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Wealth effects associated with spin-offs:

Empirical evidence from the Nordics

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Abstract: This study focuses on the abnormal returns associated with spin-offs in the Nordics. The sample consists of 84 completed spin-offs between 2000 and 2020. Similar to the vast majority of previous studies, a significant three-day cumulative average abnormal return around the announcement date is documented, showing abnormal returns of 3.03%. Further, focus-increasing spin-offs exhibit a 4.08% median cumulative abnormal return compared to 1.48% for non-focus-increasing, where the median difference between the two subsamples is significantly different from zero. This study is also the first to document significantly negative abnormal returns for the parent firms, in the long run, implying an underperformance of the parent after the spin-off. On the contrary, the long-run returns for the spun-off entities and the pro-forma combined firms record no significant results in any of the holding periods examined, which is in line with previous European research and the efficient market hypothesis.

Key words: Spin-offs, wealth effects, cumulative average abnormal return, announcement date, long-run performance, efficient market hypothesis

JEL Classification: G32; G34

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1. Introduction

The suggestions for the optimal corporate structure have been changing over time, going from the previous larger conglomerate structure in the 1980s, characterised by diversification of businesses (Davis, Diekmann, and Tinsley, 1994), to focusing more on synergies, through both M&A and streamlined operations including spin-offs. Hence, this transition has resulted in companies going from a more sluggish structure and suppressed valuation, towards more "light-weighted" pure-play firms, being able to more efficiently allocate capital across divisions and realise synergies (Whited, 2001).

Due to M&A being an important growth strategy for many companies, it has been a constant discussion of whether these transactions enhance value. Meanwhile, the discussion regarding spin-offs, i.e. a demerger and listing of a subsidiary or division on a pro-rata basis, where the shareholder of the parent company end up holding shares in both companies, has been more in the shadows as this corporate action is relatively uncommon (Chai, Lin, and Veld, 2018).

A significant amount of academic research has shown that spin-offs in the US tend to create value for shareholders in the form of positive cumulative average abnormal returns (Veld and Veld-Merkoulova, 2009). As a potential consequence of this, the amount of spin-offs on the European market has increased drastically in recent years, showing positive cumulative average abnormal returns between 2.6% and 5.4% (Kirchmaier, 2003; Veld and Veld-Merkoulova, 2004; Sudarsanam and Qian, 2007). This can also be reflected in the financial industry, where funds have been initiated with the core focus of investing in coming spin-offs, already spun-off entities, and its parent, as fund managers believe that investments prior to the announcement of a spin-off will create excess return (Carnegie, 2021). In contrast to the clear consensus of value creation around the announcement**,** it is unclear whether spin-offs are associated with abnormal returns in the long run, as previous results differ and commonly lack statistical significance. Additionally, the number of studies are few and are mainly concentrated towards the US, where further research on this topic is proposed by Veld and Veld-Merkoulova (2009) and Chai, Lin, and Veld (2018).

Several different factors have been analysed trying to explain why a spin-off would be value-enhancing. For example, focus-increasing[1] spin-offs, i.e., the divestment of a company that is unrelated to the company's core business, has shown to be associated with positive abnormal returns. Further, relative size[2] is another commonly analysed factor where the majority of the studies document that larger spin-offs result in higher abnormal returns, relative to smaller spin-offs. The degree of information asymmetry[3] is another well-documented factor where most academics argue that spin-offs reduce information asymmetry resulting in a more "fair" valuation of the company and positive abnormal returns (Veld and Veld-Merkoulova, 2009).

This study investigates cumulative average abnormal returns around spin-off announcements as well as the long-run stock performance. Furthermore, potential sources of wealth effects from spin-offs will be examined. This study is building on the ending-year of Veld and Veld-Merkoulova (2004), covering the period between 2000 and 2020. As previous studies largely being restricted to the United States, and research on whether spin-offs create value in Europe still remains low, this thesis aims to investigate the rather unexplored Nordic[4] market; a geographic area that has never been solely focused on before. Interestingly, there has been an increasing trend of spin-offs in recent years, which makes it a relevant and discussed topic in the world of corporate finance. Despite this, the most up-to-date study to our knowledge was conducted in Australia by Chai, Lin, and Veld (2018), covering spin-offs from 1999-2013. Thus, the combination of the Nordic market along with the increasing trend of spin-offs, as well as outdated studies, serve as purposes for this thesis. This motivates us to examine the following research question:

Do spin-offs in the Nordics result in abnormal returns, and what factors can explain these potential wealth effects?

The focus will lie on the following sub-questions in order to evaluate the research question:
i) *What are the wealth effects associated with the spin-off announcement?*

[1] Focus-increasing spin-offs are measured by the 2-level BICS code. If the 2-level BICS code of the spun-off entity differs from that of the parent, it is classified as focus-increasing.
[2] Relative size is determined by dividing the market capitalisation of the spun-off entity by the sum of the market capitalisation of the spun-off entity and the parent company.
[3] Information asymmetry is measured by the deviation of the analyst's earnings forecasts. A high level of disparity among analysts, reflected in high forecast errors, implies high information asymmetry.
[4] Throughout, the Nordics refer to Denmark, Finland, Norway, and Sweden.

ii) *What are the long-run wealth effects for the parent firms, spun-off entities, and pro forma combined firms, associated with spin-offs?*
iii) *What factors can explain the wealth effects associated with spin-offs around the announcement date and in the long run?*

In line with previous research, we document a positive cumulative average abnormal return of 3.03% around the announcement for spin-offs in the Nordics between 2000 and 2020. Additionally, we find evidence suggesting that focus-increasing spin-offs, as well as spin-offs by companies with high information asymmetry, are associated with a positive cumulative average abnormal return around the announcement. On the contrary to previous studies, we are not able to document any statistical difference between large and small spin-offs. The long-run performance for the spun-off entities and pro-forma[5] combined firms record no significant results in any of the holding periods examined. At the same time, we contribute with new evidence, documenting that long-run performance for the parent company yields significant negative abnormal returns for the holding periods 6-, 12-, and 36 months. However, none of the factors show any explanatory power of the long-run abnormal returns.

As the latest study on the European market was conducted by Sudarsanam and Qian (2007), we provide an updated view on the topic with modern data, covering a longer period. Further, as new methodologies have been developed over time, many of the historical studies referred to have been using criticized methods. Hence, by using a more up-to-date and profound methodology, we contribute with further guidance and robustness to the existing literature. Additionally, we bring awareness about the different explanatory factors associated with wealth effects, and hence, contribute to managers making more well-grounded decisions when deciding whether to spin-off an entity or not. Finally, due to the increasing trend of spin-offs along with the 21-year time frame, the sample size is sufficient for a study focusing solely on the Nordics. This enables us to be the first to conduct a study on wealth effects connected to spin-offs, giving an insight into the Nordic market.

[5] Defined as the weighted market capitalisation of the parent firm and the spun-off entity at the ending of the first day of trading.

2. Theory and hypothesis development

2.1 Efficient market hypothesis

The efficient market hypothesis (EMH) builds on the premise that everyone in the market has the same information, and therefore stocks should be valued at a fair price (Fama, 1970). Therefore, it should not be possible to generate alpha[6], unless taking higher risks, i.e. investing in risker assets.

The theory suggests that informational efficiency is dependent on competition in the financial market, where the market participants are constantly competing for excess returns. Fama (1970) argues that this leads to the market being efficient, where all available information is priced-in, reflecting the securities' fair value.

The theory is highly relevant in the case of examining if spin-offs generate abnormal returns, especially in the long run. This is due to the fact that according to the EMH, the abnormal return should be incorporated in the returns arising from the announcement day, meaning that abnormal returns in the long run, should not be possible as those returns should already be priced in (Veld and Veld-Merkoulova, 2004). However, research in the early eighties has suggested the opposite to the EMH and Fama (1970), which has led to a debate and intensified the studies around abnormal returns in the long run of spin-offs (Kothari and Warner, 2006).

Veld and Veld-Merkoulova (2004) show results that suggest that the European market is efficient. In studies by Brav, Geczy, and Gompers (2000), and Loughran and Ritter (2000), they highlight the importance of whether the method of equal-weighted returns or value-weighted returns are used when measuring the long-run performance and its efficiency, as they can lead to significantly different results. While Fama (1998) suggests that the value-weighted returns better predict the wealth effect, evidence shows that equal-weighted return is superior to the value-weighted when indicating the European market efficiency (Veld and Veld-Merkoulova, 2004). Though, the EMH has been criticised by many theorists, and not the least the investment community. One of the more common criticisms, that goes in line with DeBondt and Thaler (1985, cited in Malkiel, 2003), is that the perception among investors is not always rational, and can be subject to both optimism and pessimism. This, they argue, will lead to

[6] Alpha implies generating excess returns relative to a benchmark.

deviations from the "true" fundamental value of the company, as to later show mean reversion. This goes against the theory of Fama (1970) who argues that stock prices should not deviate from their fair value.

2.2 Hypothesis development

Spin-offs have become an increasingly popular alternative for companies. Consequently, the academic research around the stock returns connected to this has experienced a significant increase as well, mainly due to the shareholder being the most important party in the restructuring (Veld and Veld-Merkoulova, 2009). Below, we develop the hypothesis based on existing findings and the efficient market hypothesis.

The reasons behind the decision to spin-off an entity are many and can differ substantially between firms. Even though the reasons for a spin-off may differ, there is a clear consensus that it results in a positive cumulative average abnormal return (CAAR) among previous research around the announcement day, creating value for shareholders. This is further supported by the investor community, where the rather famous Swedish fund manager Simon Blecher[7] argues that the excess return commonly is an instant effect of the company's press release regarding the spin-off.

[7] Simon Blecher manages the fund "Carnegie Spin-Off", investing in companies involved in spin-offs (i.e. both parents and spun-off entities) as well as companies that potentially will do a spin-off.

Table 1 - Studies on abnormal returns of spin-offs around the announcement

Study	Country	Research period	Observations	Event window	CAAR (%)
Schipper and Smith (1983)	US	1963-1981	93	(-1, 0)	2.84***
Hite and Owers (1983)	US	1963-1981	123	(-1, 0)	3.30***
Miles and Rosenfeld (1983)	US	1963-1980	55	(0, 1)	3.34***
Rosenfeld (1984)	US	1963-1981	35	(-1, 0)	5.56***
Copeland et al. (1987)	US	1962-1982	188	(-1, 0)	3.03***
Denning (1988)	US	1970-1982	42	(-6, 6)	2.58[n.r.]
Seifert and Rubin (1989)	US	1968-1983	51	(-1, 0)	3.26***
Ball et al. (1993)	US	1968-1990	39	(-1, 0)	2.55[n.r.]
Vijh (1994)	US	1964-1990	113	(-1, 0)	2.90***
Allen et al. (1995)	US	1962-1991	94	(-1, 0)	2.15***
Michaely and Shaw (1995)	US	1981-1988	9	(-1, 1)	3.19[n.r.]
Slovin et al. (1995)	US	1980-1991	37	(0, 1)	1.32***
Seward and Walsh (1996)	US	1972-1987	78	(-1, 0)	2.60***
Johnson et al. (1996)	US	1975-1988	104	(-1, 0)	3.96***
Daley et al. (1997)	US	1975-1991	85	(-1, 0)	3.40***
Desai and Jain (1999)	US	1975-1991	144	(-1, 1)	3.84***
Krishnaswami and Subramaniam (1999)	US	1978-1993	118	(-1, 1)	3.28***
Mulherin and Boone (2000)	US	1990-1999	106	(-1, 1)	4.51***
Maxwell and Rao (2003)	US	1976-1997	79	(0, 1)	3.59***
Veld and Veld-Merkoulova (2008)	US	1995-2002	91	(-1, 1)	3.07***
Kirchmaier (2003)	Western Europe	1989-1999	48	(-1, 1)	5.40***
Veld and Veld-Merkoulova (2004)	Western Europe	1987-2000	156	(-1, 1)	2.62***
Sudarsanam and Qian (2007)	Western Europe	1987-2005	157	(-1, 1)	4.82***
Boreiko and Murgia (2010)	Western Europe	1989-2005	97	(-1, 1)	4.80***
Murray (2000)	UK	1992-1998	25	(-1, 1)	-0.19***
Schauten et al. (2001)	UK	1989-1996	23	(-1, 1)	2.13[n.r.]
Sin and Ariff (2006)	Malaysia	1986-2002	85	(-1, 0)	1.80*
Truong (2017)	Australia	2002-2011	61	(-1, 1)	3.58***
Chai, Lin, and Veld (2018)	Australia	1999-2013	103	(-1, 1)	2.93***

Notes: This table presents the cumulative average abnormal stock returns around the announcement dates of spin-offs.

[n.r.]Significance level is not reported for this event window; ***Significance at the 1% level; **significance at the 5% level; *significance at the 10% level.

Source: Veld and Veld-Merkoulova, 2009

The conclusion that spin-offs are related to positive abnormal returns, is clearly stated in the table above, with a CAAR of -0.19% as an outlier. The CAARs variate between -0.19% and 5.56% and differ primarily due to the usage of different datasets and methodologies (Veld and Veld-Merkoulova, 2009). The historical research on spin-offs is heavily concentrated on the US market, although research covering other markets is increasing. This mainly has to do with spin-offs becoming more popular in Europe from 1995 and onwards (Veld and Veld-Merkoulova, 2004). Similar to the studies conducted on the US market, research on the European market (Kirchmaier, 2003; Veld and Veld-Merkoulova, 2004; Sudarsanam and Qian, 2007), found that spin-offs are associated with positive wealth effects around the announcement date. However, the Swedish sub-sample was not associated with a positive

CAAR that was significantly different from zero, due to spin-offs of big property divisions by Swedish banks (Veld and Veld-Merkoulova, 2004).

Interestingly, as previous research and the investor community suggests[8] that a large part of the abnormal returns often appear on the announcement, the potential to generate excess returns on spin-offs becomes more speculative, as one has to invest ahead of the spin-off.

This leads to the first null hypothesis of this study:

***$H_{0,1}$:* Spin-offs do not exhibit positive cumulative average abnormal returns around the announcement day**

Pioneering results from the early eighties, showing inconsistent results in relation to the efficient market hypothesis, was the catalyst that resulted in an increasing amount of studies on long-run performances (Kothari and Warner, 2006). Different from the findings around the announcement day, the consensus regarding the outcome for the long run differs among researchers, while also commonly lack statistical significance.

Table 2 - Studies on long-run stock market performance

					Event window (%)			
Study	**Region**	**Research period**	**Observations**	**Firm / Security**	**6m**	**12m**	**24m**	**36m**
Cusatis, Miles, and Woolridge (1993)	US	1965-1988	131	Parent	6.80%*	12.50%**	26.70%**	18.10%
			146	Spun-off entity	-1.00%	4.50%	25.00%**	33.60%**
			141	Pro-forma		4.70%	18.90%**	13.90%
Michaely and Shaw (1995)	US	1981-1988	30	Spun-off entity		-36.60%***	-59.13%***	
Desai and Jain (1999)	US	1975-1991	155	Parent		6.51%	10.58%	15.18%
			162	Spun-off entity		15.69%***	36.19%***	32.32%***
			155	Pro-forma		7.69%	12.70%	19.82%***
McConnel, Ozbilgin, and Wahal (2001)	US	1989-1995	80	Parent	8.64%	13.48%	19.21%	5.14%
			96	Spun-off entity	8.90%	7.21%	5.75%	-20.87%
Powers (2001)	US	1989-1998	187	Parent		2.49%		
			187	Spun-off entity		-6.25%		
Kirchmaier (2003)	Europe	1987-2000	34	Parent	-4.90%		-5.90%	
			41	Spun-off entity	-4.20%		17.30%*	
			34	Pro-forma	-7.30%*		4.20%	
Veld and Veld-Merkoulova (2004)	Europe	1965-2000	68-106	Parent	3.88%	-0.65%	6.49%	-0.41%
			53-70	Spun-off entity	11.96%	12.58%	13.72%	15.15%
			45-61	Pro-forma	-2.23%	-2.33%	4.24%	2.01%
McConnell and Ovtchinnikov (2004)	US	1990-2003	267	Parent	10.70%	5.91%	4.64%	-2.21%
			311	Spun-off entity	12.20%	10.59%**	8.20%	2.87%**
Rudisuli (2005)	US and Europe	1980-2005	330-435	Parent		7.70%	17.30%	15.90%
			229-336	Spun-off entity		18.90%**	30.90%***	55.80%**
Sudarsanam and Qian (2007)	Europe	1994-2006	129	Parent		-3.90%	-6.20%	7.10%
			142	Spun-off entity		7.20%	17.50%	23.00%
			129	Pro-forma		-2.30%	8.30%	8.40%
Chai, Lin, and Veld (2018)	Australia	1999-2013	40	Parent	-4.33%	19.30%	23.43%**	19.18%

Notes: This table presents the results on the long-run stock performance of parents, spun-off entities, and pro-forma combined returns. The long-run performance is measured as the BHAR after the spin-off completion.

The test statistic test the hypothesis that the mean holding-period return equal to zero (***) 1% significance, (**) 5% significance, (*) 10% significance; two-tailed test

Source: Veld and Veld-Merkoulova, 2009

[8] "It is about finding the companies that potentially will do a spin-off, that is how we will deliver excess returns" - Simon Blecher

Both Veld and Veld-Merkoulova (2004), as well as Qian and Sudarsanam (2007), did not find any significant abnormal returns while measuring the long-run performance of spin-offs during a three-year period on the European market. On the contrary, other research found both significant and rather strong performance by the spun-off entities (Cusatis, Miles, and Woolridge, 1993; Desai and Jain, 1999; Rüdisüli and Zimmermann, 2005), emphasising that the abnormal return is primarily driven by focus-increasing spin-offs (Veld and Veld-Merkoulova, 2009). While Michaely and Shaw (1995) found the complete opposite, i.e. high significance and an extreme underperformance by the spun-off entities, unable to provide any clear evidence of why this is.

The studies showing positive long-run abnormal returns have mainly been conducted on the US market. Veld and Veld-Merkoulova (2004) believe that the increase in spin-offs in Europe, between 1987 and 2000, could be a result of the studies implying positive wealth effects in the US. This can also be reflected in the financial market, where funds have been implemented with the core focus of investing in coming spin-offs or already spun-off entities and its parent. However, the results can differ significantly depending on the sample and methodology used. To test whether spin-offs are associated with long-run abnormal returns, the following null hypothesis is stated:

***$H_{0,2}$:* Parent companies, spun-off entities, and pro-forma combined firms, respectively, do not exhibit long-run abnormal returns after the spin-off**

Investigating whether focus-increasing spin-offs are generating CAARs is one of the most commonly studied factors, as it is the main argument by practitioners when motivating a spin-off (Mukherjee, Kiymaz, and Baker (2004) cited in Veld and Veld-Merkoulova, 2009). Increasing the industrial focus through a spin-off leads to companies being able to focus on its core business. Additionally, previous research has shown that well-diversified companies withhold a diversification discount relative to focused firms, as they experience a significant loss of value through overinvestments and inefficient allocation of capital (Berger and Ofek, 1995; Whited, 2001).

Intuitively, divesting a company that is unrelated to the company's core business, is an efficient way to streamline the business, and hence let the pure values of each entity flourish separately.

This is somewhat a consensus among institutional investors and theorists during the announcement, where e.g., Veld and Veld-Merkoulova (2004) found that spin-offs that are not closely related to the core business experienced a CAAR of 3.57% during the event window. This is further supported by Qian and Sudarsanam (2007), who found similar results while studying the European market.

Interestingly though, a more recent study by Chai, Lin, and Veld (2018) found that focus-increasing spin-offs on the Australian market are not associated with CAARs around the announcement day. They argue that these spin-offs increase the risk of the business for the parent company, as it leads to a decreasing diversification. However, both Desai and Jain (1999) as well as Daley, Mehrotra, and Sivakumar, (1997) see this through another perspective, arguing that this rather leads to a diversity of assets under management, and hence increases the managerial efficiency. In contrary to their findings around the announcement, Chai, Lin, and Veld (2018) found significant positive abnormal returns for the parent company over the long run (12- and 24 months) that weakly could be explained by the spin-offs being focus-increasing. Therefore, they suggest that the focus-increasing spin-offs might best be recognised by the market months after the announcement day. Based on the above-mentioned previous literature, the following two null hypotheses will be investigated:

***$H_{0,3a}$*: Focus-increasing spin-offs do not exhibit a positive cumulative abnormal return**

$H_{0,3b}$: There is no difference in cumulative abnormal returns between focus-increasing and non-focus-increasing spin-offs

The financial market builds on trust in order to effectively allocate capital, converting savings into economic growth (OECD, 2019). It is not uncommon to see companies having a suppressed valuation, due to the misbehaviour and lack of faith in the management. Therefore, a spin-off would be value-enhancing if the firms were to be listed as separate units, as it reduces the information asymmetry (Krishnaswami and Subramaniam, 1999). Though, Krishnaswami and Subramaniam (1999) point out that this is especially applicable to firms with fewer negative synergies among the divisions.

While Habib, Johnsen, and Naik (1997) agree that spin-offs reduce the level of information asymmetry, they argue that spin-offs make the price system more informative, as companies

are transformed into several separately listed firms. This improves managerial decision-making and facilitates the valuation for uninformed investors, leading to a higher valuation (Habib, Johnsen, and Naik, 1997).

On the contrary, the study by Huson and MacKinnon (2003) suggests the opposite, emphasising that spin-offs rather increase the information asymmetry, as some investors capitalise on insider information about certain divisions. Thus, having a greater diversity would minimise this advantage for the investors and lead to less information asymmetry.

Based on past studies, we find a stronger belief among previous academic research that spin-offs reduce information asymmetry, thus leads to a more "fair" valuation of the company and a positive CAAR. Therefore, taking the level of information asymmetry into account when studying abnormal returns is essential. This leads to the following two null hypotheses in this study:

$H_{0,4a}$: Spin-offs of companies with a high degree of information asymmetry do not exhibit a positive cumulative abnormal return

$H_{0,4b}$: There is no difference in cumulative abnormal returns between spin-offs with a high- or low degree of information asymmetry

Veld and Veld-Merkoulova (2009), who conducted a meta-analysis of previous studies within the field, found that spin-offs are value-enhancing around the announcement. Intuitively, if a spin-off per se creates a wealth effect, then the relative size of the spin-off should be essential. Meaning that larger spin-offs should theoretically result in higher abnormal returns, relative to smaller spin-offs. Veld and Veld-Merkoulova (2009) argue that this is possibly related to the spin-offs being focus-increasing. In other words, if a company spins off a large entity that is unrelated to the core business of the parent, then this announcement is likely to produce a positive reaction, as to a smaller spin-off of a non-related subsidiary.

The relative difference in wealth effect between large and small spin-offs has received a clear hearing from previous research, where Hite and Owers (1983), Miles and Rosenfeld (1983), and Veld and Veld-Merkoulova (2004) all documented positive significant results. This leads to the final two null hypotheses in this study:

***$H_{0,5a}$*: Large spin-offs do not exhibit a positive cumulative abnormal return**

$H_{0,5b}$: There is no difference in cumulative abnormal returns between large and small spin-offs

There is a handful of other potential factors that have been receiving focus from theorists, besides the above-mentioned. One of which is the geographical focus[9] of spin-offs, i.e., spin-offs of subsidiaries and divisions that increase the geographical focus for the parent. Veld and Veld-Merkoulova (2004) found significant evidence that spin-offs that increase geographical focus are value-enhancing. However, the overall agreement among theorists is not aligned and several arguments, for and against geographical focus being value-enhancing, have been presented. Some argue that geographical focus tends to reduce the economies of scale, harming production (Chai, Lin, and Veld, 2018). Agreeing is Veld and Veld-Merkoulova (2004), but instead, they believe that this signals that the management has made poor decisions in expanding the business and now eats crow. While others are viewing this from the shareholder's perspective, arguing that investors might be willing to pay a premium for a well-diversified company, as it commonly reduces the risk of the investment (Chai, Lin, and Veld, 2018).

Others have studied the taxes in conjunction with spin-offs, as some spin-offs on the US market have been associated with taxes, while this is commonly not the case in European countries due to deferring tax payments (Veld and Veld-Merkoulova, 2004). Intuitively, as spin-offs are taxable, they would be value destructive rather than creating a positive wealth effect, which is in line with Krishnaswami and Subramaniam (1999) who found that taxable spin-offs have a negative impact on abnormal returns.

Another interesting aspect to shine a light on is the case of the bondholders and how they are affected by the spin-off. Both Maxwell and Rao (2003) and Chai, Lin, and Veld (2018) argue that the spin-off leads to a loss in collateral, which increases the risk for the bondholders. In the case of focus-increasing spin-offs, there is a reduction in diversification, leading to a greater risk for the bondholder. At the same time, previous studies have shown that focus-increasing

[9] Commonly measured as a spin-off and listing of a subsidiary or division on a foreign exchange (different from the parent).

spin-offs are value-enhancing for shareholders. Consequently, this leads to a higher risk of companies having their credit rating being downgraded, which therefore supports the theory of wealth transfer from bondholders to the shareholders (Maxwell and Rao, 2003).

3. Data

3.1 Data selection and validation

The sample period in this study ranges from January 2000 to December 2020. The initial screening is based on completed spin-offs in the Nordics and is retrieved from Bloomberg. A Nordic spin-off is defined as where a Nordic parent company spins off a subsidiary or division. Both the parent firm and the spun-off entity must be independently managed and valued at the stock market following the completion of the spin-off. Countries included in the Nordic sample are Denmark, Finland, Norway, and Sweden. Iceland is not included as there were no spin-offs during the sample period. The data selection consists of a three-stage process, filtering the initial screening sample of 246 spin-offs to the final sample of 84 spin-offs:

a) initial screening on completed spin-offs in the Nordics conducted between 2000-01-01 and 2020-12-31 (246);

b) misclassifications[10] of spin-offs led to the removal of companies. Each transaction from the initial sample is manually verified to see if the definition of a spin-off is fulfilled (91);

c) missing share price during the estimation period and/or the event window (84).

Data collection on stock prices and the country-specific indexes is mainly retrieved from Refinitive Eikon, and if there is missing data for a certain firm, Bloomberg is used (leading to a couple of firms have remained in the sample, as Bloomberg sometimes have share price data that Refinitive Eikon does not have). Similarly, market capitalisation and I/B/E/S are also retrieved from Refinitive Eikon, together with some support from Bloomberg. The Bloomberg Industry Classification Standard (BICS) is retrieved from Bloomberg.

To be able to accurately conduct the event study, it is of high importance that the event of interest coincides with the correct date. In this study, the event of interest is the spin-off

[10] Split-offs and carve-outs were included in the initial screening.

announcement date. Announcement dates are provided by Bloomberg, as it is highly critical to have the correct announcement day, all 84 spin-offs included in the sample are manually verified by looking at the companies' press releases, articles from official newspapers, and other reliable resources. The earliest press announcement of the spin-off is used as the announcement date. The announcement date was changed to an earlier date for 49 out of the 84 spin-offs during the manual verification.

3.2 Data description

Table 3 reports the annual distribution of the whole sample by country. One can note that a majority of the spin-offs, i.e. with 53 observations (63%) from 2000 to 2020, are completed on the Swedish market. The Norwegian market has experienced 20 observations (24%) meanwhile Finland eight observations (10%). Hence, the remaining three (4%) spin-offs are completed on the Danish market, implying a large uneven distribution between the countries. Further, the distribution of spin-offs is varying largely over time. In both 2004 and 2006, the Nordics recorded eight spin-offs, the highest transaction intensity during the time period. In contrast to 2000, as well as in each of the two years following the financial crisis (i.e. 2009 and 2010), one spin-off was conducted.

Table 3 - Spin-off distribution by country and year

Year	Denmark	Finland	Norway	Sweden	Total	Cumulative (# spin-offs)
2000				1	1	*1*
2001			1	1	2	*3*
2002				1	1	*4*
2003			1	1	2	*6*
2004	1		1	6	8	*14*
2005		1	1	2	4	*18*
2006			3	5	8	*26*
2007			2	3	5	*31*
2008		1	1	1	3	*34*
2009			1		1	*35*
2010				1	1	*36*
2011		1	1	3	5	*41*
2012			1	4	5	*46*
2013		2		3	5	*51*
2014			1	2	3	*54*
2015		1		1	2	*56*
2016			1	5	6	*62*
2017	1			5	6	*68*
2018	1		1	3	5	*73*
2019		1	1	2	4	*77*
2020		1	3	3	7	*84*
Total	**3**	**8**	**20**	**53**	**84**	

Table 4 summarises the different industry classifications in order to map the spin-offs by industry. Interestingly, spin-offs are particularly common in sectors such as Health Care,

Industrial Products, and Industrial Services, which represent 50% of the total. So, there is a large uneven distribution among the spin-offs in the Nordics.

Table 4 - Overview of the spin-offs by industry

Parent - Industry (2-level BICS)	# of spin-offs	Spun-off entity - Industry (2-level BICS)	# of spin-offs
Consumer Discretionary Products	4	Consumer Discretionary Products	4
Consumer Discretionary Services	4	Consumer Discretionary Services	4
Consumer Staple Products	1	Consumer Staple Products	0
Financial Services	2	Financial Services	3
Health Care	13	Health Care	12
Industrial Products	14	Industrial Products	12
Industrial Services	15	Industrial Services	17
Materials	5	Materials	5
Media	2	Media	3
Oil & Gas	6	Oil & Gas	10
Real Estate	6	Real Estate	5
Retail & Whsle - Discretionary	3	Retail & Whsle - Discretionary	4
Software & Tech Services	8	Software & Tech Services	4
Renewable Energy	1	Renewable Energy	0
Utilities	0	Utilities	1

4. Methodology

4.1 Short-horizon event study

The announcement effect surrounding the spin-off is measured through an event study. Event studies have been conducted for many years in different financial contexts, examining return behaviour for a sample of firms in connection to a certain event, (e.g. M&A transactions, spin-offs, stock splits, etc.). Kothari and Warner (2006) provide an overview of event study methodologies and their development. They conclude that the basic statistical format of completed event studies over the past 30 years has remained unchanged over time.

To be able to measure abnormal returns, a model for calculating a security's normal return must be specified (i.e., expected returns unconditional on the event but conditional on other information). There are several methods to measure the expected return of a security, where the market model and the constant mean return model being the two most common. In this study, the market model is used, which is a one-factor statistical model that quantifies the expected returns by benchmarking each security's return relative to a market portfolio. The expected return for each security is then compared to the performance around the event of interest. The deviation from the expected return is then referred to as the abnormal return

(MacKinlay, 1997). A broad-based benchmark index for each Nordic country being analysed is used as a proxy of the market portfolio, in line with the European study by Veld and Veld-Merkoulova (2004), who also use country-specific indexes.

The decision behind using the market model is due to the potential advantages it has compared to the constant mean model, which assumes that through time, the mean return of a given security is constant. By using the market model instead of the constant mean model, the variance of the abnormal return is reduced as the portion of the return that is related to variation in the market's return is removed (MacKinlay, 1997). Further, as several prior empirical studies on wealth effects associated with spin-offs are using this methodology, results can be compared in a more accurate manner[11].

The formula for expected return for firm *i*, in period *t*, based on the market model is given by:

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

where the parameters β_i and α_i are estimated by regressing the security's returns relative to the market return over a period prior to the announcement, called the estimation period. The estimation period used in this study is [-220, -21] trading days relative to the spin-off announcement date, which is day 0, in line with Veld and Veld-Merkoulova (2004) and Sudarsanam and Qian (2007). The chosen estimation period is assumed to be close enough to the spin-off announcement, and hence, capturing the normal performance of a given security, while not being affected by any potential leakage of information prior to the spin-off announcement.

The difference between actual stock returns and expected stock returns is referred to as abnormal returns, which is the unexpected return at any point in time *t*, for each security *i*:

$$AR_{it} = R_{it} - E(R_{it}) \quad (2)$$

where AR_{it} is the abnormal return, R_{it} is the realised return and $E(R_{it})$ is the expected return for security i, in time *t*.

The event study aims to measure whether the cross-sectional distribution of returns is abnormal at the time of the event of interest (Kothari and Warner, 2006). As this study seeks to examine

[11] See for example Krishnaswami and Subramaniam (1999), Veld and Veld-Merkoulova (2004), Sudarsanam and Qian (2007), Chai, Lin, and Veld (2018), among others.

if the announcement of the spin-off is, on average, associated with a wealth effect, the focus will be on the first moment of the return distribution. Hence, an average abnormal return for the whole sample is calculated for each specific day included in the event window. This procedure is meant to further isolate the spin-off announcement effect by eliminating idiosyncrasies in measurement due to specific stocks.

The formula for average abnormal return (AAR) in time *t* is expressed as:

$$AAR_t = \frac{1}{N}\sum_{i=1}^{N} AR_{it} \tag{3}$$

Further, analysing whether the average abnormal returns for periods around the spin-off announcement are equal to zero is also of interest. If there is information leakage associated with the spin-off announcement, the abnormal return should be reflected prior to the event day. Additionally, by examining the speed of adjustment when the information of the spin-off is publicly announced, market efficiency is indirectly tested. Hence, examining pre- and post-event returns provides information on potential information leakage and market efficiency. Thus, in addition to the cross-sectional aggregation, we want to capture the total impact of the spin-off during the whole event window, accounting for the time-series effect (Kothari and Warner, 2006).

To form the cumulative average abnormal return (CAAR), the average abnormal returns over the T days in the event window are summed:

$$CAAR_T = \sum_{t=1}^{T} AAR_t \tag{4}$$

When investigating the CAARs around the announcement day, one of the more commonly used methods in more recent years has been to study a three-day event window, starting at one day before the announcement, till one day after. Hite and Owers (1983) argue that it is not possible to distinguish between the day preceding the announcement and the actual day of the announcement, therefore it is of great relevance to have a margin of error when estimating the CAAR around the announcement date. Hence, in line with previous research, calculations for the three-day CAAR over the event window [-1, +1] are conducted. Further, to examine the market efficiency and the potential of information leakage, CAARs during the event windows, [-10, -1], [-1. 0], [0, +1], and [+1, +10] will also be tested.

To test whether the CAARs in the different event windows are statistically different from zero, a t-test is conducted. Significances are tested at the 1%-, 5%-, and 10% level, using a two-sided test. Abnormal returns are assumed to be independently and identically distributed in this test. The test statistics are given by:

$$\frac{CAAR_T}{[\sigma_T^2]^{1/2}} \tag{5}$$

where

$$\sigma_T^2 = L\,\sigma^2(AAR_t) \tag{6}$$

$\sigma^2(AAR_t)$ being the variance of the one-period average abnormal return and L is the number of days. The interpretation of equation (6) is that a larger L, results in a higher variance for the CAAR, and it assumes time-series independence of the one-period average abnormal return. Assuming that the variance of the one-period average abnormal return is estimated correctly, the test statistics in equation (5) is well-specified. However, in the case of event-time clustering, the assumption of independent abnormal returns would be violated. This would bias the estimated standard deviation downward and the test statistic outlined in equation (5) upward (Kothari and Warner, 2006).

4.2 Long-horizon event study

In contrast to the short-horizon event study which is relatively straightforward and widely accepted among researchers, the methodology used for the long-horizon event study varies significantly when measuring abnormal performance. Further, the statistical tests used to detect any potential long-run abnormal stock returns show a lot of variation (Barber and Lyon, 1997). According to Barber and Lyon (1997), many of the commonly used approaches are conceptually flawed, potentially leading to biased test statistics.

Cusatis, Miles, and Woolridge (1993) conducted the first paper on the long-run performance of companies involved in spin-offs, using the buy-and-hold abnormal returns (BHARs) approach. Their use of BHARs was later criticized by Fama (1998), due to the assumption made of the event firms being independent (Veld and Veld-Merkoulova, 2009). Lyon, Barber, and Tsai (1999) presented improved methods for testing the long-run abnormal stock performance, adjusting the t-statistics for overlapping samples. More recent papers examining the long-run performance related to spin-offs uses this approach (Veld and Veld-Merkoulova, 2009).

Cumulative abnormal returns (summed monthly abnormal returns), or BHARs (the compounded return on a sample firm less the compounded return on a reference portfolio/matched firm) are commonly used methods when testing the long-run abnormal performance (Barber and Lyon, 1997). Barber and Lyon (1997) favour the BHARs over the cumulative abnormal returns (CARs) for two reasons. First, they provide evidence of CARs being biased predictors of BHARs, which can lead to incorrect conclusions. Secondly, even if the conclusion based on CARs is correct, the documented magnitude does not equal the value of investing in the mean or median sample firm relative to a suitable benchmark over the time of interest. However, that is exactly what long-run event studies are trying to answer (Barber and Lyon, 1997). Following this argument, the BHAR-model is employed in this study to measure the long-run abnormal performance.

Further, opinions on whether to use equal-weighted or value-weighted returns are different in the literature. Loughran and Ritter (2000) argue that equal-weighted returns should be used in the case of measuring the abnormal returns on the average firm, associated with a random event. On the contrary, Fama (1998) argues that the total wealth effect experienced by an investor is better captured when using value-weighted returns. The argument proposed by Loughran and Ritter (2000) falls in line with the intention of this study, i.e., to measure if a random spin-off will be associated with a long-run abnormal performance. Therefore, the focus will be on equal-weighted returns in our results, but to capture the total wealth effect experienced by an investor, we will also present the value-weighted returns.

When applying the BHAR-model, an appropriate benchmark needs to be selected. One approach is to use a reference portfolio (e.g. a market index). This approach has been shown to suffer from three significant biases (i.e. the new listing bias, the rebalancing bias, and the skewness bias) which are discussed in detail by Barber and Lyon (1997). Barber and Lyon (1997) identify a method to solve the misspecification by using a characteristic-based matching approach (control firms of similar size, industry, and market-to-book ratios). This approach yields well-specified test statistics. Following these findings, the matched-firm approach will be used as the appropriate benchmark when applying the BHAR-model. The matched-firm approach has been widely used following the work of Barber and Lyon (1997), thus, providing further support for the selection of the method used in this study (Kothari and Warner, 2006)[12].

[12] See for example Desai and Jain (1999), McConnell and Ovtchinnikov (2004), Veld and Veld-Merkoulova (2004), Chai, Lin, and Veld (2018), among others.

4.3 Matching firm procedure

The procedure to identify a matching firm to each parent and the spun-off entity is conducted in the following way;

First, the 2-level BICS[13] code is used to find companies in the Nordics within the same industry. Thus, the firms can be matched with any company within its sector, in the Nordics. In the European study by Veld and Veld-Merkoulova (2004) they look for matching companies within the same country, but as the Nordic countries share many similarities we allow the matched firm to be from any of the countries included. This increases the sample size and the potential of finding an appropriate match. Secondly, we further filter the withheld matched firms by size. Size is measured by the market capitalisation at the time of the first day of trading. Firms with a market capitalisation of +/-25%, relative to the sample firm, remain as potential matched-firm candidates. If there is no match at the +/-25% level, an increase to +/-50% is conducted. Lastly, the firms remaining are sorted by their market-to-book ratio at the time of the spin-off. The firm with the closest market-to-book ratio to the sample firm is used as the matching firm. If the matched firm is being delisted for some reason, the firm with the second closest market-to-book ratio is used throughout the rest of the period. The same method applies if the second firm is being delisted, then the firm with the third closest market-to-book ratio is used, and so on.

4.4 The BHAR-model

In line with prior studies, long-run performance is examined at 6-, 12-, 24-, and 36 months after the spin-off. The long-run performance will be tested on parents, spun-off entities, and the pro-forma combined firms to give a more complete view. The buy-and-hold return (BHR) for the parent, spun-off entities, and pro-forma combined firm, for each holding period of 6-, 12-, 24-, and 36 months is calculated using the following formula:

$$R_{i,t} = \left[\prod_{t=1}^{T}(1 + r_{i,t})\right] - 1 \tag{7}$$

where $r_{i,t}$ is defined as the monthly return on stock *i*, in month *t*, relative to the completion date of the spin-off. Next, the buy-and-hold abnormal returns (BHARs) are calculated by the

[13] BICS (Bloomberg Industry Classification Systems) classifies the general business activities of companies.

difference between the sample firm and the matched firm, where $R_{m,t}$ is the BHR for the matched firm over the same respective periods:

$$BHAR_{i,t} = (R_{i,t} - R_{m,t}) \tag{8}$$

To arrive at the matched firm-adjusted return ($\overline{MFAR_t}$), the BHARs are averaged across each subsample, thus, one matched firm-adjusted return is estimated for every sample of parents, spun-off entities, and pro-forma combined firms for each holding period (Chai, Lin, and Veld, 2018). Computed by the following formula:

$$\overline{MFAR_t} = \frac{\sum_{i=1}^{N}(R_{i,t} - R_{m,t})}{N_x} \tag{9}$$

where N_x is the number of firms in the examined sub-sample.

To test the statistical significance of the matched firm-adjusted returns, the following t-statistic is conducted, as suggested by Barber and Lyon (1997):

$$t = \frac{\overline{MFAR_t}}{s_x/\sqrt{N_x}} \tag{10}$$

where s_x is the cross-sectional standard deviation of $\overline{MFAR_t}$ in the investigated subsample x, for the N firms in the investigated subsample x. However, as previously mentioned, the use of conventional t-statistics to measure the significance of long-run performance, assume event firms being independent (Fama, 1998). Therefore, the improved method derived by Lyon, Barber, and Tsai (1999), which adjust the t-statistics for overlapping samples, is used:

$$t_{sa} = \sqrt{n}\left(S + \frac{1}{3}\gamma S^2 + \frac{1}{6n}\gamma\right) \tag{11}$$

with

$$S = \frac{\overline{AR_\tau}}{\sigma(AR_\tau)} \tag{12}$$

and

$$\gamma = \frac{\sum_{i=1}^{N}(AR_{\tau i} - \overline{AR_\tau})^3}{n\sigma(AR_\tau)^3} \tag{13}$$

where the sample mean is denoted as $\overline{AR_\tau}$, and $\sigma(AR_\tau)$ is the cross-sectional sample standard deviation of abnormal returns for the sample of N companies. The estimate of the skewness

coefficient is denoted as γ, and $\sqrt{n}S$ represents the conventional t-statistic. Significances are tested at the 1%-, 5%-, and 10% level.

4.5 Factors explaining wealth effects

As mentioned in Section 2, several factors can potentially explain the wealth effects associated with spin-offs. The three most documented factors are focus-increasing, relative size, and information asymmetry. In addition to the estimations of the CAARs around the spin-off announcement and the long-run performance, this study aims to investigate these potential factors. A dummy variable methodology is applied to create subsamples, explained in detail in the section below.

4.6 Proxies

Focus-increasing. The factor "focus-increasing" is based on the Bloomberg Industry Classification Standard (BICS). If the 2-level BICS code for the parent company differs from the spun-off entity's 2-level BICS code, the spin-off is defined as an improvement in industrial focus. The same methodology is applied by Desai and Jain (1999) and Veld and Veld-Merkoulova (2004). A dummy variable is applied on whether the spin-off is focus-increasing (1) or non-focus-increasing (0).

Information Asymmetry. A frequently used proxy for the level of information asymmetry by previous studies, is the deviation of the analyst's forecast (Krishnaswami and Subramaniam, 1999). To measure the information asymmetry, analyst's earnings forecasts from the institutional brokers estimate system (I/B/E/S) is used, retrieved from Refinitiv Eikon. I/B/E/S reports a monthly mean, median, and standard deviation for firms, based on submitted analyst's estimates that month. More specifically, the information asymmetry proxy is determined by the standard deviation (in percentage) of all earnings forecasts for the next 12 months, made in the last month of the fiscal year prior to the year of the spin-off announcement. The idea behind this variable is that if there is a high level of disparity among analysts, reflected in high forecast errors, information asymmetry between the firm and the outside market (about its cash flows and value) is also high (Krishnaswami and Subramaniam, 1999). This method is also conducted by Veld and Veld-Merkoulova (2004), supported by evidence provided by Elton, Gruber, and Rentzler (1984) regarding the use of analysts' earnings forecasts as a measure of information asymmetry. A dummy variable whether the spin-off has a high level of information asymmetry (1) or a low level of information asymmetry (0) is applied. To cope with different economic

states during the years studied in this report, all the firms' forecast errors are not compared to the median of the whole sample. Instead, the firm's forecast errors are compared to the firms' median in the same time period (the spin-off announcement year). The motive behind this is; as the deviation among analyst's forecasts tends to be lower in steady economic states, compared to the uncertainty following an economic downturn, the information asymmetry proxy should arguably be better reflected in this way. Further, a parent company with no I/B/E/S reports, thus no analyst coverage, is assumed to have a high level of information asymmetry.

Relative size. Relative size is determined by dividing the market capitalisation of the spun-off entity by the sum of the market capitalisation of the spun-off entity and the parent company. This is calculated on the day of the completion of the spin-off, in line with Krishnaswami and Subramaniam (1999), and Veld and Veld-Merkoulova (2004). A dummy variable whether the spin-off is large (1) or small (0) is applied. A spin-off that is larger than the sample median is defined as large. The median relative spin-off size in this study is 28.3% with a mean of 30.3%. This is larger than the previous US studies, where Desai and Jain (1999) report a median relative size of 13.8% with a mean of 21.5%, and Krishnaswami and Subramaniam (1999) find a mean of about 22% (no median is reported). In the European study by Veld and Veld-Merkoulova (2004) the sample shows a median relative size of 29.6% with a mean of 33.5%, which is approximately in line with our study.

5. Empirical findings and analysis

5.1 Results - Abnormal returns around the announcement

In Table 5, we present the cumulative average abnormal returns (CAARs) for different event windows surrounding the spin-off announcements. Similar to previous research, we find the CAARs around the spin-off announcement to be significantly different from zero, allowing us to reject $\boldsymbol{H_{0,1}}$, which states that spin-offs do not exhibit positive CAARs around the announcement day. During the main event window [-1, +1], a CAAR of 3.03% is reported, significant at the 1% level. The CAAR of 3.03% on the Nordic market is in line with previous European studies. For example, Veld and Veld-Merkulova (2004) and Sudarsanam and Qian (2007), provide results of 2.62% and 4.82%, respectively, over the same event window (significant at the 1% level). Interestingly, our result is almost identical compared to the meta-

analysis (summary of 26 event studies) conducted by Veld and Veld-Merkulova (2009), reporting a significant CAAR of 3.02%. Further, both the event windows [-1, 0] and [0, +1] are also associated with significant CAARs of 2.31% and 2.48%, respectively. There are no significant CAARs for the longer event windows [-10, -1] and [+1, +10], which supports the efficient market hypothesis, arguing that the abnormal returns should be incorporated at the announcement date.

Table 5 - Cumulative average abnormal returns (CAARs)

Event Window	**-10 to -1**	**-1 to 0**	**-1 to +1**	**0 to +1**	**+1 to +10**
CAAR	-0.57%	2.31%*	3.03%***	2.48%**	0.90%
t-statistic	*-0.67*	*1.89*	*2.64*	*2.36*	*0.92*
CAAR (winsorized)	-0.39%	2.30%**	2.79%**	2.16%*	0.61%
t-statistic	*-0.44*	*2.22*	*2.50*	*1.83*	*0.86*

To see the impact of the extreme values in our sample, we have conducted a 90% winsorization. This means that all observations greater than the 95th percentile are set equal to the 95th percentile and all observations smaller than the 5th percentile are set equal to the 5th percentile. In Table 5, we observe that the CAARs in the smaller event windows (i.e. [-1, 0], [-1, +1], and [0, +1]) after conducting the winsorization are similar to the original results. These are all still significant with minor changes in the t-statistics. The event window [-1, 0] becomes significant at the 5% level in contrast to the previous 10% level. The event window [0, 1] results in the opposite, changing from being significant at the 5% level to the 10% level. For the main event window [-1, 1] we observe a modest decrease in CAAR from 3.03% to 2.79%. Further, the t-statistic show a slight decrease as well, resulting in a significance level of 5%. By looking at the longer event windows (i.e. [-10, -1] and [+1, +10]), we observe minor changes as well, where the CAARs remain insignificant. This can be seen as support for the efficient market hypothesis, showing no signs of abnormal returns in the longer event windows as the abnormal returns should be incorporated at the announcement date. Further, the robustness check indicates that our results are not heavily dominated by any extreme values, which provides further reliability to our empirical findings.

In Table 6, characteristics for each day in the interval [-10, +10] around the announcement, are summarised. The majority of the days prior to the announcement date exhibits negative average abnormal returns, showing no sign of information leakage. As presented in Table 5, the CAAR is insignificantly negative over the event window [-10, -1] of -0.57%, which strengthens the

support for no information leakage during this period. However, by looking at the prior day of the announcement, we notice the highest proportion (56.47%) of spin-offs exhibiting positive abnormal returns during the interval [-10, -1]. Additionally, the average abnormal return one day before the announcement amounts to 0.53% with an abnormal median return of 0.19%. This could potentially indicate information leakage affecting the share price of the parent company before the spin-off is publicly announced. As expected, the announcement date exhibits the largest average abnormal return of 1.77% with a median abnormal return of 1.17%. Out of the 84 spin-offs conducted, 70.59% yields a positive average abnormal return on the announcement date. This is slightly higher than the 60.19% reported by Veld and Veld-Merkulova (2004) and the 63.22% reported by Chai, Lin, and Veld (2018).

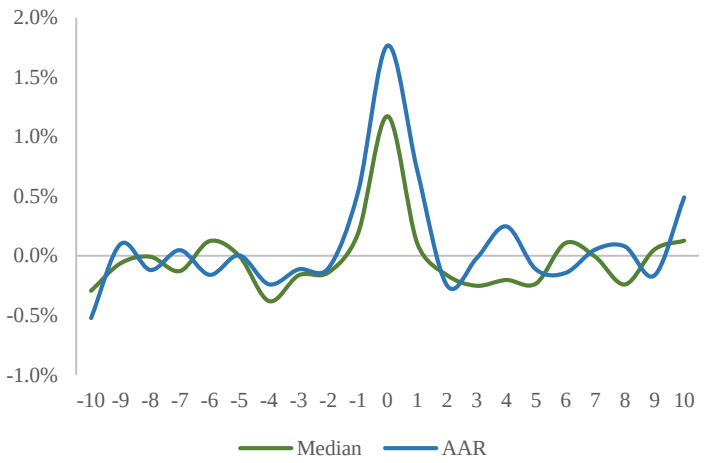
By examining the post-event returns, we can see that the days after the main event window [-1, +1] are mainly associated with negative median abnormal returns. This indicates a slight overreaction to the spin-off announcement, as was suggested by DeBondt and Thaler (1985, cited in Malkiel, 2003), vaguely implying that the market is not absorbing the new information fully efficiently.

Table 6 - Spin-off announcement effect

Day	AAR	CAAR	% positive	Median
-10	-0.52%	-0.52%	41.18%	-0.29%
-9	0.10%	-0.42%	47.06%	-0.06%
-8	-0.12%	-0.54%	52.94%	-0.01%
-7	0.05%	-0.49%	47.06%	-0.13%
-6	-0.16%	-0.65%	52.94%	0.12%
-5	0.00%	-0.65%	51.76%	0.00%
-4	-0.24%	-0.89%	37.65%	-0.38%
-3	-0.11%	-1.00%	50.59%	-0.16%
-2	-0.10%	-1.10%	50.59%	-0.14%
-1	0.53%	-0.57%	56.47%	0.19%
0	1.77%	1.20%	70.59%	1.17%
1	0.72%	1.91%	52.94%	0.10%
2	-0.25%	1.67%	41.18%	-0.16%
3	-0.02%	1.64%	45.88%	-0.25%
4	0.25%	1.89%	47.06%	-0.20%
5	-0.11%	1.78%	48.24%	-0.23%
6	-0.14%	1.64%	50.59%	0.11%
7	0.05%	1.69%	52.94%	-0.01%
8	0.08%	1.77%	44.71%	-0.24%
9	-0.16%	1.60%	54.12%	0.05%
10	0.49%	2.10%	52.94%	0.13%

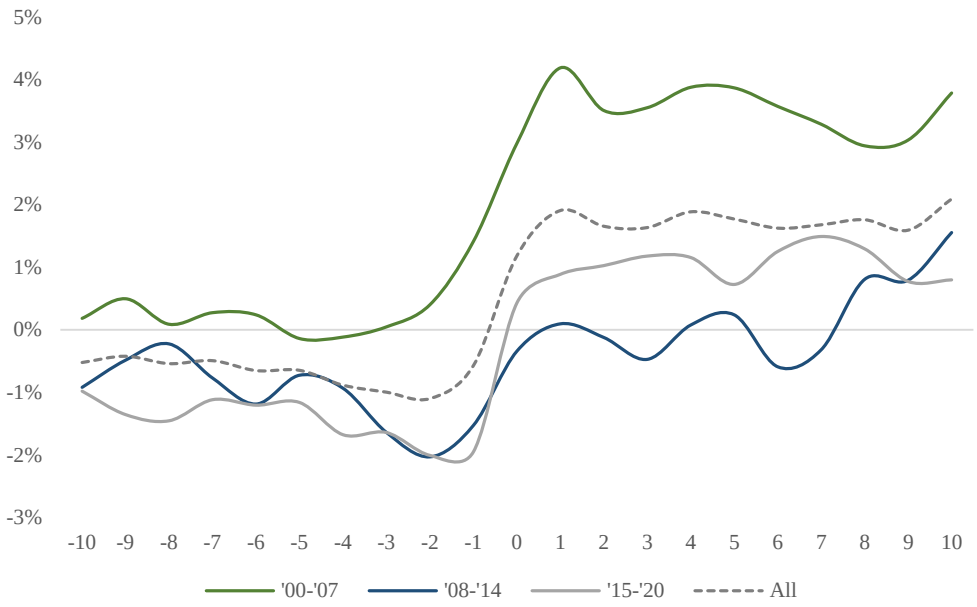
To easier assimilate the information in Table 6, and to visualise the abnormal behaviour around the announcement date, a chart with the distribution of both median- and average abnormal returns are provided below (Figure 1). One can see how the abnormal returns are centered around the announcement date.

Figure 1 - Abnormal returns around the announcement



In figure 2, we have divided our sample into three different periods, to give an overview of if the CAARs differ through time. All subsamples show clear abnormal behaviour around the spin-off announcement. The period associated with the highest CAAR is between 2000 and 2007. This period also indicates a potential of information leakage at an earlier state compared to the sample containing all spin-offs. Hence, the true spin-off announcement effect is not fully captured at the announcement date. It is also worth mentioning that this period indicates an overreaction, as the abnormal returns trend downwards the following days. Further, spin-offs conducted from 2008 and onwards, seem to exhibit lower CAARs than all spin-offs combined.

Figure 2 – Cumulative average abnormal returns



5.2 Results - Long-run abnormal returns

When examining the long-run performance, as presented in Table 7, we are not noticing any significant results for the spun-off entities and the pro-forma combined firms. Therefore, we cannot reject $\boldsymbol{H_{0,2}}$, which states that companies do not exhibit long-run abnormal returns after the spin-off. On the contrary, parent firms show significant negative abnormal returns in the long run, in three out of the four different periods, allowing us to reject $\boldsymbol{H_{0,2}}$ for the parent firms. This result differs from previous studies on the US market, where the majority of studies provide insignificant positive abnormal returns for the parent firms. For example, McConnell, Ozbilgin, and Wahal (2001) found insignificant positive abnormal returns for the parent firms across all holding periods. Previous research in Europe has instead shown results slightly skewed towards negative abnormal returns for the parent firms, but with no significance provided. Hence, this study is the first to document statistical evidence of negative abnormal returns for the parent firms. Looking at the abnormal returns for the spun-off entities we notice insignificant positive abnormal returns across all periods except for the holding period of 36 months. This result is in line with previous research in Europe, except for the holding period of 36 months, as both Veld and Veld-Merkulova (2004) and Sudarsanam and Qian (2007) found insignificant positive abnormal returns across all holding periods. The returns for the pro-forma combined firms represent the returns that the investment would have yielded if the investor were to remain invested in both the parent firms and the spun-off entities after the

spin-off. Thus, this investor would have experienced superior returns relative to the investor with exposure only to the parent firms. However, as the returns are insignificant, no statistical evidence can be provided. The results for the spun-off entities and pro-forma combined firms can be seen as support for the efficient market hypothesis, showing no signs of abnormal returns in the long run.

Table 7 - Long-run abnormal returns

	Equal-weighted mean	*t-statistics*	**Value-weighted mean**	*t-statistics*	**N**
Parent firms					
6 months	-9.92%***	2.87	-6.43%*	1.96	78
12 months	-10.57%*	1.85	-1.25%	0.23	75
24 months	-11.70%	1.27	12.76%	1.66	71
36 months	-23.59%*	1.88	-6.90%	0.69	64
Spun-off entities					
6 months	5.80%	1.07	6.5%	1.19	77
12 months	3.72%	0.58	1.3%	0.22	73
24 months	9.22%	0.98	-4.9%	0.43	65
36 months	-8.22%	0.96	-7.6%	0.89	57
Pro-forma combined firms					
6 months	-4.67%	1.36	-2.66%	0.78	75
12 months	-3.49%	0.51	-0.46%	0.04	71
24 months	4.80%	0.55	7.11%	0.81	64
36 months	-5.52%	0.50	-3.96%	0.35	56

Due to some spin-offs having a trading history of fewer than six months, the sample size is slightly less than the 84 observations around the announcement. The decrease in observations between six months and 36 months is due to the delisting of companies during the holding periods. (***) 1% significance, (**) 5% significance, (*) 10% significance.

To give a more holistic view, we also measure the long-run performance using the value-weighted approach as suggested by Fama (1998). As previously stated, the long-run returns can be highly dependent on which methodology is used, and therefore, by applying both methodologies, we provide further robustness and capture two different perspectives of measuring the long-run performance.

In Table 7, looking at the value-weighted mean, we notice that the parent firms are associated with negative abnormal returns except for the holding period of 24 months. However, the results only provide a significant negative abnormal return for the 6-month holding period for the parent firm. In addition to the equal-weighted approach, we provide further statistical evidence for a negative wealth effect during this holding period. We also observe insignificant abnormal returns, varying between positive and negative, for both the spun-off entities and the

pro-forma combined firms for each respective holding period. Hence, we do not receive any indication of potential abnormal returns and provide further support to the efficient market hypothesis.

5.3 Testing of factors around the spin-off announcement

Table 8 presents both the median and average cumulative abnormal returns over the main event window [-1, +1] for each respective sub-sample.

Table 8 - Announcement abnormal return

Event window [-1, +1]	**CAR (mean)**	*t-statistics*	**CAR (median)**	*t-statistics*	**N**
Focus-increasing	4.42%**	2.18	4.08%**	2.38	30
Non-focus-increasing	2.26%*	1.80	1.48%***	3.31	54
Difference	2.16%	0.91	2.60%*	-1.73	
High information asymmetry	3.43%**	2.35	2.33%***	4.07	59
Low information asymmetry	2.08%*	1.73	1.33%**	2.50	25
Difference	1.36%	0.72	0.99%	-0.46	
Relative size (large)	2.50%	1.62	1.82%***	3.09	42
Relative size (small)	3.55%**	2.33	2.28%***	3.06	42
Difference	-1.05%	-0.48	-0.45%	-0.30	

The mean CAR for each subsample is tested if it is statistically different from zero using a t-test. The significance of the difference in means is also conducted using a t-test. The non-parametric Wilcoxon signed-rank test is used for measuring the significance of the medians for each subsample. Besides the distribution-free assumption, which is favourable when dealing with smaller data sets, it serves as a robustness check against the t-test on the mean CARs. The significance of the difference in medians is tested using the non-parametric Mann-Whitney U-test. (***) 1% significance, (**) 5% significance, (*) 10% significance.

In Table 8, we see that the mean CARs for focus-increasing spin-offs (4.42%) are larger than the respective for non-focus-increasing (2.26%). Focus-increasing spin-offs are significant at the 5% level, allowing us to reject $\boldsymbol{H_{0,3a}}$ and we can start to believe that focus-increasing spin-offs are associated with a positive mean CAR. Different from Veld and Veld-Merkoulova (2004) and Desai and Jain (1999), the mean difference is not significant. Therefore, we cannot tell whether focus-increasing spin-offs are associated with a higher mean CAR than non-focus-increasing.

Further, we find significant median CARs of 4.08% versus 1.48%, for the focus-increasing and the non-focus-increasing spin-offs, respectively. Similarly to the mean, we can reject $\boldsymbol{H_{0,3a}}$, which implies that focus-increasing spin-offs are associated with a positive median CAR.

Additionally, we are also noticing that the median difference of 2.60% is significant at the 10% level, implying that focus-increasing spin-offs are associated with a higher median CAR than the non-focus-increasing spin-offs. This allows us to reject $\mathbf{H_{0,3b}}$, which states that there is no difference in CARs between focus-increasing and non-focus-increasing spin-offs.

Table 8 also presents the sub-sample of information asymmetry. We notice that spin-offs with a high degree of information asymmetry exhibit a mean CAR of 3.43%, significant at a 5% level. Thus, we can reject $\boldsymbol{H_{0,4a}}$, which implies that spin-offs of companies with a high degree of information asymmetry exhibit a positive mean CAR. Spin-offs with low information asymmetry also exhibit a positive mean CAR of 2.08%, significant at the 10% level. Hence, we notice that a high degree of information asymmetry tends to generate a higher mean CAR than spin-offs characterised by low information asymmetry. On the contrary to the results provided by Krishnaswami and Subramaniam (1999), this difference is not significantly different from zero, and we can therefore not reject $\mathbf{H_{0,4b}}$, which states that there is no difference in CARs between spin-offs with a high- or low degree of information asymmetry. Our result is in line with Veld and Veld-Merkulova (2004), also reporting no statistical significance between the mean differences.

Similarly, the median CAR for spin-offs with a high degree of information asymmetry is 2.33% versus 1.33% for low. With significance levels of 1% and 5% respectively, we observe that a high degree of information asymmetry tends to generate a higher median CAR, but the difference is not statistically significant.

To summarise, the factor testing of information asymmetry indicates that it is associated with positive CARs. This falls in line with the stronger belief among previous academic research that spin-offs reduce information asymmetry, leading to a more "fair" valuation of the company, resulting in positive CARs.

Looking at the last sub-sample in Table 8, we notice that larger spin-offs show a mean CAR of 2.50%, but the returns are not statistically significant. Therefore, we cannot reject $\boldsymbol{H_{0,5a}}$, which states that large spin-offs do not exhibit a positive CAR. Interestingly though, we note that smaller spin-offs are associated with a higher mean CAR of 3.55%, at a 5% level of significance. However, as the difference between larger- and smaller spin-offs is not significant, we cannot tell whether there is a relative difference in wealth effect between large

and small spin-offs. Unlike previous research, where Hite and Owers (1983), Miles and Rosenfeld (1983), and Veld and Veld-Merkoulova (2004) all reported significant results in the difference, showing that large spin-offs are associated with higher wealth effects compared to smaller, we cannot reject $\boldsymbol{H_{0,5b}}$, which states that there is no difference in CARs between large and small spin-offs.

On the contrary to the insignificant results regarding the average large spin-off above, we find that the median CAR for larger spin-offs amount to 1.82%, allowing us to reject $\boldsymbol{H_{0,5a}}$, while smaller spin-offs exhibit a median CAR of 2.28%, both at a significance level of 1%. Thus, we notice that smaller spin-offs tend to generate higher abnormal returns than larger spin-offs, but the difference is not statistically significant. Even though it is not statistically significant, it is interesting that our sub-sample suggests that smaller spin-offs are associated with higher CARs. This could be related to the result of industry focus, i.e., if smaller spin-offs tend to be focus-increasing, then this announcement is likely to experience a more positive reaction, compared to larger non-focus-increasing spin-offs.

5.4 Testing of factors in the long run

To test the factors in the long run, the matched firm-adjusted return (MFAR) is regressed over the three factor-dummies (relative size, focus-increasing, and information asymmetry). The MFAR received from the parent firms is used, as we provide evidence of significant negative abnormal returns (except for the holding period of 24 months). The regressions are conducted for each holding period of 6-, 12-, 24-, and 36 months.

Table 9 - Testing of factors in the long-run (parent)

Holding period \ Variable	Intercept	Relative size	Focus-increasing	Information asymmetry	N	Adj. R2
6 months	-0.09	0.06	0.08	-0.09	78	5.36%
t-statistics	*-(1.25)*	*(0.86)*	*(1.14)*	*-(1.24)*		
12 months	-0.18	0.16	0.03	-0.04	75	-0.19%
t-statistics	*-(1.42)*	*(1.53)*	*(0.23)*	*-(0.33)*		
24 months	-0.10	0.14	-0.12	-0.08	71	-2.28%
t-statistics	*-(0.54)*	*(0.86)*	*-(0.70)*	*-(0.44)*		
36 months	-0.39*	0.14	0.07	0.08	64	-3.49%
t-statistics	*-(1.91)*	*(0.74)*	*(0.34)*	*(0.41)*		

Table 9 shows the factor-specific abnormal returns for the parent firms in the long run, for each respective holding period. Starting with relative size, we notice a slightly positive coefficient throughout all four periods, but none of which are significant. Similarly, focus-increasing is

also associated with a slightly positive coefficient across all periods except for the holding period of 24 months, all of which are insignificant. Consequently, we cannot state that there is a difference in abnormal returns for the parent firms between focus-increasing spin-offs and non-focus-increasing spin-offs. On the contrary, information asymmetry is associated with a slightly negative coefficient across all periods except for the holding period of 36 months. Interestingly, this suggests that high information asymmetry generates lower abnormal returns compared to a spin-off with low information asymmetry, for the holding periods of 6-, 12-, and 24 months. However, similar to both the relative size and focus-increasing factors, the coefficients lack significance. To summarise, none of the factors show any explanatory power of the long-run abnormal returns.

6. Conclusion

This study examines wealth effects associated with spin-offs around the announcement and in the long run, as well as factors explaining this wealth effect. We find that spin-offs conducted on the Nordic market between 2000 and 2020 are associated with cumulative average abnormal returns around the announcement. More specifically, we report a result showing a cumulative average abnormal return over the event window [-1, +1] of 3.03%, significant at the 1% level.

Additionally, we find evidence suggesting that focus-increasing spin-offs are associated with a positive cumulative average abnormal return around the announcement, which supports the main argument by practitioners when motivating a spin-off. On the contrary to previous studies, we cannot find any evidence that larger spin-offs relative to smaller spin-offs are associated with higher wealth effects. Finally, we find that companies with a high information asymmetry prior to the spin-off exhibit a significant positive cumulative average abnormal return.

Further, we are the first to document significant negative abnormal returns for the parent firms during the 6-, 12-, and 36-month holding periods, which questions both the value creation among spin-offs and the efficient market hypothesis. However, no significant results for either the spun-off entities or the pro-forma combined firms in any of the examined holding periods are documented. This supports the efficient market hypothesis, stating that new information should be incorporated at the announcement, rather than in the long run.

Limitations and topic for further research

When examining potential factors that can explain the wealth effects associated with spin-offs around both the announcement date and in the long-run, we focus on three factors; focus-increasing, information asymmetry, and relative size. As discussed in Section 2, there are additional potential explanatory factors proposed in previous studies. Hence, for a more holistic view and increasing robustness, additional factors could have been included in this study. However, some of these factors do not apply to the Nordic market, e.g., taxes and geographical focus. For example, in the United States, some spin-offs are taxable and have therefore been included as a factor in US studies. On the contrary, spin-offs in Europe are generally not taxable, as it is possible to defer tax payments (except for in France, Germany, and the Netherlands). Thus, it is not a relevant factor to be included in this study (Veld and Veld-Merkoulova, 2004). Additionally, only one spin-off in our sample was recognised as increasing the geographical focus. Therefore, this rather commonly used factor has been excluded as well.

There are also studies (Maxwell and Rao, 2003; Veld and Veld-Merkoulova, 2008) focusing on the potential wealth transfer between bondholders and stockholders. While spin-offs lead to abnormal returns for the shareholder around the announcement, they also make companies less diversified, which harms the bondholders (Veld and Veld-Merkoulova, 2008). However, many European companies (as well as companies included in our sample) still use bank debt (Veld and Veld-Merkoulova, 2004), that is not publicly traded. As a result, we do not consider this potential factor.

Chai, Lin, and Veld (2018), who conducted a study of spin-offs on the Australian market, found that the three-day cumulative average abnormal returns for mining companies were notably higher than the other industries. The difference was not significant, but it highlights a potential area for further research, i.e., whether certain industries experience a greater cumulative average abnormal return around the announcement day than other industries.

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