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Do spin-offs create shareholder value? The Nordic context

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Abstract

This thesis investigates the magnitude- and determinant factors of the short-term abnormal returns upon announcing voluntary corporate spin-offs. The sample consists of 88 completed Nordic spin-off transactions, announced between 2001 and 2021. The sources of the abnormal returns considered are (1) increased business focus, (2) relative size of the spin-off and (3) level of information asymmetry. An event study is conducted, revealing a positive and significant 3-day abnormal return for the full sample of 3.11%. Moreover, we find significant abnormal returns in the month before the formal announcement, which suggests information leakages. The results also show significantly larger positive wealth effects for focus-increasing and large spin-offs, while no evidence supports decreased information asymmetry as a determinant factor of the abnormal returns. A cross-sectional regression confirms the positive wealth effects associated with the relative size of the spin-off but weakens the explanatory value of the business focus variable.

Keywords: Corporate restructuring, Spin-off, Event study, Abnormal return
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1. Introduction

Corporate restructuring is a fundamental part of the competitive landscape and entails maximizing shareholder value by seeking the optimal combination of a set of strategic business units. When restructuring operationally, firms can choose between expanding and divesting. While expansion allows for growth by capturing new markets and realizing positive synergies, divestments are rather undertaken to streamline operations (Duhaime & Grant, 1984). As firms grow in size, the relative importance of trimming the tree increases. At a certain tipping point, economies of scale become diseconomies of scale and diversification becomes an inefficient allocation of capital. For example, the 1960s merger wave especially saw an increased conglomeration in the U.S with acquisitions of unrelated businesses that increased diversification. But starting in the 1970s, lacking operational performance caused many of these conglomerate mergers to be reversed through divestments (Porter, 1987).

The increased desire to focus on the core business established a breeding ground for research on divestitures in general, and spin-offs in particular. A spin-off is a unique divestment transaction as it neither involves any capital inflow nor any negotiations with other companies. Instead, a spin-off implies a separation of a multi-segmented parent company through a pro-rata distribution of the shares in a subsidiary, after which the business unit is listed as a separate company with an identical ownership structure to that of the parent (Tübke, 2004).

This paper seeks to examine the short-term abnormal returns of spin-off announcements in a Nordic context. The foundational event studies of such were all published in the 1980s in America. Hite & Owers (1983) and Schipper & Smith (1983) examined various samples of U.S spin-offs and discovered a substantial abnormal share price gain of around 3% upon announcing the intent to separate a business unit. Subsequent research has been nearly unanimous in that spin-off announcements generate positive abnormal returns, where increased business focus and decreased information asymmetries have been identified as two common sources. Meanwhile, the amount of spin-offs completed has been on a steady rise globally. In 2021, some of the most historically successful conglomerates - General Electric, Johnson & Johnson and Toshiba - all decided value is maximized by splitting their respective empires into several, more niched firms (Dowd, 2021).

Spin-offs have also become more frequent in a Nordic context. For example, Metso spun off Valmet in 2013, and in 2016, SCA listed its hygiene business, Essity. In 2017, Autoliv announced the separation of Veoneer, while Atlas Copco departed with Epiroc. In 2018, MTG and Schibsted spun off NENT and Adevinta, respectively, while Danish freight giant Maersk listed its oil drilling division, Maersk Drilling. Despite the increased popularity, the pool of existing research is heavily skewed towards American spin-offs. Only a few peer-reviewed studies have focused on the Western European markets. Even fewer study Nordic spin-offs specifically, and the ones recently published have all been conducted on a bachelor's or master's level with most of them focusing solely on Swedish transactions. Thus, there is room for an up-to-date, comprehensive study on the spin-off announcement effects in the Nordics.

The main contribution of this thesis is adding to a very limited pool of research in the Nordics regarding how existing shareholders are affected by a spin-off decision. Furthermore, we hope to bring clarity to external analysts in their evaluation of potential spin-off targets and provide managerial insight into the strategic process of organizing a set of business units. This is achieved by answering mainly two research questions: 1) Do spin-off announcements yield any significant positive wealth effects in the Nordic context? and 2) If found, what potential factors could explain any short-term abnormal returns?

The structure of the paper is as follows: Section two, "Literature review", presents relevant theory, provides a walkthrough of empirical evidence from previous research and introduces potential determinant factors explaining the abnormal returns of spin-off announcements. Section three, "Method", outlines the design of the study, while section four, "Data", introduces the sample. Section five, "Result and Discussion", presents the findings from the statistical tests and considers their implications. Finally, section six, "Conclusions", highlights the central outcomes, contributions and limitations of the study.

2. Literature review

This section starts by defining different types of divestments. After that, the efficient market hypothesis is introduced, before empirical evidence from previous research on the abnormal returns of spin-off announcements is presented. This is followed by a walkthrough of determinant factors behind the abnormal returns, after which the hypotheses are summarized.

2.1 Definitions of different divestment techniques

There are mainly four types of divestitures, and while they all imply an immediate decrease in firm size, they have different implications. A *sell-off* (or *hive-off*) is simply an asset sale, including entire subsidiaries, to an external party, typically full-cash transactions. An *equity carve-out* also raises capital by partially selling shares in a subsidiary to external investors through an IPO, with the parent firm typically maintaining a controlling interest. A *spin-off*, however, is a non-cash transaction, where shares in an existing or newly created subsidiary are distributed to existing shareholders in the parent company on a pro-rata basis. This entails an initially identical ownership structure to that of the parent and thus, a shareholder in the parent company owns shares in both entities after the transaction. Moreover, spinning off a business unit implies that assignable assets are transferred to the new firm and a consequent asset-base reduction in the parent. A *split-off* is similar to a spin-off, the only difference being that shareholders must exchange their shares in the parent firm for shares in the new entity (Tübke, 2004).

This thesis focuses exclusively on spin-offs. The exclusion of other transactions is primarily because of our desire to focus solely on operationally strategic motives for pursuing divestments. Because of their added financial motives, this naturally excludes cash-raising divestments such as sell-offs and carve-outs, while split-offs are excluded because of lacking empirical evidence.

2.2 Efficient market hypothesis

In essence, this paper studies the effects of a firm announcing new information to the market. Here, the efficient market hypothesis (EMH) provides explanatory value. The hypothesis dates back to the work of Eugene Fama (1970), who concluded that stocks always trade at their fair value, meaning that all available information is reflected in the share price. Semi-strong efficiency is a common modification that implies all *public* information is reflected in the current share price. An implication is that stock prices rapidly react when new information becomes publicly available, such as the announcement of a spin-off. Even though the spin-off might take several months to finalize, investors immediately adjust their expectations and the potential value creation is thus reflected in the share price reaction. Naturally, to conduct an event study on the wealth effects of spin-offs, assuming semi-efficient markets is crucial.

To find the event date and the consequent share price reaction, we look at the *first announcement when any information about the spin-off becomes public,* in line with the foundational research of Hite & Owers (1983). The first announcement of intent is the most information-critical since spin-offs, unlike other corporate restructurings, do not rely on a third-party buyer or seller. This means that the parent firm is in full control of the transaction's completion, pending approval from shareholders. Thus, an announcement of the board's proposal for an extraordinary general meeting to vote in favor of the spin-off, which is typically made weeks or months after the first announcement of intent, does not reveal significant new private information.

2.3 Previous research on spin-off announcement effects

The foundational papers on voluntary spin-off announcements were all published in 1983 in America. Hite & Owers (1983) studied 123 firms that announced spin-offs between 1963 and 1981 and found a cumulative average abnormal return (CAAR) of 3.30% over the interval -1 to 0, where day 0 was defined as the day of the first press release issued by the company showing intent to spin-off a business unit. Similaringly, Schipper & Smith (1983) found a CAAR of 2.84% [-1, 0] for their sample of 92 firms.

Announcement effects of equal magnitude have been discovered in the majority of studies published since (see table 2.1). For example, Desai & Jain (1999) looked at 155 U.S spin-off announcements between 1975 and 1991 and discovered a CAAR of 3.84% [-1, 1]. Veld & Veld-Merkoulova (2009) conducted a global meta-analysis on 26 spin-off event studies, where 20 came from the U.S. They found strongly significant 2- or 3-day CAARs that vary between 1.32% and 5.56% with a mean of 3.02%, the majority of event windows being [-1,1] but also [-1, 0] or [0, 1]. A recent publication by Owers & Sergi (2021) found a 3-day abnormal return of 3.06% [-1, 1] when they studied 249 spin-offs in the U.S between 2007 and 2017. Despite the research being heavily centered around American firms, similar announcement effects have been observed in the Western Europe markets. For example, Veld & Veld-Merkoulova (2004) studied 156 announcements between 1987 and 2000 where the majority came from the U.K, Germany, Italy and Sweden. The authors found a 3-day CAAR of 2.66% [-1, 1]. Likewise, Sudarsanam & Qian's (2007) European sample of 157 spin-offs from 1987 to 2005 shows a CAAR of 4.82% [-1, 1].

Table 2.1: Studies of spin-off announcement effects

This table presents cumulative average abnormal returns for various studies conducted in America and Europe. *Study* shows the name of the authors and the year of publication. *Market* describes the geographical focus of the study and *Period* refers to the time interval during which the spin-offs were announced. *Sample Size* is the number of spin-offs studied and *Event Window* denotes for which days the cumulative average abnormal return is calculated. CAAR refers to the cumulative average abnormal return. Asterisks indicate level of significance at 10% (*), 5% (**) and 1% (***).

Study	Market	Period	Sample Size	Event Window	CAAR (%)
Hite & Owers (1983)	U.S	1963-1981	123	[-1, 0]	3.30***
Schipper & Smith (1983)	U.S	1961-1983	92	[-1, 0]	2.84***
Miles & Rosenfeld (1983)	U.S	1962-1980	55	[0, 1]	3.34***
Desai & Jain (1999)	U.S	1975-1991	144	[-1, 1]	3.84***
Krishnaswami & Subramaniam (1999)	U.S	1979-1993	118	[-1, 1]	3.28***
Kirchmaier (2003)	Europe	1989-1999	48	[-1,1]	5.40***
Veld & Veld-Merkoulova (2004)	Europe	1987-2000	156	[-1, 1]	2.66***
Sudarsanam & Qian (2007)	Europe	1987-2005	157	[-1, 1]	4.82***
Owers & Sergi (2021)	U.S	2007-2017	249	[-1, 1]	3.06***

However, less conformity is found when looking at event windows before the announcement. Contrary to many other corporate restructurings such as M&A, spin-offs are intra-firm transactions which naturally excludes buyers or sellers. The only potential external actors that could be involved in the spin-off process are legal advisors, strategic consultants and banks. However, studying press releases, neither advisors nor banks are typically involved before the first announcement. Rather, the firm typically begins by simply stating an intent to spin-off a business unit in its first press release, before declaring it will begin a phase of strategic and legal work needed to implement the desired change. Hence, the risk for leakage of sensitive information before the first press release should be substantially smaller. In a semi-efficient market, share prices reflect publicly known information. Finding statistically significant excess returns for a period before day 0 is thus regarded as unlikely.

Indeed, early studies of Hite & Owers (1983) and Schipper & Smith (1983) disregarded researching such event windows. Contrarily, Miles & Rosenfeld (1983) find evidence showing spin-off announcements are preceded by a period of abnormal returns. Their 181-day study period [-120, 60] found a statistically significant CAAR of 22.1% where over half (13.6%) is created days -120 through -20. Krishnaswami & Subramaniam (1999), however, find no such indications with an insignificant CAAR of 1.56% [-30, -6]. In contrast, Veld and Veld-Merkoulova (2004) and Sudarsanam & Qian (2007) - who both study European spin-offs - find significant CAARs of 0.62% and 1.75%, respectively, for the event window [-10, -1]. The most peculiar finding comes from Kirchmaier (2003), who studied 48 European spin-offs showing a CAAR of 6.3% for the event window [-10, -1], significant on a 1% level.

Less research has been published on the Nordic markets specifically. Scheutz (1988) studied 13 Swedish spin-offs from 1983 to 1984 and found no significant excess returns. However, we find the study deficient as the sample is small and his chosen transactions would today rather be defined as equity carve-outs than spin-offs. Furthermore, Veld and Veld-Merkoulova (2004) published a subsample of 24 Swedish spin-offs from 1987 to 2000 that showed an insignificant 3-day CAAR of 0.82% [-1, 1]. The authors say the result is partly driven by Swedish banks spinning off property divisions that they were forced to acquire during the debt crisis of 1990-1994, which generally caused negative announcement reactions.

Despite lacking evidence in the Nordics, it seems a consistent finding across the last 40 years of publications that the announcing firm experiences cumulative abnormal returns of around 3% over the interval -1 to 1, as seen in table 2.1. Thus, we expect our sample of spin-off announcements in Sweden, Norway, Finland and Denmark to display significant wealth gains, as expressed in hypothesis 1.

→ H1: *Nordic spin-off announcements yield positive abnormal stock price reactions.*

2.4 Factors explaining the positive wealth effects of spin-offs

2.4.1 Increasing business focus

The most well-cited argument for pursuing spin-offs is the company's increased ability to concentrate on the core business instead of diversifying its resources across dissimilar business units. To begin, diversification has been shown to have a hampering effect on firm value. The phenomenon is known as the "conglomerate discount" and implies that the value of a group of unrelated business units is less than the sum of its parts. Berger & Ofek's (1995) valued business units on a stand-alone basis and found a 13-15% conglomerate value loss, while a more recent study by Khorana et al. (2011) found conglomerates trading at 10% lower valuation multiples than their purer peers. Pursuing focus-increasing spin-offs can thus unlock value by removing complexity and eliminating diseconomies of scale and scope. If mergers create value with positive synergies ("2 + 2 = 5"), spin-offs do so by removing negative ones, in line with a logic of "4 - 2 = 3". More specifically, value creation is achieved by, for example, 1) streamlining business models, 2) removing overhead expenses, 3) improving management control systems and/or 4) addressing corporate governance issues (Hite & Owers, 1983; Desai & Jain, 1999; Veld & Veld-Merkoulova, 2009).

By definition, cross-industry spin-offs - where parent and spin-off operate in different industries - remove diversification, and are thus deemed focus-increasing. This phenomenon was researched further when Daley et al. (1997) looked at standard industry classification (SIC) codes of 85 spin-offs between 1975 and 1994 in the U.S. If the SIC codes of the parent firm and spin-off diverged on a 2-digit level, the transaction was labeled cross-industry. 60 transactions were deemed focus-increasing and the subsample displayed a CAAR of 4.3% [0, 1]. The non-focus increasing 25 spin-offs showed an insignificant CAAR of 1.4%.

Subsequent papers applying the same methodology to determine the business focus find mostly conforming results. Desai & Jain (1999) found significant CAARs of 4.45% and 2.17% for the 103 focus-increasing spin-offs and the 41 non-focus-increasing spin-offs, respectively. Veld & Veld-Merkoulova (2004) concluded that the difference in CAAR between the 73 firms that completed focus-increasing spin-offs and the 35 that did not was 2.08%. However, the authors found business focus partly lost its significance in the cross-sectional regression when other variables such as information asymmetries, size and geographical focus were included to explain the abnormal returns. Thus, the authors are left confused about the variable's impact. Contrarily, Sudarsanam & Qian (2007) found the increased focus to have positive and significant coefficients in all of their regressions. In conclusion, as expressed in hypothesis 1a, we expect focus-increasing spin-offs to display higher excess returns.

→ H1a: *Firms that by undertaking a spin-off increase their business focus experience higher short-term abnormal returns.*

2.4.2 Size of spin-off

Following the arguments of increasing business focus and removing inefficiencies, the structural impact of the spin-off should depend on the portion of assets spun off. Accordingly, it seems intuitively appealing that the potential for abnormal returns should be higher if a larger part of the firm is divested. Previous research confirms this logic. Hite & Ower's (1983) study of 123 spin-offs showed a median divestment of 6.6%, after which they split the data set into one "large" and one "small" subsample. The median divestment for the large and small groups was 19.9% and 2.4%, respectively. Relatively large spin-offs had 2-day [-1, 0] excess returns of 5.2%, in comparison to the 0.8% of relatively smaller ones. Miles & Rosenfeld (1983) instead classify all divestments over 10% as "large", rendering 34 large and 21 small spin-offs in their sample of 55 securities. The large and small groups displayed a CAAR of 4.80% and 2.07% [-1, 1], respectively. However, this methodology can be questioned as the authors set the 10% cut-off point rather arbitrarily.

Krishnaswami & Subramaniam (1999), Veld & Veld-Merkoulova (2004) and Sudarsanam & Qian (2007) instead test the relative size of the spin-off as a continuous variable. All studies found with significance that abnormal return is positively related to the size spun off in their respective regressions, where multiple other variables were included. As expressed in

hypothesis 1b, we also expect the relative size of the spin-off to be a source of the abnormal returns.

→ H1b: *Firms that divest a relatively larger part of their business through a spin-off will experience higher short-term abnormal returns.*

2.4.3 Decreasing information asymmetry

Beyond increasing the focus of remaining operations, firms can separate business units to mitigate information asymmetries between themselves and the market. In contract theory, asymmetrical information is defined by one party having more or better information than the other, causing power imbalance and inefficiencies in transactions (Akerlof, 1970). Albeit a complex organizational structure can be unambiguous for management, the composition and co-existence of multiple business units risk causing obscureness for external parties. The asymmetrical information creates uncertainty for investors and hampers their ability to fairly estimate the firm's market value. If the true value is misconceived, one significant implication of external undervaluation is the constraint it places on raising capital. Undertaking a spin-off immediately removes parts of the asymmetries as the listing process forces the disclosure of key information of the business unit, such as financial statements and governance structures (Habib et al., 1997).

Krishnaswami & Subramaniam (1999) were the first to test whether information asymmetries have explanatory value in motivating spin-off decisions and explaining potential announcement wealth gains. They developed multiple variables for information asymmetry, including the standard deviation of forecasted earnings from equity analysts, based on data from the Institute of Brokerage for Investment Services (IBES). First, the authors prove that information asymmetries predict future spin-off activity. Furthermore, the authors argue that only undervalued firms have an incentive to pursue spin-offs. On this note, Mazur (2015) adds that almost 60% of spin-offs reported "business undervaluation" as a motive in their filings to the U.S Securities and Exchange Commission (SEC). As the true value is disclosed, Krishnaswami & Subramaniam (1999) hypothesize spin-off wealth gains should be positively related to the level of asymmetries perceived, which their results confirm. However, Veld & Veld-Merkoulova (2004) did not find any such positive correlation in their European sample. Despite their findings, we expect the level of asymmetries found to be a source of abnormal returns, as displayed in hypothesis 1c.

→ H1c: *The level of information asymmetries perceived at the parent company is positively related to short-term abnormal returns.*

2.4.4 Other factors

There exist several other potential sources of spin-offs' abnormal returns. However, the factors listed below are beyond the scope of this thesis but should be presented to and considered by the reader anyhow.

Investor sentiment: IPO volume has been shown to fluctuate significantly depending on the investor sentiment, creating hot and cold issue markets (Lowry, 2003; Helwege & Liang, 2004; Ljungqvist et al., 2006). Similaringly, Sudarsanam & Qian (2007) propose a catering theory where managers cater to investor sentiment and demand for corporate focus when undertaking spin-offs. They found a positive association between the prevailing market demand for business focus and spin-off announcement excess returns.

Lenient taxation: Contrary to sell-offs where capital gains are subject to taxation, spin-offs are tax-exempt transactions if certain requirements are fulfilled, depending on the country. Krishnaswami & Subramaniam (1999) find that taxed spin-offs have 2-day CAARs of 1.21% whereas untaxed spin-offs returned 3.43%. In Sweden, the introduction of lex Asea in 1991 allowed for tax-free spin-offs if 1) the parent firm is listed, 2) shares are distributed on a pro-rata basis and 3) 100% of the subsidiary is divested (Skatteverket, 2011). Denmark has adopted the EU Merger Directive that removes tax obstacles for spin-offs. In Norway and Finland, most spin-offs are tax-exempt but rely on approval from tax authorities (Taxand, 2018).

Growth through M&A: Mazur (2015) states business units are inhibited to grow through acquisitions if they are part of conglomerates. The author argues a spin-off has enhanced M&A opportunities as it can use its newly issued stock as an "acquisition currency". The main arguments are that the strategic fit becomes easier with a same-industry, pure-play peer and that potential M&A targets would be more inclined to accept its stock as payment instead of that of a diversified, multi-segment firm. In a sample of 151 U.S spin-offs between 1992 and 2005, Mazur (2015) concludes that the average spin-off makes five acquisitions in the first five years after its listing, which is more than the average IPO.

2.5 Hypotheses

In light of theory and previous research results, the following hypotheses are presented. H1 explores the fundamental research question, while H1a, H1b and H1c examine determinant factors of potential abnormal announcement returns.

H1: *Nordic spin-off announcements yield positive abnormal stock price reactions.*

H1a: *Firms that by undertaking a spin-off increase their business focus experience higher short-term abnormal returns.*

H1b: *Firms that divest a relatively larger part of their business through a spin-off will experience higher short-term abnormal returns.*

H1c: *The level of information asymmetries perceived at the parent company is positively related to short-term abnormal returns.*

3. Method

The fundamental research methodology employed in this study is the Event Study Methodology (ESM), outlined by MacKinlay in 1997. Consistent with previous studies, the ESM is used to examine what impact a spin-off announcement has on the share price. To test the announcement effect, we begin using statistical t-tests for the full sample and the subsamples - which are divided based on the explanatory variable in question - for multiple event windows. After that, the explanatory variables are examined concurrently through a cross-sectional regression.

3.1 Event Study

Given the efficient market hypothesis (Fama, 1970), the effect of a spin-off will immediately be reflected in the share price when a firm reveals the corresponding information. Hence, the impact on shareholder value can be measured by studying the share price at the time around this event.

As common practice, the period of interest - the event window - is expanded to multiple trading days to capture price effects before and after the specific event date. The time prior to the announcement is of interest as information may leak. However, the risk of information leakages is considered to be relatively low compared to interfirm deals such as mergers or asset sales, as spin-offs are internal transactions. Furthermore, the time following the event is of interest as abnormal returns may be lingering, i.e the market may not quickly incorporate the information.

Examining the impact of the announcement requires a measure of abnormal return (AR). AR is defined as the difference between actual- and expected return for each day in the event window for a given security, where the expected return is estimated with the use of the market model as specified in equation (1):

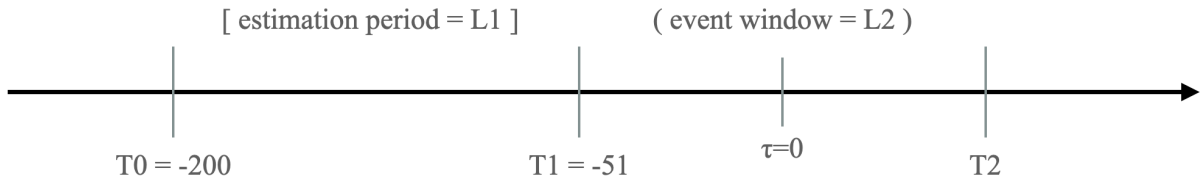
$$(1)\ R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

$$E(\varepsilon_{it} = 0)$$

$$var(\varepsilon_{it}) = \sigma^2_{\varepsilon_i}$$

The market model allows for determining the anticipated daily returns of a share price in relation to the market portfolio. R_{it} and R_{mt} are the t-period returns on stock *i* and the market respectively. The coefficient α_i is the ordinary least squares linear regression estimate of the intercept and β_i is the ditto of the slope. ε_i is the zero mean disturbance term. The coefficients are estimated with the use of daily returns for the stock price against its corresponding index over the 150 days estimation period (Hite & Owers, 1983), from τ = -200 to τ =-51 (see figure 3.1). Separate country broad-based stock indexes are used as proxies for the market portfolio. Although a single Nordic index would be preferable, the Nordic capital markets are not fully integrated and the use of a Nordic index may introduce noise (Veld & Veld-Merkoulova, 2004). The indexes used are OMX Stockholm Price Index (OMXSPI), Oslo Börs All-Share Index (OSEAX), OMX Helsinki All-Share Index (OMXHPI) and OMX Copenhagen All Shares Index (OMXCPI). For the market model to be applicable, asset returns are assumed to be jointly multivariate normally-, identically- and independently distributed through time.

Figure 3.1: Estimation period and event window



To calculate AR, the predicted return is subtracted from the actual return for each day in the event window, as expressed in equation (2). The abnormal return is under H0, conditional on the market returns in the event window, jointly normally distributed with a zero conditional mean - as specified by equation (3) - and a conditional variance, as expressed in equation (4).

$$(2) \qquad AR_{i\tau} = R_{i\tau} - (\widehat{\alpha_i} + \widehat{\beta_i} R_{m\tau})$$

$$(3) \qquad AR_{i\tau} \sim N(0, \sigma^2(AR_{i\tau}))$$

$$(4) \qquad \sigma^2(AR_{i\tau}) = \sigma^2_{i\varepsilon} + \frac{1}{L1}\left[1 + \frac{(R_{m\tau} - \widehat{\mu}_m)^2}{\widehat{\sigma}^2_m}\right]$$

Given that the estimation period (L1) is relatively large, the second component of equation (4) - the sampling error - can be assumed to be zero. Thus the variance of AR can be assumed to be equal to the variance of the disturbance term. To analyze the data and draw conclusions, ARs are aggregated along two dimensions; through time and across securities. As specified in equation (5), the cumulative abnormal return (CAR) is the sum of abnormal returns for the individual security over the event window from τ_1 to τ_2 where $T_1 < \tau_1 \leq \tau_2 \leq T_2$ (for reference, see figure 3.1). As specified in equation (6), the cumulative average abnormal return (CAAR) is the mean CAR for multiple securities. Similar to the AR, CAR and CAAR under H0 are both assumed to be normally distributed.

$$(5) \qquad CAR_i(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} AR_{i\tau}$$

$$Var(CAR_i(\tau_1, \tau_2)) = \sigma_i^2(\tau_1, \tau_2) = (\tau_2 - \tau_1 + 1)\ \sigma_{\varepsilon_i}^2$$

$$CAR_i(\tau_1, \tau_2) \sim N(0, \sigma_i^2((\tau_1, \tau_2))$$

$$(6) \qquad CAAR = \overline{CAR}(\tau_1, \tau_2) = \frac{1}{N}\sum_{i=1}^{N} CAR_i(\tau_1, \tau_2)$$

$$var(CAAR) = \frac{1}{N^2}\sum_{i=1}^{N} \sigma_i^2(\tau_1, \tau_2)$$

$$CAAR \sim N[0, \sigma^2(\overline{CAR}(\tau_1, \tau_2))]$$

The aggregation of CAR across securities assumes that there is no clustering, i.e the event windows of the included securities do not overlap. The absence of clustering entails zero covariance between securities which is necessary to make the distributional results presented applicable. Given the large time interval of this study relative to the size of the sample, it is plausible to assume that the impact of time clustering of events is negligible. The distributional assumptions in combination with the absence of clustering imply that the abnormal returns, across securities, will be independent.

Given the distribution of CAAR, it is possible to test H0. In the absence of abnormal returns, the expected value of CAAR is zero. Hence, a t-test can be performed to determine whether or not CAAR is significantly different from zero, as specified in equation (7):

$$(7) \qquad \theta_1 = \frac{CAAR_{(\tau_1,\tau_2)}}{var(CAAR_{(\tau_1,\tau_2)})^{1/2}} \sim N(0,1)$$

3.2 Variables and Regression

For the t-tests, the full sample is divided into two subsamples with regard to the variable in question; *business focus*, *relative size* and *information asymmetry*. The divisions are further explained below. Beyond the t-tests on CAAR for the whole- and subsamples, a cross-sectional regression is used to examine the relation between the degree of abnormal returns and characteristics specific to the event observation (MacKinlay, 1997). Cross-sectional regression is an appropriate tool when there are multiple hypotheses for the source of abnormal returns and is similar to the method used by Desai & Jain (1999) and Veld & Veld-Merkoulova (2004), for example.

$$CAR_i = \beta_0 + \beta_1 * FOCUS + \beta_2 * SIZE + \beta_3 * INFASYM + \beta_C * HOTTIME + \varepsilon$$

$$E(\varepsilon) = 0$$

Cumulative Abnormal Return (CAR) is the dependent variable and is the difference between actual- and expected return for a given event window and security. Cumulative Average Abnormal Return (CAAR) is the mean value of CAR for an aggregated sample of securities. The variables on the right-hand side are the explanatory- and control variables, further discussed below.

Business focus (FOCUS) - *Focus* is an explanatory dummy variable that shows whether or not the parent firm and spin-off operate in different industries. This is determined by looking at SIC codes of the parent firm and the newly spun-off entity when listed. In line with previous research, if divergence was found on a 2-digit level, the transaction was deemed as cross-industry (thus, focus-increasing) and given the number 1. We hypothesize in H1a that focus-increasing spin-offs yield higher abnormal returns compared to non-focus-increasing spin-offs.

Relative size of spin-off (SIZE) - *Size* refers to the percentage of the firm spun off by the parent firm and is proxied by the majority of research (e.g Hite & Owers, 1983; Veld &

Veld-Merkoulova, 2004) by the market capitalization of the spin-off relative to the sum of market capitalizations of the parent and the spin-off after its first day of trading:

$$SIZE = \frac{MV(E)_{Spin-off}}{MV(E)_{Parent} + MV(E)_{Spin-off}}$$

Size is regarded as explanatory and will be both a dummy variable and a continuous one. For the dummy variable used in the t-tests, spin-offs were divided based on the sample's median of 23% divested. Spin-offs with a size equal to or above 23% were classified as *large.* Consequently, spin-offs with a size less than 23% were classified as *small*. In line with hypothesis 1c, larger spin-offs are predicted to yield higher abnormal returns. One observation had to be excluded because of lacking data on market capitalizations.

Standard deviation of forecasts (INFASYM) - Similar to Krishnaswami & Subramaniam (1999) and Veld & Veld-Merkoulova (1999), the proxy for information asymmetry is the standard deviation of analyst earnings forecasts aggregated by the Institutional Brokers' Estimate System (IBES), showing analysts' deviation from a consensus (mean) forecast on net income for each parent firm. The authors argue disagreement among analysts indicates lacking business data and thus asymmetrical information between firm and market. We hypothesize in 1d that this independent variable should be positively related to abnormal returns. To gain comparability between observations, the measure is standardized using the *relative* standard deviation, which shows the ratio of the standard deviation to the mean earnings forecast, in absolute terms.

Forecast data was gathered for the last month of the fiscal year prior to the announcement as analysts tend to be overly optimistic at the beginning of the year and gradually revise the estimates downward as the year progresses (Krishnaswami & Subramaniam, 1999). Several observations had to be excluded because of insufficient analyst coverage, reducing the sample to 56 observations. Thus, we conclude a risk of this variable being biased towards larger firms with more widespread analyst coverage. A further downside of using the relative standard deviation is if the mean is close to zero. In such cases, the value of the relative standard deviation becomes exceptionally large. With the use of a conventional rule of thumb for data trimming, values above 1.5 interquartile range are excluded in the cross-sectional regression, resulting in a further reduction of sample size from 56 to 52.

Temperature of the spin-off market (HOTTIME) - To limit the influence of extraneous variables, we introduce the control variable *Hottime* which equals 1 if the spin-off is completed[1] during a year with an above-average number of spin-offs, and 0 if not. The calculations are based on the initial rather than the final sample, as the latter risks being affected by an oversampling of more recent transactions. Similar to Sudarsanam & Qian (2007), this dummy variable indicates the temperature of the divestiture market and proxies investor sentiment. It is used to control for announcement effects of such instances where the spin-off decision was purely time-motivated and driven by positive economic sentiment.

[1] Although the year of the announcement is preferable, the correct announcement date - in contrast to the year of completion - is not available for all observations in the initial sample. Hence, to reduce the impact of the availability bias, the proxy for investor sentiment is based on the year of completion.

4. Data

4.1 Data sources

The sample firms included are Nordic listed[2] companies that have formally announced, through a press release, and later on completed a pure, voluntary[3] spin-off. An initial data sample of 168 spin-off transactions in the interval of 2000 to 2021 was collected from tax authorities, stock exchanges, SDC Platinum and S&P Capital IQ. The initial 168 spin-offs included 130 Swedish, 24 Norwegian, 3 Danish and 11 Finnish transactions. Beyond enabling a larger data set, the clustering of transactions from the Nordics into one sample is reasonable because of several shared characteristics of the countries. First, the Nordic financial markets have historically been very robust and share common legal regulations. Second, the countries have macroeconomic and social similarities in education, healthcare and pensions (Nordic Council of Ministers, 2020). Third, the exchanges of Stockholm, Helsinki and Copenhagen are all gathered under Nasdaq Nordic which applies joint exchange regulation (Nasdaq, 2022).

As previously mentioned, the announcement date is defined as the date when the *first information* about a potential spin-off reaches the public.[4] To find the announcement date, we started with the dates listed in S&P Capital IQ or SDC Platinum. In some cases, there was a divergence between the date listed in the database and the true announcement date. Thus, to find the earliest publication, for each transaction we manually cross-checked the database-listed announcement date by back-tracking press releases on official company web pages, Cision News Portal and Globe Newswire for at least one year. For cases where the announcement date was not listed in S&P Capital IQ or SDC Platinum, we back-tracked press releases from the first day of trading for at least two years. Naturally, a manual process like this involves the risk of human error and the incorrect identification of the event date. However, we believe the methodology of cross-checking information to be the most suitable to combat the partial deficiencies of databases. The ability to precisely identify the date of an event is a crucial characteristic of a successful event study.

[2] Listed during the time of the spin-off announcement.
[3] Voluntary means the transaction was not a result of legal enforcement. We found no such cases in our sample.
[4] If the press release was made after the closing hours of markets, the announcement date is set to the subsequent trading day.

Historical prices for the shares and indices were collected from Nasdaq and Refinitiv Eikon. Market capitalizations of the two newly separated entities were gathered from Refinitiv Eikon, together with aggregated analyst forecast data from IBES. For industry classifications, historical SIC codes were compiled from S&P Capital IQ.

4.2 Final sample

For various reasons, all spin-offs in the initial data set were not included in the final sample. First, some companies announce the spin-off of several subsidiaries concurrently. For example, Securitas spun off Loomis, Securitas Direct and Securitas Systems all at once in 2006. Such transactions are treated as one single spin-off as the separate reactions are impossible to disentangle systematically. Second, spin-offs announcements that coincide with another major corporate action - such as reversed takeovers, mergers or seasoned equity offerings - are excluded to avoid confounding share price adjustments (Schipper & Smith, 1983)[5]. Third, spin-offs for which the announcement date could not accurately be determined were excluded. This was especially true for transactions made earlier in the time interval. Furthermore, firms with incomplete historical stock price data or too low liquidity that results in a deficient pricing resolution were also excluded.

Due to the extensive exclusion of data points, the final sample may be affected by an availability bias characterized by two factors: the passage of time and company size. This may result in an over-sampling of recent spin-offs and/or spin-offs conducted by large parent firms where press releases are easily found despite the first announcement occurring a long time ago.

Lastly, companies such as ABB or Swedish Match that have recently revealed the intent of - but not yet completed - a spin-off transaction are not included in the final sample. Although the intent has been published, it is cumbersome to collect all historical cases where the news was announced but the spin-off was ultimately aborted. To maintain consistency, only completed spin-offs are included. Therefore, the sample and the conclusions drawn from the consequent tests are characterized by a survivorship bias without uncompleted transactions.

[5] An alternative approach to treating spin-offs with coinciding corporate actions, applied by Hite & Owers (1983), is to create a separate subsample.

In conclusion, the sample was reduced from an initial 168 observations to a final 88 observations (see table 4.1). The exclusion of 80 spin-offs may appear excessive. However, we believe the degree of scrutiny is a way of dealing with the shortcomings of established databases and is what makes our final sample unique.

Table 4.1: Sample cleaning

The table presents the systematic removal of data points and the final sample's country distribution. The "Preliminary sample" is the total number of identified Nordic spin-offs in the period 2000-2021. The "Final sample" is the spin-off transactions on which this study is conducted. Spin-off transactions were excluded for four different reasons: 1) spin-offs that were announced concurrently from the same parent, 2) simultaneous major corporate actions that also affect the share price, 3) unclear or unidentifiable announcement date or 4) lacking share price information.

Preliminary sample	**n = 168**
Multiple spin-offs announced concurrently	-4
Simultaneous corporate action	-28
Unclear announcement date	-36
Lacking share price information	-12
Final sample	**n = 88**
of which are Swedish spin-offs	*60*
of which are Norwegian spin-offs	*18*
of which are Finnish spin-offs	*8*
of which are Danish spin-offs	*2*

4.3 Descriptive statistics

The distribution of the final sample across the study period shows that 2020 is the year with the most spin-off announcements, followed by 2017 and 2016 (see appendix A). One can also observe a significant decrease in activity during the financial crisis of 2008 and 2009. Studying the periods 2000-2010 and 2011-2021 in table 4.2, there is an increase of 22 announcements in the latter 10-year period. However, it is difficult to conclude whether this is caused by the aforementioned availability bias or by an increased market desire to

undertake spin-offs, or both. Finally, one can observe that Sweden has, throughout the length of the study, been by far the most active Nordic country.

Table 4.2: Announcements per year and per country

This table presents the sample distribution of the final sample by year horizontally and by country vertically. The final sample consists of the 88 Nordic spin-off transactions announced from 2001 through 2021.

Year	Swe	Nor	Fin	Den	**Total**	Year	Swe	Nor	Fin	Den	**Total**
2000					**0**	2011	2		1		**3**
2001	2				**2**	2012	2	1			**3**
2002	1				**1**	2013	4		2		**6**
2003	1	1			**2**	2014	1	1			**2**
2004	4	2			**6**	2015	4		1		**5**
2005	4		2		**6**	2016	6	1			**7**
2006	4	1			**5**	2017	6			1	**7**
2007	1	3			**4**	2018	2	2		1	**5**
2008			1		**1**	2019	2	2			**4**
2009	1	1			**2**	2020	6	2			**8**
2010	4				**4**	2021	3	2			**5**
‘00-‘10					**33**	‘11-‘21					**55**

Table 4.3 shows a breakdown of the final sample by industry. With a total of 24 spin-offs, industrial companies were the most frequently represented in the sample. This is reasonable given the overrepresentation of Swedish spin-offs, where many industrial companies are found. The second and third most represented industries were services and oil & mining, respectively. However, since 2-digit standard industry classifications (SIC) are broad, it is difficult to draw any further conclusions about a specific industry’s tendency to undertake spin-offs. For example, by SIC definition, parent firms ranked under “services” range from gambling and casino (Betsson, Unibet), staffing agencies (Poolia), cleaning services (HomeMaid) and security (Gunnebo, Securitas).

Table 4.3: Announcements per industry

This table presents the final sample's distribution by industry, and within each industry, the number of spin-offs is classified as either *focus-increasing* or *non-focus-increasing*. A spin-off is classified as *focus-increasing* if the SIC codes of the parent firm and the spun-off subsidiary diverged on a 2-digit level. Otherwise, it was classified as a *non-focus-increasing* spin-off.

Industry	**Total**	Focus	Non-focus
Oil & Mining	13	3	10
Construction	6	6	0
Pharmaceuticals & Chemicals	10	5	5
Industrials	24	13	11
Transportation & Energy	5	4	1
Wholesale & Retail	6	1	5
Real estate & Finance	10	6	4
Services	14	8	6
	88	46	42

5. Results and Discussion

The chapter begins with a presentation of results and corresponding statistical deductions for the fundamental research question; do spin-off announcements yield positive abnormal stock returns? Subsequently, to investigate sources of potential wealth gains, results are shown for the subsamples of the hypothesized explanatory variables; *business focus*, *relative size of spin-off* and *level of information asymmetry*. Lastly, cross-sectional regressions are presented together with tests of robustness. Results are discussed all throughout.

5.1 Hypothesis 1

→ *Nordic spin-off announcements yield positive abnormal stock price reactions.*

In Table 5.1, average cumulative abnormal returns for various event windows are presented. The full sample of 88 observations displays event day and 3-day [-1, 1] abnormal returns of 2.98% and 3,11% respectively, both at 1% level of significance. Thus, the hypothesis that Nordic spin-offs yield positive abnormal stock price reactions upon announcement is confirmed. Furthermore, the results are in line with previous research and almost identical to the CAAR of 3.02% [-1, 1] shown by Veld & Veld-Merkoulova (2009) in their meta-analysis of spin-off research.

Table 5.1: Full sample

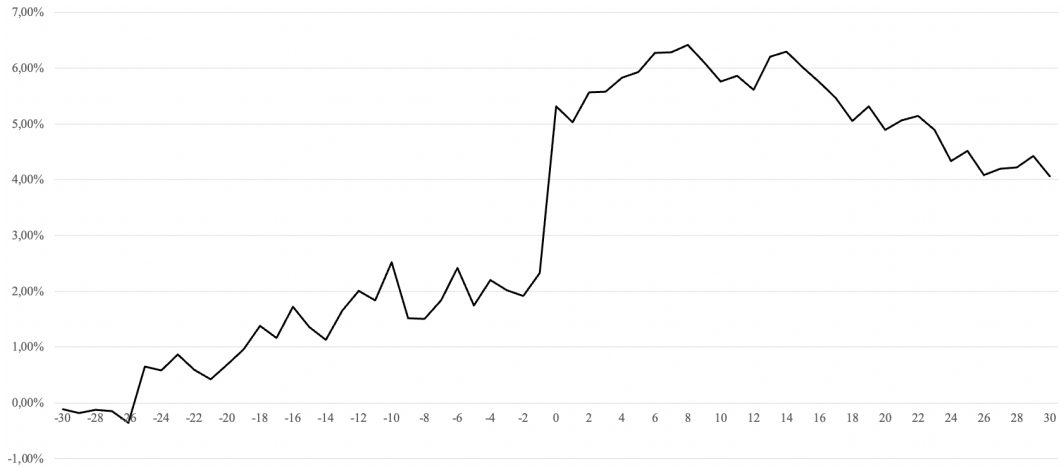
The table shows Cumulative Average Abnormal Return (CAAR) for the final sample of 88 Nordic spin-offs for various event windows. For each event window, CAAR, t-statistic and percentage positive are reported. "Percentage positive" is the proportion of spin-off transactions with a value of CAR greater than zero. The significance of the mean is tested against zero. Asterisks indicate level of significance at 10% (*), 5% (**) and 1% (***).

Event window	CAAR (%)	t-statistic	Percentage positive
-30, -6	2.42*	1.5976	58%
-10, -1	0.50	0.4959	48%
-5, -1	-0.08	-0.1199	44%
0	2.98***	4.7829	77%
-1, 1	3.11***	3.9197	70%
1, 5	0.62	0.8423	49%
6, 30	-1.87	-1.3211	41%

The price reaction is concentrated on the day of the announcement, which provides evidence for the semi-strong efficient market hypothesis by Fama (1970). However, the event window [-30, -6] also displays significant positive abnormal returns. The gradual incorporation of the forthcoming announcement during the month before the actual event date can also be seen in figure 5.1. As mentioned earlier, the risk of information leakage is considered relatively low given the transaction's exclusion of external actors. Thus, the period prior to the first official announcement should theoretically not exhibit abnormal returns. Nevertheless, indications of information leakages have been found both in this study and in previous research, but without great conformity. For example, Krishnaswami & Subramaniam (1999) found a statistically insignificant CAAR of 1.56% [-30, -6] compared to our significant CAAR of 2.42% for the same period. Miles & Rosenfeld (1983) studied the period -60 to -11 and found a 5%-significant CAAR of 2.33%, suggesting some agreement with our results but without direct comparability given the different event windows. However, the most diverging finding comes from Kirchmaier (2003), who found a CAAR of 6.3% [-10, -1], significant on a 1% level, compared to our insignificant 0.5% [-10, -1].

Figure 5.1: Cumulative Average Abnormal Return

This figure shows the Cumulative Average Abnormal Return (CAAR) for the final sample for 30 days prior to and 30 days after the announcement date.



Beyond pure information leakages, there could be other explanations as to why spin-off announcements are seemingly preceded by a period of abnormal returns. Naturally, one possibility is the incorrect identification of announcement dates. Over time, the method of identification has changed from scanning through the business press physically to dates being stored electronically on the internet. For example, the 1983 study from Miles & Rosenfeld

describes: *"The Wall Street Journal Index was used to determine when the public announcement of the spin-off appeared in the Wall Street Journal (WSJ). The article then was examined to ascertain if it contained the initial announcement of the proposed spin-off."* Despite press releases being widely available online today, the risk of misidentifying a certain publication as the first announcement remains, no matter if dates are compiled from databases or through a manual process. However, the fact that the large majority of the wealth creation is densely concentrated around the identified announcement date across all research, including this thesis, disputes the possibility of misidentification.

Assuming announcement dates are correctly identified, perhaps the most reasonable cause is information leakage. In broad terms, it will include firm representatives who - inadvertently or advertently - advertise vague or more specific restructuring plans in informal settings before the formal announcement of a future spin-off. This information leakage could be occurring through a multitude of forums - everything from casual conversations with external parties to business meetings or press interviews. As the rumors spread, the information is gradually incorporated into the share price before the official press release.

Yet, it does not necessarily have to be verbal leakages. By virtue of a firm's organizational structure, the competitive landscape and current market trends, another possibility is that spin-off transactions are more or less anticipated by the market. Like some companies are ripe for being acquired, investors can also predict a firm to separate a business unit. In other words - as the transaction is expected to generate shareholder wealth - a potential spin-off could be incorporated into the price to some degree before the official announcement. Nevertheless, to correctly predict the press release of an internally generated transaction without insider information seems extremely delicate and near impossible. Thus, we are left confused by the abnormal returns created in the event window [-30, -6]. While some form of information leakage seems like the most reasonable cause, its source remains unidentified.

5.2 Hypothesis 1a

→ *Firms that by undertaking a spin-off increase their business focus experience higher short-term abnormal returns.*

Business focus as a determinant factor of abnormal returns in spin-off transactions is a widely studied topic, and the results from the t-tests confirm previous findings, see table 5.2. The distribution between *focus* and *non-focus* spin-offs is relatively even, where 46 spin-offs are classified as the former and 42 as the latter. In line with the prediction in hypothesis 1a, *focus increasing* spin-offs yield a CAAR of 4.38% [-1, 1], significantly different from *non-focus increasing* spin-offs with CAAR of 1.73% [-1, 1]. The results for the focus increasing group are similar to that of other research, e.g 4.5% [-1, 0] of Daley et.al (1997) and 4.45% [-1, 1] of Desai & Jain (1999). Veld & Veld-Merkoulova (2004) showed a difference in means between the two groups of 2.08% [-1, 1], similar to the 2.65% [-1, 1] seen in table 5.2. The aforementioned ex-ante stock movements during the event window [-30, -6] are especially noticeable for the focus-increasing subsample, although the difference in mean is non-significant. Vice versa, the magnitude of the ex-post decline in CAAR [6, 30] is higher in the non-focus-increasing subsample, with a difference in mean significantly larger than zero.

Table 5.2: Business focus

This table presents values CAAR for various event windows for the subsamples *Focus-* and *Non-Focus-Increasing* spin-offs. A spin-off is classified as *Focus-increasing* if the SIC codes of the parent firm and spun-off subsidiary diverge on a 2-digit level. Otherwise, it is classified as a *non-focus increasing* spin-off. The significance of the mean is tested using a t-statistic against zero. ΔMean shows the difference in CAAR of the two subsamples, tested with a two-sample t-test whether the means of the subsamples are equal or not. Asterisks indicate level of significance at 10% (*), 5% (**) and 1% (***).

	Focus-Increasing (46)		**Non-Focus-Increasing (42)**		
Event window	**CAAR (%)**	**t-statistic**	**CAAR (%)**	**t-statistic**	**ΔMean**
-30, -6	4.23**	1.9183	0.43	0.2109	3.80
-5, -1	-0.07	-0.0869	-0.10	-0,0836	0.03
0	4.28***	4.8062	1.56**	1.8892	2.72**
-1, 1	4.38***	3.6757	1.73**	1.7195	2.65**
1, 5	1.09	1.0031	0.10	0.1097	0.09
6, 30	0.21	-0.1037	-4.16	-2.1612	4.37*

5.3 Hypothesis 1b

→ Firms that divest a relatively larger part of their business through a spin-off will experience higher short-term abnormal returns.

Following intuition, relatively larger spin-offs should be associated with larger wealth effects. Indeed, the results show (see table 5.3) a significant difference in CAAR between the large and small spin-offs, in line with hypothesis 1b. The median relative size spun off is 23%, while the large and small subsamples have median values of 41.5% and 12.5%, respectively. Moreover, the values of percentage spun off are fairly equally distributed between ~1% and ~60% (see appendix B). The large subsample yields a CAAR of 4.94% for the event window [-1, 1], in contrast to 1.28% for the small subsample. Findings of equal manner are presented by Hite & Owers (1983). The authors show an announcement day CAAR of 2.3% and 0.1% for the large and small samples, respectively. However, their sample had a median value of relative spin-off size of 6.6% which is not directly comparable with our sample's median of 23%. Perhaps, as spin-offs have become increasingly more frequent around the world, the average size divested has grown.

Table 5.3: Size of spin-off

This table presents values of CAAR for various event windows for the subsamples *large* and *small* spin-offs. A spin-off is classified as *large* if the relative size of the spin-off is equal to or larger than the final sample's median value of 23%. Otherwise, it is classified as a *small* spin-off. The relative size is calculated as the ratio between the market capitalization of the spin-off and the sum of market capitalizations of the parent and the spin-off after its first day of trading. ΔMean shows the difference in CAAR of the two subsamples, tested with a two-sample t-test whether the means of the subsamples are equal or not. Asterisks indicate level of significance at 10% (*), 5% (**) and 1% (***).

	Large (44)		**Small (43)**		
Event window	**CAAR (%)**	**t-statistic**	**CAAR (%)**	**t-statistic**	**ΔMean**
-30, -6	0.65	0.3162	4.18**	1.8866	-3.53
-5, -1	0.86	1.0868	-1.03	-0.9142	1.89*
0	4.30***	4.3790	1.67**	2.2904	2.63**
-1, 1	4.94***	3.9548	1.28*	1.4034	3.66**
1, 5	1.52**	1.7504	-0.29	-0.2345	1.81
6, 30	-2.17	-1.4153	-1.59	-0.6579	-0.58

A question that arises with the hypothesis of relative size spun-off is what values above 50% entail. As seen in appendix B, there is a fairly equal sample distribution of relative spin-off size, ranging from ~1% to ~60% along with two outliers of >80%. According to the intuition of larger abnormal returns for larger spin-offs, the maximum wealth effect should occur when the spin-off entity amounts to ~50% of firm value. By then, the potential of eliminating structural inefficiencies and diseconomies of scale should, at least theoretically, peak. For relative sizes exceeding 50%, the inverse relation to what we hypothesize is a logical inference. For example, following this rationale, a firm that spins off a subsidiary representing 10% of firm value should experience an equal effect to that of a firm that spins off a subsidiary representing 90% of firm value. Put differently, we do not expect a spin-off with a relative size of 90% to yield a higher abnormal return than a spin-off with a relative size of 10%. As seen in appendix B, the large majority of spin-offs in our sample have a relative size of less than 50% (the 75-percentile equals 41.5%), hence the impact of spin-offs larger than 50% on our results is limited.

5.4 Hypothesis 1c

→ *The level of information asymmetries perceived at the parent company is positively related to short-term abnormal returns.*

Table 5.4 presents the results for the *high*- and *low* information asymmetry subsamples. Similar to Veld & Veld-Merkoulova (2004) but contrary to Krishnaswami & Subramaniam (1999), we do not find explanatory value for the level of information asymmetry. In the study of Veld & Veld-Merkoulova (2004), the high- and low information asymmetry sub-samples showed CAAR values of 1.44% and 3.45% [-1, 1], respectively. In other words, their results showed the opposite relation to the presumed. In this study, both samples demonstrate positive values of CAAR for the 3-day event windows of [-1, 1], with slightly higher values, yet no significant differences, for the *high* information asymmetry subsample. A noticeable detail is the considerable difference between the two subsamples, nor yet statistically significant, of CAAR for the event window [-30,-6].

Table 5.4: Information asymmetry

This table presents values of CAAR for various event windows for the subsamples of *high*- and *low* information asymmetry spin-offs. A spin-off is classified as *high* information asymmetry if it has an above-median value of the proxy relative standard deviation of earnings forecasts, which measures the ratio of the standard deviation to the mean earnings forecast in the last month of the fiscal year prior to the announcement. The data is aggregated by IBES and the sample is reduced by 32 observations because of non-existent forecast data for some of the firms. ΔMean shows the difference in CAAR of the two subsamples, tested with a two-sample t-test whether the means of the subsamples are equal or not. Asterisks indicate level of significance at 10% (*), 5% (**) and 1% (***).

	High (28)		**Low (28)**		
Event window	**CAAR (%)**	**t-statistic**	**CAAR (%)**	**t-statistic**	**Mean**
-30, -6	4.37*	1.5712	0.66	0.2718	3.71
-5, -1	0.59	0.5105	-0.16	-0.2301	0.75
0	4.00***	2.7951	3.62***	5.3036	0.38
-1, 1	4.71***	2.5377	3.20***	3.8009	1.51
1, 5	0.59	0.5877	0.72	0.5740	-0.13
6, 30	-0.91	-0.3881	-3.47	-1.6762	2.56

5.5 Cross-sectional regression

The following section aims to explore if the results found for the subsamples above remain valid when analyzing the explanatory variables concurrently and when introducing a control variable. All regressions study cumulative average abnormal return (CAAR) for the event window [-1, 1]. Regression (1), (2) and (3) in table 5.5 treats each of the explanatory variables separately. Regression (4) includes all independent variables, but due to a lack of data for the variables proxying information asymmetry, it is based on a significantly reduced sample. Thus, we also decide to test *Focus* and *Size* exclusively in regression (5).

Table 5.5: Regressions

This table presents the results from cross-sectional regression. The dependent variable is Cumulative Abnormal Return (CAR), showing the aggregate actual return less the expected return for a given security over the three-day interval [-1, 1], where expected return is estimated using the market model. The independent variables are 1) Increased business focus (*FOCUS*), a dummy that equals 1 if the SIC codes of the parent firm and spin-off diverge on a 2-digit level, 2) Size of spin-off (*SIZE*), a continuous variable for the percentage of assets divested proxied by the relative market capitalizations of the two entities upon the spin-off's first day of trading and 3) Relative standard deviation of earnings forecasts (*INFASYM*), a continuous variable that shows the ratio of the standard deviation of analysts' earnings forecasts to the mean earnings forecast in the last month of the fiscal year prior to the announcement. The control variable is temperature of the spin-off market (*HOTTIME*), a dummy that equals 1 if the spin-off was announced during a year with an above-average number of announcements based on the initial sample. In regression (2) through (5), observations are missing because of lacking data. 1 observation is missing for *SIZE,* while 32 observations are missing for *INFASYM* where another 4 were excluded because of data trimming. R-squared, adjusted R-squared values and the number of observations for each regression are also reported. Asterisks indicate significance at 10% (*), 5% (**) and 1% (***). T-statistics are reported in parentheses.

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
FOCUS	0.026 (1.64)			0.016 (0.72)	0.023 (1.50)
SIZE		0.113*** (2.79)		0.122** (2.02)	0.107*** (2.66)
INFASYM			0.014 (0.17)	0.022 (0.28)	
HOTTIME (Control)	0.009 (0.54	0.003 (0.16)	0.031 (1.45)	0.010 (0.44)	0.002 (0.11)
Observations	88	87	52	52	87
R^2	0.0353	0.0901	0.0421	0.1308	0.1141
Adjusted R^2	0.0126	0.0684	0.0031	0.0568	0.0821

5.5.1 Business focus

Despite evidence of significant differences in mean abnormal returns between focus-increasing and non-focus-increasing spin-offs (see table 5.3), the dummy variable loses its explanatory power in the regressions contrary to the hypothesis. Although *Focus* yields positive coefficients with relatively high t-statistics in regression (1) and (5), the values are not significantly different from zero. This leaves us confused about the impact of this variable. Theoretically, the strategic benefit of increasing focus on the core business is strong. By separating unrelated business units, management and employees are allowed to specialize their competencies, business models are optimized, excessive overhead expenses are removed, governance structures are improved and capital structures are better adapted after the level of operational risk perceived. Accordingly, Sudarsanam & Qian (2007) find strongly significant and positive coefficients across all regressions. Contrarily, Veld & Veld-Merkoulova (2004) find no such continuity. For 86 observations, the authors first test *Focus* and *Size* together. Contrary to our results in regression (5), the authors find significantly positive coefficients for both. However, once the proxies for information asymmetry and geographical focus are introduced - with a subsequent sample size reduction to 72 observations - *Focus* loses its significance.

Backed with evidence from previous research, this leads us to believe that while business focus plays some part in the abnormal returns, perhaps its importance is limited. Another risk is faulty methodology. Either S&P Capital IQ wrongly classified companies' industries, or - perhaps more likely - using diverging SIC codes as an estimate of business focus is inappropriate. Naturally, the variable employed in this study and across literature captures if the parent firm removed diversification or not, which is then presumed to proxy an increased focus on the core of operations followed by the aforementioned strategic benefits. But given how widespread and hypothetical these strategic benefits are, the consequences of separating unrelated segments will likely be highly individual, with significant differences from firm to firm. Perhaps, assuming the causality of different industry codes → increased business focus → strategic benefits → abnormal returns is much too presumptuous.

5.5.2 Size of spin-off

Contrary to the outcome for business focus, the variable for relative size of the spin-off keeps its explanatory power. The coefficient is positive and significant when examined on its own

in regression (2), together with all independent variables in (4) and jointly with *Focus* in regression (5). The results add to an already congruent pool of research that the percentage of assets divested successfully explains abnormal returns (Krishnaswami & Subramanian, 1999; Veld & Veld-Merkoulova, 2009). Interestingly, the variable *Size* differs in its nature compared to measures of business focus and information asymmetry. While the latter two can be regarded as primary sources of abnormal returns, *Size* is better described as a secondary source of abnormal returns. It is not the size of the spin-off in itself that generates the abnormal returns - but rather the possibilities for value creation it enables. As discussed before, the potential impact of a spin-off should be larger the higher percentage of assets divested. Whether that impact is generated from increased business focus, decreased information asymmetries or something completely different remains unknown. However, given the results of this study, it is certain that the size of the spin-off plays a crucial part in unlocking that potential.

5.5.3 Information asymmetry

The proxy for information asymmetry, relative standard deviation of forecasts, is found insignificant across all regressions. Thus, the hypothesized abnormal returns through decreased information asymmetries between the firm and the market is contradicted, similar to the findings of Veld & Veld-Merkoulova (2004). Yet, we still believe that information asymmetry per se might have explanatory power, as concluded in other studies (Habib et al., 1997; Krishnaswami & Subramanian, 1999). The lacking explanatory power of the variable may be caused by the shortcomings of our data sample, where the already relatively small sample of 88 observations was further reduced to 52 transactions due to a lack of aggregated forecast data. We also conclude a risk of the variable being biased towards larger firms, which generally have more widespread analyst coverage.

Furthermore, the measure itself - relative standard deviation of forecasts - may be an inaccurate proxy for information asymmetry. The variable shows analysts' deviation from a consensus (mean) estimate of net income. One potential cause of disagreement among analysts is the riskiness of the firm, where forecast errors are generated simply because the firm has more volatile earnings; not because of asymmetrical information. Moreover, the measure is potentially affected by the phenomenon of information cascade. This phenomenon explains situations where analysts base their forecasts on the works of other analysts. If

analysts, to various degrees, neglect their judgment, the standard deviation will likely decrease and the proxy for information asymmetry becomes deficient.

An alternative method of estimating information asymmetry is to examine market characteristics. For example, Krishnaswami & Subramaniam (1999) employ *volatility in abnormal returns around earnings announcements* as a proxy for information asymmetry, suggesting that volatile reactions imply high information asymmetry. Another variable used is *bid-ask spread* (e.g Leuz & Verrecchia, 2000), suggesting that the size of spread is a hedge towards adverse selection originating from information asymmetry.

5.6 Robustness

To evaluate the validity of our regression coefficients and the assumptions made, tests of robustness were conducted. First, a White test for the presence of heteroskedasticity was performed. Since there is no reason to assume the residuals in the regression model to be homoskedastic, heteroskedasticity-consistent t-statistics - also known as White standard errors (White, 1980) - are used to test the robustness of our model. When controlling for heteroskedasticity, the levels of significance are slightly reduced and for regression (5) relative size is no longer significant (see appendix C), yet the general implications of our results remain. Second, a correlation matrix was introduced to test for multicollinearity. As seen in appendix C, there are no critical levels of correlation among the variables that would cause problems in the regression analysis. The highest collinearity reported is 0.375, between the variables *Size* and *Hottime.*

5.7 Summary of results

First, we conclude that Nordic spin-offs during the period 2001-2021 yield significant announcement gains in line with the results of previous research. The full sample shows CAAR values of 2.98% for the event date in isolation and 3.11% for the event window [-1, 1], both significant at a 1% level. Thus the first hypothesis, that Nordic spin-off announcements yield positive abnormal stock price reactions, is confirmed. Furthermore, we observe a relatively large positive stock price movement in the 30 days prior to the announcement, presumably caused by information leakages.

Second, the subsamples of *focus-increasing* and *large* spin-offs show significantly higher returns than their respective counterparts, in line with hypotheses 1a and 1b. Contrarily, hypothesis 1c is not confirmed as high information asymmetry spin-offs do not show significantly higher abnormal returns upon the spin-off announcement compared to low information asymmetry spin-offs.

Third, for the cross-sectional regressions, only the relative size of the spin-off yields significant results and maintains its explanatory power. Although the variable for business focus provides positive coefficient values with relatively high t-statistics, the results remain non-significant. We conclude that the strategic essence of increasing business focus is hard to capture in a single variable, and we are left with mixed evidence on the impact of increased business focus. Finally, the proxy for information asymmetry does not provide any explanatory value in the regression. We conclude that the standard deviation of analysts' forecasts risks being an inaccurate proxy, but also attribute the insignificance of the results to the shortfalls of the data sample.

6. Conclusions

Contributions

The main purpose of this paper is to contribute to existing empirical spin-off research by providing an updated analysis of a relatively unexplored geographical area - the Nordics. The study examines the magnitude- and determinant factors of the abnormal stock price gains associated with corporate spin-off announcements. A strongly significant average cumulative abnormal return of around 3% is documented in proximity to the spin-off announcement for the sample of 88 Nordic spin-off transactions, announced between 2001 and 2021. Furthermore, an unexpected finding was the significant positive excess returns accumulating during the 30 days before the official announcement, which we presume to be potential information leakages.

Three hypotheses for the source of the abnormal returns are subsequently discussed. First, strong evidence is found that focus-increasing spin-offs yield significantly higher abnormal returns than non-focus-increasing do. However, we are left confused over the explanatory power of the variable after conducting cross-sectional regressions, where it loses its significance. Second, contrary to previous findings, we do not find evidence that decreasing information asymmetry explains abnormal returns. Third, similar to the majority of research, the size of the spin-off largely explains abnormal returns. We conclude this is reasonable since the variable is rather a secondary than a primary source of abnormal returns as it encompasses multiple sources of value creation concurrently. By spinning off a larger part of the business, the possibility to unlock this value simply increases.

Limitations

The principal limitation of the study is the sample size and the general access to data. Although the geographical- and time scopes are rather extensive, the final data set of 88 observations remains smaller than most of the previous research; partly because of the relatively lacking frequency of spin-offs in the Nordics compared to other regions, and partly because of the scrutiny employed in excluding observations. Furthermore, the proxy for information asymmetry caused a further decrease in sample size. Naturally, this hinders properly examining its explanatory value as a determinant factor of abnormal returns. Another limitation is the design of the variables for business focus and information asymmetry. The measure for business focus is limited in its scope as it is proxied using

diverging SIC codes, where the strategic benefits of increasing business focus risk being left uncaptured. The measure for information asymmetry, the relative standard deviation of analysts' earnings forecasts, is deficient because it risks being influenced by volatile earnings and information cascading among analysts.

Suggestions for future research

A starting point for future research is to examine the abnormal returns prior to the first official announcement more thoroughly. Although some papers include similar findings to ours, there is no research conducted to our knowledge that examines more deeply why such excess returns are found. Furthermore, alternative and potentially more accurate proxies for business focus need to be explored. This is equally true for testing information asymmetry. Here, Krishnaswami & Subramanian (1999) provide many possible examples that can be applied to a future Nordic study with a larger focus on information asymmetry as a determinant factor. Moreover, studying completely different sources of the wealth effects is another takeoff point for further research. For example, some studies have compiled management's outspoken rationale for the spin-off decision and tested it against abnormal returns (Hite & Owers, 1983; Veld & Veld-Merkoulova, 2009). Another possibility would be to test Sudarsanam & Qian's catering theory, which examines the market demand for corporate focus, in a Nordic context.

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Appendix A - Descriptive statistics

Figure A.1: Observations by year of announcement

The table shows the distribution of the 88 spin-offs included in the final sample across years of announcement, with the number of spin-offs announced on the vertical axis and year on the horizontal.

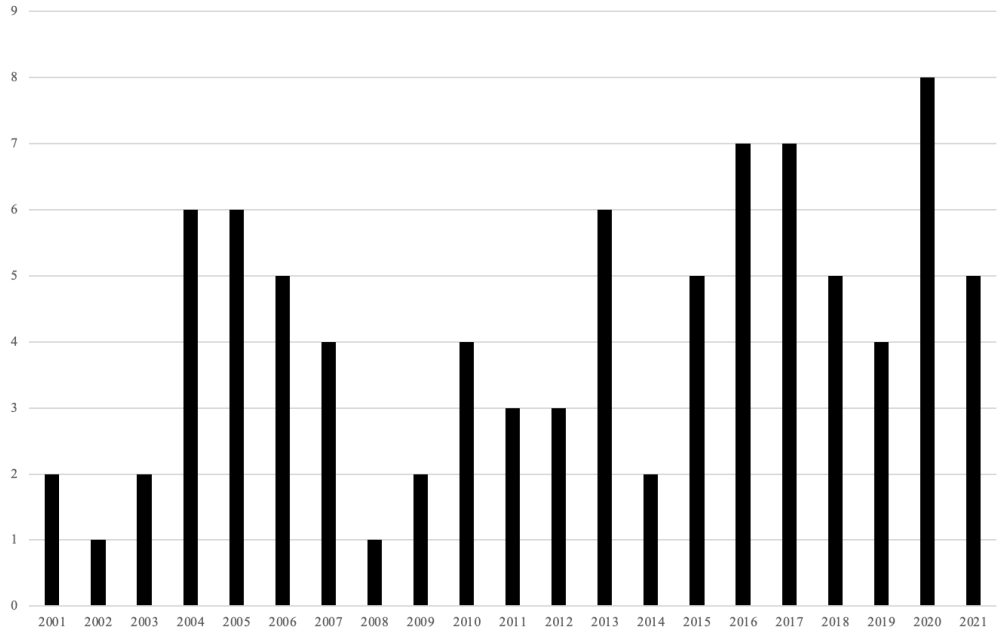


Table A.1: Distributional data of CAAR

This table shows the distributional data for the full sample of 88 Norid spin-off transactions. Minimum and maximum values of CAAR for the different event windows along with the 5-, 25-, 50-, 75-, and 95-percentile values.

Event window	Min (%)	Max (%)	P5 (%)	P25 (%)	P50 (%)	P75 (%)	P95 (%)
-30, -6	-37.6	37.8	-21.1	-5.6	1.7	9.1	32.7
-5, -1	-17.0	34.4	-12.1	-2.7	-0.3	1.7	10.9
0	-14.5	33.4	-5.3	0.1	1.8	6.3	11.1
-1, 1	-17.0	47.3	-7.3	-0.5	2.2	6.3	12.8
1, 5	-16.6	22.0	-8.7	-3.1	0.0	4.1	13.3
6, 30	-42.2	55.2	-25.7	-8.7	-0.5	4.0	20.6

Appendix B - Sub-samples

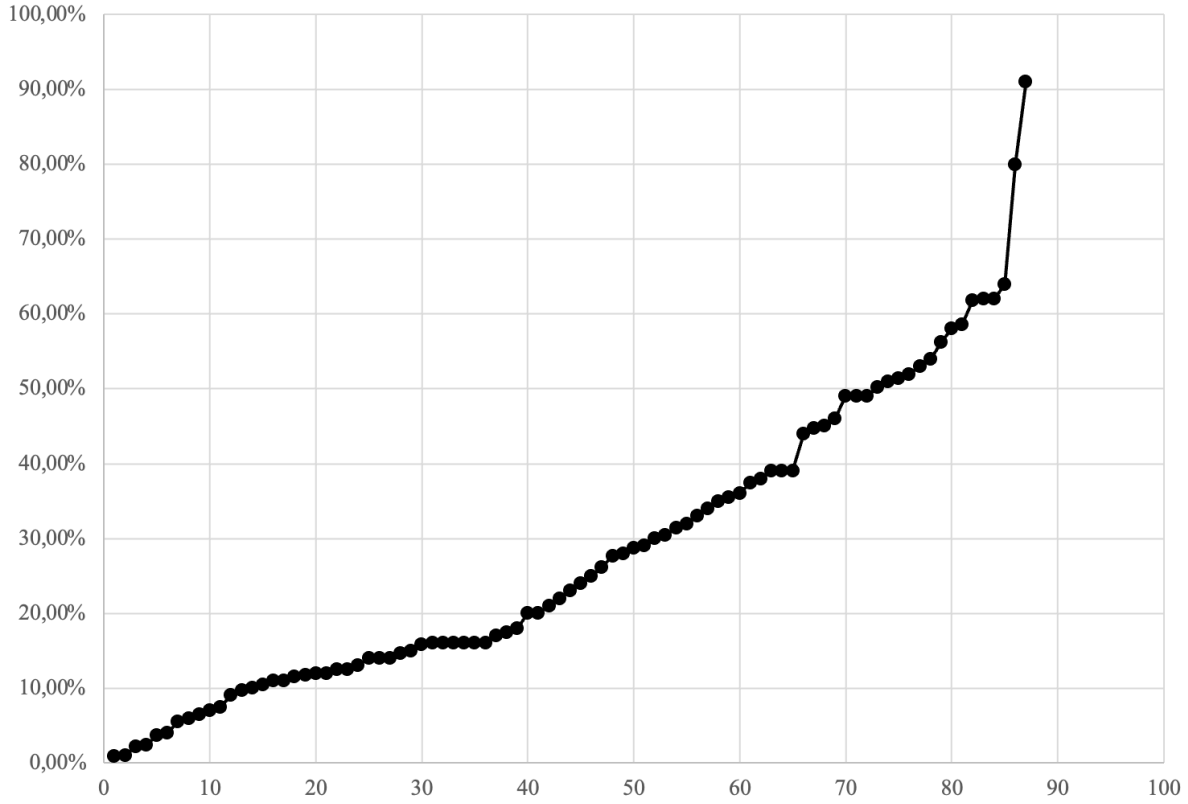
Table B.1: Distributional data of relative size

The table presents the final sample's distribution of *relative spin-off size*, showing data for minimum- and maximum values along with median and first- and third quartile values.

Variable	Min (%)	Max (%)	P25 (%)	P50 (%)	P75 (%)
Size	0.9	91.0	12.5	23.0	41.5

Figure B.1: Distributional data of relative size

The figure shows 87 spin-off transactions in numerical order on the horizontal axis with respect to the *relative spin-off size* (%) on the vertical axis. One observation in the final sample was excluded because of the lack of information regarding the *relative spin-off size.*



Appendix C - Robustness tests

Table C.1: Cross-sectional regression with heteroskedasticity-consistent *t*-statistics.

This table presents the cross-sectional regression with dependent variable Cumulative Abnormal Return, CAR [-1,1] and independent variables: *Increased business focus* (FOCUS), *Relative spin-off size*(SIZE), *Standard deviation of earnings forecasts* (INFASYM) and *Temperature of spin-off market* (HOTTIME). t-statistics in parentheses are based on White heteroskedasticity-consistent standard errors. Asterisks indicate significance at 10% (*), 5% (**) and 1% (***).

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
FOCUS	0.026 (1.65)			0.016 (0.85)	0.023 (1.57)
SIZE		0.113** (2.27)		0.122 (1.56)	0.107** (2.23)
INFASYM			0.014 (0.24)	0.022 (0.36)	
HOTTIME (Control)	0.009 (0.57)	0.003 (0.17)	0.031 (1.40)	0.010 (0.55)	0.002 (0.12)
Observations	88	87	52	52	87
R^2	0.0353	0.0901	0.0421	0.1308	0.1141
Adjusted R^2	0.0126	0.0684	0.0031	0.0568	0.0821

Table C.2 - Correlation matrix

The table presents a correlation matrix between the explanatory variables: *Increased business focus* (FOCUS), *Relative spin-off size* (SIZE), *Standard deviation of earnings forecasts* (INFASYM) and *Temperature of spin-off market* (HOTTIME).

Variables	FOCUS	SIZE	INFASYM	HOTTIME
FOCUS	1.000			
SIZE	0.140	1.000		
INFASYM	-0.085	0.009	1.000	
HOTTIME	0.237	0.375	0.058	1.000