-term incentive is effective to alleviate short-terminist behavior and agency issues. Furthermore, it has been found that owner-managers tend to run their companies more efficiently than those who do not own shares in the company which they are running, it has been concluded that ownership is a powerful incentive for CEOs to increase firm value (von Lilienfeld-Toal & Ruenzi, 2014).

2.3 Theoretical Model

Based on theory and previous empirical findings, a theoretical model was constructed to illustrate the connection between the research question and the theoretical framework (see figure 1).

Figure 1: Theoretical Model



3. Method

In order to test the proposed hypotheses with a quantitative framework, a deductive approach was used. Contrary to an inductive approach, the study aimed to test whether the hypotheses either could be confirmed or rejected through collected data. Therefore, a deductive approach was the best fit (Bell, Bryman & Harley, 2019). Further, the epistemology of positivism was applied since the objective reality was studied through a direct approach, by collecting quantitative data.

To collect the sufficient data which enabled the conduction of the study, a survey was created, aimed towards the CEOs of commodity firms, with CEOs of the Swedish steel, paper, and wood and lumber industries as a specified sample. The survey was not presented in the context of the hypotheses, but rather as an objective collection of information (although the subjects knew that it was for a bachelor thesis and the general subject, they did not know about the specific research question or the study's hypotheses). The survey was initially provided by e-mail with a shorter message clarifying what institution the authors belonged to, as well as the purpose of the study. Then the respondents, that had not answered the survey following the e-mail, were contacted by phone to provide a personalized contact with the authors, thus increasing the rate of which the respondents would answer the survey. The calls were conducted within ten days after the initial e-mail with the survey.

The questions in the survey were inspired by previous research on CEO-factors, such as: Lindorff and Prior-Jonson (2013), Saidu (2019) and Wu, Levitas, and Priem (2005). The survey was designed with three sections, each sector gathering information about a specific area. The first section treated general information and educational background, the second section touched upon previous work-life experience, the third and last section took company ownership into consideration, in terms of shareholdings in the company of which they were CEO. Some questions were multiple choice questions, where the respondent could pick more than one alternative (where suitable to do so), on other multiple-choice questions only one choice could be made. Some questions, regarding age, years worked in their respective industry, years worked at their current company and tenure as CEO, were so-called "open questions", where the respondent filled in an exact number of years applicable to their situation.

Everyone in our sample were contacted with the same methods, with an e-mail containing the survey, a potential follow-up phone call and possible additional follow-up e-mails if the survey was not answered within a certain time frame of three business days after the phone call. All questions provided were the same for all respondents and, since the commodity production industry is homogeneous, the questions were presumed as applicable to all respondents. Of course, some industry-specific changes in the informational text were modified for each industry.

3.1 Sample

The sample consisted of Swedish companies active in the commodities industry. More specifically, the sample was narrowed down to three industries: the steel, paper and wood production industries. This distinction, as previously mentioned, was due to the industries' homogeneity and all of them being producers of commodity goods.

At the time of sampling our data, there were 100 Swedish steel- and metal firms provided by the database largestcompanies.se (2021). However, some companies didn't specifically work with steel and metal but rather with the shaping and bocking of plate or with production of machines and tools used in steel and metal production, for instance producing crucibles. Because of this, a substantial amount of the sample had to be excluded, leaving a sample of 44 CEOs at Swedish firms active in the metal and steel producing industry. Out of those companies, 36 answered the survey, providing data for the study. The response rate was approximately 81.8%.

In the paper industry, 100 companies were provided by largestcompanies.se (2021). After sorting for companies that did not produce paper or paper products, but that instead were active in similar or adjacent industries, the sample contained 54 companies. Out of those, 22 companies answered the survey. The response rate was approximately 40.7%.

In the forestry industry, 100 companies were provided by largestcompanies.se (2021). After sorting for companies that were not active in forestry, but instead adjacent industries like forestry counselling, 28 companies were included in the sample that were contacted. Out of those, 12 companies answered our survey. The response rate was approximately 42.9%.

3.2 Measurements

In order to derive statistically significant correlations from the data to test the study's hypotheses, multiple linear regressions were conducted in STATA. In other words, all collected independent variables were tested against the chosen financial performance metrics, the dependent variables, rather than just one independent variable at the time. This is because it is difficult, if not improbable, to draw ceteris paribus conclusions from simple linear regressions (Woolridge, 2020).

The model used in the regressions is a Multiple Linear Regression (MLR) Model, which was mathematically formulated as follows:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \cdots + \beta_k x_k + u,$$

where y is the dependent variable, and x_1, x_2, x_3 and so forth, to x_k, are the independent variables. The coefficient β_0 is the intercept of the regression, whilst the coefficients β_1, β_2, β_3 and so forth to β_k, are the coefficients for every independent variable from the collected data. Their value determines the effect that a unit increase (decrease) of a specific independent variable has on the dependent variable y. The constant variable u is the error term of the MLR model and can be explained as the unobserved factors that influence y, that weren't included in the model as independent variables.

3.2.1 Dependent Variables

The performance metric that the independent variables were tested for, were ROCE (Return On Capital Employed) as well as EBITDA (Earnings Before Interest, Taxes, Depreciation and Amortization). The financial data for each firm was retreived from the firms' financial statements listed on www.allabolag.se.

ROCE
Return on capital employed is deemed important when it comes to assessing a company's financial condition according to Lisek, Luty, and Zioło (2020). It represents the shareholder returns against invested capital and is used to legitimize investment in a company (Lisek, Luty & Zioło, 2020). ROCE, calculated as:

$$\frac{EBIT}{Total\ Assets - Total\ Current\ Liabilities},$$

will mainly test the efficiency of the capital of the companies.

EBITDA Margin
EBITDA is a significant benchmark for determining the quality of a company's reported earnings (Luciano, 2003). In order to achieve a measurement comparable across firms of different sizes, we used EBITDA margin so as to see performance as a percentage rather than simply a sum to make it easily comparable. EBITDA, calculated as:

$$Operational\ Income - (Interest\ Expenses + Tax + Depreciation + Amortization),$$

is the adjusted earnings of the commodity firms, and measures the economic profitability of a company, not taking financial costs into account.

Table 1: Dependent Variables

Dependent Variable	**x**
ROCE	*ROCE2019*
EBITDA	*EBITDA%*

3.2.2 Independent variables

The independent variables can be derived from the proposed hypotheses. In other words, they can be wordily described as *education*, *educational orientation*, *CEO tenure* and *industry tenure*. Furthermore, they are illustrated with their mathematical counterparts, which we used in our regression analyses.

Education
In terms of education, the MLR tested both for number of years of university studies and the level of education pursued by the CEO. Number of years of university education was presented in absolute numbers, with one year of university education equal to one unit increase in *YearEduc*. The highest level of education pursued by the respondents was presented as dummy variables, with one for bachelor's level, one for master's level and one for doctorate level. If the respondent's highest level of education was pre-university, the dummy variables would all take upon the value 0.

Educational Orientation
What type of education the respondents studied was tested for with dummy variables. If the respondents only studied a management program at university, the dummy variable *Management* would undertake the value 1, whilst the other dummy variables for educational type would

undertake the value 0. If a respondent studied more than one field out of the ones considered, for example with a double degree, all dummy variables applicable would undertake the value 1.

CEO Tenure
CEO tenure was tested for in absolute numbers, with 1 year as CEO equaling a value of 1.

Industry Tenure
Industry tenure was tested for in absolute numbers, with 1 year of industry experience equaling a value of 1.

Table 2: Independent Variables

Independent Variable	**x**
Education: - *Years of university education* - *Highest level of education:* o *BSc* o *MSc/MBA* o *PhD*	*Variables:* - *YearEduc* - *Dummy variables:* o *BSc* o *MSc* o *PhD (Removed due to 0 on all respondents)*
Educational orientation: - *Management* - *Business and Economics* - *Engineering* - *Other Educational orientation*	*Dummy variables:* - *Management* - *B&E* - *Engineer* - *OtherEduc*
CEO tenure	*CEOTenure*
Industry tenure	*IndusTen*
Company tenure	*CompTen*

3.2.3 Control Variables

Independent variables that were not connected to the hypotheses were presented as control variables. They were variables that were expected to explain some variation in the dependent variables, which provides a purpose to include them in the model to minimize the importance of the error term, *u*. In conclusion, the variables included in the model are summarized in *Table 3*.

The variable *Man* took upon the value 1 when the respondent was a man, and 0 when the respondent was a woman (no respondents identified as other). When the respondent was internally appointed as CEO, the variable *Internal* took upon the value 1, and 0 if the appointment was external. If the respondent was CEO for a steel- or paper company, the respective variables *Steel* and *Paper* took upon the value 1, if the respondent was CEO for a lumber company, both industry dummy variables equaled 0.

Table 3: Control Variables

Control Variable	**x**
Age	*Age*
Gender - *Man as gender*	*Gender (dummy variable for man)* - *Man*
Previous CEO experience	*CEOExp*
Ownership	*Ownership*
Other management positions	*ManPos*
Researcher experience	*ResExp*
Form of appointment - *Internal appointment*	*FormApp (dummy variable for internal)* - *Internal*
Industry - *Steel industry* - *Paper industry*	*Industry (dummy variables for industries)* - *Steel* - *Paper*

3.2.4 Statistical Testing

Regression Analyses
To measure the correlation between our independent and dependent variables we conducted two regression analyses, one with each dependent variable on the independent variables. After the data was formatted, the command *regress* in STATA was applied (see Exhibit 4).

ANOVA Test
Our population from which we deducted our sample was the commodity industry. Due to the low number of Swedish companies within a specific sub-industry (for instance steel), we included several sub-industries, steel, paper and lumber, which were all controlled for in our regression analyses with industry dummy variables. Because of these circumstances, in combination with that our research question is not aimed towards measuring differences in variance and mean between sub-industries, an ANOVA test was not conducted for our sample in this study.

3.3 Limitations

There are certain limitations to quantitative studies that can be distinguished. There is for instance a difficulty assessing how many conclusions that can be drawn from the empirical results. As mentioned by Bell, Bryman, and Harley (2019), a correlation coefficient that is computed from the collected data, can only be interpreted as the likelihood of the coefficient appearing in the population from which the sample was taken from.

Further, this study is somewhat limited by the relatively small sample size of only 70 respondents. Because of this, the conclusions drawn from the results deciphered from the survey answers needs to be of especially high statistical significance.

Additional limitations can be derived from the fact that some insecurities exist regarding self-completion surveys. There is (almost) no way to confirm that the respondents were telling the truth, or if they understood the questions correctly. Even though they had the possibility to e-mail

us with questions, it is assumed that the respondents, CEOs of various-sized companies, had other priorities.

The results from the study were based on statistical results from regression analyses, which were then discussed in a theoretical context in light of the hypotheses. There could be limitations as a consequence of the research method used, in why some empirical results took upon a certain statistical value. Because of the limited evaluation of individual respondent's answers, further complications might not have been taken into account when the results were concluded.

3.4 Reflexive and Ethical Considerations

When conducting the study and collecting data, the ethical propositions used in business research were followed to the extent possible. In accordance with the data protection regulations enforced by Stockholm School of Economics, all respondents were informed that part-taking in the study was optional, and that they would be excluded from the e-mailing-list if they expressed their wish to be excluded. Furthermore, even though some personal data was collected from the respondents, such as name, gender and age, they were not distributed further by the authors, and only used as either control variables (age, gender) or as a confirmation of which CEOs that had participated in the study thus far (name). A third option for gender was also included in accordance with emerging societal norms, which even are formalized in legislations in some countries (Cecco, 2018). To ensure further privacy, no names or company names were disclosed in the thesis and all data was deleted after the completion of the study in accordance with the Stockholm School of Economics guidelines for data processing and secrecy.

The respondents also received all necessary information about the purpose of the study, as well as what institution the study was conducted with, in order to provide the sufficient background information and preventing deception. Since the study's main goal was to enhance the authors educational progression, it was firmly believed that that all possible existence of harm that may have been inflicted upon respondents from participating in the study was avoided.

The three most prominent quality criteria in business research, reliability, replicability, and validity, proposed by Bell, Bryman, and Harley (2019), were followed to the extent possible during the conduction of the study. The results are reliable and repeatable since the findings were derived from a public sample of CEOs at commodity industry companies, presuming that the point in time in which the repeated study is conducted is the same, since human capital factors such as tenure constantly change. The study is replicable since the methods for collecting data are thoroughly presented, in combination with the survey questions and statistical programs used to achieve the empirical results presented. Since the respondents' names and companies have been kept anonymous, however, the exact sample derived from the population cannot be completely replicated. The validity of the study was fulfilled to the extent possible. The measurements were valid in the sense that the empirical findings presented were assessed in consideration of the statistical significance of the regression model, as well as the discussion in connection with the theoretical framework and literature on which the hypotheses were based on. Conclusions regarding the results were then ensured to have validity in terms of causal relations and in generalizability.

4. Results (Empirics) and Analysis

In total, 126 companies of various sizes active in the commodities industry were contacted, out of a total of 300 companies provided by the database largestcompanies.se. The respondents amounted to 70 CEOs distributed between the commodity industries steel, paper and lumber, which gave us a response rate of 55.6%. The response rate and the number of companies contacted differed between the industries to some extent, which mainly can be derived from when the CEOs from the respective industries were contacted. Further, the gender distribution of our sample was 90% male and 10% female.

In our sample, 36 out of 70 respondents held either a Bachelor's degree or a Master's/MBA degree, whilst the rest did not pursue university studies (zero doctorates). 42 respondents were internally hired for the CEO position whilst 28 were hired from external positions from another company. A larger majority of the CEOs in the sample did not have any experience as a CEO before entering their current position. Notably, only one respondent had experience as a researcher at a university.

Additionally, 48 of the CEOs held other top management positions within the same company at the time of conducting the survey, and 49 CEOs had private ownership in the company they were CEO of. *(see Exhibit 1).*

Table 4: Response Rate

Industry	**Companies Provided**	**Companies Contacted**	**Survey Answers**	**Response Rate**
Steel Industry	100	44	36	81.8%
Paper Industry	100	54	22	40.7%
Lumber industry	100	28	12	42.9%
Total	300	126	70	55.6%

Table 5: Gender Distribution

Gender	**Men**	**Women**	**Other**
n	63	7	0
Distribution	90%	10%	0%

The empirical findings showcased a great variety between individual respondents in terms of absolute values. Number of years of education after high school varied from zero to seven years, and the independent variables related to tenure varied from zero to over 50 years. Furthermore, the dependent variables were derived from companies with both negative and positive EBITDA margins and return on capital employed.

Table 6: Variable Summary

Variable	**Obs.**	**Mean**	**Std. Dev.**	**Min**	**Max**
Age	70	55.49	7.48	36	74
YearEduc	70	2.39	2.11	0	7
CompTenure	70	20.79	14.18	1	53
CEOTenure	70	14.05	12.27	0	55
IndustryTen	70	28.01	12.94	1	55
ROCE2019	70	30.21%	87.40%	-71.83%	696.90%
EBITDA%	70	6.76%	11.19%	-39.97%	43.94%

4.1 Analysis of Hypotheses

The variation of the models is shown in *Tables 7 and 8*. The MLR-model for ROCE showed a variation in the observed data of 52.70, which can be divided into the variation in the modelled values: 20.17, and the variation in the error between the modelled values and the observed data in our sample: 32.53. The F-statistic for the model was 1.63 meaning that the variables are jointly statistically significant at the 10% significance level. The fraction of the variation of ROCE that could be explained by the values of the independent variables can be concluded as the adjusted R-squared value of 0.148.

The MLR-model for EBITDA margin showed a variation in the modelled values of 0.45 and a variation in the observed data of 0.86. The variation in the error between the modelled values and the observed data amounted to 0.42. The F-statistic for the model was 2.84 meaning that the variables are jointly statistically significant at the 1% significance level. The fraction of the variation of EBITDA margin that could be explained by the values of the independent variables can be concluded as the adjusted R-squared value of 0.336.

Table 7: Multiple Linear Regression Analysis – ROCE

Observations			70		
F(19, 50)			1.63		
Prob > F			0.085		
R-squared			0.383		
Adjusted R-squared			0.148		
Root MSE			0.807		
Source	SS		df	MS	
Model	20.17		19	1.06	
Residual	32.53		50	0.65	
Total	52.70		69	0.76	
(Hx) **ROCE2019**	**Coef.**	**Std. Err.**	**t**	**P > | t |**	**[95% Conf. Interval]**
Man	0.538	0.387	1.39	0.170	-0.239;1.314
Age	-0.002	0.021	-0.11	0.916	-0.045;0.041
(1a) BSc	0.170	0.438	0.39	0.700	-0.710;1.050
(1a) MSc	-0.184	0.581	-0.32	0.752	-1.351;0.982
(1b) Management	0.951	0.439	2.17	0.035	0.070;1.832
(1b)B&E	-0.617	0.354	-1.74	0.088	-1.328;0.094
(1b) Engineering	-0.696	0.433	-1.61	0.114	-1.566;0.174
(1b) OtherEduc	-0.577	0.461	-1.25	0.216	-1.502;0.349
(1a) YearEduc	0.127	0.119	1.06	0.293	-0.113;0.367
(2a) CompTen	-0.017	0.017	-0.98	0.333	-0.051;0.018
Internal	0.395	0.283	1.40	0.169	-0.173;0.964
Steel	0.313	0.333	0.94	0.352	-0.356;0.981
Paper	0.259	0.353	0.73	0.468	-0.451;0.968
(2a) CEOTenure	0.005	0.018	0.27	0.787	-0.031;0.041
CEOExp	0.054	0.314	0.17	0.863	-0.577;0.686
(2b) IndusTen	0.009	0.013	0.68	0.500	-0.018;0.036
ResExp	-0.843	0.919	-0.92	0.364	-2.689;1.004
ManPos	-0.361	0.228	-1.58	0.120	-0.820;0.097
Ownership	-0.400	0.260	-1.54	0.130	-0.923;0.122
_cons	0.149	1.285	0.12	0.908	-2.433;2.731

Table 8: Multiple Linear Regression Analysis – EBITDA Margin

Observations			70		
F(19, 50)			2.84		
Prob > F			0.002		
R-squared			0.519		
Adjusted R-squared			0.336		
Root MSE			0.091		
Source	SS		df	MS	
Model	0.45		19	0.02	
Residual	0.42		50	0.01	
Total	0.86		69	0.01	

(Hx) **EBITDA%**	**Coef.**	**Std. Err.**	**t**	**P > | t |**	**[95% Conf. Interval]**
Man	0.039	0.044	0.90	0.373	-0.049;0.127
Age	0.005	0.002	1.90	0.063	-0.000;0.010
(1a) BSc	0.102	0.050	2.06	0.044	0.003;0.202
(1a) MSc	0.096	0.066	1.46	0.151	-0.036;0.228
(1b) Management	0.090	0.050	1.81	0.076	-0.010;0.190
(1b)B&E	0.057	0.040	1.43	0.159	-0.023;0.138
(1b) Engineering	0.092	0.049	1.87	0.067	-0.007;0.190
(1b) OtherEduc	0.020	0.052	0.38	0.706	-0.085;0.124
(1a) YearEduc	-0.009	0.013	-0.64	0.524	-0.036;0.018
(2a) CompTen	0.008	0.002	4.11	0.000	0.004;0.012
Internal	-0.026	0.032	-0.82	0.415	-0.091;0.038
Steel	0.046	0.038	1.21	0.230	-0.030;0.121
Paper	0.087	0.040	2.18	0.034	0.007;0.167
(2a) CEOTenure	-0.003	0.002	-1.44	0.156	-0.007;0.001
CEOExp	0.050	0.036	1.41	0.165	-0.021;0.122
(2b) IndusTen	-0.004	0.001	-2.47	0.017	-0.007;-0.001
ResExp	-0.068	0.104	-0.65	0.518	-0.276;0.141
ManPos	-0.045	0.026	-1.75	0.086	-0.097;0.007
Ownership	0.011	0.029	0.38	0.709	-0.048;0.070
_cons	-0.382	0.145	-2.63	0.011	-0.674;-0.090

4.1.1 Analysis of Hypotheses 1a and 1b

Hypothesis 1a – The CEO's education will have a positive effect on financial performance in the commodities industry.

Our empirical findings in *tables 7 and 8* show a positive, yet not statistically significant relationship between holding a bachelor's degree and ROCE (return on capital employed), interestingly the relationship between EBITDA margin and holding a bachelor's degree was both positive and statistically significant, at the 5% significance level. The latter provides partial support for hypothesis 1a. Looking at a master's degree from a university the results tell a different story. The relationship between ROCE and an MSc degree was negative and not statistically significant, whilst the relationship with EBITDA margin was positive, yet not statistically significant at the

95% confidence level. Additionally, the number of years of education post high school showed a negative correlation with EBITDA margin, but a positive relationship with ROCE, both statistically insignificant at the 95% confidence level. Although the findings support hypothesis 1a to a certain degree, the only statistically significant support was found regarding a bachelor's degree's effect on EBITDA margin. Further, there was also a lack of cohesion in the findings, for these reasons, hypothesis 1a is neither rejected nor supported at the 95% confidence level.

Hypothesis 1b – CEOs educated in engineering will produce a higher financial performance in the commodities industry than CEOs educated in other fields.

The findings show that an engineering degree has a negative relationship with ROCE, though statistically insignificant at the 95% confidence level. It showed the largest negative correlation out of all the educational fields examined. Its relationship with EBITDA margin showed the largest positive relationship out of the educational fields represented in the data, just missing the statistical confidence mark at the 95% level. Thus, hypothesis 1b is rejected at the 5% significance level.

H1a	Not supported
H1b	Rejected

In accordance with Human Capital Theory, we hypothesized that education would have a positive effect on CEOs' output of financial performance (H1a), we also factored in different types of education to discover whether there would be any differences between them (H1b). Our findings support the notion that explicit knowledge (general human capital) in terms of education would increase financial performance to a certain degree. The data suggests that the level of education has a positive impact on ROCE up to a bachelor's degree, although what effects an additional step (MSc) has on financial performance remains unclear. The reverse relationship between an MSc degree and EBITDA margin and ROCE lacked statistical significance and therefore we cannot draw any conclusions surrounding how an additional investment in further education impacts financial performance. Since previous research had shown a similar ambiguity when examining the effects of education as one broad variable, we factored in that the field of education would matter, in line with Garcia-Blandon, Argilés-Boch, and Ravenda (2019) and Saidu (2019). Hypothesis 1b was inspired by the findings of Saidu (2019), and Garcia-Blandon, Argilés-Boch and Ravenda (2019) suggesting that CEOs with engineering degrees produce higher performance. Our data does not provide any evidence of this to be the case.

4.1.2 Analysis of Hypotheses 2a and 2b

Hypothesis 2a – CEOs with longer tenures as CEO at their current company will produce worse financial performance than those with shorter tenures as CEO.

Longer tenures as CEO were associated with a small negative relationship to EBITDA margin, and a small positive relationship to ROCE, however not statistically significant at the 95% confidence level. Company tenure, likewise, showed a small negative relationship with ROCE and a small positive relationship with EBITDA margin, neither were statistically significant at the 95%

confidence level. Therefore, hypothesis 2a is rejected at the 95% confidence level as no clear and statistically significant conclusion could be drawn.

Hypothesis 2b – CEOs with longer tenures within the industry they are currently working in will produce better financial performance than those with shorter tenures in that industry.

Industry tenure showed a statistically significant (95% confidence) negative relationship with EBITDA margin, and a positive relationship with ROCE, though lacking statistical significance at the 95% confidence level for the latter. Hypothesis 2b is rejected on the 95% confidence level.

H2a	Rejected
H2b	Rejected

Being referred to as a double-edged sword (Oh, Chang & Jung, 2018) we acknowledged the emergence of cognitive inflexibility related to longer tenures as CEO, hypothesizing that longer CEO tenures would result in worse financial performance (H2a), and extended the hypothesis in line with Human Capital Theory, predicting that firm- and industry-specific tenures should have a positive effect on financial performance and previous research's findings of positive correlation between industry tenure and financial performance (H2b). Our results do not provide statistically significant evidence of a positive correlation between industry tenure and financial performance as suggested by Human Capital Theory and previous empirical findings, nor does it substantiate the notion of cognitive inflexibility associated with longer tenured CEOs to decrease financial performance.

4.2 Additional Findings

Management & Organization Education
Education within management and organization showed the largest positive impact on ROCE, and the second largest positive impact on EBITDA margin, with statistical significance at the 5% confidence level for ROCE, and at the less significant 10% level for EBITDA margin. These findings do support some positive correlation between management and organization education and company financial performance. This provides partial support to Saidu (2019) and Garcia-Blandon, Argilés-Boch and Ravenda (2019) regarding CEOs with operations-based educational background producing higher overall performance. This was not included in hypothesis 1b as the primary focal point out of operations-based education was engineering in these two studies.

Industry Characteristics
There also was a statistically significant difference in EBITDA margin for the paper industry, showing the importance of adjusting our MLR-model for specific financial sub-industry characteristics.

5. Discussion

This thesis was conducted to shed light on the various factors with CEOs at Swedish commodity firms that affect financial company performance. By collecting individual data of tenure, education and company-dependencies, among other things, we tested for the significant effect that these factors may have, formulating the research question as:

"Which are the factors among CEOs of Swedish firms in the commodities industry that are associated with company financial performance?"

Human Capital Theory suggests that human capital that individuals acquire such as tenure and education increase performance and efficiency among individuals and their decision-making. However, the results of this study have not been able to find concrete, coherent and statistically significant evidence between company financial performance and specific human capital related CEO factors.

Even though the lack of statistical significance limited the support for the proposed hypotheses, certain research findings could be deciphered from our regression analyses. Within the Swedish commodities industry, we can derive a joint effect on financial company performance from CEO factors. Which factors, however, were more difficult to distinguish due to the lack of statistical significance. Industry tenure had a statistically significant, negative effect on the companies' EBITDA margin, whilst company tenure had a statistically significant positive effect. These results are in alignment with previous studies and contributes to the field of research by further minimizing the ambiguity regarding tenure and its effect on company financial performance.
The educational aspect of human capital also had a visible effect on company financial performance, when testing for our sample. CEOs with a bachelor's degree as their highest level of education showed a statistically significant, positive effect on EBITDA margin, with over 10 percentage points increase in EBITDA margin compared to a CEO with only a high school diploma. Furthermore, our regressions derived a statistically significant, positive effect on ROCE, when the CEOs had undergone an educational program in management. As a contribution to the field of research within Human Capital Theory, the ambiguity of the educational effects on company performance is decreased in the respects previously mentioned, whilst some conclusions that were implied by previous research, could not be supported in the study. The effect of a master's degree, as well as a degree in engineering, showed no clear correlation with financial performance, and without statistical significance.

Furthermore, the study has provided the research field with industry-specific effects on company financial performance. The lack of studies covering the effects of CEO factors in the commodities industry sheds new light on the results derived from this study's analyses.

5.2 Limitations and Future Research

An obvious limitation to the study was the lack of statistically significant results that could be concluded from the regression analysis of the sample. This could be a consequence of a number of things: too small sample; lack of independent variables; or for instance, poor choice of independent variables in relation to the dependent variables.

One specific limitation to the statistical models used in the study is that the results for ROCE regressed on the independent variables weren't jointly statistically significant at a 5% significance level. It could be argued that using the same independent variables for both ROCE and EBITDA margin led to one model having a better fit than the other. There also are limitations with our statistical model in terms of what independent variables that were selected. All independent variables are in some shape or form related to the CEO, but the model failed to control for company-specific factors such as years active, revenue or geographical location, to name a few. These variables could have improved the model further, providing more clarity and significance to our results.

Limitations to the results of the study include the financial measurements that were chosen to cover the "*company financial performance*". There exists a substantial amount of financial performance measurements that could have replaced EBITDA margin and/or ROCE, or have been added as dependent variable addition to further strengthen our results.

This thesis focused on CEO's human capital and its effects on company financial performance within the commodity industry. Future research within the area of CEO factors and their effects on company financial performance should explore the possibilities of conducting it in other industries than the commodity industry. Furthermore, studies both within and outside the commodity industry should consider collecting a bigger sample, as well as controlling for company-specific factors to get more nuanced and statistically significant results. Human Capital Theory is a well-researched subject, but it can be applied to more specific areas and expanded to include more top management positions in the respective firms to properly map the effects of human capital.

6. Conclusion

Factors among CEOs that affect company financial outcomes is a well-researched field, with a vast variety of focal points on factors, parameters used to represent financial performance and industries examined. Even though CEO factors and their effects on financial performance is a field that has received a lot of attention, there is a large ambiguity and lack of consensus as to which factors affect company financial performance and to what extent they do. This thesis sought to bring clarity to the question:

"Which are the factors among CEOs of Swedish firms in the commodities industry that are associated with company financial performance?"

To do this, the effects on financial performance (in terms of return on capital employed and EBITDA margin) of level of education, field of education, CEO tenure and industry tenure were examined in the context of the homogeneous commodities industry sectors: metal- and steel, lumber and wood, and paper. The results came out mostly statistically insignificant, thus conclusions were unable to be drawn regarding the effects of these variables on financial performance in the commodities industry. The study was unable to answer the research question with statistical significance, but the data suggests that education may have a positive effect on financial performance, although, in this study, statistically insignificant. Regarding tenure no conclusion was able to be drawn. These results appear inconsistent with the predictions of Human Capital Theory and previous empirical findings in the field.

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Appendix

Exhibit 1: Additional Independent Variables

Level of Education

n	High School	BSc	MSc/MBA	PhD
Education	34	20	16	0

Field of Education

n	Management	Business/Econ.	Engineering	Other
Field Education	6	23	28	20

Form of Appointment

n	Internal	External
Form of appointment	42	28

Previous CEO Experience

n	Previous CEO experience	No CEO experience
CEO Experience	15	55

Previous Researcher Experience

n	Research experience	No research experience
Researcher experience	1	69

Other Management Positions

n	Other management pos.	No other management pos.
Management pos.	22	48

Company Ownership

n	Ownership in company	No ownership in company
Ownership	49	21

Exhibit 2: Manuscripts

Phone Call Manuscripts

”Hej [namn]

Jag heter [mitt namn], jag och min kurskamrat [den andras namn] håller på att genomföra vår kandidatuppsats på Handelshögskolan i Stockholm.

Som en del av arbetet så utför vi en enkät genom vilken vi insamlar områdesrelevant data ämnat att undersöka vilka faktorer hos verkställande direktörer som påverkar företags finansiella prestation. Mer specifikt är studien inriktad på den svenska [industri]. Jag och min

uppsatspartner skulle uppskatta enormt om du vill bidra till vår studie med cirka tre minuter som det tar att svara på enkäten.

Om du önskar delta i enkätstudien kan jag skicka dig länken på mail."

Email Manuscript

"Hej!
Vi är två studenter som arbetar med vår kandidatuppsats på Handelshögskolan i Stockholm. I uppsatsen undersöker vi vilka faktorer hos verkställande direktörer i den svenska [industri]. Denna data samlar vi in genom en enkät som tar maximalt fyra minuter att besvara.

Vi är väldigt tacksamma om ni väljer att bidra till undersökningen genom att svara på enkäten. Observera att deltagande är valfritt.

Enkäten och mer information gällande vilken typ av data som samlas in samt sekretess finnes i länken nedan:

[länk till enkät]

Med vänlig hälsning,
Otto Svensson & Victor Kjellström"

Exhibit 3: Survey

Samtycke till att delta i denna enkätstudie
Som en del av kandidatprogrammet i Business & Economics på Handelshögskolan i Stockholm så utför vi, Otto Svensson och Victor Kjellström, en kandidatuppsats. Denna uppsats undersöker vilka faktorer hos verkställande direktörer inom den svenska [industri] som påverkar företagens finansiella prestation. Detta arbete baseras på områdesrelevant data insamlat genom denna enkät. Deltagande är valfritt och denna text är ämnad att ge dig nödvändig information gällande deltagande i denna studie. Du kan vid vilken tidpunkt som helst återkalla ditt samtycke och din data kommer följaktligen att raderas permanent.

Sekretess
De svar du anger i enkäten kommer att behandlas konfidentiellt och kommer enbart att tillgängliggöras för handledare för uppsatsen och kursens management team.

Säker lagring av data
All data kommer att lagras och bearbetas sekretessbelagt och kommer att bli permanent raderad när projektet är slutfört.

Ingen personlig data kommer att bli offentliggjord
Uppsatsen kommer inte att innehålla någon information som kan leda till att du identifieras som deltagare i studien.

Dina rättigheter enligt GDPR
För att läsa mer om datahantering och dina rättigheter associerade med hantering av personlig data, vänligen besök: https://www.hhs.se/en/about-us/data-protection/

Titel på projektet: What Determines a CEO's Impact on Financial Performance in the Swedish Commodities Industry? A Quantitative Study on the Swedish Commodities Industry.

Vårterminen, 2021

Syftet med studien: Syftet med studien är att undersöka vilka faktorer hos verkställande direktörer som påverkar företagens finansiella prestation.

Studenter ansvariga för enkäten: Victor Kjellström, Otto Svensson.

Handledare och avdelning på Handelshögskolan i Stockholm (HHS): Anna Söderblom, Department of Management and Organization.

Handledares e-postadress: Anna.Soderblom@hhs.se

Typ av data som samlas in och bearbetas: Namn, e-post adress, ålder, kön, bakgrundsinformation om dig som respondent såsom utbildningsbakgrund, tidigare arbetslivserfarenhet och innehav av andelar i företaget du är VD för.

Jag har tagit del av informationen ovan och samtycker till att delta i denna enkätstudie
- **Namn:**
- **Företag:**

Sektion 1: Om dig
Vilket kön identifierar du dig som?
a. Man
b. Kvinna
c. Annat

Hur gammal är du?
- (Öppen fråga, de anger själva exakt ålder)

Ange din **högsta** utbildningsnivå.
a. Grundskoleexamen
b. Gymnasieexamen
c. Kandidatexamen från ett universitet
d. Masterexamen från ett universitet
e. Doktorsexamen från ett universitet

Inom vilket ämnesområde tog du examen?
a. Ingenjörsutbildning
b. Ekonomi och business
c. Management och organisation
d. Annat

Hur många år efter gymnasiet studerade du i full studietakt?
- (Öppen fråga, de anger själva antal år)

Sektion 2: Arbetslivserfarenhet

Hur länge har du arbetat på ditt nuvarande företag? (Antal år)

- (Öppen fråga, de anger själva antal år)

Vid tidpunkten du blev rekryterad till VD positionen, var du:

a. Anställd på ditt nuvarande företag (intern)
b. Annat (extern)

Hur länge har du varit VD över ditt nuvarande företag? (Antal år)

- (Öppen fråga, de anger själva antal år)

Har du tidigare varit VD?

a. Ja
b. Nej

Under hur många år har du arbetat inom [industri]?

- (Öppen fråga, de anger själva antal år)

Har du tidigare arbetat som forskare på ett forskningsinstitut eller universitet?

a. Ja
b. Nej

Besitter du några ytterligare samtida chefspositioner på samma företag som du är VD för?

a. CFO
b. COO
c. CTO
d. Annan

Sektion 3: Ägarskap

Äger du andelar i det företag du för närvarande är VD för?

a. Ja
b. Nej

Exihbit 4: Stata Do-File

```
138  import excel "C:\Users\46738\Documents\2 - What Determines a CEO's Impact on Financial Performance_ (1-36).xlsx", sheet("Survey") firstrow
139  summarize Age YearEduc CompTenure CEOTenure IndustryTenure ROCE2019 EBITDA2019
140  regress ROCE2019 Man Age BSc MSc Managment BE Engineer OtherEduc YearEduc CompTenure Internal Steel Paper CEOTenure CEOExp IndustryTenure ResExp ManPos Ownership
141  regress EBITDA2019 Man Age BSc MSc Managment BE Engineer OtherEduc YearEduc CompTenure Internal Steel Paper CEOTenure CEOExp IndustryTenure ResExp ManPos Ownership
```