LUND UNIVERSITY
SCHOOL OF ECONOMICS AND MANAGEMENT

Beating the Odds

Investigating the Predictors of Stock Price Superiority in Swedish High-Quality Companies

Bachelor's Thesis in Financial Economics

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Abstract

The fundament of the efficient market hypothesis is that no historical information can be used to predict stock returns. Despite this, so-called quality investing is a popular practice and a strategy that has generated above-average market returns. By analysing Swedish high- and low-quality companies, this study aims to answer the relationship between certain financial metrics and stock returns. Further on, this study defines high-quality companies that, on average, generate results greater than low-quality companies. High-quality companies are shown to have a strong positive correlation to the growth rate in the EV/EBIT multiple and a weak but positive relationship to ROA. Low-quality companies have a weak positive relationship to the growth rate in EV/EBIT.

Keywords: High-quality, stock price, quality investing, predictability of stock price, EMH.

Acknowledgements

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Abbreviations

Abbreviations	*Definition*
BLUE	Best Linear Unbiased Estimator
CAGR	Compounded Annual Growth Rate
EBIT	Earnings Before Interest and Taxes
EBITDA	Earnings Before Interest Taxes Depreciation and Amortization
EV	Enterprise Value
KPI	Key Performance Indicator
ROA	Return on Assets
ROC	Return on Capital
ROE	Return on Equity

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1. Introduction

This chapter aims to introduce the subject of this thesis and state the hypotheses. Along with this, supporting background will be provided to give the reader ground to stand on. This section concludes the results of the report.

1.1 Background

1.1.1 The Swedish Financial Landscape

This thesis examines the years 2018-2022, a period marked by major economic events. However, if one approaches a helicopter view, it is evident that Swedish stocks have performed well during the period, as can be seen in Figure 1 below. The graph shows the OMXSPI index which is the all-share index for the Stockholm Stock Exchange.

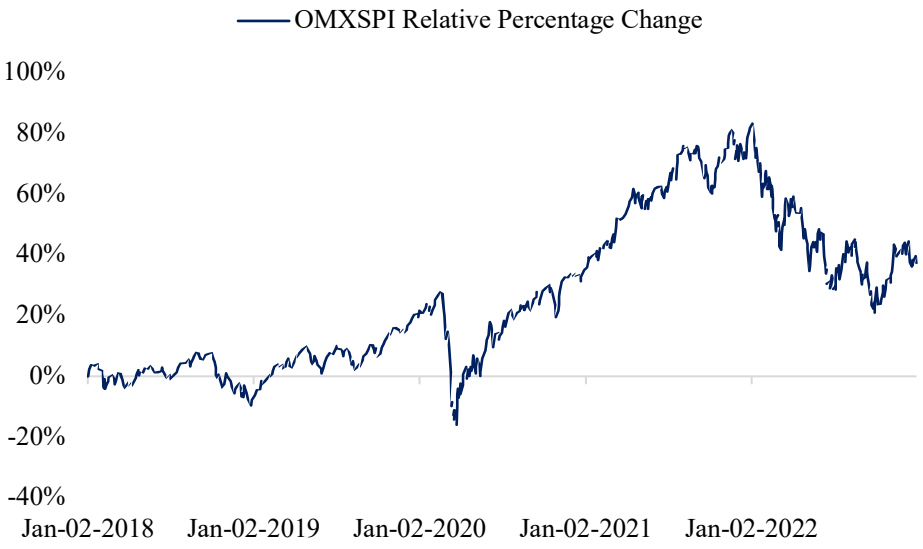

Figure 1 OMXSPI Relative Percentage Change (Capital IQ, 2024)

During the observed period, the Swedish stock market experienced a decline in only one year – 2022. In that year, the OMXSPI index fell by approximately 30%, resulting in a reduction in the market capitalizations of Swedish publicly listed companies of around SEK 3,868 billion. This downturn was driven by significant economic uncertainty, rising inflation rates, and high interest rates, all of which tightened the finances of Swedish households. Historically, there has been a strong trend of declining stock prices when interest rates are high, and this time was no exception. Additionally, after looking at the OMXSPI volatility, it is evident that the years 2018-2022 were volatile, not least because of the COVID-19 pandemic outburst. This led to a

substantial drop in the Stockholm exchange, followed by a period in which the Swedish central bank, Riksbanken, lowered interest rates, ultimately leading to a 64% increase in Swedish share capital between 2020 and 2021 (SCB, 2023). The economy in 2022 was also marked by the war in Ukraine. This led to a supply shock that raised energy prices and further increased the inflation rate (Apel & Ohlsson, 2022).

1.1.2 Quality Investing

Quality investing has been a popular investment philosophy for a long time. It explains the practice of investing in companies that generate stable returns, have a strong balance sheet, and are not prone to huge market fluctuations. At the same time, as these companies tend to generate consistent performances and increase shareholder value, they also seem to be less risky than low-quality companies. It is evident that high-quality companies outperform the market. Given this, it is easy to understand why the philosophy of quality investing is popular and why investors study it (Schroders, n.d.). Asness et al. (2019) find that high-quality stocks in the U.S. and 24 other countries (Sweden included) have lower beta values than the average, meaning that the stocks have a history of lower volatility and that the companies tend to perform well under recessions. The result of this study is consistent with high-quality stocks being underpriced, or alternatively that low-quality stocks are overpriced. In addition, they also find that the cost of quality varies over time and that when the price is low, future returns are excessively higher for these high-quality stocks compared to low-quality ones.

Considering this, value creation may be a product of several factors, but this thesis aims to extrapolate what variables can explain why high-quality companies outperform low-quality ones, as well as whether investors possess the ability to predict stock returns. In doing this, we intend to understand what metrics are important in value creation for high-quality companies and important for investors and management to keep track of. This type of research is not commonly done on Swedish companies, which is why it is of interest to expand the research to the Swedish market. Further on, one thing that economic theory always comes back to is profit maximisation. This thesis expands on this and applies it to the stock market. We want to extrapolate what metrics management should focus on in order to generate excess returns and what metrics investors should look at to be able to make informed investments. This study thus aims to answer the question of what predictors best explain stock returns of Swedish high-quality companies.

1.2 Research Question

The aim of this thesis is to answer the following research question:

- What predictors can explain why Swedish high-quality companies outperform low-quality companies in terms of stock price?

1.3 Definitions

To define a quality company three key measures have been used. The measurements have been selected based on relevance to a firm's long-term stability and the quality of the business coupled with data availability. This has been done to generate a concise definition of quality companies that is easy to measure in the regression.

1.3.1 Geographic Location and Type of Company

The companies analysed in this thesis are publicly traded Swedish companies. This criterion has been set to generate plausible results applicable in markets surrounding the Nordics. Being in Sweden, these companies provide local relevance and good investor insights. Information about privately owned companies is limited, and thus the thesis only covers public companies.

1.3.2 Net Income 5yr CAGR

Five-year net income CAGR measures the compounded annual growth of a company's net income with the following formula: $(\frac{\text{End value}}{\text{Beginning value}})^{\frac{1}{n}} - 1$. To differentiate high-quality companies from others, a criterion has been established that requires a five-year net income CAGR to be strictly positive. This criterion ensures that high-quality companies have demonstrated stable and increasing profits for at least the past five years. Without a positive net income CAGR we cannot be sure that the company is healthy. The primary focus of the report is to extrapolate what generates quality for high-quality companies, and thus, stable profits are important.

1.3.3 Revenue 5yr CAGR

The five-year revenue CAGR quantifies the yearly growth rate of revenues over a five-year period. For high-quality companies, observing an uptick in sales is crucial, and this metric offers insight into the effectiveness of their business model by showcasing the annual growth rate of sales over five years. To accommodate a diverse range of companies, this figure does not necessarily need to be excessively high, as it is considered alongside other factors.

Consequently, a five-year revenue CAGR exceeding 10% is sought after for a company to be classified as high-quality.

1.3.4 Net Debt/EBITDA

Net Debt/EBITDA is an important measurement of the financial stability of a company. Net Debt, which is the remaining debt after removing liquid means, is central in analysing a company's ability to pay off its liabilities. A higher Net Debt is a liability because of this, since it is the remaining debt that the company is unable to pay off directly, and investors therefore face a higher risk of the company not being able to cover its liabilities.

EBITDA is earnings before interest, taxes, depreciation, and amortization, and shows how big the company's operations are. A bigger operational profit will usually mean a steady cash flow, something which is a heavy indicator of stable finances. The quota Net Debt/EBITDA thus provides a value on how much bigger the remaining debt is than earnings before interest, taxes, depreciation, and amortization, and gives the analytics a measurement of how many years it takes to repay debt given that the quota stays constant. This indicates that a higher value means more insecure finances and that it takes a longer time for the company to repay its debt. A Net Debt/EBITDA lower than two is therefore an indication of a high-quality company.

1.4 Research Limitations

The scope of this thesis is limited to encompass exclusively companies geographically located in Sweden and that are publicly listed entities. Considering this, it is vital to acknowledge that the capacity to extrapolate the findings of the study may be constrained by variations in financial landscapes across countries. However, it is noteworthy that companies operating within the Swedish market are known for their ability to yield substantial returns, making this market relevant for discovering significant predictors of high growth. In addition, the central objective of this thesis is to identify predictors that explain why high-quality companies outperform low-quality ones in terms of stock price. In pursuing this analysis, certain variables will be excluded, including management quality, capital allocation strategies, and exogenous factors such as macroeconomic conditions. Despite these limitations, the study aims to provide insights into the factors influencing stock prices.

1.5 Preview of Results

This study has in its empirical analysis found that there are differences in what influences high- and low-quality companies stock returns. Not only do high-quality companies have higher

average stock returns, as expected by previous research, but they also have a significant and high correlation with the growth rate in EV/EBIT. This relationship was also significant for low-quality companies, but to a much lower degree. High-quality company stock returns are also found to have a small but significant relationship with ROA.

2. Literature Review

This section introduces the literature laying the ground for the thesis. A discussion about similarities with previous research will be presented and finally, we hope to contribute to further research as our object it to find out what makes quality companies outperform the market.

The efficient market hypothesis (EMH) is highly relevant when predicting market returns and is one of the cornerstones in financial economics. It concludes that if the market is efficient, all information is included in the stock price, and thus, it is impossible to make a profit on trades grounded in specific information. Fama (1970) presents three different forms of the EMH - the weak form, the semi-strong form, and the strong form. All forms of market efficiency reflect the extent to which information is incorporated into stock prices. The weak form is limited to historical data, the semi-strong form includes both historical and all publicly available information, and the strong form contains these as well as insider information meaning that all information reaching the market will immediately be accounted for in the price. Thus, if the strong form is present, such information cannot be used to forecast stock prices and make profits. This implies that investors cannot use financial metrics to predict stock prices and that risk is the only metric that can increase returns. However, in an article published by Ou and Penman (1989), it is evident that financial statements contain fundamentals, such as ROA, Debt/Equity, and profit margin measures, that are not reflected in the stock price. This means that investors can draw advantages of such information to predict returns and consequently outperform market indices. Zhang (2023) further argues that EV/EBIT affects the model positively and that stocks with a higher EV/EBIT multiple generate higher alpha, meaning that they outperform the market. Consequently, companies with a lower multiple generate lower alpha values. Additionally, Zhang also finds that EV/EBIT tends to increase the significance of the regression model, motivating the inclusion of the multiple to generate more accurate results.

Malkiel (2003) supports these takes, suggesting that markets cannot be perfectly efficient, as that would mean that investors would not have any incentive to discover information that could

help in predicting future movements in stock prices. Moreover, historical patterns in stock prices exist and can even persist shortly, but Malkiel argues that these historical patterns are unlikely to remain in the long run. Such historical patterns will therefore, according to Malkiel, not help investors predict stock prices, supporting the weak form of the EMH. Thus, with non-perfectly efficient markets, it is of high practical and theoretical importance to study the metrics that are not accounted for but still have a positive effect on the stock price. The results of the findings from this study could therefore further the knowledge of what creates value for shareholders, but whether the results will remain relevant for a longer period of time is not sure.

Coibion and Gorodnichenko (2012) conclude that models implementing information asymmetries are more reliable in forecasting for firms, consumers, and other economic agents. These informational asymmetries create significant economic consequences due to wrongful pricing on the equity markets and inefficient resource allocation. De Bondt and Thaler (1985) discuss these informational asymmetries within behavioural economics, a perspective that is of interest in studying variations in and forecasting of stock prices. Their study implies that overreactions to market news can lead to over- and under-pricing, which is relevant in studying how long-term stable metrics can have an unaccounted-for effect on the pricing of an asset. Contrary to these findings, Jegadeesh and Titman (1993) could not find any evidence of any overreactions. Instead, they concluded that "overreactions" were only a result of lagging reactions to specific information about the companies. As Jegadeesh and Titman's study analysed companies' returns during six months directly after a period of higher yield, this study's timeframe should account for such variations and analyse the significance of quality over a longer period, something that can be seen as a complement to both studies. Noteworthy is though that no analysis of the beta-variable is utilised in this study, because of a focus on high-quality companies regarding capital structure and cash flow, and not simply a low beta-value. Therefore, our results and conclusions might differ from previous research, even if they are not contradicting each other. Their research is however interesting for the theoretical framework and background of the expectations of the results from this study. In their study on the quality anomaly, Bouchaud et. al. (2016) could find a high correlation between operating cash flow and stock price. This correlation was found by comparing forecasted and realised stock price trends, and it showed that analysts often underestimate or even negatively predict stock prices when measuring such metrics. By expanding their research question with new geographical areas and financial metrics, this study wishes to deepen the understanding of stock price forecasting models and the value of quality in firms. The consensus of not perfectly

efficient markets creates the ability to continuously further the research of predictors of returns, as such predictors are volatile to exogenous variables based on factors like geographical location and changes in market trends.

Swedish high-quality companies could exhibit almost twice the stock price returns compared to low-quality companies between 2018-2022, which can be seen later in the study. Finding metrics that are indicators of quality would therefore provide the ability to create replicable means to correctly valuating stocks. No specific portfolio advice is disclosed in this study, as it only aims to show the importance of such metrics. This study should though be considered as a complementary academic source in further research and forecasting of high-quality stock price development.

Macroeconomic changes and geographical differences influencing stock prices are also important in understanding how to interpret the results of this study. In making accurate conclusions, it is crucial to give explanations and understand exogenous changes to the stock price development. It is also important to compare the results of this study to other similar studies in evaluating its results. Baker et al. (2016) could provide empirical proof of macroeconomic instability as a driver of stock price volatility, something that has affected the stock prices during the period 2018-2022 due to the COVID-19 pandemic and the Ukraine war. The paper did not dive deeper into which companies were affected the most by macroeconomic instabilities, and it would be of relevance to research how low-quality and high-quality stocks performed differently during macroeconomic uncertainty. Fernandez-Perez et al. (2016) study skewness in returns and strategies to receive higher returns by investing in firms with previous negative skewness. With their analysis, they concluded that this strategy would generate returns significantly greater than the market risk premium, which therefore would be a valuable comparison to this study. Complementing research about quality effects on stock price could deepen the understanding of how skewness fluctuates prices on the stock market. Analysing factors that affect the predictors would also be of interest for deepening the understanding of quality companies, since even if there is a significant relationship between the stock price development and a certain predictor, these could both be a result of good management for example. Tailab (2014) concludes in his study that the profitability of firms is closely related to the management of inventory. Such managerial variables are not considered in this study, which should be kept in mind as they could have a significant relationship with other of the variables as well and influence stock returns.

The literature has presented several interesting takes on the ability to predict stock returns and what factors could help make informed forecasts. At the same time as the EMH means that information already is priced into the stock price, researchers suggest that financial statements contain fundamentals that are not reflected in the stock price. Thus, one hypothesis that the thesis will address is whether it is possible to predict stock returns with such metrics. Further on, if it is possible to predict future stock returns it is also of interest to see if the measurements are identical for all firms. In this study, this is examined by comparing what ratios have the same effect on stock prices for high- and low-quality companies. The hypotheses are formally stated below in Table 1.

Hypotheses	
$H0_1$	One cannot predict stock prices using financial ratios
$H0_2$	Financial ratios predicting stock price are identical for all firms

Table 1 Hypotheses based on literature

3. Data

This section aims to give the reader an in-depth exploration of the data the thesis is based on. It contains motivations for the selection of certain KPIs as well as it provides clarifications of how the data has been processed.

3.1 Selection of Financial Ratios

The selection of financial ratios is grounded in the Literature Review. We have selected classical financial ratios that are usually used when evaluating a company's value creation. The most common metrics to evaluate are ones that regard the companies' profits, margins, and financial stability. Thus, when selecting KPIs these subjects have been in consideration. As supported by Ou and Penman (1989) ROA, Debt/Equity, and profit margin measures can explain changes in stock prices as they are not reflected in the price and thus can help predict future price levels. We have therefore included ROA, Debt/Equity, Net Income-margin, and EBIT-margin in the regression to see if these variables can explain why high-quality stocks increase in price. Additionally, looking at the research presented by Zhang (2023) it is of great interest to include EV/EBIT in the regression. The multiple generates more accurate results as well as there is a correlation between higher EV/EBIT values and the alpha of companies. Thus, EV/EBIT is included in the model to test if this research is accurate and if there is a correlation between the

multiple and rising stock prices. Finally, we ended up with 7 metrics which are tested in the regression, as seen in Table 2 below.

Valuation	*Efficiency*	*Profit measures*	*Leverage*
EV/EBIT	ROA	EBIT-margin	Debt/Equity
	ROC	Net Income-margin	
	ROE		

Table 2 Financial Ratios

All data was retrieved from the Capital IQ screen builder (Capital IQ, 2024). Since stock price information is crucial to the study, some observations from the screening have been excluded because of lacking such information. Correct terminology of the KPIs can be found in Abbreviations.

3.2 Data collection

Collecting the data is one of the crucial steps in creating trustworthy results with the regression model. The first step is to define which companies will be included. Criteria of what companies must fulfill to be regarded as high-quality were set to provide the Definition. Further on, literature such as Ou and Penman (1989) and Zhang (2023) lay the ground for the selection of the financial metrics listed in Table 2. When a successful screening was made, the data was exported into Excel where we organized it accordingly for Stata to run the regression. In Excel the multiple EV/EBIT was also created. The data is in panel format, as the observations are individual to each company and period. The strategy is to create a data sample containing stock price information as well as financial ratios and multiples that can be regressed on the stock price over time in order for us to draw conclusions about what makes the stock price increase.

3.3 Data Processing

To find the variables that best explain the stock price movement, several OLS linear regressions are tried to find the best fit. All variables are tested in their original form and as their percentage change over time in a regression with all independent variables. To decide which set of variables is the best, the Adjusted R-squared of each different regression was the motivator if the variable is used in its original or percentage form. In other words, if using the percentage change came with an increase in Adjusted R-squared, the variable is kept in its percentage change form given that the regression is BLUE. After this, a VIF-test for multicollinearity is made. Concluded from

these tests is that the percentage form leads to a higher Adjusted R-squared in all variables, but due to multicollinearity EV/EBIT is the only variable that is reformatted in the regression.

The data for stock price and EV/EBIT is therefore taken as their percentage change. This was done by taking the first difference of the logarithm of both variables and is done to be able to calculate changes in the metrics over time. As stock price development is what is of interest in this study, merely stock price as the independent variable would not tell us anything noticeable, and that is why it is made into its percentage change. Using percentage changes in stock price and EV/EBIT rather than in Debt/Equity, EBIT-margin, Net Income-margin, ROA, ROE, and ROC is motivated by the fact that it produces a higher Adjusted R-squared value while still avoiding multicollinearity. The percentage change in EV/EBIT provides more dynamic insights into changes in company valuation, which is a critical driver of stock price movements in the short term. This focus aligns better with the aim of understanding predictors of stock price performance, particularly in high-quality versus low-quality companies.

Due to a high number of intersections among several KPIs, there is a risk of autocorrelation and multicollinearity in the dataset. Since both EBITDA and revenue are used as criteria for the companies, it is highly likely that using EBIT-margin, EV/EBIT, and Net Income-margin as independent variables could cause issues. Consequently, tests for multicollinearity are necessary to identify and address any such problems. To test for multicollinearity, a VIF-test is used on a regression with all independent variables.

Variable	***VIF***
EV/EBIT % Ch.	1.15
Debt/Equity	1.60
EBIT-margin	11.14
Net Income-margin	10.48
ROA	5.27
ROE	4.38
ROC	8.07

Table 3 VIF-test on high-quality companies

As can be seen in Table 3 both EBIT-margin and Net Income-margin have a VIF value above the threshold for multicollinearity.

Variable in model	*Net Income-margin*	*EBIT-margin*
Adj. R-squared	15.16	14.98

Table 4 Adj. R-squared using Net Income-margin or EBIT-margin in the regression on high-quality data.

After evaluating the VIF-test, it is evident that some variables must be dropped due to multicollinearity to provide statistically secure results. We find that Net Income-margin and EBIT-margin have multicollinearity and create two separate models using only one of the two variables. Since the model using only Net Income-margin have the highest Adjusted R-squared value, EBIT-margin is dropped.

Variable	*VIF*
EV/EBIT % Ch.	1.15
Debt/Equity	1.57
Net Income-margin	1.59
ROA	4.89
ROE	3.97
ROC	8.00

Table 5 VIF-test for multicollinearity on high-quality data

As ROC has a relatively high VIF-value, the variable is dropped. The regression is thereafter tried without ROC and a new VIF-test is conducted. The VIF for all remaining values are below three, which is a satisfactory result, and the Adjusted R-squared of the regression increased to 15.21. Thus, including ROC would not provide any satisfactory results, why the variable must remain excluded. In order to be able to make the best comparison between high- and low-quality companies, the same adjustments are made in the low-quality data. A VIF test is done on these variables as well, which in Table 6 can conclude that no multicollinearity is present.

Variable	*VIF*
EV/EBIT % Ch.	1.07
Debt/Equity	1.01
Net Income-margin	1.06
ROA	1.04
ROE	1.10

Table 6 VIF-test for multicollinearity on low-quality data

3.4 Summary Statistics

The data is divided into separate summaries for high- and low-quality, since it is of interest in comparing the values of the two different types of companies.

Variable	*Obs.*	*Mean*	*Std Dev*	*Min*	*Max*
Stock Price % Ch.	998	0.0438	0.2179	-0.8824	0.9768
EV/EBIT	797	-0.0035	0.7430	-4.4513	4.4939
Debt/Equity	782	61.0717	122.3856	0.063	1392.6
Net Income-margin	993	11.8666	19.4691	-271.9	187.9
ROA	987	7.9027	7.9673	-20.9	46.6
ROE	989	21.8040	102.9126	-3091.3000	253.4

Table 7 Summary of high-quality company's data

Variable	*Obs.*	*Mean*	*Std Dev*	*Min*	*Max*
Stock Price % Ch.	1,237	0.0227	0.2563	-1.5069	1.5593
EV/EBIT	902	0.0031	0.7857	-4.3184	6.4900
Debt/Equity	1,199	160.8595	470.4288	0.057	8866.7
Net Income-margin	1,219	34.4717	159.8278	-251.1	2691.6
ROA	1,198	2.1052	6.6238	-53.2	31.4
ROE	1,211	-6.4808	246.2895	-8280.4	302.6

Table 8 Summary of low-quality company's data

The summary of the data shows us several noticeable differences between high- and low-quality companies. Most importantly a difference in the change in stock price, as this confirms the thesis of high-quality companies being able to have higher stock returns while maintaining lower risk through stable value creation and a low debt ratio. High-quality companies also outperform low-quality companies in ROA, ROE, and Debt/Equity. This further strengthens the thesis of high-quality companies being more stable and generating high returns.

From the data and previous tests, we can draw some conclusions. The first one is that Net Income-margin affects the performance of a firm more than EBIT-margin, supported by the higher Adjusted R-squared value illustrated in Table 4. This is the reason for the EBIT-margin

measurement being dropped. The second conclusion that can be drawn is that ROC does not affect the rise in stock prices as much as ROA and ROE, and by dropping the variable a higher Adjusted R-squared value is achieved. This strengthens the robustness of the model leading to more accurate results because of the arbitrariness of ROC as a variable. Looking at the Net Income-margin, it is evident that low-quality companies have higher values. This could be because of a short-term profit focus but is not researched further in this study. It should be noted that this is only speculative, but the same reason could also be the explanation as to why these companies are not considered high-quality.

After processing the data and dropping variables that affect the fit of the model negatively, we can be sure that the model now contains correct data that can be used to draw conclusions. Since financial metrics are more common in certain sectors, it is also of interest to see if high- and low-quality companies are more occurring in those sectors.

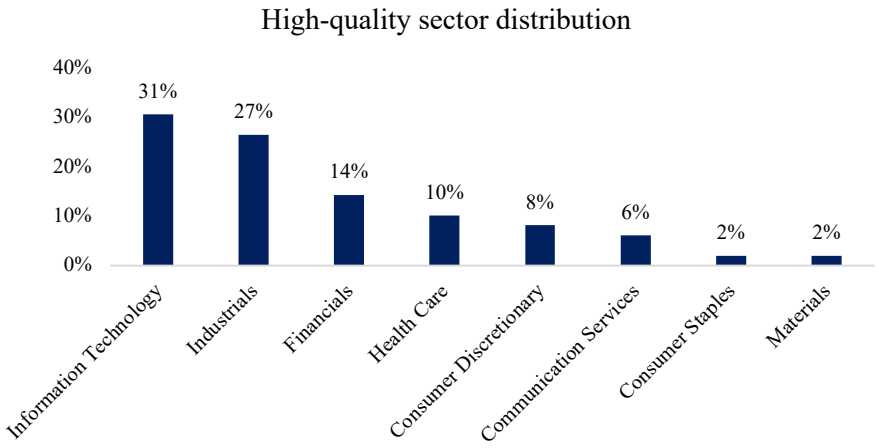

Figure 2 High-quality companies sector distribution (Capital IQ, 2024)

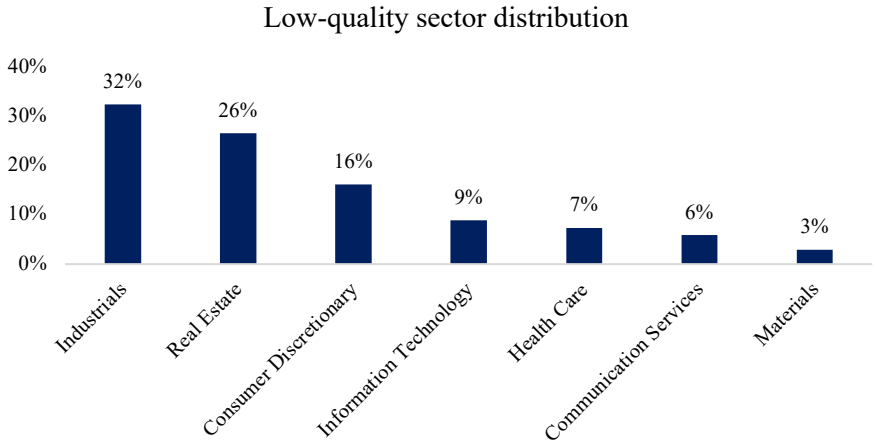

Figure 3 Low-quality companies sector distribution (Capital IQ, 2024)

As can be seen in Figures 2 and 3, the sector distribution for high- and low-quality companies are mostly similar except for one major difference. The Information Technology sector is the most common for high-quality companies while there are no high-quality companies in the Real Estate sector. This could be a potential explanation for why ROA is lower for low-quality companies since real Estate is a much more asset-heavy sector compared to informational technology.

4. Empirical Strategy

This section aims to go through the methodology the thesis is based on. It will give a detailed description about how results will be maintained.

4.1 Model

4.1.1 Selection of Company Sample

The regression analysis in this thesis is based on a sample of 125 companies, consisting of 57 high-quality companies and 68 low-quality companies. The categories are defined in the Definitions section and meet specific criteria, with a common theme being the requirement of a five-year track record. This duration is set to ensure that high-quality companies have consistently delivered strong revenues and margins along with low debt levels over time, substantiating their high-quality status. Companies that have been listed recently or have only just started generating profits are excluded due to their lack of evidence of a proven track record.

4.1.2 Selection of Regression Model

As the data is in panel format the options for the regression are to either use a pooled OLS or a model specifically for panel data. Pooled OLS is not used for empirical testing, since it ignores the time frame of the data and instead regresses all data as having the same individual characteristics. This would mean that the pooled OLS excludes any individual quality traits, making the results arbitrary for our research question. By instead analysing the data using fixed and random effects, these invariances can be accounted for (Nwakuya & Ijomah, 2017). Two regressions are made using random and fixed effects. This is done due to simplicity in Stata and complete transparency in presenting the results. Depending on the results from the regressions a Hausmann test would be considered if random and fixed effects gave different significant variables.

Once the data is collected, we can proceed with running the regression. The model will contain panel data testing each variable over several time periods and follows an OLS multiple regression model:

$$y_{it} = \beta_0 + \beta_1 x_{it} + \beta_2 x_{it} + \ldots + \beta_n x_{it} + \varepsilon_{it}$$

The regression is tested separately with random effects, fixed effects, and robust standard errors. Fixed effects are to account for any time or individual-specific trends in the error term and robust standard errors are used to account for heteroskedasticity and autocorrelation in the data. We can rule out these measurement errors if all three regressions give significant results on the same variable. Any results only given in one or two of the models are therefore disregarded and not considered for further analysis but will be addressed in the Results section. This type of model effectively tells us what variables that are significant predictors of increases in stock price. Once significance is found in all three models, we can be sure that the results are correct in the 95% confidence interval.

5. Empirical Findings

This section presents the empirical findings and provide detailed presentation of the results. All data was retrieved from Capital IQ's Screen Builder, using the restraints for high- and low-quality public companies in Sweden.

5.1 Model

The regression model was built separately for companies being either high or low-quality. The motivation behind creating two separate models is the ability to conduct further analysis and comparison on high- and low-quality companies, and thus making it possible to conclude what predictors are significant and more prevalent in high-quality companies. Results from the regression will hopefully indicate why high-quality companies deliver higher stock price returns, while still maintaining a lower volatility and risk.

The regression model that is used for this empirical analysis is an OLS**.** A multiple regression is made for high- and low-quality companies, where stock price and EV/EBIT are exhibiting their percentage changes per calendar quarter. The independent variables being used are EV/EBIT, Debt/Equity, Net Income-margin, ROA, and ROE. Motivation for the choice of independent variables is found in Definitions and further in Data Processing.

$$Stock\ Price_{it} = \beta_0 + \beta_1 \frac{\text{EV}}{\text{EBIT}}_{it} + \beta_2 \frac{\text{Debt}}{\text{Equity}}_{it} + \beta_3 \text{NetIncomemargin}_{it} + \beta_4 \text{ROA}_{it} + \beta_5 \text{ROE}_{it} + \varepsilon_{it}$$

The stock price variable is, as stated, collected over several time periods. It is defined as the last closing price of each quarter during the period 2018-2022. Consequently, the other variables are also collected using metrics during that same day.

5.2 Results

This section will summarise the results from the regression models and present it as values and in text. It is further used as the empirical ground for the analysis and conclusion.

5.2.1 High-quality Results

Variable	*Coefficient*	*Std. Error*	*z*	*P>|z|*
EV/EBIT % Ch.	0.1228	0.0112	10.92	0.000***
Debt/Equity	0.0003	0.0002	1.09	0.277
ROA	0.0110	0.0023	4.77	0.000***
ROE	-0.0008	0.0006	-1.34	0.179
Net Income-margin	-0000	0.0008	-0.01	0.990
Constant	-0.0371	0.0235	-1.56	0.119
R-squared	0.1577			

Table 9 Regression on high-quality companies with random effects

Variable	*Coefficient*	*Std. Error*	*t*	*P>|t|*
EV/EBIT % Ch.	0.1348	0.0122	11.06	0.000***
Debt/Equity	0.0001	0.0003	0.45	0.653
ROA	0.0151	0.0030	5.11	0.000***
ROE	-0.0011	0.0007	-1.63	0.104
Net Income-margin	0.0007	0.0010	0.76	0.446
Constant	-0.0691	0.0312	-2.22	0.027**
R-squared	0.1463			

Table 10 Regression on high-quality companies with fixed effects

Variable	*Coefficient*	*Robust Std. Error*	*t*	*P>|t|*
EV/EBIT % Ch.	0.1348	0.0216	6.25	0.000***
Debt/Equity	0.0001	0.0002	0.65	0.521
ROA	0.0151	0.0043	3.51	0.001***
ROE	-0.0011	0.0016	-0.94	0.353
Net Income-margin	0.0007	0.0016	0.46	0.644
Constant	-0.0691	0.0349	-1.98	0.053*
R-squared	0.1463			

Table 11 Regression on high-quality companies with robust standard errors

The R-squared values of the regression models are represented in Tables 9, 10, and 12, where it can be observed that all three models give an R-squared value of around 15%. Considering the complexity and high number of predictors that are present in guiding the stock price, an R-squared at this level is very satisfactory. This is due to *EV/EBIT % Ch.*, as it has a severely higher coefficient than any other variable in all three models.

As mentioned in previous parts, it is from future research expected that ROA should have an increasing effect on the stock price. Based on Tables 9, 10, and 12, it can be concluded that ROA has both a positive coefficient and significance in all regression models, explaining around 1.5% of the percentage change in stock price.

Other than that, it can be concluded that the change in EV/EBIT has a high positive correlation with the stock price, which is expected since enterprise value is highly dependent on the stock price. Moreover, EV/EBIT is utilized to measure a company's valuation and assess whether its stock is over- or undervalued, and it could be considered suspicious if no correlation was found. Accordingly, a high stock price corresponds to a higher EV/EBIT multiple. However, this correlation is not universally applicable and varies across industries due to differing EV/EBIT levels, but because of the percentage change being used, it can be applied universally. The same can be said about the variables that are not used as their percentage change, and the results could differ if specific industries were analysed instead. ROA, ROE, and Net Income-margin are all dependent on what industry the company operates in, and it can be argued that the percentage change should be used instead. However, as mentioned in the Data Processing section, this comes with multicollinearity meaning less reliable results.

Therefore, the interpretation of what constitutes increases in stock price should ideally be tailored to the specific circumstances of each company for a more reliable assessment. The regression model estimates the stock price movement, reflecting changes in EV/EBIT and ROA. Consequently, we can draw conclusions about the change in the EV/EBIT multiple, which increases with the increase in stock price. Furthermore, we can also find significance between stock price and ROA. ROA reflects how well a company uses its fixed and tangible assets, and consequently, a higher ROA multiple in high-quality companies should attract investors since it means that the company effectively uses its assets leading to higher returns and an increased stock price.

5.2.2 Low-quality Results

Variable	*Coefficient*	*Std. Error*	*z*	*P>|z|*
EV/EBIT % Ch.	0.0333	0.0101	3.30	0.001***
Debt/Equity	-0.0000	0.0000	-0.99	0.321
ROA	-0.0006	0.0015	-0.40	0.687
ROE	-0.0003	0.0004	-0.84	0.403
Net Income-margin	0.0001	0.0001	1.05	0.295
Constant	0.0097	0.0113	0.86	0.390
R-squared	0.0184			

Table 12 Regression on low-quality companies with random effects

Variable	*Coefficient*	*Std. Error*	*t*	*P>|t|*
EV/EBIT % Ch.	0.0329	0.0104	3.15	0.002***
Debt/Equity	-0.0000	0.0000	-1.4	0.161
ROA	0.0007	0.0020	0.37	0.712
ROE	-0.0004	0.0006	-0.68	0.495
Net Income-margin	0.0001	0.0001	1.79	0.074
Constant	0.0064	0.0145	0.44	0.659
R-squared	0.0155			

Table 13 Regression on low-quality companies with fixed effects

Variable	*Coefficient*	*Robust Std. Error*	*t*	*P>|t|*
EV/EBIT % Ch.	0.0329	0.0130	2.54	0.014**
Debt/Equity	-0.0000	0.0000	-2.40	0.019**
ROA	0.0007	0.0014	0.51	0.611
ROE	-0.0004	0.0009	-0.44	0.660
Net Income-margin	0.0001	0.0002	0.90	0.369
Constant	-0.0064	0.0162	0.40	0.694
R-squared	0.0155			

Table 14 Regression on low-quality companies with robust standard errors

The R-squared value from the low-quality model shows us that our model is a significantly better fit for high-quality than for low-quality companies. The models for low-quality companies have less than a 2% fit, which means that they barely explain any variation in the stock price. Since this model is used only as a comparison to the high-quality model this is not a concern for the study but rather quite helpful. As the regressions should find the difference in predictors between high- and low-quality companies, the variables do not explain stock prices in low-quality companies, and consequently just explain this difference. If the models had a more similar fit, the results could point towards high- and low-quality companies having similar significant predictors in their stock prices.

The low-quality models only show a consequent significant correlation between the EV/EBIT and changes in stock price. The coefficient is positive and much lower than the coefficient for high-quality companies. We can therefore conclude that the results from the high-quality model are unique for high-quality companies, which helps in concluding what predictors distinguish high- and low-quality companies. In the model using robust standard errors a significant relationship can also be found in Debt/Equity, but the coefficient is so close to zero that nothing conclusive can be said.

6. Analysis

This section introduces a thorough analysis on the research question of the thesis. Further on, it aims to address both hypotheses presented in the Literature Review, namely “One cannot predict stock prices using financial ratios” and” Financial ratios predicting stock price are identical for all firms”.

What predictors can explain why Swedish high-quality companies outperform low-quality ones in terms of stock price?

High-quality investing is a common practice for several actors in financial markets and gives investors the ability to lower their risk without sacrificing stock returns (Schroders, n.d.). From the selection of companies in this study, it can be concluded that Swedish public high-quality companies outperform low-quality firms in stock returns, which strengthens the idea of quality investing being a viable strategy for generating higher profits for investors. This is shown in Tables 7 and 8 and complements previous research on high-quality companies. Previous research regarding financial metrics that are unaccounted for in the stock price shows that investors can take advantage of using ROA, Debt/Equity, and Net Income-margin (Ou & Penman, 1989; Schroders, n.d.). By including these metrics in the regression and comparing the results between high- and low-quality companies, presented in the Results section, conclusions can be drawn.

The biggest difference between the two models for high- and low-quality companies is the fit, which was around 15% for high-quality companies and around 1.5% for low-quality companies. The variables chosen therefore have a much better ability to explain the stock returns for high-quality companies, which is mainly due to the high coefficient of EV/EBIT percentage change. Measuring the percentage change in EV/EBIT gives us the ability to see how the market reacts to shifts in the valuation of a company, which evidently is more important for high-quality companies. The market will have a significantly larger reaction to changes in the valuation of a company if it is high-quality, something that can be due to the already existing likeliness to invest in these companies. So even if they are more stable in their capital structure and cash flow, high-quality companies might be more volatile to changes in their enterprise value and EBIT. As proposed by De Bondt and Thaler (1985), this might be due to market overreactions, which is an explanation for why informational asymmetries influence stock prices. However, there is no indication of this being true or false in this case.

Further on, the reason for high-quality companies having higher valuations can be because they are able to motivate their high valuations with their proven business- and revenue models to a much larger extent than what low-quality companies can. A common investment strategy involves focusing solely on undervalued companies. Highly successful investors like Warren Buffett take a slightly different approach. Buffett targets large, well-established companies that

can be acquired at fair prices, a strategy that also is highly popular. He seeks businesses with strong growth potential and whose management are great capital allocators, recognizing that these factors are essential for creating value. Although this strategy is grounded in value investing, Buffett prioritizes finding "wonderful" companies at fair prices rather than just undervalued ones. The types of businesses he invests in are consistently of high quality (Stone, 2024). The fact that such companies consistently generate superior stock returns thus motivates their valuations.

High-quality companies could also show consistently significant and positive correlations in all three high-quality models. This result was not surprising, but the insignificance of ROA in the low-quality model is not something that was expected. There are different possible explanations as to why the two company types give differing significance levels to ROA. Since ROA is a KPI that varies depending on what sector a firm is operating in, the higher ratio of low-quality companies may operate in high-asset industries. This would mean that on average, ROA could be lower in low-quality companies due to a higher total level of assets and not due to inefficient use of capital. There is some indication of this, as low-quality companies are in the capital-heavy Real Estate sector to a higher degree. In contrast, high-quality companies are more occurring in the informational technology sector, which is a relatively asset-light sector. Further research would have to be done for a conclusion to be drawn regarding this possibility.

The other explanation is that there is a causality effect between ROA and stock returns, which is stronger, or unique, to high-quality companies. This would then be the reason for the significance of ROA in high-quality companies. There could also be a possibility that it is only low-quality firms that do not have a significant relationship with ROA, but that all companies of other quality levels have a significant relationship. As only Swedish high-quality companies are not analysed, no conclusion can be drawn concerning other quality levels. Even if the relationship between ROA and stock price was found to be significant in high-quality companies it can only explain around 1.5% of the percentage change in stock price. It is a very small and for many investors an insignificant increase in value, but ROA can still be used as an indicator of the future returns of high-quality companies.

Additionally, some variables presented in the study are insignificant in explaining changes in the stock price of both high- and low-quality companies. These variables include Debt/Equity and ROE, and it is evident that the variables do not affect the stock price of such companies

positively. Ou and Penman (1989) argue that Debt/Equity is not reflected in the stock price and that one can use the metric to predict stock prices, but this study shows that the metric should not be used to forecast future returns. Further on, Malkiel (2003) presented research about historical information on financial markets arguing that it cannot be used to make stock price predictions in the long run. Malkiel's take is strengthened by the results of this study regarding the metrics ROE and Debt/Equity, as they might have been unaccounted for in the stock price at the time when Ou and Penman's study was conducted. ROE and Debt/equity might now be accounted for in the stock price, which follows in line with Malkiel's findings. However, because ROA as a profit predictor seemingly is unaccounted for in the stock price both today and when Ou and Penman conducted their study, Malkiel's conclusions are not wholly supported by our results. Whether the results from this thesis are applicable in the long run or not is not definite, and we can, therefore, neither disregard nor confirm the conclusions from Malkiel.

Further on, the result of this thesis allows us to draw conclusions about the study's two hypotheses. Starting with the ability to predict stock returns, the result strengthens the argument made by Ou and Penman (1989) regarding some variables not being reflected in the stock price. The regression run in this thesis supports that an investor can forecast stock prices using historical values of *EV/EBIT % Ch.* and/or ROA, meaning that the weak form of the EMH is not supported and $H0_1$ is rejected. It is found that companies with high historical EV/EBIT and/or ROA tend to experience rises in their stock price clarifying that some financial metrics can help predict future stock prices, as stated by Ou and Penman (1989). Further on, this leads us to the next hypothesis regarding if these metrics are the same for all companies. Looking at the regression, it is evident that this is not the case. The model states that *EV/EBIT % Ch.* and ROA are significant predictors for stock prices in high-quality companies whereas only *EV/EBIT % Ch.* is significant for low-quality companies. In addition, the fit of the models and the coefficient of *EV/EBIT % Ch.* percentage change should be considered. *EV/EBIT % Ch.* produces a much better fit for the high-quality model. The significance in the models is supported by the research by Zhang (2023), who argues that the inclusion of EV/EBIT in a model generates more accurate results. Through this analysis the conclusion can be drawn that the metrics are different when measuring stock prices in high- and low-quality companies and that specific metrics have different effects on high- and low-quality companies, rejecting $H0_2$.

In order to draw any conclusions on a long-term time frame, the study should be expanded to a longer period. Not making any investment choices based on the results is also motivated by previous research. Malkiel (2003) concluded in his study that there exist certain possibilities to take advantage of historical trends in investing, something that this thesis also concludes. But these opportunities only exist in the short term as investors eventually take advantage of any arbitrage profits that can be made from historical data, according to Malkiel. Furthering the research of this thesis over a longer period could either strengthen or rebut Malkiel's research. If the results from the empirical study only are relevant in the short term, as Malkiel concludes, they still strengthen the conclusions of Coibion and Gorodnichenko (2012) that models which implement informational asymmetries generate higher profits.

7. Conclusion

Markets are not perfectly efficient and historical information about financial metrics is at least for short time frames unaccounted for in stock price. This opens the ability for investors to use information asymmetries and make profits by using knowledge about which financial metrics have an unaccounted effect on stock returns. High-quality investing is a popular strategy utilising such metrics, where stability in cash flows, capital structure, and capable management are metrics that previously have generated above-average returns. This thesis has, by analysing high- and low-quality companies, strengthened these statements as well as answered the research question of the study. Through an empirical analysis comparing high- and low-quality companies, it can be concluded that the growth rate in the EV/EBIT multiple has a significant relation to stock returns, but a relation that is almost ten times higher for high-quality companies than for low-quality companies. ROA was also found to have a significant relationship to the stock returns of high-quality companies.

To expand on the study's conclusion, a larger time frame would give clarity to whether these relationships are present in the long term and is one of the takeaways of the study's ability to improve. Further improvements on the research would be comparisons with companies that are neither high- nor low-quality, as it would open up for new research questions and draw more general conclusions about what predictors guide stock returns in all quality types of companies. In addition, it would also be interesting to further this research by looking at analyst recommendations and management skills, since these metrics also tend to have an impact on the companies valuation and stock price. Finally, the study aims to spread knowledge about

what metrics investors and management could focus on as well as to inspire further research on the subject.

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