Stockholm School of Economics

Master Thesis in Finance

# The Swedish Disease

## Impact of company spin-offs on firms' operational performance and equity value

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**Abstract**

This paper sets out to examine the equity price performance as well as operational performance in both the long- and short-term for Nordic spin-offs. More specifically, the paper evaluates the performance for 110 spin-off entities, both the parent and spun-off company, between the years 1998-2017. The performance is assessed in relation to relevant stock indexes as well as a custom-built operational benchmark. The performance is first evaluated using event studies which revealed that on average there is a cumulative abnormal return of 4.5% at the announcement date for equity price performance. The study also finds positive abnormal development over the spin-off period for operational metrics; those being Sales growth, Return on Invested Capital, Gross margin and Cash Flow from Operations over Assets. The results of the study indicate a robust positive relationship from factors such as industry focus and spin-off impact on the operational metrics and a negative impact from a recession factor. However, long-term there are no statistically significant results for the equity performance of spin-offs, but over a 4-year time period it does outperform the index.

**Keywords:** Spin-off, Nordic, Operating Performance, Public Markets, Sales Growth, EBITDA, ROIC, Long-term Performance
**JEL Classification:** G34, G32, G14, L25

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# Section 1

# Introduction

Spin-offs are an unique type of divestiture defined by the CFA Institute as *"a form of restructuring in which the shareholders of the parent company receive a proportional number of shares in a new, separate entity; shareholders end up owning stock in two different companies where there used to be one"*. In other words, a pro-rata distribution of the shares of a firms' subsidiary to the shareholders of the company. This corporate action is unique, in the sense that there is no cash used in the transaction. After the spin-off, shareholders hold shares in both the parent company and the subsidiary.[1]

There are several reasons why executives may be incentivized to pursue spin-offs as a restructuring activity; this includes: to mitigate information asymmetry between the company and the stock market; to narrow their focus to be more agile in pursuing growth and restructuring opportunities; or other fiduciary or non-fiduciary reasons, all to create shareholder value. It may be argued that management is able to achieve these improvements by separating and simplifying a company's structure. Studies have shown that companies that increase their industrial focus are often associated with higher returns compared to companies that do not (see e.g. Daley et al. (1997), Desai and Jain (1999)).

Despite having significant company and shareholder impact, the subject of restructuring activities has received very limited attention from the academic community compared to other more known corporate actions such as mergers and acquisitions or joint ventures (Lee and Madhavan, 2010). Moreover, a majority of the research in the field is either dated or US-centric with limited coverage of Europe. The limited body of research

1 Throughout the paper, spin-off, spin-off event, spin-off companies etc. will always refer to both the parent and the spun-off company.

is currently focused predominantly on the stock price impact of spin-offs, either on the announcement day effect or on the long-term stock performance. For example, Cusatis et al. (1993) and Desai and Jain (1999) find abnormal returns on the announcement day for spin-offs and for long-run performance.

However, given the above-mentioned motivations for pursuing a spin-off, there is little research on the underlying operating metrics and how these metrics develop as well as the effectiveness of this corporate action to achieve its stated goals following the spin-off. There is also a lack of quantitative and qualitative studies regarding the operational development to assess empirical evidence on the underlying motivations from the history of corporate spin-offs and connecting empirical findings with suitable theoretical frameworks.

## 1.1 Purpose

Despite their being increased demerger activity in the Nordic capital markets, which some bankers call "The Swedish Disease", there is still only limited research on spin-offs in general and especially for the Nordic region. This thesis therefore looks to further investigate spin-offs, and in particular how a spin-off develops over a longer time horizon with a special focus on the operating metrics. To do this, one needs to study the stock price development, both at announcement date and over the long-term, and compare this to the underlying operating performance measures. By examining the underlying metrics, the expectations at the announcement date can be analyzed to understand if they are realized and to quantitatively evaluate to what degree changes in operational performance are meeting the expectations of the market.

## 1.2 Contribution

There are several papers that have studied the announcement- and long-term effects of spin-offs on the stock price performance, but a limited focus has been spent on the underlying operating metrics. The research results on stock price performance has been contradicting with findings both confirming and dismissing expected abnormal returns. As a result, we hope to bring updated insights for the Nordic market as a whole by performing several event studies and regressions on the operating performance metrics

as well as the stock price performance against the benchmark indexes. Our main contribution will be the empirical review of operational measures. By comparing them to the long-run performance of the stock prices of the spun-off entities, we will be able to gain an initial impression of whether the improvements that have been realized are aligned with market expectations. Through the regression analysis, the thesis will also highlight several variables such as leverage, industry focus and the impact of recessions on the change in the underlying operating metrics, which previously have not been extensively researched in a Nordic setting. Through this, we aim to touch upon the empirical effects for pursuing a spin-off and the effect they have on a company's operating performance.

## 1.3 Summary of findings

The study finds that spin-offs generate both short-term abnormal equity returns as well as operational improvements. Similar to previous literature, the study shows a 4.5% cumulative abnormal return of the stock price at the announcement date. The operating metrics show improvement against the industry benchmark for most measures with the Return on Capital Invested (ROIC) showing an improvement of 0.4%-points and the Operating Cash Flow over Assets (OCF/Assets) improving by 4%-points. However, the results did not, with any statistical significance, identify any improvement in the Earnings before Interest, Tax, Amortization and Depreciation (EBITDA) margin.

The regression, which tested the dependent variables against a subset of variables regarding the improvement of the operational metrics against the industry benchmark, found that certain factors impacted some of the operational metrics positively, while others negatively. The findings showed that increased industry focus, i.e. separating two businesses in different industries through a spin off, was the strongest driver for OCF/Assets with a 6% positive impact on this metric. There was also a statistically significant negative impact caused by recessions on most metrics. Of the Nordic countries, it was shown that Swedish and Danish markets had a positive impact on the development of a few of the operating metrics against the industry benchmark, while Norway revealed a negative impact.

The study finds weak statistical support for a connection between the underlying improved operating performance and the long-term performance of the equity. However, the study does highlight that Nordic spin-offs outperform the benchmarks in combina-

tion with operational improvements over the same time period. This is interpreted to be caused by exceeded operational improvement compared to the market expectation at the announcement as well as increased industry focus, resulting in the outperformance of the stock price long-term.

## 1.4 Outline

The remainder of this thesis is organized into six sections as described below. Section two outlines key research from previous literature starting from conglomerates and the underlying factors that drive spin-offs; studies that highlight stock price returns; and lastly how differing operating metrics are affected by spin-offs or divestitures.[1] Section three defines the hypothesis. Section four outlines the methodology used in the paper. Section five outlines the data collection and description. Section six includes results and discussion on the main hypotheses of the thesis as well as the main findings of the statistical tests. Section seven includes a final discussion of the findings in the thesis.

1 A divestiture is the partial or full disposal of a business unit through sale, exchange, closure, or bankruptcy. A divestiture most commonly results from a management decision to cease operating a business unit because it is not part of a core competency.

# Section 2

# Literature Review

To understand a company's rational for undertaking a spin-off of a business division, it is valuable to have an understanding of the underlying theoretical reasons for pursuing these corporate actions. The simple answer is the fundamental economic rational, meaning that the parent company expects a higher value for the two separate entities. This stems from a set of financial theories which will be further explored in this chapter.

## 2.1 Previous Research on Conglomerates

To comprehend why a company pursues a spin-off, it is essential to also understand conglomerates and why these firms previously pursued a path of corporate mergers. Over the past 100 years there has been a couple of merger waves, which are periods with a distinct market characteristic for corporate control. Merger waves are periods with dramatically increased company takeover activity where the findings in the working paper by Patrick J. Cusatis; James A. Miles; J. Randall Woolridge (1993) suggests that during the 60's and 70's one of the primary reasons for pursuing mergers was to achieve firm diversification. Other researchers, however, have found additional reasons for the merger wave. Shleifer and Vishny (1991) highlights that the takeover wave was also driven by corporate cash flows and the pursuit of higher equity valuations. This stemmed from companies' unwillingness to pay dividends together with favorable terms in the equity markets for raising capital, resulting in the increased takeover activity.

The merger wave was followed by the "demerger" wave of the 80's which resulted in firms spinning-off unrelated business units. It also started a research wave, which

looked to highlight several of the underlying reasons for pursuing spin-offs.

Several papers have analyzed conglomerates and especially the conglomerate discount. Lang and Stulz (1994) show that the relation between Tobin's q[1] and firm diversification had a negative impact on a firms performance. More recent papers such as Khorana et al. (2011) who look at spin-off discounts in a more recent setting find that conglomerates trade at a 10% discount in comparison to their pure-play peers. Schoar (2002) talk about management focus and highlight it through a study on the productivity of production plants. Their findings show that firms that diversify experience a net reduction in productivity.

## 2.2 Underlying factors motivating Spin-off decisions

### 2.2.1 Industrial Focus

One of the most frequently cited factors for pursing spin-offs is *industrial focus*, which refers to a spin-off, were the intention is for the parent company to concentrate its focus on its core business. Daley et al. (1997), Sudha Krishnaswami; Venkat Subramaniam (1999) and Desai and Jain (1999) found statistically significant abnormal returns for spin-offs that aim to focus business operations compared to a focus diluting spin-off. *Focus* increasing means that the parent company has a different industry classification code compared to its subsidiary. In addition to the *focus* parameter, Desai and Jain (1999) studied the long-term performance of spin-offs following the announcement date. This yielded interesting results as they found that the *focus* increasing spin-offs exhibited persistently superior performance for the post spin-off time frame.

### 2.2.2 Information Asymmetry

Studies have shown that conglomerates often are subjected to *information asymmetry*, as it is hard to gain an understanding of all the diverse business units. Sudha Krishnaswami; Venkat Subramaniam (1999) argue that companies pursue spin-offs to close the gap of information between the capital markets and the company. Gilson et al. (2001) indicate that the information asymmetry may result in a undervaluation for the firm or low analyst coverage. Their findings suggest a significant increase in analyst

1 The Tobin's Q ratio equals the market value of a company divided by its assets' replacement cost. Thus, equilibrium is when market value equals replacement cost.

coverage as well as a 30-50% increase in the accuracy of analysts' forecasts following a spin-off. Sudha Krishnaswami; Venkat Subramaniam (1999) further find that firms with high levels of information asymmetry often show signs of higher abnormal returns if adjusted for the likelihood of a spin-off when the announcement has been made. This underscores the effect of information asymmetry in spin-offs. This effect was later researched by Chemmanur and He (2016) who looks at the information asymmetry from the aspect of institutional investors and their trading. Their findings can be summarized into three main parts. First that it seems to be suggested that spin-offs increase institutional investors trading by relaxing constraints. Secondly, that institutional investors trading patterns have predictive power for long-term performance and announcement day effect and lastly that they are able to realize significant abnormal returns by trading in the subsidiary. Overall, they show that spin-offs enhances information production by institutional investors who profit from this production.

Habib et al. (1997) also researched information asymmetry. They established an information-based heuristic-evaluation model for spin-offs that demonstrates how a company can increase its value by spinning off a subsidiary. They draw from the fact that a spin-off will result in an increased number of securities traded on the market, which will make the price system more informative as the market will be provided an increased number of financial reports and business related information that in turn results in a reduction of information asymmetry.

### 2.2.3 Geographical Focus

*Geographical focus* is a factor often mentioned as an underlying rationale for companies wanting to pursue a spin-off. Veld and Veld-Merkoulova (2004) find a statistically significant negative coefficient for geographical focus improvement. This is mainly driven by negative earnings which may stem from the fact that increasing geographical focus can result in a reduction of economies of scale or a competitive disadvantage compared to competitors who operate internationally.

### 2.2.4 Other

Other factors that may drive spin-off activity are *Taxes*, *Wealth transfers* and *Leverage*.

Taxes can be a deciding factor for whether to execute a spin-off. For example, based on data from the US and research from Sudha Krishnaswami; Venkat Subramaniam

(1999), spin-offs that are taxed are often connected with a lower positive abnormal return compared to non-taxable spin-offs.

Wealth transfers, (which are a transfer of wealth from bondholders to stockholders) are another possible justification to carry out a spin-off. This in combination with size can be an explanatory factor for pursing the spin-off. The research papers Hite and Owers (1983), Miles and Rosenfeld (1983) and Sudha Krishnaswami; Venkat Subramaniam (1999) find that wealth effects are greater when the portion of assets spun-off are larger.

Debt overhang is an effect of a firm being over levered which hampers its ability to invest in value creating projects. Several papers have researched the effect of debt overhang in companies and Hennessy (2004) finds that debt overhang distorts both the level and composition of investment, with under-investment being more severe for long-lived assets. Lang et al. (1996) researched the effect of leverage on investment and firm growth. They find a negative relationship between leverage and future growth at the firm level.

## 2.3 Previous Research on Spin-off Equity Performance

There are several studies that have published results regarding the stock price performance of companies involved in a spin-off. The research falls into two main camps: those who primarily focus on the stock market effect at announcement (e.g. Hite and Owers (1983) and Miles and Rosenfeld (1983)); and those researching stock-performance over a limited time period following the spin-off (e.g. Woo et al. (1992) and Cusatis et al. (1993))

Overall, the research of announcement effects on a company spin-off is fairly aligned, where most find statistically significant positive abnormal returns on the announcement date of the spin-off in the combined company. One of the first papers showcasing this phenomenon was Miles and Rosenfeld (1983) who analyzed 92 American firms between 1963-1980 that undertook a spin-off. Their findings showed a cumulative average abnormal return of 22% in the interval of 180 trading days, i.e. 120 days prior and 60 days following the completion date.

Similarly, Hite and Owers (1983) found in their analysis of 123 American firms that underwent spin-offs a cumulative positive abnormal return of 7% in a 50 trading day interval, i.e. between announcement and 50 days prior to the spin-off completion date.

Hite and Owers (1983) furthered the research by dividing spin-offs by their publicly stated purpose. They found positive excess returns for the spin-offs that separate diverse business areas and found negative returns over the event period for firms that executed the transaction in response to legal or regulatory issues.

Research in this area has further expanded to the ex-post spin-off effects. According to Fama (1998) and the efficient market hypothesis in its semi-strong form, the equity prices should include all available public information. According to this view, there should be no additional abnormal returns from the spun-off entities after price movements immediately following the announcement. However, research has found some conflicting results. Veld and Veld-Merkoulova (2004) find that in the case of US spin-offs there is long-run outperformance, but this is not the case for European spin-offs. Cusatis et al. (1993) study the effects of ex-post spin-offs for American firms and they also found statistically significant long-term outperformance for both the parent and the spun-off entity over a longer time period. These findings seem to contradict the efficient market hypothesis by Fama (1998) as there should not be any additional outperformance from the portfolio spin-off firms.

Sudha Krishnaswami; Venkat Subramaniam (1999) provide several explanations to justify the long-run outperformance effect. Their study highlights that the outperformance may arise from the long-term elimination of negative synergies between the spun-off company and the parent company. This would increase the value of both companies simultaneously. These synergies could not have been expected by the stock market participants at the announcement date of the spin-off, otherwise it should have been included in the initial stock price reaction at the spin-off announcement. The second reason relates back to Sudha Krishnaswami; Venkat Subramaniam (1999) regarding information asymmetry. If both the parent and spun-off company are very different businesses, the combined valuation might be too complex to accurately estimate and as such result in difficulties communicating potential value to the market at the spin-off announcement. According to Sudha Krishnaswami; Venkat Subramaniam (1999), this explanation does not contradict the efficient market hypothesis as the information asymmetry is the core reason for the long-run outperformance.

Overall, empirical evidence points towards the view that the stock market on average underestimates the long-term positive operational effect of a spin-off at the announcement date, which in turn leads to the positive abnormal returns of both the parent and

spun-off company.

## 2.4 Research on Spin-offs operational performance

Previous literature focused on the underestimation of long-term performance among spun-off companies, and it interested us to also review the hypothesis from the perspective of the underlying operating performance metrics of said companies. As there is very limited research in the area of operating performance on spun-off companies, this section is divided into two main parts; findings related to spin-offs and those related to other forms of business divestitures.

With regards to operating performance in spun-off entities Woo et al. (1992) studied the operational performance of 51 voluntary spin-offs by non-financial firms over a six year period looking at four main performance measures: Return on Assets (ROA, Market/Book (M/B) ratios, Alpha on M/B and sales growth. Their findings did not indicate any improvement in the spun-off entities on any of the performance measures and actually found that over the three-year post-event period the sales growth, M/B and ROA decreased by 55, 51 and 49% respectively over the corresponding pre-event period compared to their benchmark. They adjusted for market movements by comparing the change in the overall S&P 500 M/B ratio rather than using an industry specific measure for each of the performance measures as the metrics may vary between industries.

Desai and Jain (1999) also looks at an operational measure in combination with the long-run performance of equity prices in the US market between 1975-1991. They researched how cash flow from operations over the total asset base (OCF/Assets) developed over the holding period and later regress it against the stock price performance. Their paper's main findings are that spin-offs made to increase industry focus are the only spin-offs that create both long-run operational and equity outperformance, in comparison to the non-focus spin-offs. In their results, they found an improvement by around 3.8%-points in the OCF/Assets for the industry focus spin-offs.

The other type of operational metrics studied are related to the divestiture of business units from a parent in a private setting. Bergström et al. (2007) researched how buyout funds improve their portfolio companies' operating metrics over the holding period. This research is relevant as it cites the same underlying factors for pursuing a public spin-off and the impact it should have for improving operating performance (fo-

cus, agency problems, etc.). Their findings show, without respect to their peer groups, that the holding companies experience positive development for all tested operating metrics (sales growth, EBITDA margin and ROIC). EBITDA margin improved by 3.5% and the ROIC improved by as much as 17% over the holding period.

The findings most relevant to our study are Woo et al. (1992) and Desai and Jain (1999) given they researched public firms compared to Bergström et al. (2007) who researched private divestments. However, both papers highlight interesting aspects regarding operating metric performance development, which is an area this thesis will look to explore in more detail.

# Section 3

# Hypothesis

The purpose of this section is to develop the hypotheses based on previous spin-off literature and the market dynamics of corporate transactions. With activist owners such as Cevian and EQT recently pushing through deals, such as the divestiture of ABB's power-grid division and Cramo's demerger of Adapteo, the topic of spin-offs appears to be both current and highly relevant. With many influential Swedish institutions arguing in support of spin-offs, not only in Sweden but also in Europe, some banks are starting to call the phenomena "The Swedish Disease". This inspired us to investigate the question on the performance effects of such actions and specifically; can spin-offs generate both stock price and operational improvements. Most previous research has been published on the topic of equity effects and found short- and long-term stock price outperformance. However, we would like to research this question further by investigating a few of the fundamental operational metrics in addition to the stock-based analysis. This is to be able to assess the effects of a spin-off on the operational performance across our defined time-horizon of seven years (two years prior and 5 years after including the spin-off year).[1] This empirical study has the potential to contribute in gaining a more comprehensive view on operational performance development post spin-off. It will also explore the empirical evidence on this subject in relation to financial theories and proposed causal relationships (e.g. management focus, board expertise, etc.) and assess the magnitude of value created against relevant benchmarks.

Our hypotheses are:

1 The event horizon of seven years is due to the time it takes to implement operational changes. The two years prior to the spin-off, are used as a performance reference and the five years after to capture all operational improvements.

*H1) Nordic spin-off announcements are significantly and positively related to abnormal stock returns around the announcement date.*

The reasoning to study this particular question, despite there being several previous papers covering the event, is that it is used as a building block and reference for the following hypotheses in the paper, but also to gain the latest result from Nordic spin-offs equity price development.

*H2) Nordic spin-off's operational metrics change significantly and positively in relation to an industry adjusted benchmark, and operational performance improvements are gradually realized and persistent in the years following the spin-off event.*

The rational to explore the operational metrics stems from the low coverage it has received in previous literature. The underlying operating performance is the result of the factors impacting the spin-off decision and company development. In our view, gaining an understanding on the development of the results is crucial to later be able to investigate factors such as industry focus, leverage etc. In terms of the realization of key operational improvements, we expect to see gradual improvement as these are contingent upon management's ability to implement changes over the long-term. As such, the speed of change can reveal information on the uncertainty associated with realizing operating improvements, which could correlate to the stock price reaction.

*H3) (a) Operational improvements on Nordic spin-offs are positively associated with proxies for industry focus and spin-off impact, and (b) negatively associated with proxies for debt-overhang and financial distress (recession) (c) while exhibiting significant country differences with a positive coefficient for Sweden.*

By testing this hypothesis, which includes three test components, we aim to broadly explore the relationship between observations on operational improvements across key metrics against potential explanatory factors mentioned in previous literature. This is done to outline directions for future research as well as to confirm the direction and magnitude of these effects on the Nordic sample set (with expected positive factors tested in A, and negative factors tested in B). This is enhanced by sub-test C, aimed to reveal how operational improvements in Nordic countries compare against each other. Sweden has the largest and most active financial market of the Nordic countries. Therefore, we assume that it is also the most developed and has a positive impact on operational

improvements.[1]

*H4) Nordic spin-offs are associated with positive stock price abnormal returns in the long-run.*

The logic for testing the long-run equity performance of Nordic spin-offs is to put it in relation to the underlying operational metrics, which in accordance with the efficient market hypothesis should drive the stock price. Our belief is that if firms are able to achieve operational improvements this should also be reflected in the stock price. From this, an interesting relational inference could hopefully be identified.

1 According to corporate finance theory, one of the reasons for the existence of conglomerates is the advantage of internal capital markets. In the case of Sweden, with a developed financial market, spin-offs are in a better position to successfully operate independently and therefore increase operational performance.

# Section 4

# Methodology

One of the primary goals of this study is to empirically measure and analyze improvement in operational performance as well as abnormal stock price returns from a spin-off event. Both the operational metrics as well as stock price movements are analyzed in excess of any improvements that can be attributed to general developments in the companies' industry.

Studies by Desai and Jain (1999), Miles and Rosenfeld (1983) and additional European focused research on spin-offs by Veld and Veld-Merkoulova (2009), show evidence of significant abnormal returns. In order to investigate operational performance, it is necessary to confirm if the sample set of Nordic spin-offs exhibit similar abnormalities in equity performance around the spin-off announcement.

If significant abnormal equity returns for the Nordic spin-off sample is confirmed, a further step is to perform empirical event studies on operational performance to investigate whether there are any significant changes in operational metrics and the factors driving these changes, which can be observed through reported financial statements.

## 4.1 Stock price event study methodology

For evaluating the presence of stock abnormal returns (AR), a risk-adjusted return model is selected as specified by MacKinlay (1997) "Market Model". Market model is specified as a statistical model that allows you to determine the expected return of a security in relation to a market return, assuming joint normality of asset returns (B.1).

For each of the publicly traded companies from the sample set of spin-offs, stock

prices have been retrieved from primary stock exchange listings, denominated in a local currency corresponding to the country of the company's registered headquarters. The stock prices have been retrieved for the period 1998 until 2019.

The basis for the benchmarks is country specific MSCI indexes denominated in local currencies covering years between 1998 and 2019. The choice of MSCI index is determined by its construction (MSCI, 2007), which is a representative proxy for each of the Nordic equity markets. To determine the anticipated stock performance in relation to its corresponding index and eliminate the market movements, $\beta_{mk}$ coefficients have been estimated using the Market Model. Market model coefficients are estimated with OLS linear regression for three years of each stock closing log-returns before the announcement date against its corresponding country-specific MSCI benchmark daily close log returns. Samples with a trading history of fewer than three years prior to the spin-off or incomplete stock-price datasets, low trading volume or inadequate pricing resolution, have been excluded from this analysis.

Further, to isolate announcement effect from market movements, a theoretical expected return is estimated. This base-line estimate is determined by applying a previously calculated beta factor to a market model utilizing MSCI index as the basis.

An abnormal return, as per MacKinlay (1997), is a disturbance of the market model on an out of sample basis. Together with the null hypothesis, the abnormal returns will be jointly normally distributed and with a zero conditional mean and conditional variance $\sigma^2_{\epsilon_{i\tau}}$ formally specified by equation (B.3).

Abnormal returns can then be measured using the estimated parameters for the market model(B.2).

To determine the value of daily abnormal returns, the difference between actual daily log-returns and the corresponding beta adjusted benchmarks are computed. For the purposes of analysis, an event window horizon is defined using calendar days in order to take into account a potential spread of insider information outside trading hours and its potential effect on stock prices, including variances due to the day of the week for the announcement.

Two sets of event horizons are defined, short- and long-term. In order to capture short-term abnormal returns, the short-term event window commences thirty calendar days prior to the announcement date and ends thirty days following the spin-off announcement. The second event window is defined to commence 100 days prior to the

spin-off announcement $T_1$, the period the data starts showing the first indications of persistent abnormal returns, and ends four calendar years after the announcement event $T_2$. This is in order to estimate long-term stock price effects of the spin-off event.

In order to analyze the long-term performance of equity, a stock price adjustment has been made for the spin-off event. Up until the spin-off, the companies are one entity and at the spin-off event, the parents stock price is adjusted to capture the spun-off company's demerger. This is to enable a long-term analysis looking from the announcement date.

Furthermore, in order to draw overall inferences in this study, observations on abnormal returns have been aggregated around the time period for individual spin-offs using MacKinlay (1997) specifications for cumulative abnormal return (CAR) from $\tau_1$ to $\tau_2$ where $T_1 < \tau_1 \leq \tau_2 \leq T_2$. Where CAR is simply the sum of abnormal returns as per equation (B.4).

Accordingly, cumulative abnormal returns (CAR) over the two time-periods are determined from the start window for all trading days. Across non-trading days CAR is interpolated between two trading days' CAR values, this is done to allow comparability across companies with varied announcement timing.

Given the observations in the sample set are derived from independent events across multiple companies and industries, it can be reasonably assumed that the observations are independent with cumulative abnormal returns under $H_0$ as formally defined by (B.5).

Additionally, a test for the null hypothesis $H_0$ can be conducted with a distribution of the abnormal returns and the cumulative abnormal returns. Subsequently, to validate the presence of abnormal returns a t-test is performed for each of the days within the event window in order to verify if during any given day cumulative abnormal returns are statistically significantly different from zero.

Considering that the key inferences hold: a) cumulative abnormal returns with no clustering; b) no overlap in the event windows; and c) independence across securities, which are formally expressed with equation (B.6), the estimation of $var\overline{CAR_\tau}$, $H_0$ can be tested using a standard t-statistic with an equation (B.7),and aggregated over the event window as cumulative sum of abnormal returns specified by formula (B.10).

To test the results on AR, considering stock returns can have high volatility and that the relatively strong hypothesis that stock returns show significant abnormal returns

close to the period of the spin-off announcement, a five-percent significance level was applied to verify that cumulative abnormal stock returns are different from zero.

## 4.2 Operational performance methodology

In order to assess changes in operational performance of spin-off companies, the analysis has been structured around the review of a subset of key operational metrics, available either directly from financial statements of publicly traded companies or metrics calculated from the reported data. To identify the change in operational performance for each operational metric, the data set covers two years prior to the spin-off event and up to five years of data after the spin-off event. Even though there are significant limitations in using restated accounting measures of a company that was previously part of a group, due to cost and revenue allocation practices within the corporation, using two years of data prior to the spin-off enables reasonable empirical comparison. A second time horizon with a higher degree of reliability of data in operational performance is the time period between the year of the spin-off up until four years following the spin-off. Over this time period, a spun-off company, as a separate economic unit, can be compared to its baseline performance, or industry benchmark, to assess the effects of the implemented changes for the new separate company. The study is limited to five years at-, or post-, spin-off operational performance on the premise that operational effects resulting from a corporate spin-off are partially initiated at the announcement and require a significant duration of time to fully materialize. While over a longer time period, the impulse effect of the spin-off event is expected to decline as the new company, or industry events, become more prevalent to the changes in the company's operational metrics.

Considering relative inertia in the change of operational metrics, data has been sampled on a fiscal year basis. This frequency is preferred due to: seasonality of commercial activity; higher accuracy of accounting statements due to annual reporting and audit cycle; and cross-period comparability. Operating values are retrieved from commercial databases containing annually reported and audited financial statements.

In order to isolate the company-specific effects related to a spin-off event from the overall industry development that may be driving changes in operational performance levels, changes in operational metrics should be evaluated against an appropriate benchmark. A key methodology objective is to ensure data consistency and geographical com-

parability between operational metrics investigated from spin-off-sample and benchmark measures. Therefore, the most appropriate benchmark should be constructed from the same corresponding metrics and data-sources as the operational measures. An alternative of using a third-party benchmark would be sub-optimal due to variation in definitions and computation methodology of operational measures, as well as differences in company sampling between the spin-off sample and the benchmark, which potentially could significantly distort the evolution of performance over time.

For this study, the benchmark is constructed based on industry attributes. Given industry developments are one of the most prominent exogenous factors driving key operational metrics. A more granular secondary industry classification has been used for several major sectors for a superior match between the spin-off company and sector benchmarks. This mainly pertains to Healthcare, Industrial, Financial and Information Technology as a sizeable number of diverse sub-sector companies in these sectors, allow a more accurate choice of peers in index construction.

Benchmarks are constructed from operational metrics available from public-traded companies that are domiciled in Nordic countries. Taking into consideration significant variability of market conditions over the measured time period together with variability in terms of the set of listed public companies, a custom benchmark algorithm has been specified in order to deliver the most representative and comparable benchmark for each sample. Each sample is classified by primary, and when index sample-set allows a more granular approach use secondary, industry attributes according to GSIC[1] standard, and manually validated using company publications and third-party public information. Using industry attributes and announcement dates, a subset of public-traded companies belonging to the same industry that have reported the selected metrics over the entire event window period is then created. Creating a sub-set of companies that have been reporting over the entire analyzed period allows for consistency and comparability across periods. This approach reduces the set of companies available for a more accurate estimation of benchmarks, but by eliminating companies that were undergoing listing, delisting or buyout processes, eliminates operational effects resulting from such activities and results in a more representative benchmark.

Specified operational measures are extracted from the database using the index company subset. Depending on the measure's specification, an aggregation procedure is

1 GSIC - Global Industry Classification Standard, developed by MSCI and Standard & Poor's, and integrated in the Capital IQ data source classification.

performed across the companies and period to generate an index time-series. Considering that the operational measures can be represented either in monetary terms or as a percentage, analysis of these measures requires a defined approach. There are two specified aggregation methods for this study. The first method, which is used in margin and return measures, is “revenue weighted level aggregation”. The second index aggregation used for monetary denominated operational metrics is "relative change aggregation", which measures the average differences in the metric across time periods. These methods allow relative changes across companies to be averaged, either equally or revenue weighted depending on the most appropriate analysis specification for a given measure.

"Revenue weighted level aggregation" measures the corresponding operational metric for each index subset company across the event window and computes a matrix containing the relative weight of the revenue generated by any given company (B.12) from the total revenue generated by the index subset. The index is computed as the product of a matrix, containing operational metrics for a company during a given year. The relative sales weight (B.12) is summed for each company to generate the index time series . (B.14)

"Relative change aggregation" method computes the percentage change in the level of a given operational metric for each index subset company, generating a matrix containing values for each company and period (B.15).

Further processing is contingent on the nature of measures investigated. If a measure is assumed to be primarily exogenous driven, this procedure allows the revenue weighting and sums the values to compute an index time-series (B.16).

If the operating measure in question is assumed to be endogenously driven by internal company-specific processes, a more adequate benchmark is averaging the levels and comparing the sample company against an average measure across its industry. This aggregation procedure allows for flexibility in the process of index quantification.

The selection of the revenue-based aggregation method, instead of the market value based indexing is determined by the historical nature of operational metrics. Operational metrics do not incorporate information on expected long-term returns which are driving market valuations and therefore render market value indexes less suitable for this analysis. This is discussed by Brav (2000) and Loughran and Ritter (2000) who look at different statistical methods, and related statistical problems in the calculation

of long-term excess returns.

To test the hypotheses on operational effects, a varied set of operational metrics will be investigated, including metrics relating to operational engineering previously cited by Bergström et al. (2007). However, the scope is not limited to only those metrics. A majority of the measures are retrieved directly from Capital IQ, while other measures are derived directly from retrieved financial data points. Due to the metric definition and computation procedures, there is a risk of significant numerical anomalies, such as margin computations on net losses, negative or close to zero book values of equity or negative net debt values, when these values are used as components in a computation of the selected metrics. Therefore, these data points are directly excluded from the sample to control for such anomalies in the case where measures for any given year have evidently invalid values. Further, to control for abnormalities in the operating measures on both the sample set and benchmark before aggregation, a measurement series is tested for outliers. In the case of significant anomalies, these values are winsorized between 1st and 5th percentile on both extremes. Percentile choice of winsorization is proportional to the number of such anomalies at each tail and is specified distinctly for each measure.

To mitigate potential distortions in operating metrics, all likely outliers are individually reviewed for significant irregularities in data or computation results. If during this review a potential outlier is not confirmed to be driven by a computational or data issue and that its significantly different value is substantiated in operational activities, this observation is included in the dataset and normalized using winsorization. Otherwise verified outliers' datapoints are removed from the analysis subset.

Considering the scope of potential operational transformations that can be executed by a spun-off company in order to realize operational improvements, it is important to adapt the company to its industry environment or adjust its structure to ensure sustainable stand-alone operation. There are multiple measures that can reflect such transformations such as sales growth to capture improvements on the top-line performance resulting from customer and market focus, changes in the level of gross margin to capture changes in product portfolio, value proposition and competitive differentiation, ROA to measure changes in the economic performance of the business before financial engineering and ROIC to measure efficiency in capital allocation and profitable use of the resources. Particular attention in this study is focused on the development of return

measures (ROIC, ROA, ROE), operating margins (gross margin & EBITDA margin) and sales growth as these are the most suitable measures to compare operational performance of companies across industries and sections of time as mentioned by Ayash and Schütt (2016) and Veld and Veld-Merkoulova (2009) and shown to relate with value creation in operational engineering and turnaround on buyout transactions by Bergström et al. (2007). In addition to the core operational measures, this analysis includes a ratio of OCF/Assets, that allows to isolate company development from industry-wide effects, and associated with abnormal equity returns on spin-offs by Desai and Jain (1999).

To assess the changes in the capability of the spun-off companies to control cost-structure and generate profits, this study will review changes in EBITDA margins against industry benchmark, as well as sales growth and different return measures. It will both review the measures against the industry benchmark and in terms of their trend development over time. Following the assessment on the final set of measures, the thesis will explore assets and liabilities structures, with specific focus on divergences against the industry on asset base growth and debt change, supplemented by the assessment in measures relating to SG&A and income tax expenses to assess changes associated with the stand-alone operation.

To assess the changes in the operational metrics, the study applies an event study analysis covering the period of two years before the spin-off and four years after the spin-off. As the basis of the comparison the study uses company-level differences between the sample performance and its corresponding benchmark across the fiscal years. For each period, company-level $\Delta$ values are tested for statistically significant differences from zero. Within each period, $\Delta$ values are aggregated across the companies using a revenue weighted method for relative measures, or average change aggregation for absolute measures.

To analyze the effects of potential spin-off specific factors driving changes in operating metrics, an OLS multi-factor regression analysis of each metric has been performed. For most measures, a consistent subset of factors is specified in the regression models that includes company specific level of leverage to proxy for debt overhang, divergence between parent and spin-off company industry classification as proxy for industry focus and execution of the spin-off prior or during a recession period as proxy for distressed sales. To assess the effects of the spin-off event against a pre-existing trend, a dummy variable classifying the year at-, or after, the spin-off from before the spin-off event has

been added. This is complemented by an assessment of country differences in spin-off performance from interaction between spin-off dummy and country dummies for Sweden, Norway, Finland and Denmark. In order to assess market timing effects, two additional factors have been specified: recession years dummy that classifies spin-offs executed during the year when official reported GDP growth for corresponding Nordic country has been negative or indicated a significant slow-down; a second factor captures pre-recession year spin-offs, announced one year prior to any recession year as defined above.

# Section 5

# Data and Descriptive Statistics

This section explains the process through which the data has been gathered, resulting in the final dataset used for the evaluation of the hypotheses. The data can be grouped into two main sets from the initial list of firm spin-offs, one relating to stock prices and one for the operational metrics.

The stock price data is used to analyze hypotheses *H1* and *H4* as they relate to the announcement effects and long-run stock price performance of spin-offs.

The operational data as a more comprehensive source is used to test the main hypothesis *H2*. As the operational performance metrics research field is under researched. Collecting and structuring the operational data for the analysis is a critical step in the analysis for this paper, thus making it the most important dataset in the thesis.

## 5.1 Data Sources

The databases Capital IQ, SDC Platinum, Merger Market and Thompson Reuters Eikon have been used to collect information regarding company spin-off announcements and completions, in the Nordics between 1998-2017. The initial list was gathered from Merger Market, which included all spin-offs, successful and unsuccessful, in the Nordics. The list was later cross-checked with additional data from SDC, Capital IQ and Thompson Reuters for any additional spin-offs not included by Merger Market. In order to compare equity effects with operational effects consistently, the final sample selection includes a complete set of stock price and operational data for at least two full years after the spin-offs. This resulted in the final dataset including 110 spin-off entities in the

Nordics between 1998-2017.

Once the final list was completed, stock price and operational data was collected for all the companies. The stock price data was collected from NASDAQ and Eikon. By collecting the data from the original sources, the data is less likely to be tampered with or incorrectly adjusted for dividends or stock splits. For each company, stock prices were collected from 1998-2017 or from their listing date until delisting date. The stock price data was collected between September and October 2019.

The operational data was retrieved from the Capital IQ database, which downloads and uniformly structures operational data for most listed companies and for a limited number of private firms. The database was used to create a dataset for each of the spin-off firms using a predefined extraction query on a company level. For the index computation, a screening query has been performed on all Nordic public companies for a total set of 15 operational measures, which were used to create the industry indexes. By using a database such as Capital IQ for operational data collection, the dataset is consistent in terms of structure, balance sheet and income statement item groupings, and treatment of non-recurring items. Although consistent data collection by an industry-standard data provider partially mitigates differences across companies in financial statement reporting, it does not eliminate data distortion risk associated with differences in accounting standards, or methodology selection within a standard, since companies vary in their accounting treatment of items such as capitalization of R&D, recognition of leases[1], and amortization and goodwill. All reviewed operational metrics have been collected between September and October 2019.

A potential bias affecting the final data sample set is the availability bias. The availability bias induces a limitation of the completeness and accuracy of historic spin-off data. As data providers coverage of historic information has proven to be limited, it has resulted in an over-sampling of primarily large publicly listed and well-established companies, while under-sampling small and mid-sized companies and excluding private transactions from the screening scope. This bias is likely to result in an underestimation of the effects associated with spin-off performance as larger companies have a relatively higher standard of operational management and governance (Bloom et al., 2015), and therefore reduces potential operational improvements as a result.

1 With the introduction IFRS 16 and IAS 17 in 2019, financial leases are capitalized, but due to use of historical data in this study, this divergence persists.

## 5.2 Descriptive Statistics

The initial screening for spin-offs found a total of 257 entities that announced spin-offs in the Nordic countries between 1998-2019, of which 128 were parent companies. The list was later deducted due to multiple factors such as companies never listing, being bought out or subsequently delisted within two years after spin-offs, making operational analysis unfeasible and thus reducing the final set of public spin-offs companies to 110 (which includes both the parent and the spun-off entity).

**Table 5.1**: Observations by announcement year

The table contains a vertical dimension of the sample distribution by year and a horizontal dimension selection, filtering for the screened spin-offs. "Screened" column represents the total number of spin-offs entities identified during a given year. "Parent" represents the portion of the screened entities that are the original entity before the spin-off. "Stock-data" shows the number of entities which are listed on the exchange and has available stock price data. "Op. data" reports entities with available operational metrics both before and after the spin-off. The "Final set" represents the total number of spin-offs that fulfill all of the above-mentioned criteria for the study.

| Year | Screened | Parent | Stock data | Op. data | Final set |
|---|---|---|---|---|---|
| *1998* | 16 | 8 | 5 | 6 | 6 |
| *1999* | 14 | 7 | 7 | 7 | 6 |
| *2000* | 26 | 13 | 5 | 5 | 5 |
| *2001* | 20 | 10 | 7 | 8 | 6 |
| *2003* | 8 | 4 | 5 | 5 | 5 |
| *2004* | 23 | 11 | 10 | 10 | 10 |
| *2005* | 16 | 8 | 9 | 6 | 6 |
| *2006* | 17 | 9 | 11 | 8 | 7 |
| *2007* | 31 | 15 | 12 | 12 | 12 |
| *2008* | 8 | 4 | 1 | 1 | 1 |
| *2009* | 2 | 1 | 0 | 0 | 0 |
| *2010* | 4 | 2 | 2 | 2 | 2 |
| *2011* | 8 | 4 | 6 | 6 | 6 |
| *2012* | 6 | 3 | 5 | 5 | 5 |
| *2013* | 10 | 5 | 7 | 7 | 7 |
| *2014* | 4 | 2 | 4 | 4 | 4 |
| *2015* | 12 | 6 | 7 | 5 | 5 |
| *2016* | 8 | 4 | 7 | 7 | 7 |
| *2017* | 12 | 6 | 10 | 10 | 10 |
| *2018* | 8 | 4 | 7 | 0 | 0 |
| *2019* | 4 | 2 | 4 | 0 | 0 |
| ***Total*** | **257** | **128** | **131** | **114** | **110** |

**Table 5.2**: Observations by industry composition

The table presents the distribution of selected companies across the geographical location of the headquarters and GSIC industry classification. "Count" shows the number of companies in each country and industry. "Parent" reports the number of companies out of "Count" that are classified as the parent in the spin-off. "Increased ind. focus" reports the number of companies from pairs of spin-offs that resulted in different industry classification for at least one entity in the pair.

| Country | Count | Parent | Inc. ind. focus |
|---|---|---|---|
| **Sweden** | **66** | **40** | **36** |
| *Communication Services* | 1 | 1 | 1 |
| *Consumer Discretionary* | 11 | 6 | 4 |
| *Consumer Staples* | 2 | 0 | 2 |
| *Energy* | 2 | 1 | 0 |
| *Financials* | 6 | 5 | 3 |
| *Health Care* | 12 | 7 | 7 |
| *Industrials* | 23 | 14 | 15 |
| *Information Technology* | 5 | 4 | 2 |
| *Materials* | 2 | 1 | 2 |
| *Real Estate* | 2 | 1 | 0 |
| **Finland** | **19** | **9** | **11** |
| *Energy* | 1 | 0 | 1 |
| *Financials* | 3 | 1 | 1 |
| *Health Care* | 1 | 0 | 1 |
| *Industrials* | 9 | 6 | 5 |
| *Information Technology* | 4 | 1 | 2 |
| *Utilities* | 1 | 1 | 1 |
| **Norway** | **19** | **13** | **3** |
| *Consumer Discretionary* | 1 | 1 | 0 |
| *Consumer Staples* | 2 | 1 | 0 |
| *Energy* | 6 | 4 | 0 |
| *Health Care* | 2 | 1 | 0 |
| *Industrials* | 2 | 2 | 1 |
| *Information Technology* | 4 | 3 | 2 |
| *Materials* | 2 | 1 | 0 |
| **Denmark** | **6** | **3** | **4** |
| *Health Care* | 2 | 1 | 2 |
| *Industrials* | 3 | 2 | 1 |
| *Materials* | 1 | 0 | 1 |
| ***Total*** | **110** | **65** | **54** |

The industry most frequently represented in the sample set, as seen in table 5.2, was Industrials. Industrials had a total of 37 companies of which 24 were parent companies and 13 the spun-off entity. The second and third most active industries were Healthcare and Consumer Staples.

The distribution of spin-offs across the years in the sample set varies. The year with the most spin-offs was in 2007 when there was 12, followed by 2004 and 2017, each having 10 spin-off events. Between 1998 and 2008 there was an average of 18 spin-offs per year in Nordics, while between 2015 and 2019 the average was only 9 spin-offs per year. Over the period between 2008 and 2015, the number of spin-offs was limited, averaging only four companies per year with an upward trend between 2016-2017. This would imply that spin-offs prior to the recession of 2008-2009 are over-represented in the sample, with a significant portion of recent spin-offs still in the first few years of independent operation.

The country distribution over the sample period showcases that Sweden has been the most active Nordic country in executing spin-offs, reaching a total of 66 spin-off entities, followed by 19 in Norway, 19 in Finland, 6 in Denmark and no events for Iceland. This illustrates that across the Nordics, corporate spin-offs are mostly a Swedish phenomenon.

A potential bias with the sample set, is related to survivorship bias. The data becomes skewed, as it only contains firms which were not bought out from the exchange. This might have an impact on the results, as companies with lower growth and operational improvement potential, remained on the exchange resulting in an underestimation of the operational effects of spin-offs. This is highlighted by Gompers et al. (2016) who showcased that buyout funds aim to take private the most attractive firms that have the greatest potential for growth and operational improvement.

# Section 6

# Results and Discussion

## 6.1 Empirical findings on event studies

### 6.1.1 Stock Price

Stock price movements are a well-researched area within spin-offs, with most research having focused on the US and Europe. The most frequent method for researching abnormal returns in spin-offs is looking at the announcement date reaction and comparing it to an appropriate underlying index. Table 6.1 shows a sign test for the total observation as well as a graph visualizing the table. What can be seen in the table is a 4.5% cumulative abnormal return that is statistically significant on the day of the announcement. It is also the only statistically significant result we find during the period 30 days prior and 30 days post the announcement day.

These findings are in line with papers such as Hite and Owers (1983), Miles and Rosenfeld (1983) and Cusatis et al. (1993), that have reported mean equity abnormal returns between 7-22% on the announcement day. Our findings are smaller, but comparable to a more recent meta-study by Veld and Veld-Merkoulova (2009), that reported a 3.0% average CAR by analyzing 69 observations from 26 studies. A lower CAR in our study compared to studies from '80s and '90s is likely due to differences in the sample sets, where our sample might consist of a different industry composition or have less industry focus. Industry focus has been reported in papers (e.g. Desai and Jain (1999)) to have a positive impact on stock price development. The finding confirms our *H1* hypothesis, that there is a positive abnormal return for stock prices on the day of the announcement. This in turn should indicate that the market expects improvements in the

**Figure 6.1**: Nordic short-term cumulative abnormal returns (CAR)


Source: NASDAQ/Eikon, spin-off stock price data as of October 2019.

**Table 6.1**: Cumulative average abnormal returns (short-term)

The table shows cumulative abnormal returns (CAR) for groups of days around the announcement date of the spin-off. The observations start 30 calendar days before the announcement. Within each group, average CAR, median CAR and t-statistic values are reported. The significance of the mean is tested against zero. "Percentage positive", reflects the aggregate number of companies and days for which a CAR greater than zero has been observed.

| Interval | Mean % | t-statistic | Median | Pct. positive |
|---|---|---|---|---|
| **All Nordics (N=110)** | | | | |
| *-30 to -20* | 0.07 | 0.12 | 0.10 | 58.21 |
| *-20 to -10* | 0.95 | 0.97 | 1.02 | 65.65 |
| *-10 to -5* | 1.47 | 0.99 | 1.43 | 62.61 |
| *-5 to -1* | 2.14 | 1.30 | 2.17 | 61.41 |
| *-1 to 0* | 2.68 | 1.45 | 2.68 | 60.87 |
| *0* | 4.53*** | 2.58 | 4.53 | 65.22 |
| *1 to 5* | 3.28 | 1.61 | 3.26 | 59.78 |
| *5 to 10* | 3.28 | 1.54 | 3.32 | 64.35 |
| *10 to 20* | 2.17 | 0.93 | 2.12 | 64.13 |
| *20 to 30* | -0.35 | -0.09 | -0.56 | 61.52 |

**:10% significance | **:5% significance | ***:1% significance*

operating performance to justify the increase in stock price. The performance measures will be further analyzed in the following section.

### 6.1.2 Operating Metrics

In order to gain an understanding of operational performance metrics development following the spin-off, this paper has utilized event studies to benchmark the performance measures against an industry benchmark over a time series of two years prior to the spin-off and five years following the spin-off date. This is done to gain an understanding of the development of the individual operating metrics for the subsequent years following the spin-off. The thesis has analyzed 15 different measures, but only a handful will be presented and analyzed as we perceive these to be the most interesting; the measures analyzed are sales growth, gross margin, EBITDA margin, ROIC as well as OCF/Assets. The measures were selected based on their relevance, connection to previous literature presented earlier in this thesis and the ability to capture most parts of the financial statements.

**Table 6.2**: Event Study - Operational metrics vs Index

This table represents the effects of spin-offs on operational performance measures across two years before and four years after the spin-off. The mean effect represents an equally weighted and winsorized average of the company's abnormal operational performance. Abnormal operational performance is the difference between the spin-off company and the industry benchmark. Year 0 is defined as the fiscal year of the spin-off. In parenthesis is the t-statistic value for significance test against zero. "Before spin-off" shows the mean effect for a group of years [-2, -1], and "After Spin-off" reports the average for fiscal years at and after the spin-off year [0,4]. "N" for annual measures represents the number of companies used in the estimation; "N" for before and after is the number of data points each year. "Diff." reports the difference between the average effect before and after the spin-off event.

| **Year from split** | **-2** | **-1** | **0** | **1** | **2** | **3** | **4** | **Avg. Before** | **Avg. After** | **Diff.** |
|---|---|---|---|---|---|---|---|---|---|---|
| **Sales Growth** | | | | | | | | | | |
| Mean Effect | | -0.05 | 0.02 | 0.09*** | -0.01 | 0.08** | 0.02 | -0.05 | 0.04*** | 0.09 |
| *t-statistic* | | -1.33 | 0.48 | 2.86 | -0.24 | 2.34 | 1.15 | -1.33 | 2.74 | |
| *N* | 0 | 84 | 93 | 87 | 78 | 77 | 66 | 84 | 401 | |
| **Gross Margin** | | | | | | | | | | |
| Mean Effect | 0.06*** | 0.08*** | 0.07*** | 0.08*** | 0.11*** | 0.09*** | 0.09*** | 0.07*** | 0.09*** | 0.01 |
| *t-statistic* | 2.83 | 3.88 | 3.23 | 3.05 | 4.11 | 3.35 | 3.19 | 4.78 | 7.58 | |
| *N* | 89 | 102 | 104 | 96 | 86 | 85 | 74 | 191 | 445 | |
| **EBITDA Margin** | | | | | | | | | | |
| Mean Effect | 0.00 | 0.01 | 0.00 | 0.01 | 0.00 | -0.01 | 0.00 | 0.01 | 0.00 | -0.01 |
| *t-statistic* | 0.21 | 0.87 | 0.00 | 0.51 | 0.04 | -0.47 | -0.13 | 0.84 | 0.00 | |
| *N* | 86 | 98 | 100 | 92 | 83 | 82 | 71 | 184 | 428 | |
| **ROIC** | | | | | | | | | | |
| Mean Effect | -0.04*** | -0.05*** | -0.05*** | -0.04*** | -0.04*** | -0.04*** | -0.04*** | -0.05*** | -0.04*** | 0.00 |
| *t-statistic* | -2.83 | -4.56 | -4.26 | -3.41 | -3.88 | -3.39 | -2.76 | -5.20 | -7.95 | |
| *N* | 82 | 92 | 105 | 97 | 87 | 87 | 76 | 174 | 452 | |
| **OCF/Assets** | | | | | | | | | | |
| Mean Effect | -0.22*** | -0.19*** | -0.21*** | -0.20*** | -0.24*** | -0.17*** | -0.18*** | -0.20*** | -0.20*** | 0.00 |
| *t-statistic* | -9.39 | -7.03 | -9.20 | -8.28 | -7.45 | -3.91 | -5.21 | -11.16 | -14.40 | |
| *N* | 88 | 107 | 107 | 98 | 88 | 87 | 76 | 195 | 456 | |

**:10% significance | **:5% significance | ***:1% significance*

The first performance measure studied was the development of the change in sales growth compared to the benchmark index development over the same period. The table shows a statistically significant outperformance for year one and year three with sales change exceeding the industry benchmark by as much as 9% and 8%. From the table, it can also be concluded that the year prior to being spun-off and the second year after, show signs of negative sales growth in comparison to the industry benchmark growth. These values are however not statistically significant. From the results, we can see that the majority of spin-offs are able to outperform their benchmark in sales growth in all years except the second year after the spin-off. However, only two of the years are statistically significant. The improvement in sales could be due to a variety of reasons, with one being an increased number of growth opportunities through enhanced management focus. This will be further analyzed through the industry focus factor in the regression study in the next section.

The results from the event study for gross margins, which shows the difference between the sample set of companies and the industry benchmark, shows a consistent outperformance across the entire time period when comparing the average performance before and after the spin-off. The difference between these two averages indicates that the gross margin improves on average by about 1.4%-points during the spin-off event. The largest improvement can be seen between two years prior to the spin-off (5.8%) and two years after (10.8%) indicating a 5.0%-point margin improvement. The results indicate that spin-off companies overall outperform their industry benchmark in terms of gross margins, but they are also able to improve the margin following the spin-off event. This could be due to a number of factors such as a more cost-efficient structure or more focused management of the business, but we cannot with certainty determine what the underlying cause is in the scope of this test.

Regarding the performance of EBITDA margins against the industry benchmarks, the spin-off sample set, on average, outperforms the benchmark before the spin-off event by as much as 1.2%-points. Following the spin-off, the margins decreases to a near 0% outperformance against the benchmark. None of the values, however, are statistically significant and we cannot with certainty conclude any of the results in the scope of the event study. One reason is due to a significant variation in the EBITDA margins across the companies, ranging from 30%-points below to 36%-points above the benchmark and thus the statistical significance of the results is weak. The results could be due to that

costs from the spin-off such as SG&A trickle down to the EBITDA margin, distorting any improvements gained in the gross margin. The increase in SG&A can be seen in the event study table A.1 that shows statistically significant increase in the change of SG&A over the event horizon.

The ROIC measure is used as it is one of the most industry neutral measures, as it only includes the invested capital base. The event study highlights the difference in ROIC compared to the benchmark over the event period. The event study shows strong statistical significance for all the years prior and after the spin-off. There is a positive effect on the metric from the spin-off with positive mean effect when comparing the average mean before and after, as the difference indicates an improvement in ROIC by 0.4%-points. The largest improvement can be seen between one year prior to the spin-off (-5.4%-points compared to the benchmark) until four years after (-4.0% when compared to the benchmark), were we can see an improvement by 1.4%-points. Given that all the measures are statistically significant we can confirm that there is an improvement in ROIC following the spin-off event. What can be inferred from the results is that the companies are able to either decrease the invested capital base or improve their returns from the same capital base, which indicates operational improvements in the companies undertaking spin-offs.

The OCF/Assets is a metric previously used by Desai and Jain (1999) to test for operational improvements in the spun-off companies. The event study looks at the difference between the spin-off companies and their benchmark indexes. The results for the metric show improvement with strong statistical significance across the entire spin-off period. What can be seen in the event study is that the two years prior to the spin-off, the sample set companies underperform their benchmarks by -21.7%-points. At the end of the event period this underperformance has decreased to -17.7%-points indicating an improvement in the operations by 4%-points. A similar, but smaller improvement can be seen when comparing the one year prior to spin-off with the last year, which indicates an improvement of 1.4%-points. An explanation to why much of the improvement happens before the spin-off event could be due to firms initiating efficiency plans prior to the spin-off. Overall, these results are in line with previous studies and showcase the operational improvement that spin-off companies undergo. The study by Desai and Jain (1999) also looked at the industry focus impact of these improvements, which will be reviewed using regressions in the next section.

Overall, we can conclude that there is statistical significance to infer that spin-offs improve operating performance proving our second hypothesis *H2*. Metrics such as sales growth, gross margin, ROIC and OCF/Assets exhibit the strongest significance and the clearest improvements. For the underlying factors driving the change, the next section will run regressions on the operating metrics analyzed here and try to unveil what potentially could be driving the improvement, be it country, industry focus or leverage. We have also run a number of other event studies on measures and segmented them by country. These findings can be found in the appendix as a supplement to the main findings.

## 6.2 Results on factor analysis and regressions

**Table 6.3**: Regression analysis on operational factors

This table contains the results of the factor analysis on 110 spin-offs between 1998 and 2017, each across seven fiscal years around the spin-off date. Only samples with a complete set of variables have been included, with a total n = 484, 610, 626 and 651 observations for each respective measure representing a combination of companies and years. All observations have been treated for outliers. The regression is specified as a multi-factor linear model with OLS coefficient estimation. Dependent variables are the difference between spin-off companies respectively sales growth, EBITDA Margin, ROIC, Operating Cash-Flow over Assets and their industry benchmark. Explanatory factors are quantitative, and the dummy proxies Industry Focus, Recession, Pre-Recession, Spin-off Impact and Leverage are investigated as factors. Industry Focus (1 = Yes) when GSIC differs between parent and spun-off company. Recession (1= Yes) for spin-offs announced during a year of GDP slow-down in Nordics. Pre-Recession (1=Yes) for spin-offs announced one year before the recession. Spin-off Impact (1=Yes) for spin-off year and years following the spin-off. Leverage is defined as Total Assets/Equity for a given company and year.

| | **(OLS)** | | | |
|---|---|---|---|---|
| ***Spin-off factors*** | **Sales Growth Coef.** (t-statistic) | **EBITDA Margin Coef.** (t-statistic) | **ROIC Coef.** (t-statistic) | **OCF/Assets Coef.** (t-statistic) |
| Constant | -0.02 | 0.08*** | -0.08*** | -0.22*** |
| | (-0.54) | (5.08) | (-5.46) | (-6.67) |
| Industry Focus | -0.03 | -0.02* | 0.01 | 0.07*** |
| | (-1.10) | (-1.77) | (1.24) | (2.99) |
| Recession Impact | -0.07* | 0.01 | -0.03** | -0.16*** |
| | (-1.83) | (0.59) | (-2.03) | (-5.23) |
| Pre Recession Impact | -0.02 | -0.06*** | 0.02 | 0.11*** |
| | (-0.42) | (-3.42) | (1.25) | (3.00) |
| Spin-off Impact | 0.10** | -0.01 | 0.01 | 0.00 |
| | (2.52) | (-0.96) | (0.50) | (0.16) |
| Leverage | -0.05 | -0.02*** | 0.01** | 0.00 |
| | (-0.92) | (-4.69) | (2.56) | (0.08) |
| N | 484 | 610 | 626 | 651 |
| *R2* | 0.026 | 0.069 | 0.026 | 0.058 |
| *Adj. R2* | 0.016 | 0.062 | 0.018 | 0.051 |

**:10% significance | **:5% significance | ***:1% significance*

The independent regression variables were selected based on previous findings and the results presented in earlier sections of this paper. Only sales growth, EBITDA margin, ROIC and OCF/Assets will be analyzed using the independent variables.

The spin-off impact dummy carries some explanatory value as shown in the different operating metric regressions. Industrial focus is a heavily studied variable in previous literature (Daley et al. (1997), Desai and Jain (1999), Sudha Krishnaswami;

Venkat Subramaniam (1999)). Industrial focus is an argument put forth through the theory of conglomerate discount and in turn should result in an improvement of the operating metrics through a spin-off of an unrelated business unit. The regression also looks at the explanatory value shown through the dichotomy between the pre-recession and recession impact variables. It adds a temporal element in the sense of how previous bad times may have an impact on the overall outcome of spin-offs. Lastly, country effect is analyzed and the inclusion of the variable stems from the thesis focus on Nordic spin-offs and tests if there is any clear difference between the countries regarding the operational development. Overall, as seen in the tables above, the variables have low explanatory value as no regressions has a $R^2$ or $adj.\ R^2$ value that exceeds 0.07. As a result, the statements following the results should be seen in the light of this low explanatory value of the measures.

Pivoting back to the variables, the industry focus dummy highlights rather interesting results, as it has a 6% positive impact with statistical significance for OCF/Assets and a negative 2% impact on EBITDA margins. The sales growth and ROIC measure show no statistical significance, and as such nothing conclusive can be determined from these measures. This is largely in-line with most previous literature with Desai and Jain (1999) also finding a positive impact from industry focus among their findings and no operational performance improvement on the same measure for companies without an industry focus. A potential explanation could be the conglomerate discount and that by separating the two firms, a larger focus can be allocated to each specific industry. The negative impact on the EBITDA margin is most likely due to the sample measure volatility, which showed no significance during the event study.

The leverage dummy shows limited signs of significance or impact on the operational performance metrics in our sample. It is only statistically significant for ROIC and EBITDA margin. In those measures, we find for ROIC a positive 1% impact and for the EBITDA margin a negative 2% impact. The results are also mixed, making it harder to reach a conclusion. For both sales growth and OCF/Assets, we see no statistically significant results and thus we cannot infer anything from it. Our expectation was that a higher leverage should limit the company's ability to invest in NPV positive projects or initiatives due to debt overhang (Lang et al., 1996) and therefore have a negative impact on the operational performance. However, the underlying cause is unclear given our results point in opposite directions.

As mentioned above, the spin-off impact dummy highlights the actual impact the spin-off event has on the operating performance metrics following the spin-off. This variable highlights the results from the event study, showing that the spin-off event has had a statistically significant positive impact on sales growth. The spin-off event is shown to have a 9.5% positive impact on the development of sales growth post spin-off. All other measures do not exhibit any statistically significant results and we cannot with certainty assume that the results are different from zero. To understand the exact reason for the improvements seen in sales growth, a further study with a more qualitative heuristic to explain these factors would be needed. From previous findings, we can only assume it is related to management focus and expertise which stems from the conglomerate discount research.

The recession variables highlight the effects of recessions and whether spin-offs have performed poorly during certain periods. Given the fact that a sub-sample of our spin-offs were finalized during different recessions, we found it interesting to also analyze if a spin-off occurs just before, or during, whether a recession would have any substantial impact on the operating performance of the companies. Our results find at least one of the two recession measures to be statistically significant for each of the measures. The results showed a negative impact on the spin-off performance if the spin-off occurred during the recession. For sales growth, it had a -6.7% impact and for ROIC and OCF/Assets it had -2.6% and -15.7% respectively. The results for pre-recession impact are, however, inconsistent showing a statistically significant negative impact on EBITDA margin by -5.9% and a positive 11.0% on OCF/Assets. No other measures indicated any statistically significant results. The magnitude of the results may be affected by the low significance of the EBITDA margins event study. The overall negative impact of recessions is interesting as it indicates that companies' performance development is more negatively impacted if the spin-off occurred during a recession compared to their benchmark. One area for further study could be if the quality of spin-offs during recessions are worse than spin-offs that occur during better economic times. One plausible explanation could be that spin-offs in recessions are of a more defensive nature to better fund the remaining business after the spin-off.

Lastly, we observe very weak explanatory power between the country origin of spin-off and the company's operating metrics development. For each performance measure, we observe low robustness in the results with only one country dummy regression per

**Table 6.4**: Regression analysis on geographical factors

This table contains the results of the geographical factor analysis on 110 spin-offs between 1998 and 2017, each across seven calendar years around the spin-off date. Only samples with a complete set of variables have been included with a total n = 485, 612, 626 and 651 observations for each respective measure representing combinations of companies and years. All observations have been treated for outliers. The regression is specified as a multi-factor linear model with OLS coefficient estimation. Dependent variables are the difference between spin-off companies respectively sales growth, EBITDA Margin, ROIC, Operating Cash-Flow over Assets and their industry benchmark. Explanatory factors are interactions between Spin-off Impact and Country dummy variables. Spin-off Impact (1=Yes) for spin-off year and years following the spin-off and Country dummy (1=Yes) for samples headquartered in a given jurisdiction.

| | **(OLS)** | | | |
|---|---|---|---|---|
| ***Country*** | **Sales Growth Coef.** (t-statistic) | **EBITDA Margin Coef.** (t-statistic) | **ROIC Coef.** (t-statistic) | **OCF/Assets Coef.** (t-statistic) |
| Constant | -0.05 | 0.01 | -0.05*** | -0.20*** |
| | (-1.40) | (0.82) | (-5.41) | (-9.97) |
| Sweden | 0.13*** | 0.01 | 0.02 | 0.01 |
| | (3.12) | (0.74) | (1.52) | (0.26) |
| Norway | 0.04 | -0.03** | -0.04** | -0.04 |
| | (0.77) | (-2.02) | (-2.47) | (-1.13) |
| Denmark | 0.07 | -0.02 | 0.03 | 0.12* |
| | (0.92) | (-0.69) | (1.26) | (1.92) |
| Finland | 0.06 | -0.03 | 0.00 | 0.00 |
| | (1.20) | (-1.56) | ’(0.15) | (0.11) |
| N | 485 | 612 | 626 | 651 |
| *R2* | 0.024 | 0.017 | 0.026 | 0.009 |
| *Adj. R2* | 0.016 | 0.010 | 0.019 | 0.003 |

**:10% significance | **:5% significance | ***:1% significance*

metric being statistically significant. The measure which has the highest explanatory power is ROIC, with a $R^2$ value of 0.026.

The results show that for sales growth, all countries have a positive impact. However, only Sweden has a statistically significant result, showing a positive impact of as much as 12.5%. The ROIC, which also had the largest explanatory power of the four measures, shows a much lower country origin impact than sales growth. Here, the only country with a statistically significant result is Norway. Norway showcases a -3.7% impact on ROIC development following the spin-off. For the EBITDA margin, the only statistically significant result is seen in Norway, which highlights a -3.5% impact of the spin-off. For the OCF/Assets, the only country with statistically significant results is Denmark, with a positive impact of 12.3%. Our findings raise the questions of how a country may affect the operational performance development of spun-off companies. Due to the low explanatory power and that we have not run country specific regressions on the underlying factors, the results do not provide any indications on the casual relationship between the reviewed factors and operating metrics.

Although the results have low explanatory power, an interesting observation is the negative impact Norway seems to have on the operational metric improvement. One possible explanation might be related to how developed the financial markets are in each country and how many institutional investors there are. This can loosely be connected to the findings of Chemmanur and He (2016) and the impact institutional investors have on the equity performance, both in the long- and short-term on spin-offs. In their paper they find that a lower number of institutional investors can be the reason for lower stock price returns. Given that only Norway exhibits lower operational performance development due to country of origin, this may be due to certain market dynamics compared to its Nordic neighbors with either a low number of activist investors impacting performance (Chen and Feldman, 2018), capital market efficiency, taxation, regulation or competitive landscape for companies in Norway. As seen in Chen and Feldman (2018)[1], activist investors may often have a positive impact on the outcome of spin-offs. These hypotheses are however difficult to fully assess without a deeper analysis of the specific firms and the underlying reasons for the spin-off. A deep dive on the Norwegian market compared to its Nordic neighbors would be required for a more precise analysis which could be done in future research.

1 Chen and Feldman (2018) studies the impact of activist investors on divestitures. Their findings indicate an improvement of operational performance for up to two years following the divestiture.

Overall, we find that the spin-off impact and industry focus mostly have a positive effect with statistical significance on the return measures of spun-off companies compared to their benchmark index which confirms our section a) of the *H3* hypothesis. These findings are robust across several of the performance measures but exhibit weak explanatory value. However, we do not find evidence to support that leverage has any impact on the operational performance as the significant results we found are contradicting each other and hence do not support section b) of *H3* hypothesis. The country dummies show low explanatory value and highlight the fact that the Swedish and Danish markets have a positive impact on a few of the operating measures, while Norway negatively impacts operating performance with statistical significance which is in-line with section c) of the *H3* hypothesis. As we have analyzed several factors to gain an overall impression of what is driving the improvement instead of focusing on one measure, our results do not lend themselves to determine an explicit conclusion. However, they highlight several underlying drivers such as information asymmetry in connection with institutional- and activist investors which are factors that could be further studied qualitatively or quantitatively.

## 6.3 Results on long-term performance

The last part of the results and discussion section will touch on the long-term performance of the spin-off firms from both an equity and operational performance perspective. In this section, we will analyze the results from the long-run event study of the equity performance and try to connect it to the underlying operational metrics which have been discussed in previous sections. To connect the long-run equity performance with the underlying operational metrics, we have used a heuristic approach by running a correlation study to see which measures has the highest correlation to the equity development and try and infer what the underlying reason for the development of equity performance has been.

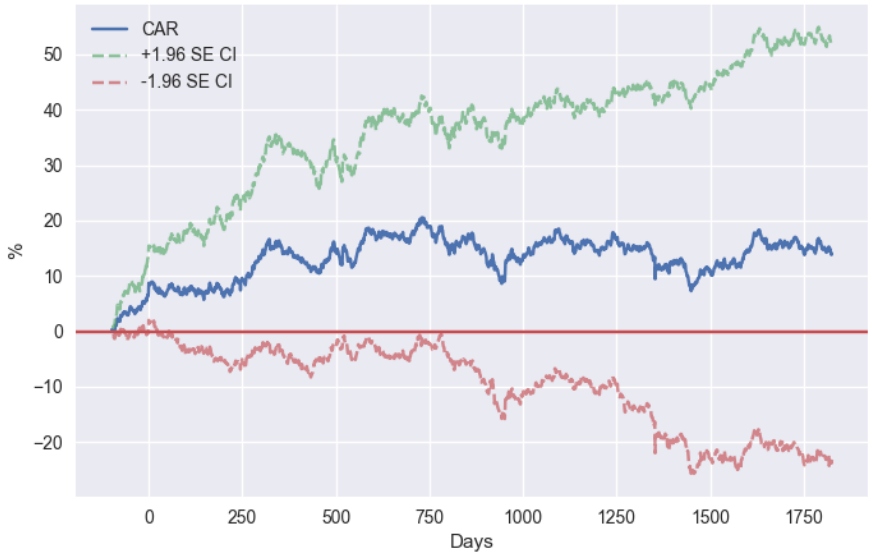
From the long-run equity performance study, the overall picture depicted in figure 6.2, is that the long-run performance[1] of the spin-off companies is positive in comparison to their benchmark indexes. The results are however not statistically significant after the period between announcement day and 50 days post spin-off, so we cannot with certainty determine whether they have abnormal positive long-term returns, however just comparing the spin-off companies to their respective benchmarks they have outperformed during the analyzed period. These findings are partly in-line with previous research, Desai and Jain (1999) who found that focus spin-offs stock prices outperform their benchmark over the research period, while non-focus spin-offs underperform their respective benchmarks. Cusatis et al. (1993) also found long-run equity outperformance for a spin-off portfolio. What can be inferred from these results is that the overall Nordic spin-off sample equity price performance outperforms the benchmark over the sample period, however not with statistical significance.

This outperformance is interesting as we in the previous sections also found improvements in most operating measures over the event period. The regression analysis found that industry focus and the spin-off event have a positive impact on the operating metrics development. We assume that this outperformance in stock price development is correlated to the development of the underlying performance measures.

From the correlation table several inferences can be made. Firstly, the overall correlation with the metrics and the stock price can be considered low with correlations ranging between -1.9% and 20.5%, indicating that these factors presumably are not the

1 CAR at day 0 for long-term horizon is 8.73% which is greater than 6.1 due to different starting points, -30 days in the short-term view and -100 days in the long-term.

**Figure 6.2**: Nordic spin-offs evolution of cumulative abnormal returns (long-term)




Source: NASDAQ/Eikon, stock prices data as of October 2019.

**Table 6.5**: Cumulative average abnormal returns (long-term)

The table shows cumulative abnormal returns (CAR) for groups of days around the announcement date of the spin-off. The observations start 100 calendar days before the announcement. Within each group, average CAR, median CAR and t-statistic values are reported. The significance of the mean is tested against zero. "Percentage positive", reflects the aggregate number of companies and days for which a CAR greater than zero has been observed.

| Interval | Mean % | t-statistic | Median % | Percentage positive |
|---|---|---|---|---|
| **Nordics (N=110)** | | | | |
| *-100 to -50 days* | 2.17 | 1.46 | 2.70 | 59.09 |
| *-50 to -30 days* | 3.87* | 1.71 | 3.84 | 59.46 |
| *-30 to -10 days* | 4.58** | 2.11 | 4.49 | 62.72 |
| *-10 to -1 days* | 5.86* | 1.86 | 5.96 | 66.18 |
| *-1 to 0 days* | 6.79* | 1.91 | 7.76 | 69.57 |
| *0 days* | 8.73** | 2.55 | 8.73 | 73.91 |
| *1 to 10 days* | 8.67** | 2.52 | 8.66 | 75.22 |
| *10 to 30 days* | 7.69** | 2.10 | 7.67 | 68.70 |
| *30 to 50 days* | 6.88* | 1.74 | 6.88 | 67.17 |
| *50 to 100 days* | 7.49 | 1.58 | 7.50 | 63.61 |
| *100 to 365 days* | 10.12 | 1.36 | 8.74 | 60.37 |
| *1.0 to 2.0 years* | 15.10 | 1.54 | 14.87 | 61.72 |
| *2.0 to 3.0 years* | 15.18 | 1.30 | 15.48 | 57.36 |
| *3.0 to 4.0 years* | 14.23 | 1.02 | 14.97 | 57.90 |

**:10% significance | **:5% significance | ***:1% significance*

**Table 6.6**: Correlation analysis between op. measures and stock price change

The table shows a correlation analysis between six operational measures' abnormal performance and the change in stock price. Operational measures are calculated on an annual frequency basis. The stock price change is computed as relative price change between the closing price of the last trading day for the previous calendar year and the last trading day of the current calendar year in excess of country MSCI benchmarks, with exclusion of changes accrued as the result of spin-off completion. Operating metrics are measured above an operating benchmark and are correlated on a company level for periods covering at least two years before the spin-off and up-to four years after or its latest available data.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1) Sales Growth | 100.0% | | | | | | |
| 2) ROIC | 21.8% | 100.0% | | | | | |
| 3) Gross Margin | 9.6% | 5.6% | 100.0% | | | | |
| 4) EBITDA Margin | 26.5% | 49.3% | 47.3% | 100.0% | | | |
| 5) Chg. in CAPEX | 15.3% | -9.6% | 2.3% | 4.7% | 100.0% | | |
| 6) OCF / Assets | 7.1% | 52.9% | 3.4% | 33.9% | -8.5% | 100.0% | |
| 7) Chg. in Stock Price | 16.9% | 15.6% | 5.7% | 20.5% | 12.8% | -1.9% | 100.0% |

main drivers of stock performance. The measures with the highest correlation with the change in stock price are sales growth, ROIC, EBITDA margin and change in Capital Expenditure (CAPEX). That sales growth shows a strong correlation is not surprising, as growth is a common metric for equity valuation models such as a DCF (Berk and DeMarzo, 2017). The second metric, with the strongest correlation with the change in stock price, is the EBITDA margin. It is often used as a proxy for cash flow by many investors, meaning an increase in the margin would indicate an increase in cash generation by the company. This metric is also often used for multiple valuation, but will also drive the DCF by increasing free cash flow. The ROIC also correlates with the change in stock price. It can be assumed that a higher ROIC would positively impact the stock price given it is a measure of capital efficiency. Change in CAPEX also shows a high correlation at 12.8%. The change in CAPEX, which in appendix table A.1 can be seen to increase over the event period, indicates that firms that are spun-off increase their CAPEX to a higher degree than their benchmark counterparts.

To summarize, we find that our spin-off sample set outperforms its benchmark index with regards to stock price development over the sample period, albeit not with statistical significance, and shows statistically significant results on improving sales growth, gross margin, ROIC, increasing CAPEX and no statistical significance on the development of the EBITDA margin.[1] The findings show that the spin-off stocks are out-

1 Statistical significance for stock performance is defined with 5% cut-off.

performing the benchmark in combination with several of the underlying operational metrics improving. This to a degree confirms our *H4* hypothesis, that improvements in the underlying operating metrics would increase stock price development (although not statistically significant). The results are in-line with previous studies such as Desai and Jain (1999) who found outperformance for companies that spun-off with increased industry focus and Veld and Veld-Merkoulova (2004) who found statistically significant long-term equity performance among US spin-offs. The results are also similar to the inferences made by Sudha Krishnaswami; Venkat Subramaniam (1999) who inferred that investors underestimate the operational improvement in complex spin-offs, thereby resulting in long-term outperformance of the stock price. This connects to Fama (1998) and the efficient market hypothesis, stating that the stock price should reflect all available information and with each passing year, new information regarding the performance is released and compared with expected levels from the announcement. In relation to previous literature, we interpret our results regarding better stock price development compared to the benchmark to be related to two main factors, under estimation of the operational metrics among investors at announcement date and industry focus. As seen in 6.2 the cumulative returns increase between year 1 and 2, almost reaching 10% significance, which might indicate that this is when most operational improvements are realized or realized to a larger degree compared to the market expectation. The interpretation related to industry focus stems from the fact that half of the sample set are industry focus spin-offs and according to the findings of Desai and Jain (1999) industry focus improving spin-offs should improve performance. Since this study has not tested the two separately, we cannot confirm this is the underlying cause but equally cannot exclude it as a driver. However, this is only our interpretations and one should be cautious when looking at long-run stock prices as they are often noisy with multiple factors potentially interacting with them. Further, the low correlation between the metrics and the stock price development, indicate that there probably are several other factors impacting the results apart from the metrics which are analyzed here.

# Section 7

# Conclusion

This paper has investigated the performance of Nordic spin-offs and assessed their equity and operational performance in relation to relevant benchmarks with the aim of evaluating underlying factors driving development. The raw data has been collected from several databases such as Capital IQ, Merger Market, Thompson Reuters Eikon, SDC Platinum, NASDAQ and MSCI. The total sample set includes 110 spin-off firms from Sweden, Norway, Denmark and Finland during the period 1998-2017. The study draws primarily upon existing methods utilized in previous papers such as an event study on stock price returns; the study also applies the method to various operating metrics that, to our knowledge, have previously not been extensively explored in the context of spin-offs. This includes, for example, operating metrics such as sales growth, ROIC, EBITDA margin, OCF/Assets.

The synthesized analysis has illuminated three key findings related to our hypotheses - the first being that both the event study on the short-term equity price performance and the operational metrics have exhibited statistically significant abnormal returns for the announcement day and statistically significant improvements of the underlying operating metrics over the period pre and post spin-off. For the equity performance, we found a 4.5% cumulative abnormal return on the announcement day. One of our operational findings is that the sales growth exceeded the benchmark performance in our study by 9% and 8% one and three years following the spin-off. Gross margin was another measure that showed improvement over the holding period, increasing by 1.4%-points between the average gross margin before and after the spin-off compared to the index. The return measures also showed improvement over the event period. As for ROIC, the effect showed a 0.4%-point improvement between the average performance

against the benchmark before and after the spin-off. For OCF/Assets, the spin-off set clearly underperforms its benchmark, but this underperformance decreases during the period indicating an improvement of as much as 4%-points. Overall, we infer that spin-off companies are able to improve their performance on a subset of key metrics for both short- and long-term operational performance and short-term equity performance following a spin-off, confirming both our *H1* and *H2* hypotheses.

Secondly, we look at the relationship between the operating metrics and the drivers of performance, such as Industry Focus, Spin-off event, Recession and Leverage. Here, our results where more inconclusive with only a few of the metrics indicating statistical significance for any of the variables. Also, the results indicate very low explanatory value due to the low $R^2$ values exhibited in all the tests. Overall, we do find a positive effect on the operational metrics from industry focus and the spin-off event, and a negative impact from recessions, which is in-line with previous studies. We also perform a regression analysis against the different countries to see if there are any differences between the Nordic countries. Once again, there was low explanatory power in the test with very few statistically significant results in combination with low explanatory values. The results did, however, indicate a positive effect on the operating metrics for a spin-off in Sweden or Denmark and a negative effect for a spin-off in Norway. We believe that the results could be due to the maturity and concentration of activist and institutional investors on these markets, but from the scope of our paper we are unable to confirm any such inference. The findings could only partially explain our *H3* hypothesis.

Lastly, we combine the results on the sample set on the operational studies and compare them to the long-run development of their stock price. An event study was performed on the long-run development of stock prices in the spin-off companies and correlated the stock performance with the operational metrics. For the long-run equity performance, we do not find statistically significant results; however, the sample set of spin-off companies has outperformed compared to their benchmark indexes. We correlated the stock price against the different operating metrics and found the strongest correlation between the stock price and sales growth, EBITDA margin and CAPEX. We believe this is due to the impact these metrics have on valuation models such as the DCF. The explanation for the outperformance of the share price when the metrics have also improved over the holding period is interpreted to be due to low expectations

at announcement which exceeded during the spin-off period as well as the increased industry focus.

In terms of the study's limitations, the findings and analysis presented within the framework of this paper are mainly constrained by the limitations of available data for spin-offs in the Nordic region. With a more extensive dataset and larger sample sets, the paper could evaluate both the equity and operational performance development with greater detail and precision. As a supplement, additional data from the greater Baltic or European region could have been used for the analysis. This could however have distorted the comparability of the accounting statements between the different countries as, for example, smaller firms are not required to follow IFRS. Another issue is the dependency on Capital IQ for accuracy in our operating data. The data has not been manually collected, but rather downloaded from Capital IQ which makes it possible for certain measures not to be correctly categorized and not exhibit the actual performance development of the spin-off. However, this is accepted, as the errors would be consistent across the entire sample set. The consistency also enables us to create a custom benchmark with the same data, and as such the errors are consistent across the entire sample and benchmark dataset. Lastly, issues regarding the explanatory value of our results limits the cause-effect relationship between potential drivers of observed operational performance improvements. As there are low $R^2$ values for most of regression tests, the explanations for the performance improvement can be questioned.

There are several promising areas in which future research could converge. First, by using the same sample set of spin-offs and their underlying operations, future research could focus on only studying a certain factor that may drive the performance improvement; this could be information asymmetry or the thorough investigation of the aspect of industrial focus from a Nordic perspective. Second, there is room to expand on the findings and study qualitative decision factors for a spin-off case study in the Nordic region and follow the operational improvement when industry adjusted. A third, area could expand on this thesis by adding a regional study comparing Nordic to European spin-offs and thereby gain better explanatory power in the key factors associated with operational improvements and stock price development. Furthermore, given the negative impact on spin-offs from Norway in our findings, it could merit a case study on Norwegian spin-offs to understand the negative development. Lastly, current spin-off studies only include public divestitures, where a study comparing private to public divestitures would expand on current literature and reduce current limitations.

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# Appendix A

# Supporting figures

**Table A.1**: Supporting event study results - operational metrics vs index

This table represents the effects of spin-offs on operational performance measures across two years before and four years after the spin-off. The mean effect represents an equally weighted and winsorized average of the company's abnormal operational performance. Abnormal operational performance is the difference between the spin-off company and the industry benchmark. Year 0 is defined as the fiscal year of the spin-off. In parenthesis is the t-statistic value for significance test against zero. "Before spin-off" shows the mean effect for a group of years [-2, -1], and "After Spin-off" reports the average for fiscal years at and after the spin-off year [0,4]. "N" for annual measures represents the number of companies used in the estimation; "N" for before and after is the number of data points each year. "Diff." reports the difference between the average effect before and after the spin-off event.

| **Year from split** | **-2** | **-1** | **0** | **1** | **2** | **3** | **4** | **Avg. Before** | **Avg. After** | **Diff.** |
|---|---|---|---|---|---|---|---|---|---|---|
| **ROA** | | | | | | | | | | |
| Mean Effect | -0.14*** | -0.14*** | -0.13*** | -0.08*** | -0.15*** | -0.11*** | -0.13*** | -0.14*** | -0.12*** | 0.02 |
| *t-statistic* | -7.71 | -6.28 | -7.84 | -5.48 | -7.11 | -4.53 | -4.55 | -9.66 | -12.87 | |
| *N* | 83 | 92 | 106 | 98 | 88 | 87 | 76 | 175 | 455 | |
| **ROE** | | | | | | | | | | |
| Mean Effect | 0.03 | -0.04* | -0.05** | -0.04 | -0.02 | -0.03 | -0.03 | -0.01 | -0.03*** | -0.02 |
| *t-statistic* | 1.15 | -1.73 | -2.00 | -1.39 | -0.87 | -1.14 | -1.00 | -0.53 | -2.93 | |
| *N* | 80 | 90 | 103 | 96 | 86 | 86 | 75 | 170 | 446 | |
| **Chg. In Debt** | | | | | | | | | | |
| Mean Effect | | -0.13 | 0.06 | 0.13 | 0.03 | 0.06 | 0.07 | -0.13 | 0.07 | 0.20 |
| *t-statistic* | | -1.22 | 0.50 | 0.90 | 0.34 | 0.74 | 0.95 | -1.22 | 1.46 | |
| *N* | 0 | 74 | 79 | 76 | 67 | 67 | 54 | 74 | 343 | |
| **Chg. In CAPEX** | | | | | | | | | | |
| Mean Effect | | 0.21 | 1.01** | 0.17* | 0.06 | 0.95** | 0.19* | 0.21 | 0.50*** | 0.29 |
| *t-statistic* | | 1.54 | 2.33 | 1.77 | 0.59 | 2.20 | 1.89 | 1.54 | 3.66 | |
| *N* | 0 | 74 | 83 | 81 | 69 | 69 | 56 | 74 | 358 | |
| **Chg. SG&A[1])** | | | | | | | | | | |
| Mean Effect | | 0.04 | 0.13*** | 0.13*** | 0.00 | 0.10*** | 0.21*** | 0.04 | 0.11*** | 0.07 |
| *t-statistic* | | 0.84 | 2.75 | 3.90 | 0.02 | 3.64 | 3.98 | 0.84 | 6.28 | |
| *N* | 0 | 78 | 91 | 83 | 75 | 72 | 63 | 78 | 384 | |

*1) Chg. in SG&A is not compared to an industry benchmark | *:10% significance | **:5% significance | ***:1% significance*

# Appendix B

# Formulas

## B.1 Event study on equity returns

Market model specification for joint normality of asset returns, model is specified as,

$$R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it} \tag{B.1}$$

with $E(\epsilon_{it} = 0$ and $(\epsilon_{it}) = \sigma^2_{\epsilon_t}$

Where $R_{it}$ and $R_{mt}$ are respective period-t returns on security $i$ and the market benchmark. $\epsilon_{it}$ is the disturbance term, with an expected zero value. $\alpha_i$ + $\beta_i$ and $\sigma^2_{\epsilon_t}$ are parameters for the market model.

Parameters for market model for abnormal returns estimation:

$$AR_{i\tau} = R_{i\tau} - \hat{\alpha_i} - \hat{\beta}_i R_{m\tau} \tag{B.2}$$

.

Abnormal returns jointly normally distributed and with a zero conditional mean and conditional variance as:

$$\sigma^2_{AR_{i\tau}} = \sigma^2_{\epsilon_{i\tau}} + 1/L_1[1 + (R_{m\tau} - \hat{\mu_m}^2)/\hat{\sigma}^2_m] \tag{B.3}$$

where $L_1$ is the length of the estimation period.

Estimation of cumulated abnormal returns:

$$CAR_i(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} AR_{i\tau} \tag{B.4}$$

.

Independence of CAR observations, formal definition:

$$CAR_i(\tau_1, \tau_2) \sim N(0, \sigma_i^2(\tau_1, \tau_2)) \tag{B.5}$$

.

CAR model inferences on cumulative abnormal returns with no clustering, no overlap in the event windows and independence across securities:

$$\overline{CAR}(\tau_1, \tau_2) \sim N[0, var(\overline{CAR}(\tau_1, \tau_2))] \tag{B.6}$$

.

CAR model test, given conditions from B.6, are fulfilled:

$$\Phi_1 = \frac{\overline{CAR}(\tau_1, \tau_2)}{var(\overline{CAR}(\tau_1, \tau_2))^{\frac{1}{2}}} \tag{B.7}$$

where, N spin-off events aggregated abnormal returns for period $\tau$ are defined as

$$\overline{AR_\tau} = \frac{1}{N} \sum_{i=1}^{N} AR_{i\tau} \tag{B.8}$$

with variance for a large event window as

$$var(\overline{AR_\tau}) = \frac{1}{N^2} \sum_{i=1}^{N} \sigma_{\epsilon_1}^2 \tag{B.9}$$

$$\overline{CAR}(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} \overline{AR}_\tau \tag{B.10}$$

$$var(\overline{CAR}(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} var(\overline{AR}_\tau) \tag{B.11}$$

.

## B.2 Operational metrics event study formulas

Company weight defined as:

$$w_k = \frac{R_k}{\sum_{n=k_1}^{k_n} R_n} \tag{B.12}$$

.

Index for any given period, is constructed as a product between vector of individual company sales in total index subset sales, with corresponding operational metric:

$$\omega_i = [w_{k_1}, w_{k_2}, w_{k_3} ... w_{k_{n-1}}, w_{k_n}] \tag{B.13}$$

$$I_{op}(\tau_{t-2}, \tau_{t+3}) = \sum_{n=k_{\tau_1}}^{k_{\tau_n}} \omega_n OP_n \tag{B.14}$$

.

Aggregation matrix:

$$\Delta_i = [\Delta_{OP_{\tau_1}}, \Delta_{OP_{\tau_2}} ... \Delta_{OP_{\tau_{n-1}}}, \Delta_{OP_{\tau_n}}] \tag{B.15}$$

Index construction with applied aggregation:

$$\Delta_i = [\Delta OP_{(\tau_1,\tau_2)}, \Delta OP_{(\tau_2,\tau_3)} ... \Delta OP_{(\tau_{n-2},\tau_{n-1})}, \Delta OP_{(\tau_{n-1},\tau_n)}] \tag{B.16}$$

# Appendix C

# Descriptive statistics

**Table C.1**: Observations by industry and announcement year

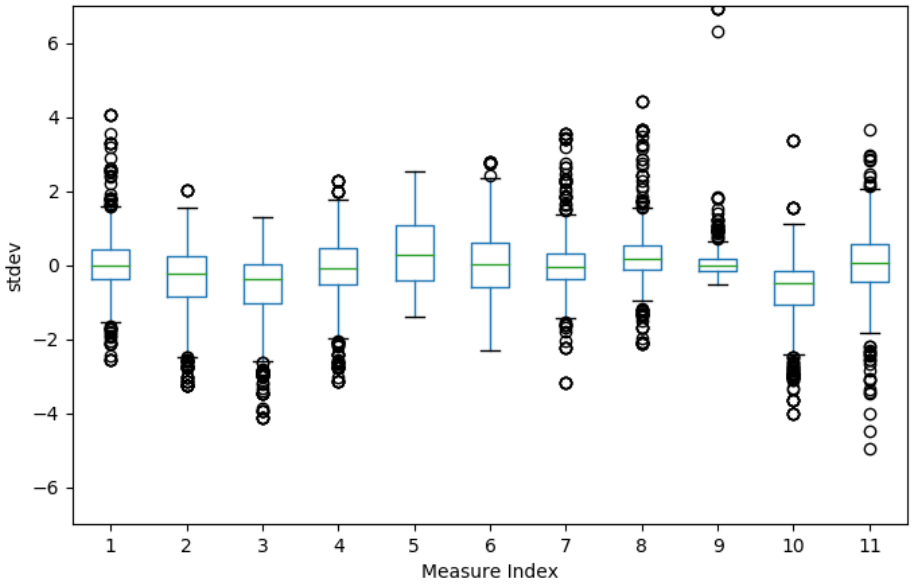
The table shows the distribution of the selected spin-off sample across GSIC industries and calendar years. Each value is either one of, or both the parent and the spun-off entity affected by the spin-off.

| **Industry** | **'98** | **'99** | **'00** | **'01** | **'03** | **'04** | **'05** | **'06** | **'07** | **'08** | **'10** | **'11** | **'12** | **'13** | **'14** | **'15** | **'16** | **'17** | **Total** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Communication Services* | | | | | | | | | | | 1 | | | | | | | | 1 |
| *Consumer Discretionary* | | | | 1 | 1 | | 2 | 3 | 1 | | 1 | | | | 2 | | 1 | | 12 |
| *Consumer Staples* | | 1 | | | | | | | 2 | | | | | | | | | 1 | 4 |
| *Energy* | | | | | 1 | | | 1 | 1 | | | 2 | | | 2 | | | 2 | 9 |
| *Financials* | 1 | | 3 | | | | 1 | 1 | | | | 1 | 2 | | | | | | 9 |
| *Health Care* | 2 | 2 | | | | 1 | 1 | | 2 | 1 | | | 2 | | | | 4 | 2 | 17 |
| *Industrials* | 3 | 1 | 1 | 2 | | 7 | 2 | 2 | 3 | | | 2 | 1 | 6 | | 1 | 2 | 4 | 37 |
| *Information Technology* | | 1 | 1 | 3 | | | | | 2 | | | 1 | | 1 | | 4 | | | 13 |
| *Materials* | | 1 | | | 2 | | | | 1 | | | | | | | | | 1 | 5 |
| *Real Estate* | | | | | | 2 | | | | | | | | | | | | | 2 |
| *Utilities* | | | | | 1 | | | | | | | | | | | | | | 1 |
| ***Total*** | **6** | **6** | **5** | **6** | **5** | **10** | **6** | **7** | **12** | **1** | **2** | **6** | **5** | **7** | **4** | **5** | **7** | **10** | **110** |

**Table C.2**: Observations by country and announcement year

| Year | Sweden | Finland | Norway | Denmark | Total |
|---|---|---|---|---|---|
| *1998* | 6 | 0 | 0 | 0 | 6 |
| *1999* | 2 | 1 | 1 | 2 | 6 |
| *2000* | 1 | 4 | 0 | 0 | 5 |
| *2001* | 3 | 0 | 3 | 0 | 6 |
| *2003* | 1 | 2 | 2 | 0 | 5 |
| *2004* | 6 | 2 | 0 | 2 | 10 |
| *2005* | 4 | 1 | 1 | 0 | 6 |
| *2006* | 6 | 0 | 1 | 0 | 7 |
| *2007* | 6 | 0 | 6 | 0 | 12 |
| *2008* | 1 | 0 | 0 | 0 | 1 |
| *2010* | 2 | 0 | 0 | 0 | 2 |
| *2011* | 2 | 2 | 2 | 0 | 6 |
| *2012* | 5 | 0 | 0 | 0 | 5 |
| *2013* | 2 | 4 | 1 | 0 | 7 |
| *2014* | 2 | 0 | 2 | 0 | 4 |
| *2015* | 2 | 3 | 0 | 0 | 5 |
| *2016* | 7 | 0 | 0 | 0 | 7 |
| *2017* | 8 | 0 | 0 | 2 | 10 |
| ***Total*** | **66** | **19** | **19** | **6** | **110** |

**Figure C.1**: Operational measures volatility



This table reports the descriptive statistics of operational measures. "Measure" specifies the operating measure as per CFA's standard definition and are computed using Capital IQ data. Values in parenthesis reference the measure index in the figure C.1. "Bench." specifies the benchmark used to evaluate the mean effects which is either "Industry" (uses a constructed benchmark which is described in the methodology) or "Price" which is the stock price index. Measures are calculated as either the change between two years or as a comparison between the same year's values.

| **Measure** | **Bench.** | **Mean** | **Min** | **Max** | **10th** | **25th** | **Median** | **75th** | **90th** | $\sigma$ | **SE** | **N** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Sales Growth (1)* | *Industry* | 0.027 | -0.802 | 1.272 | -0.297 | -0.120 | -0.007 | 0.127 | 0.403 | 0.315 | 0.014 | 485 |
| *ROIC (2)* | *Industry* | -0.045 | -0.384 | 0.236 | -0.197 | -0.100 | -0.027 | 0.028 | 0.083 | 0.118 | 0.005 | 626 |
| *ROA (3)* | *Industry* | -0.127 | -0.818 | 0.259 | -0.400 | -0.205 | -0.078 | 0.004 | 0.054 | 0.199 | 0.008 | 630 |
| *ROE (4)* | *Industry* | -0.025 | -0.701 | 0.508 | -0.302 | -0.119 | -0.017 | 0.104 | 0.249 | 0.223 | 0.009 | 616 |
| *Gross Margin (5)* | *Industry* | 0.082 | -0.322 | 0.584 | -0.226 | -0.095 | 0.065 | 0.252 | 0.430 | 0.232 | 0.009 | 636 |
| *EBITDA Margin (6)* | *Industry* | 0.002 | -0.306 | 0.366 | -0.173 | -0.077 | 0.003 | 0.080 | 0.173 | 0.132 | 0.005 | 612 |
| *Debt Change (7)* | *Industry* | 0.033 | -2.832 | 3.160 | -0.889 | -0.353 | -0.042 | 0.288 | 0.958 | 0.895 | 0.044 | 417 |
| *SG&A (8)* | *Zero* | 0.100 | -0.781 | 1.609 | -0.274 | -0.051 | 0.059 | 0.196 | 0.502 | 0.366 | 0.017 | 462 |
| *CAPEX (9)* | *Industry* | 0.449 | -1.266 | 17.224 | -0.676 | -0.383 | -0.024 | 0.404 | 1.337 | 2.395 | 0.115 | 432 |
| *CFO / Assets (10)* | *Industry* | -0.201 | -1.145 | 0.957 | -0.615 | -0.304 | -0.144 | -0.044 | 0.066 | 0.285 | 0.011 | 651 |
| *Stock price change (11)* | *Price* | 0.173 | -0.929 | 4.029 | -0.415 | -0.187 | 0.105 | 0.361 | 0.713 | 0.632 | 0.029 | 471 |

**Table C.3**: Descriptive statistics on the operation measures

# Appendix D

# Definitions

| Measure | Description | Data Source |
|---|---|---|
| Gross margin | Is calculated as difference between sales and the cost of sales (e.g. the cost of goods or services sold over a given period) | Capital IQ |
| ROA | Return on assets is an economic performance and profitability ratio calculated as net income divided by an average of total assets between two fiscal years | Capital IQ |
| ROE | Return on equity is an economic performance profitability ratio calculated as net income divided by average book value of total equity between two fiscal years. | Capital IQ |
| OCF | Cash flow from operations, is the net amount of cash obtained from operating activities over a fiscal year. | Capital IQ |
| ROIC | Return on invested capital is calculated as NOPAT (net operating income after tax, which is equal to sales less operating costs and theoretical taxes) divided by Invested Capital (fixed assets plus non-cash current assets less short term payables). | Capital IQ |
| Assets | Total (net) assets are calculated as Total Equity plus Net Debt (which excludes excess cash) | Capital IQ |
| OCF/ Assets | OCF/Assets is calculated as OCF (cash flow from operations divided by Assets | Capital IQ |
| SG&A | Sales General and Administrative Expenses | Capital IQ |
| R&D | Research and Development Expenses | Capital IQ |
| EBITDA | Earnings before interest, taxes, depreciation, and amortization | Capital IQ |
| Leverage | Total Assets divided by Total Equity; specified in this form as a component of DuPont five factor model | Capital IQ |

Key source: CFA standard definitions as per Robinson et al. (2009)

**Table D.1**: Key metrics definitions