Andreas Myhrer Rafoss
Øystein Hoddø

Have European spinoffs generated long-run abnormal returns?

A study of European spinoffs completed between 1990 and 2020

Master's thesis spring 2021
Oslo Business School
Oslo Metropolitan University
MSc in economics and business administration

Abstract

We investigate the long-run abnormal returns of spun-off companies in Europe through a sample of 265 European spinoffs completed between 1990 and 2020. We find that spinoffs have generated long-run abnormal returns the following 24 to 60 months after completion. We observe abnormal returns over the entire sample period, but a fluctuating pattern of abnormal returns for spinoffs throughout the sample period. Further, we see that the smaller companies, measured by market capitalization, significantly outperformed the larger companies. This is in line with existing theory related to size premiums. We don't find evidence of the lower price/book ratio or focus-increasing spinoffs explaining the observed abnormal returns.

We would like to express our thankfulness to our supervisor, Johann Reindl. He has provided us with valuable guidance throughout the whole process. The feedback and discussions he has given us has been crucial in order to succeed with our thesis during these strange times.

Table of contents

1 Introduction **4**

1.1 Choice of topic *4*

1.2 Research question development *4*

1.3 Our contribution *6*

1.4 Motivation and the writing process *7*

1.5 Structure of the thesis *7*

2 Literature review **7**

2.1 Corporate restructuring *8*
2.1.1 Spinoff 8
2.1.2 Split-off 9
2.1.3 Equity carve-out 10

2.2 IPO *10*

2.3 Empirical findings regarding spinoffs *10*
2.3.1 Motives for spinning out a subsidiary 10
2.3.2 Previous findings 12

2.4 Efficient market hypothesis *14*

3 Data **15**

3.1 Data Collection and Processing *16*

3.2 Sample Characteristics *17*

3.3 Variables and definitions *20*
3.3.1 Monthly returns for spinoff companies 20
3.3.2 Capital Asset Pricing Model 20
3.3.3 Fama-French 5 factor model 21

4 Methodology **23**

4.1 Testing for long-term abnormal returns *23*
4.1.1 Calendar time portfolio approach 25

4.2 Focus-increasing *26*

4.3 Undervaluation as an explanation for abnormal returns *27*
4.3.1 Sorting portfolios based on P/B ratios 27
4.3.2 Sorting portfolio based on market cap 28

4.4 Long-short portfolios *29*

5 Results and discussion **30**

5.1 Factor coefficients *36*

5.2 Long-run abnormal returns *36*
5.2.1 Size portfolios 39
5.2.3 P/B portfolios 41
5.2.3 Focus-increasing 43

6 Conclusion **45**

1 Introduction

1.1 Choice of topic

Corporate restructuring can be seen as an important transaction for both the company and their shareholders. Previous studies have shown that the motives for restructuring can be anything from tax incentives, reducing bureaucratic structure, allowing companies to focus on their main business, catering investor appetite for glamour stocks or several other reasons (see Boreiko & Murgia; 2010, Sudarsanam & Qian; 2007, Veld & Veld-Merkoulova; 2004).

One of the many ways to restructure a company is by separating a part of the business through a distribution of shares to existing parent shareholder. This results in an independent publicly traded subsidiary, and this method is referred to as a *spinoff*. From a shareholder-perspective this means that you are left with shares in two companies: the parent (original firm) and the spinoff (the separated subsidiary). We found it interesting that the previous research related to spinoffs primarily focused on the announcement effect in the parent company's share price, and that the limited amount of research on the long-term abnormal returns was unclear about whether spinoffs have created long-run abnormal returns after completion. Based on this, we wanted to study the long-term effects spinoffs have on shareholder value. More specifically we wanted to test whether spinoffs have created long-run abnormal returns following the completion, contributing to previous research on the subject. In addition, if so, we also want to try to identify if undervaluation could be an explanation. Previous research has primarily covered the US, and so we chose to focus our research on Europe to add to the previous European research.

1.2 Research question development

We shouldn't be seeing any long-run abnormal returns in spinoffs if markets are efficient. The previously documented announcement returns in the parent company's stock price prior to the distribution of the shares should capture all the potential value creation from the restructuring and potential benefits from increasing efficiency. Once the shares of the spun off companies have been distributed, they should trade close to intrinsic value and as a group perform similarly to the overall market adjusted for relevant risk factors following the separation.

We suggest that spinoffs might be a place of mispricing for several reasons. In line with the *underreaction hypothesis* outlined by Ikenberry et al. (1995), we suggest that the market might treat spinoffs with skepticism following the distribution as investors are forced to rely on pro-forma financials and limited historical data. There might be significant benefits in spinoff transactions where the subsidiary is in a different line of business. Following the separation, the management structure is decentralized, and capital allocation is likely more in line with the core business. However, market participants might be skeptical to potential improvements and don't bid up the shares until there is tangible proof of improvements. This might cause a lag effect in the stock price relative to underlying value development and cause shares to be undervalued for some time before the improvements are obvious to the overall market.

Secondly, the way a subsidiary goes public through a spinoff is by distributing shares to investors in the parent company, where no cash changes hand. This differs from an IPO where new shares are offered to the public and the incentives for previous shareholders and intermediaries are to achieve the highest possible market value. This dynamic might create irrational price setting as the first market clearing price following the distribution is likely determined by selling pressure from the existing parent shareholders and not buying pressure from new shareholders. Also, spinoffs are smaller than their previously public parent and tend to be in a different line of business. This might lead to indiscriminate selling pressure from institutional investors who have certain market cap and industry constraints, as they are given shares in a company that they might be forced to sell immediately following the distribution. We therefore hypothesize that firms with characteristics that are common for undervalued shares like low P/B multiple and smaller market cap are more likely to be undervalued and therefore are likely to outperform their counterparts of higher P/B and market cap companies.

Our overall research question is:

Have spinoffs completed in Europe during the period 1990–2020 generated long-run abnormal returns?

Furthermore, we also want to investigate whether specific firm characteristics can explain potential abnormal returns. The first sub-question is based on the *size premium anomaly* for smaller companies, which is a well-known market anomaly (Horowitz et al., 2000, p. 143). In order to test this, we will sort our sample by size and test the sub-question:

1. *Can the size premium anomaly explain abnormal returns occurring from spinoffs?*

The second sub-question relates to the argument that observed abnormal returns in spinoffs could be explained by undervaluation, characterized by low P/B multiples:

2. *Can abnormal returns in spinoffs be explained by undervaluation, characterized by low P/B ratio?*

Building upon previous evidence related to the *focus increasing hypothesis*, we want to test whether focus increasing spinoffs outperform non-focus increasing spinoffs. Therefore, our third and last sub-question is:

3. *Do focus-increasing spinoffs outperform non-focus increasing spinoffs?*

1.3 Our contribution

The purpose of this thesis is to investigate whether European spinoffs have generated abnormal returns during the last 30 years. We want to add to the existing research of the long-term returns of spinoffs in Europe by looking at a bigger and more recent sample. Hopefully this can contribute to finalize the debate of whether spinoffs in Europe have generated long-run abnormal returns. We also want to investigate whether undervaluation characteristics might explain potential abnormal returns in spinoff. To our knowledge this is a subject that has been given little attention in previous research on spinoffs. Furthermore, previous studies have compared spinoff returns to Fama-French's 3 factors. The publication of Fama-French's 5 factor model in 2015 allows us to compare a more comprehensive asset pricing model to spinoff returns and see whether the new investment and profitability factor can explain some of the return profile.

1.4 Motivation and the writing process

The reason for choosing this as our topic for the master thesis was that we find spinoffs to be an interesting way of restructuring a company and going public. We found out that most of the existing literature on this field relates to the US and have shown varying results regarding the long-run abnormal returns from spinoffs. We also found that the use of spinoff as a method for restructuring has been increasingly used in Europe since the 1990s and it's interesting to investigate whether there has been a change in the return profile of spinoffs over time. The writing process has been challenging in several ways, but at the same time providing us with a lot of new knowledge. We wanted to supply the existing literature with some form of new findings. This turned out to be quite challenging as we found out that it exists a lot of papers on corporate divestitures and spinoffs. Focusing our research on Europe, the long-term effect, undervaluation and the size premium as potential drivers of spinoff returns hopefully adds some new insights to the previous research.

1.5 Structure of the thesis

The thesis will be structured in the following way. Chapter (2) will introduce a review of the existing theory on spinoffs and similar transactions. Chapter (3) will present our sample and our data. Chapter (4) presents our chosen methodology. Chapter (5) contains our analysis of the test results and general discussion of our findings in relation to previous research. Finally, chapter (6) will present the conclusion drawn from our results.

2 Literature review

In this part we will present a review of the existing literature related to spinoffs. The purpose of this part is to cover the subjects our thesis relates to, which will provide the reader with the necessary information to understand our analysis and conclusion. We start off with presenting spinoffs as a type of corporate restructuring before we refer to previous findings surrounding the experienced shareholder returns related to spinoffs. We also present theory related to IPOs to highlight the difference between spinoffs and IPOs, as they both represent a way of going public. We also refer to literature regarding the Efficient Market Hypothesis (hereby EMH), as any abnormal return evidence from spinoffs would contradict EMH theory.

2.1 Corporate restructuring

Khan & Mehta (1996, p. 885) defines corporate restructuring as the process of altering the structure of a company with the purpose of increasing or decreasing the firm's operational asset base. We will present theory related to spinoffs, equity carve-outs and split offs. This is done with the intention of presenting the reader to approaches of changing corporate structure that may seem similar to each other but has certain characteristics that make them different. It's important to mention that corporate restructuring includes either expanding or reducing the scope of the firm. This thesis aims to address return effects when the scope of the firm is reduced.

A corporate divestiture is a major corporate restructuring decision which may enable a firm to refocus in its core businesses, to pay off debts, to develop new products or to finance alternative projects (Pham et al., 2015, p. 42). The divesting process can be done in several ways, but some common forms are through a spinoff, through an equity carve-out or through a split-off (Khan & Mehta, 1996, p. 885).

2.1.1 Spinoff

When a company decides to spin off a part of their business, a subsidiary is created and publicly listed, and the shareholders of the parent company receive a proportional number of shares in the subsidiary based on their ownership in the parent firm (Sudarsanam & Qian, 2006, p. 1). Spinoffs generally don't generate any cash-flow for either the spun-out firm or the parent firm since the shares in the new subsidiary is distributed to existing shareholders without any cash changing hands.

> *The absence of external financing and taxes make spinoffs an interesting corporate transaction to analyze the determinants and the economic effects of decisions that alter the scope of the firm* (Boreiko & Murgia, 2010, p. 2).

Historically, spinoffs have been more common in the US than in Europe. To alter that, the European Union (EU) issued the 6th directive in 1982, where one of the goals was to harmonize EU country national laws and make spinoffs a viable and economically efficient restructuring transaction. Since then, tax-free spinoffs have become more common in European countries (Boreiko & Murgia, 2010, p. 3).

There are two alternatives to complete a tax-free spinoff (Schnee et al., 1998):

1. The parent company must distribute all the shares in the subsidiary (a minimum requirement of 80%) to its existing shareholders. The distribution is done on a pro-rata basis. This means that if an investor owns 5% of the shares in the parent company, he or she will receive 5% of the shares in the new subsidiary.
2. Alternatively, the shareholders can be offered the opportunity to exchange their shares in the parent with new shares in the subsidiary. This method is defined as a *split-off*, which we will cover below.

The second alternative would be more suitable for the investors who originally wanted to hold a specific part of the business, but previously were not able to due to the conglomerate structure.

2.1.2 Split-off

Similar to a spinoff, a split-off also includes that the subsidiary is listed as a new and independent entity, but the shareholders of the parent company are offered to exchange a part of their shares in the parent for the new shares in the subsidiary. This method is in some way similar to a repurchase of shares in the parent company, using shares in the subsidiary instead of cash (Eckbo & Thorburn, 2008, p. 455). The split-off usually happens after the shares of the subsidiary has been sold to public investors through an equity carve-out. This is because the subsidiary then has a market value that can be used to define the exchange rate between old shares and new shares. This form of divestiture can be well suited for the investors that initially wanted to invest in one of the subsidiaries in the parent company but have not been able to due to only the parent company being publicly traded.

2.1.3 Equity carve-out

An equity carve-out refers to a partial divestiture of a business unit where a parent company sells off a minority interest in a subsidiary to outside investors (Wagner, 2005, p. 5). When a company decides to sell off a subsidiary, this is often done through an IPO. Since these shares are sold publicly, the carve-out creates a new group of shareholders in the subsidiary. This form of divestiture separates the entity from its parent company, and the separated unit will have its own board of directors and financial statements (Allen & McConnell, 2002, p. 167). Regardless of the separation, the parent firm often keeps a controlling part of the subsidiary.

2.2 IPO

An IPO is short for Initial Public Offering. This is a way for a company to raise capital to finance their operations. Shareholders are offered to buy new shares for a given price (the offer price). When the IPO is completed, the shares can be traded at the open market if the investors that bought them at first decides to sell them. In many cases it has been observed an underpricing discount related to IPOs. E.g., it was observed an average underpricing of 20% in the US during the 1990s (Ljungqvist, 2007, p. 376). Underpricing related to IPOs are calculated as the difference between the offer price, which is the price the shares were sold to investors, and the price that the shares are traded at in the market. Aggarwal & Rivoli (1990, p. 47) presented two explanations for the abnormal returns related to an IPO. First, that the IPO was underpriced at the initial offering. Second, that the IPOs are not priced at intrinsic value in early aftermarket trading.

2.3 Empirical findings regarding spinoffs

2.3.1 Motives for spinning out a subsidiary

To understand the effect that the spinoff has on shareholder wealth, we need to see the spinoff transaction as one event. This means understanding the parent company and its core business, the subsidiary and its core business, and be able to understand the reason for why the subsidiary is spun out of the parent. In the literature, this is referred to as the *motive* for spinning off a part of the business.

In the article *European Spin-offs: Origin, Value Creation and long-term performance,* written by Boreiko & Murgia (2010), the authors highlight some factors that motivates companies to spin off a part of their business. We will quickly present some of these motives before heading over to actual findings by previous research.

Focus-increasing

Often referred to as efficiency increasing. Existing literature suggests that focus-increasing (i.e., eliminating negative synergies) should increase efficiency and consequently create value for shareholders. This claim has received good empirical support. Empirical research identifies focus-increasing spinoffs by using the SIC-code (standard industry classification code), where they classify spinoffs with different two-digit SIC code as their parents as focus-increasing. This theory suggests that the conglomerate model where one parent company owns subsidiaries in different lines of business is inefficient, and consequently by spinning of parts of the business and reducing the complexity they increase the focus of the remaining entities, which in theory should lead to more streamlined operations and efficient allocation of resources.

Asymmetric information

This is the basis for the *asymmetric information hypothesis,* which builds on the assumption that multi-divisional firms (e.g., conglomerates) are less transparent than standalone-firms, and therefore more likely to be mispriced. A spinoff should then act as a catalyst to correct the mispricing by increasing transparency of the subsidiaries as they become publicly listed as separate entities.

2.3.2 Previous findings

Study	Country	Research period	Observations	Event window	Cumulative average abnormal return (%)
Schipper and Smith (1983)	US	1963–1981	93	(−1, 0)	2.84***
Hite and Owers (1983)	US	1963–1981	123	(−1, 0)	3.3***
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)	2.6***
Johnson *et al.* (1996)	US	1975–1988	104	(−1, 0)	3.96***
Daley *et al.* (1997)	US	1975–1991	85	(−1, 0)	3.4***
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)	5.4***
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***
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*

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.

Figure 1: "Studies of wealth effects associated with spin-off announcements" by Veld & Veld-Merkoulova, 2009, p. 410

As figure 1 shows, spinoffs have historically created shareholder value in the short term through the announcement effect with significant cumulative average abnormal returns ranging from 1.32% to 5.56%. This suggest that spinoff transactions, all else equal should be a value enhancing way of restructuring a company as the market discounts the potential improvement in future cash flows at the day of the announcement by bidding up the shares. From figure 1 we also observe that the majority of previous studies on spinoffs focus on the US.

Study	Research period	Observations	Event window (%)			
			t_{sp} + 6 months	t_{sp} + 12 months	t_{sp} + 24 months	t_{sp} + 36 months
Panel A: Pro-forma combined firms						
Cusatis *et al*. (1993)	1965–1988	141		4.7	18.9**	13.9
Desai and Jain (1999)	1975–1991	155		7.7	12.7	19.8***
Veld and Veld-Merkoulova (2004)	1987–2000	45–61[a]	–2.2	–2.3	4.2	2.0
Sudarsanam and Qian (2007)	1987–2002	129		–2.3	8.3	8.4
Panel B: Parent firms						
Cusatis *et al*. (1993)	1965–1988	131	6.8*	12.5**	26.7***	18.1
McConnell *et al*. (2001)	1989–1995	80	8.6	13.5	19.2	5.1
Desai and Jain (1999)	1975–1991	155		6.5	10.6	15.2
Veld and Veld-Merkoulova (2004)	1987–2000	68–106[a]	3.9	–0.7	6.5	–0.4
Sudarsanam and Qian (2007)	1987–2002	129		–3.9	6.2	7.1
Panel C: Subsidiaries						
Cusatis *et al*. (1993)	1965–1988	146	–1.0	4.5	25.5**	33.6**
McConnell *et al*. (2001)	1989–1995	96	8.9	7.2	5.8	–20.9
Desai and Jain (1999)	1975–1991	162		15.7***	36.2***	32.3***
Veld and Veld-Merkoulova (2004)	1987–2000	53–70[a]	12.0	12.6	13.7	15.2
Sudarsanam and Qian (2007)	1987–2002	142		7.2	17.5	23.0*

Notes: This table presents the results on the long-run stock performance of parents, subsidiaries and pro-forma combined firms involved in spin-offs. The long-run performance is measured as the buy-and-hold abnormal return after the spin-off completion. t_{sp} represents the spin-off completion date.
***Significance at the 1% level; **significance at the 5% level; *significance at the 10% level.
[a]The number of observations is different for different event windows (pro-forma combined firms: 6, 12, 24, 36 months: 61, 61, 51, 45 observations, respectively; parents: 6, 12, 24, 36 months: 106, 105, 86, 68 observations respectively; subsidiaries: 6, 12, 24, 36 months: 70, 70, 60, 53 observations, respectively.

Figure 2: “Long-run stock market performance”, 2009, by Veld & Veld-Merkoulova, 2009, p. 416

It’s interesting to note that compared to the empirical results of the short-term announcement effect relating to spinoffs, the long-run return studies in figure 2 show much more varying conclusions. A more recent study was done by Boreiko & Murgia (2010) using the calendar time portfolio approach together with Fama-French’s 3 factor model on European spinoffs and their parent. They found monthly average abnormal returns of 0.7% for the spinoff subsidiaries and 0.5% for parent firms with a 36-month event window in the time period 1989-2005. Since the majority of previous studies on the long-term effect of spinoffs use the matched firm approach to investigate parent and subsidiary abnormal returns, Boreika & Murgia (2010) results might simply be an anomaly. Alternatively, the calendar time portfolio approach might be a better way to test for long-run abnormal returns in spinoffs and their previous parents.

Previous studies have identified value creating factors that could explain some of the positive return effects resulting from the spinoff transaction. We found the following findings to be most interesting:

- Baker et al. (2004) concluded, based on a theory review, that the variation of investor appetite for conglomerates have been responsible for the different valuation of diversifying and refocusing transactions between 1960s and 1980s (Baker et al., 2004, p. 19). Sudarsanam & Qian (2006) similarly argue that a catering theory can explain some of the effects on spinoff valuation. This is based on the theory that the management observes an investor demand for parts of a conglomerate, and therefore decides to spin off that part of the business to cater to that demand. This high demand causes the spun off unit to be valued higher as a separate unit then as a part of the conglomerate.
- In the article *"Do Spin-offs Really Create Value? The European Case"* written by Veld & Veld-Merkoulova (2004), the authors find cumulative average abnormal returns of 2.62% in a three-day event window covering days from -1 to +1, where +1 is the day after the spinoff is announced. They mention several factors that could explain this wealth gain, e.g., increased focus in the parent firm, reduction of asymmetric information, geographical focus, which is referred to as reducing the physical distance between parts of a company and other factors, but these other factors are given less attention as they don't seem to have much explanatory value.
- *Reversal of previous merger*: a previous merger can be reversed by restructuring the merged firms. One way to solve this is by spinning off the merged part which results in e.g., two units instead of one merged. Spinning off a business unit can be used to reverse past mergers, but not necessarily due to a failed merger. Some papers argues that such spinoffs can be due to optimization of corporate strategy and changes in product markets (Weston, 1989, p. 74).

2.4 Efficient market hypothesis

If we find evidence showing that spinoffs have generated long-run abnormal returns, this could indicate that although large parts of public markets tend to be efficient, there might exist pockets of inefficient pricing. A market is said to be efficient if the price in the market fully reflects all publicly available information. This means that the price would be unaffected by revealing all information to all participants in the market (Sewell, 2011, p. 2). In other words, it should not exist any delay or other ways that can be taken advantage of to obtain favorable effects related to prices and information in the market.

Random walk

The efficient market hypothesis, hereby EMH, is built on the term "random walk". The random walk theory was developed after a study completed by Maurice George Kendall where he examined 22 UK stocks and commodity price series. His conclusion can be cited as *"in series of prices which are observed at fairly close intervals the random changes from one term to the next are so large as to swamp any systematic effect which may be present. The data behave almost like wandering series"*. The results with a near-zero serial correlation of price changes and this was the birth of the random walk theory (Dimson & Mussavian, 2002, p. 93).

From finance theory, this term is used to point out how quickly information gets priced into the market and that exploiting this is close to impossible. The idea is that if it exists no constraints in the information flow and the information is immediately reflected in stock prices, tomorrow's prices will only reflect tomorrow's news, and therefore be unaffected by the news from today (Malkiel, 2003, p. 60). Malkiel is also the author of the book *A Random Walk Down Wall Street*, where he presented the random walk phenomenon in the following way:

> *A blindfolded chimpanzee throwing darts at the Wall Street Journal could select a portfolio that would do as well as the experts.*

The idea of this statement was to highlight the fact that in efficient markets it should not be any abnormal returns from actively picking individual stocks or groups of stocks and the investor should instead build a wide portfolio that held all the stocks in the market for a lower cost (Malkiel, 2003, p. 60).

3 Data

This section covers the description of our dataset, data collection process and definition and explanation of variables used in the tests. We will also provide the reader with what decisions we have taken regarding our sample, ways to eliminate bias and potential weaknesses related to our sample.

3.1 Data Collection and Processing

We analyze a sample of 265 European spinoffs that took place between 1990-2020. We start by screening the Thomson Reuters Refinitv Eikon deal database for spinoffs whose headquarters were in Europe and adding the following criteria's: completed deal status and effective date between 01.01.1990 - 31.12.2020. This provided us with a sample of 555 events. We retrieve the target (spinoffs) full name, industry, nation, effective date, date announced and DataStream code. We also retrieve the parents full name, DataStream code, ticker and industry.

We manually go through the entire sample and find several events that don't qualify. We remove observations from the initial sample that are either private deals, planned announcements with no deal following, spinoffs of ownership stakes of less than 80%, spinoffs where the spun off company were already public, spinoffs where we can't find any public parent company, companies where we can't find market cap, companies where we can't find P/B or financials, companies with ISIN numbers starting with US (suggesting they are headquartered in the US), multiple observations of the same transaction and observations where there is limited information. We also manually edit 30 observations where Thomson Reuters Refinitiv Eikon fail to provide a DataStream code, and through searching around on the internet and the platform we confirm that the transaction took place and manually input ISIN codes for these observations. In most of these situations Thomson Reuters Refinitiv Eikon had correctly identified the spinoff incident but failed to capture the targets name and/or code. After these adjustments we end up removing 279 observations due to the reasons mentioned above.

We then use the "static request" function in DataStream excel add-in function to retrieve ISIN codes from each company's DataStream code, which we need to download total return indexes for companies. A total return index is an index that tracks the experienced shareholder returns for a company for a given period of time. We will describe this closer later in the thesis. We then retrieve the monthly local currency total return index (RI) for all individual companies through a time series request spanning from the 1st for the month following the spinoff distribution and 60 months after, using the DataStream Excel add-in. After retrieving the RI for the spinoffs, we end up removing another 11 observations with no return/price data. These observations were shown as "ERROR" when trying to retrieve the RI. We also had to adjust the effective dates on several of the spinoffs as the RI in several instances don't start at 100, suggesting that the actual effective date differs. In these instances, we manually review the specific stocks trading history to find the first trading day and the actual effective date. After the adjustments mentioned above, we end up with a complete sample of 265 European spinoffs, with total return indexes spanning from 01.04.1990-31.12.2020.

We download market values for spinoffs, both in local currency and US dollar, market to book ratios and price to book ratios. We have to manually edit 29 observations due to missing P/B data in DataStream. In these instances, we divide the market cap on the specific dates by the most recently available previous quarterly reported book value.

We download the Fama-French 5-factor European data from Kenneth French's website which are denominated in US dollars. In order for us to be able to regress our spinoff portfolio returns on the Fama-French Factors we therefore also download US dollar adjusted total return indexes (using the X(RI)~U$ datatype) for each spinoff. The International Fama-French data only stretches back to 01.07.1990 and therefore our testing also starts in July 1990.

3.2 Sample Characteristics

The following figures will present our sample characteristics. Figure 3 is used to visualize all spinoffs completed in the period we are covering, figure 4 is intended to identify industry concentration, figure 5 presents the spinoffs sorted by nation and figure 6 compares the average market capitalization of the spinoffs in our sample to the average market capitalization of public companies in the 22 European countries in our sample.

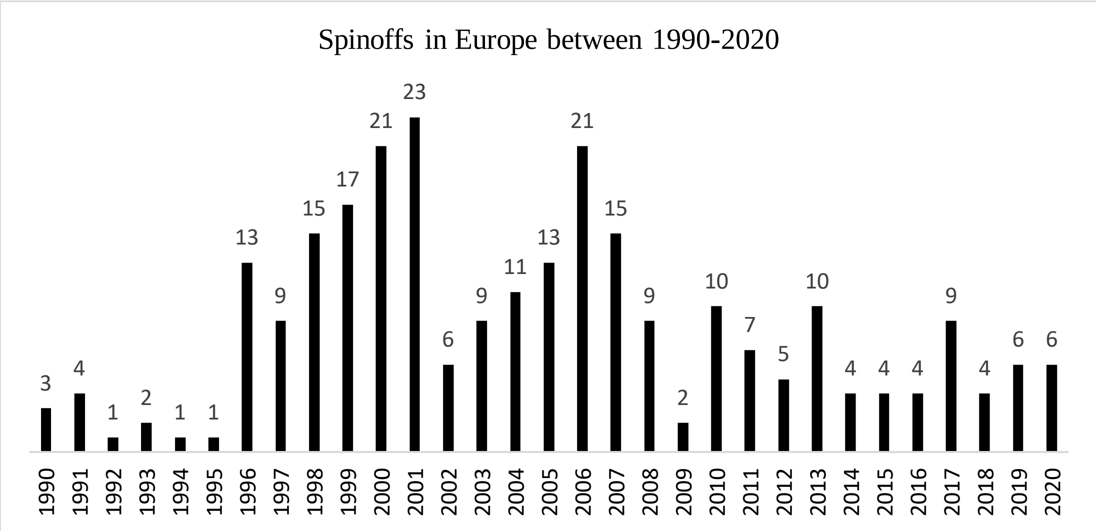

Figure 3: Spinoffs in Europe sorted by year

Figure 3 presents the number of spinoffs completed in Europe during the period 1990 - 2020, distributed by year. There seems to be a clear boom bust cycle in spinoff activity, with clustering of spinoff transactions around previous stock market peaks, identified in hindsight, followed by a dramatic reduction in activity. It's interesting to note that following the last peak in 2006, the spinoff activity in Europe has been stable with between 5-10 events per year (that fulfill our sample criteria) over the last 10 years. This might suggest a certain level of maturity for spinoffs as a new form of transaction to take companies public, or companies' reaction to less investor demand for spinoffs.

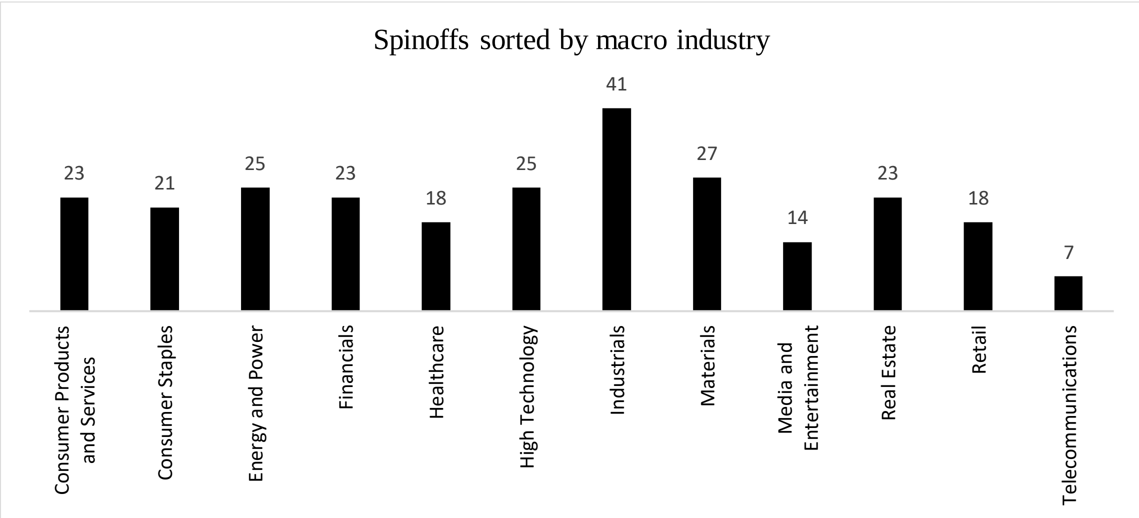

Figure 4: Spinoffs in Europe sorted by DataStream's "macro industry" classification

Figure 4 presents the spinoffs completed in Europe sorted by industry. In order to sort our sample by industry and present it in a best possible way, we have used the "target macro industry" filter from Thomson Reuters Refinitiv Eikon. This is due to our large sample where the use of specific industry would be too large for a visual presentation, and it would not necessarily provide the reader with any valuable information. The industry distribution seems to be fairly even, with no single industry representing more than 16% (industrials) of the transactions.

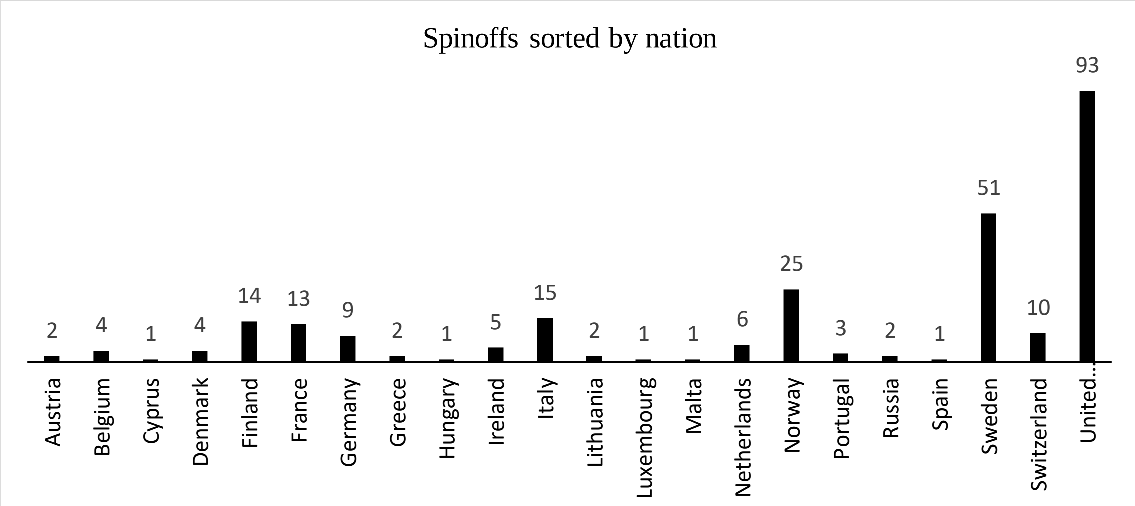

Figure 5: Spinoffs sorted by nation between 1990-2020

As can be seen in figure 5 there are nations that contribute the majority of transactions, likely due to having more developed capital markets and as a consequence of this, more publicly traded companies. 63.6% of the spinoffs took place in only 3 countries with United Kingdom representing a total of 93 spinoffs (35%), Sweden showed 51 spinoffs (19,2%) and Norway with 25 spinoffs (9,4%).

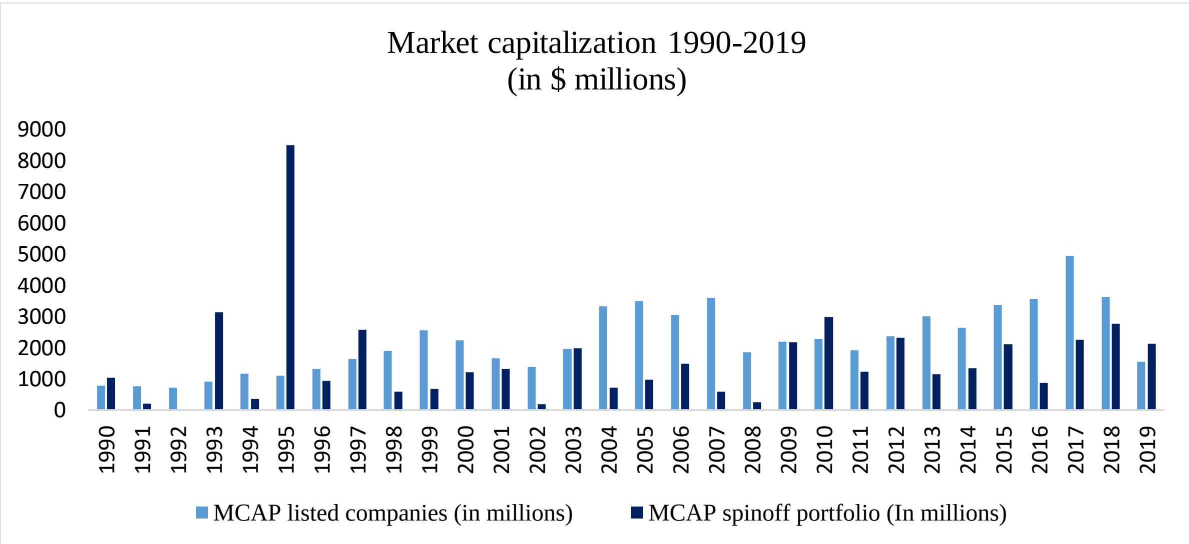

Figure 6: Spinoffs market capitalizations compared to average market capitalization of sampled European countries, 1990-2020

Figure 6 presents average market capitalization per company listed in our sampled nations in Europe from 1990 to 2020, compared to the average market capitalization in our spinoff sample by year. We retrieve the US$ market cap for the 22 European countries in our sample and number of listed companies from World Bank's webpage. The total market capitalization on listed companies was divided by the number of companies in that country on the specific year to obtain the average per company. The intention of doing this was to highlight the average size of the spun off companies compared to the average public company to get a sense of the relative size of our sampled spinoffs. Removing the extreme values in 1993 and 1995 in our sample, we get an average of 60% and a median of 52%. This means that on average the spun of firms had a size that equals 60% of the average listed companies in the relevant geographies, which is an indication that spinoffs in general are smaller companies determined by market capitalization.

3.3 Variables and definitions

3.3.1 Monthly returns for spinoff companies

The Total Return Index (RI) represents the investors total buy and hold return for each stock. It's calculated by combining the price return in the stock price and received dividends over the holding period, compared to the initial share price. The month to month returns from each spinoff are then simply calculated as the percentage change from month $t-1$ to t: $(\frac{RI(t)}{RI(t-1)} - 1)$.

3.3.2 Capital Asset Pricing Model

The capital asset pricing model (hereby CAPM) marks the birth of asset pricing theory (Fama & French, 2004, p. 26). The model was developed by William Sharpe and John Lintner. The model is used to predict a measure of the relation between risk and expected return.

CAPM builds on Harry Markowitz's model of portfolio choice. This model assumes that investors are risk averse and when they are choosing portfolios, they only care about the portfolio returns mean and variance. Investors choose among the "mean-variance-efficient" portfolios, which are the portfolios that maximize the expect return for the given amount of variance.

Sharpe and Lintner added two assumptions to Markowitz's model.

1. *Complete agreement:* given market clearing asset price at *t-1*, investors agree on the joint distribution of asset- returns from *t-1* to *t*.

2. *Borrowing and lending at a risk-free rate*: this requires that all investors can borrow and lend at the same rate and is not affected by the amount borrowed or lent.

The Capital Asset Pricing model is written as:

$$ER_i = R_f + \beta(ER_m - R_f)$$

Where the variables are defined as:

$ER_i = expected\ return\ of\ investment$

$R_f = risk - free\ rate$

$\beta_i = beta\ of\ investment$

$ER_m - R_f = market\ risk\ premium$

Over the years, some weaknesses related to CAPM have been identified. First, the model assumes that the risk-free rate will remain constant over the whole discounting period. This often turns out to not be the case, and therefore the pricing may be "wrong". Second, the model assumes that the market only contains rational and risk-averse investors (Fama & French, 2004, p. 26).

3.3.3 Fama-French 5 factor model

The original Fama-French 3-factor model, often referred to as FF3, is an asset pricing model developed in 1992 by Eugene Fama and Kenneth French (Rao & Boudreaux, 2008, p. 1). The model builds on CAPM but adds two factors to the model: size risk and value risk. Fama and French found the factors "size" and "value" to be the most significant factors, outside of market risk, for explaining the realized returns of publicly traded stocks (Womack & Zhang, 2003, p. 8). In the same way as CAPM, this model is used to explain the performance of portfolios via linear regression. The difference is that the two extra factors provide you with two additional axes, instead of a simple line regression (Rao & Bordeaux, 2008, p. 3).

The model can be seen from Bello (2008, p. 3):

$$r_{jt} - r_{ft} = \alpha + \beta_{j1}(r_{mt} - r_{ft}) + \beta_{j2}(SMB_t) + \beta_{j3}(HML_t) + \varepsilon_{jt}$$

The variables from the model measures:

r_{jt} = The realized return on security J during time period t

r_{mt} = The realized return on the market during period t

r_{ft} = The nominal risk-free rate during time period t

SMB-factor

Small minus big is the factor that accounts for size premium. The intention of the factor is to measure the additional return investors historically has received by investing in stocks with a relatively small market capitalization. This extra return is suggested as a "size premium" (Womack & Zhang, 2003, p. 10). The monthly SMB factor is calculated by classifying the stocks by the 10% smallest and the 90% largest and then calculating the average difference between the 30% smallest and 30% largest (French, 2021). A positive SMB in a month indicated that small cap stocks outperformed large cap stocks in that month, while a negative SMB indicates that the large cap stocks has outperformed the small cap stocks.

HML-factor

High minus low is constructed with the intention of measuring a "value premium" provided to investors for investing in companies with a relatively high book-to-market value, i.e., a high ratio between the value in the company placed by accountants in relation to the value the public markets placed on the company. This ratio is computed as the average return for the 50% of stocks with the highest book/market ratio minus the average return of the 50% stocks with the lowest book/market ratio. In the period 1926 to 2002, the value premium has averaged approximately 5,1% annually (Womack & Zhang, 2003, p. 9).

In 2015 Fama and French extended the three-factor model by adding two more factors that aims to capture the return premiums associated with profitability and investment (Chiah et al., 2016, p. 1). In both models created by Fama and French, the three- and five factor models, the excess return is explained by the factors in the regression equation.

From Fama & French (2015, p. 2) the five-factor model is written as:

$$R_{it} - R_{Ft} = \alpha_i + b_i(R_{Mt} - R_{Ft}) + S_i SMB_t + h_i HML_t + r_i RMW_t + C_i CMA_t + e_{it}$$

The first three factors remain the same, i.e., a combination of CAPM and the SMB + HML factor from FF3. While the two new factors, RMW and CMA is added as a profitability factor and an investment factor (Nichol & Dowling, 2014, p. 366).

RMW

Robust Minus Weak represents the difference between the returns on diversified portfolios of stocks with robust and weak profitability (Fama & French, 2015). The robustness refers to portfolios consisting of high profitability firms or low profitability firms. Fama & French states that the RMW factor can be interpreted as the average difference in profitability. It is calculated as the average return in two robust operating profitability portfolios minus the average return in two weak operating profitability portfolios.

CMA

Conservative minus aggressive is the difference between the returns on diversified portfolios of stocks of high and low investment firms (Fama & French, 2015, p. 3). This factor relates to the investment term. This is the differences between the returns on diversified portfolios of conservative and aggressive investment portfolios.

4 Methodology

In this chapter we will present our choice of research method and how we will approach our overall research question and sub-questions. We present the model we have used to analyze the long-run abnormal returns and how we have sorted our sample by different firm characteristics to test undervaluation, size and focus-increasing factors effect on spinoff returns.

4.1 Testing for long-term abnormal returns

In the article *Improved Methods for Tests of Long-Run Abnormal Stock Returns,* written by *Lyon, Barber & Tsai (1999),* the authors highlight problems related to measuring long-term abnormal returns. First, the *new listing issue* refers to the inclusion in the reference portfolio of firms that started trading after the event month, but the sample is based on firms that are tracked for a long post-event period. The second issue refers to *rebalancing bias*. This occurs because the compound returns of the reference portfolio (typically an equally weighted market index) rebalances monthly, whereas the return of the sample often is compounded without rebalancing.

The last issue refers to skewness bias, which arises because the distribution of long-run abnormal returns is positively skewed (Lyon et al., 1999, p. 165). In this case, positively skewed means that the right sided tail is thicker than the left sided tail, while a normal distribution has symmetric tails.

In addition to highlighting general issues of measuring long-term abnormal returns, the same authors point at weaknesses from two common methods for measuring long-term abnormal returns:

1. *Event study & buy-and-hold abnormal returns:* first, these methods are not able to control for cross-sectional dependence in sample observations. Second, they don't control for a poorly specified asset pricing model.
2. *Calendar-time portfolios:* this method eliminates the problems related to cross-sectional dependence among the sample firm but in contrast to the buy-and-hold abnormal returns, the abnormal return measure does not precisely measure investor experience.

Most studies on spinoffs use the buy and hold abnormal return (hereby BHAR) method where they measure the difference in buy and hold returns between the sample firm and a chosen control firm which is matched on specific characteristics like a similar book-to-market ratio, same industry, or similar size. The control firm eliminates the skewness bias since both the sample firm and the control firm should have the same chance of experiencing large positive returns (Barber & Lyon, 1997, p. 354). However, Lyon et al. (1999) argue that standard tests based on the control firm approach is not as good as the ones using the reference portfolio approach. This is because the use of a control firm results in a noisier way to control for expected returns than using a reference portfolio. The variance of the difference between the returns on two individual assets is often a lot higher than the variance of the difference between the return of an asset and a portfolio (Dutta & Dutta, 2015, p. 27).

The BHAR method has also been criticized by Fama (1998) as buy and hold returns presents the potential for skewed results from compounding returns over a longer period. Bessembinder & Zhang (2013) also criticize the method due to the fact that matched firms, although similar in terms of book-to-market ratios, industry classification or size, often lack similarity in other important aspects like idiosyncratic volatility, illiquidity, return momentum, market beta and capital investment. They find evidence showing that the majority of abnormal returns evidence found in event studies, can be explained by the differing firm characteristics between sampled and control firm (Bessembinder & Zhang, 2013, p. 83).

Based on this we have decided to rely on the Fama (1998) calendar time portfolio approach to test whether spinoffs have generated long-run abnormal returns. This is done to combat the problems mentioned and add datapoints to previous studies by using a less frequently used approach when looking at spinoffs. We also prefer the portfolio approach over the matched firm approach because we deem it more relevant for investors wanting to outperform well known indices and factors. Using a matched firm approach only tells us whether spun off firms outperform peers with similar characteristics. However, it doesn't show evidence of alpha generation compared to more common investment strategies, unless investors target an investment strategy of going long spun off firms and shorting peers to exploit potential relative outperformance.

Since our sample is relatively large compared to previous studies that look at spinoffs, we find it better to use a reference portfolio rather than control firms for each of our sample firms. Based on the argument above, we would likely introduce a high degree of variance by finding control firms for each of our sampled firms. As mentioned by Bessembinder & Zhang (2013) it's difficult to find matched firms that are similar to sampled firms on all critical aspects, and we therefore prefer the calendar time portfolio approach.

4.1.1 Calendar time portfolio approach

The calendar time portfolio approach simulates a portfolio back test by forming a time series of monthly returns in calendar time from portfolios which contains all the subsidiaries that were spun off during the previous 60 months. By calculating the monthly return for every spinoff for 60 months, starting on the 1st of the month following the spinoff completion, and then taking the average monthly return for each month in calendar time of all the spinoffs that were completed during the last 61 months we effectively create a portfolio back test of spinoffs. Each spinoff is included in the portfolio the 1st in the month following the completion of the spinoff and held for 12 to 60 months unless the firm is taken over or delisted. The portfolio rebalances every month to equal weightings. If firms are taken over or delisted, we assume that the portfolio sell the shares at the last available price and reinvest proceeds into the rebalanced portfolio. As an example, on the 1st of March 2003, the 60-month portfolio contains all the spinoffs that were completed during the time period 1st of March 1998 – 1st of March 2003.

We include stocks in the portfolio on the 1st off the month following the spinoff completion to allow investors enough time to buy the spinoff and to make it easier to match company return data and factor returns. The average return for the spinoffs in the sample the first month following the completion is 1.53% with a median of 0%. Therefore, it does not seem to be a meaningful difference in return between buying immediately following the distribution or waiting up to 1 month after in general.

We then run a single time-series regression where the dependent variable is the monthly excess return of the spinoff portfolio. This is calculated as the monthly portfolio return minus the risk-free rate, regressed on the monthly returns for the same period on Fama-French 5 factor as independent variables:

$$R_{i,t} - R_{f,t} = \alpha_i + b_i(R_{m,t} - R_{f,t}) + s_i SMB_t + h_i HML_t + r_i RMW_t + c_i CMA_t + e_{i,t} \quad (1)$$

Where $R_{i,t}$ represent the time series return from the calendar time portfolio i for calendar month t. $R_{f,t}$ represent the risk-free rate, $R_{m,t}$ represents the return of the market portfolio, SMB_t represents the return of the small minus big portfolio, HML_t represents the return of the high minus low book to market portfolio, RMW_t represents the return of the robust minus weak portfolio and CMA_t represents the return of the conservative minus aggressive portfolio. The intercept α_i represents the monthly average abnormal return of portfolio i.

4.2 Focus-increasing

Previous studies focus primarily on the potential effect the spinoff restructuring of assets has on the company and suggest that value creation following the separation can come from improved efficiency due to reduced overhead, less bureaucracy, more efficient capital allocation and more aligned incentives. They attribute these benefits to focus increasing as the new separate entities have fewer and less complex operations due to a reduction in the number lines of business.

To add to previous studies which have shown abnormal return of spinoffs following focus increasing separations we divide our sample into two portfolios based on the focus increasing principle. We use DataStream's "mid industry" descriptions for parent companies and the spun off subsidiaries to define focus-increasing transactions. Spinoffs where the mid industry of the subsidiary differs from the parents are classified as focus-increasing. The spinoffs where the parents and spun of subsidiaries operate in the same mid industry are classified as non-focus increasing spinoffs.

We separate our sample into two portfolios with one portfolio representing focus-increasing spinoffs, and the other portfolio representing non-focus increasing spinoffs. Our sample includes 161 spinoffs that we characterize as focus-increasing and selected for the focus-increasing portfolio. The remaining 104 spinoffs are included in the non-focus increasing portfolio. We then perform the calendar time portfolio approach on each portfolio and regress the related portfolio time series return on Fama-French's international 5 factor for the corresponding calendar months

4.3 Undervaluation as an explanation for abnormal returns

To add to previous studies on spinoffs we also want to test whether potential abnormal returns from spinoffs could stem from undervaluation immediately following the distribution of shares.

4.3.1 Sorting portfolios based on P/B ratios

Ikenberry et al. (1995, p. 185) hypothesize that stocks with high book to market ratios (value stocks) are more likely to be out of favor and thus potentially undervalued compared to low book to market stocks (glamour stocks). Building upon these assumptions, we want to test whether spinoffs with characteristics indicating undervaluation like low P/B ratios (the reverse ratio of the book to market ratio) outperform high P/B companies.

Since our sample consist of 265 spinoffs over 30 years, we are limited to only divide our sample into two portfolios, as more portfolios would lead to high concentration for individual portfolios and less reliable results. We use two approaches to sort spinoffs into portfolios. For approach #1 we rank the entire sample based on P/B multiples retrieved form DataStream for the 1st of the month following the distribution and create two portfolios of 132 and 133 companies over the entire 30-year period. We allocate companies with negative P/B ratios, due to negative book values, to the high P/B portfolio. We recognize that the first approach introduces bias into the portfolios as market wide swings in P/B ratios, for example following market crashes or booms, are likely to affect all companies. Sorting the entire sample may then lead to the majority of low P/B stocks originating from after crash years following the dot com bust and the great financial crisis and high P/B stocks originating from boom years leading up to market crashes. We therefore also implement approach #2 where we sort companies each year based on P/B ratios ranking relative to that year's spinoffs. In years with odd number of spinoffs we allocate the marginal observation to the higher or lower portfolio based on whether its above or below the median P/B for the entire sample of 1.51. There is 87.9% overlap in companies between the two approaches.

The lower half portfolio sorted by P/B ratio has an average ratio of 0.96 for approach #1 and 1.12 for approach #2 with a median P/B ratio of 1 for both approaches. The larger half has an average P/B ratio of 6.87 for approach #1 (excluding negative P/B companies from the average) and 6.69 for approach #2, with a median of 3.25 for approach #1 and 3.38 for approach #2. Based on this we argue that the portfolios are each good representation of low and high P/B stocks despite that we only have two portfolios to compare.

4.3.2 Sorting portfolio based on market cap

The size premium for smaller companies is one of the best-known academic market anomalies (Horowitz et al., 2000, p. 143). This implicates that firms with a small market capitalization (hereby small-cap) have higher returns compared to companies with large market capitalization (hereby large-cap). If the information flow in the market has no constraints, these anomalies should not exist if we look at it from an efficient market's theory perspective. From an investors perspective the relevant issue is if this size premium related to small-cap companies is still positive, and if it is, whether the magnitude is substantial. Some papers have claimed that this anomaly has disappeared, and that perhaps the size premium may have gone into reverse (Horowitz et al., 2000, p. 144). If this is the case the large-cap stocks should outperform the small-cap stocks, measured in return.

Similar to the P/B portfolios we use two approaches to sorting portfolios. Approach #1 involves sorting the entire sample based on the dollar-adjusted market cap on the 1st of the month following the completion. Understanding that this might bias our portfolios due to inflation and currency movements over time we also implement another approach. Approach #2 go through our sample and divide the spinoffs that took place each year into 2 portfolios based on ranked market cap in US $ compared to all spinoffs that took place the same year. In those years where there are an odd number of spinoffs, we allocate the marginal spinoff to the large portfolio if it's above the median $ market cap of the entire sample of $354M, and into the small if it's below the median. This leaves us with two portfolios consisting of 133 "small spinoffs" and 132 "large spinoff" companies spanning 30 years of return data

The smallest half portfolio has an average market cap in US$ of $111.49M for approach #1 and $158.9M for approach #2, with median market caps of $72.08M for approach #1 and $74.4M for approach #2. The largest half portfolio has an average market cap of $2,617.47M for approach #1 and $2,569.2M for approach #2, with medians of $1,351.39M for both approaches. With such wide disparities in market caps between the large and the small portfolio we again argue that the portfolios represent small and large firms well despite us only having two portfolios to compare. There is 88% overlap between the two approaches.

4.4 Long-short portfolios

In order to test the significance of potential outperformance or underperformance when comparing different portfolios we implement long-short portfolios for both the P/B and size sorted portfolios. For the long-short P/B portfolios we go long the low P/B portfolio and short the high P/B portfolios from sorting approach #2. For the size portfolios we go long the small cap portfolios, and short the large cap portfolios from sorting approach #2. The returns of the long-short portfolios are simply calculated by subtracting the excess return of the respective short portfolios from the excess returns of the long portfolios, shown by the following formula:

$$R_{ls,t} = (R_{l,t} - R_{f,t}) - (R_{s,t} - R_{f,t}) \tag{2}$$

Where $R_{ls,t}$ represents the excess returns of the long-short portfolio. $R_{l,t}$represents the time series return of the long portfolio, hereby either the low P/B or small cap portfolio. $R_{f,t}$ represents the risk-free rate. $R_{s,t}$ represents the time series return of the short portfolio, hereby either the high P/B or large cap portfolio. The resulting excess return from the long-short portfolio is then regressed on the monthly returns for the same period on Fama-French 5 factor as independent variables:

$$R_{ls,t} = \alpha_i + b_i(R_{m,t} - R_{f,t}) + s_i SMB_t + h_i HML_t + r_i RMW_t + c_i CMA_t + e_{i,t} \quad (3)$$

Where $R_{ls,t}$ represent the excess time series return of the long-short portfolio ls. $R_{f,t}$ represent the risk-free rate, $R_{m,t}$ represents the return of the market portfolio, SMB_t represents the return of the small minus big portfolio, HML_t represents the return of the high minus low book to market portfolio, RMW_t represents the return of the robust minus weak portfolio and CMA_t represents the return of the conservative minus aggressive portfolio. The intercept α_i represents the monthly average abnormal return of the long-short portfolio ls.

5 Results and discussion

The results and discussion part will be separated into two parts. The first part starts by presenting our tables, before we cover the factor coefficients of the calendar time portfolio regression for all samples. Here we discuss each portfolios estimated coefficients relative to Fama-French's 5 factors. The second part covers the long-run abnormal returns for the entire spinoff sample and the size, P/B and focus/non-focus increasing portfolios. We chose 5% as our significance level, and we will therefore not classify results that are not significant at the 5% level as significant. The following pages present our regression tables.

Table 1: Fama-French five Factor regression estimates from equally weighted calendar time portfolio approach

The table presents the estimated factor coefficients for the different equally weighted calendar time portfolios used in our study, regressed on Fama-French's 5 factor model. The approach creates a portfolio every calendar month including each spinoff in the portfolio on the 1st of the month following completion, rebalance to equal weightings each month and holds each spinoff for 12-, 24-, 36-, 48- and 60-month event windows. The portfolios excess returns, calculated by subtracting the risk free-rate from the portfolio return, is then regressed on Fama-French's 5 factors. The estimated coefficients in the table for Fama-French's SMB-, HML-, RMW- and CMA-factors in the table are the results of these regressions. Panel A shows the total spinoff sample from 01.07.1990 - 31.12.2020. Panel B shows the focus-increasing portfolio which include firms whose DataStream mid industry classification differed from its parents, and non-focus increasing spinoffs whose DataStream mid industry classification was identical to its parents. Panel C shows P/B portfolios sorted based on approach #1, where the entire sample is ranked based on P/B ratios and then divided into two portfolios, and approach #2 where two portfolios are created by sorting spinoffs each year based on P/B ratio ranking relative to spinoffs during the same year. Panel D shows small and large cap portfolios sorted by approach #1 where the entire sample is ranked based on US$ market cap and then divided into two portfolios and approach #2 where two portfolios are created based on US$ market cap ranking within each year. *, ** and *** represents significance levels of 10%, 5% and 1% respectively.

Panel A: Total Spinoff Sample, 01.07.1990 - 31.12.2020

	MktRF	SMB	HML	RMW	CMA
12 Months	1.14***	1.00***	0.16	0.22	-0.30
24 Months	1.12***	0.87***	0.18	0.33*	-0.25
36 Months	1.09***	0.76***	0.11	0.30*	-0.19
48 Months	1.08***	0.71***	0.10	0.25*	-0.13
60 Months	1.09***	0.70***	0.13	0.31**	-0.12

Panel B: Focus and Non-Focus Increasing Portfolios, 01.06.1996- 31.12.2020

	Focus Increasing						Non-Focus Increasing				
	MktRF	SMB	HML	RMW	CMA		MktRF	SMB	HML	RMW	CMA
12 Months	1.35***	1.09***	-0.29	0.07	0.15	12 Months	1.05***	0.74***	0.77**	0.46	-0.57
24 Months	1.22***	0.95***	0.01	0.29	-0.21	24 Months	1.02***	0.83***	0.58***	0.48**	-0.29
36 Months	1.17***	0.83***	0.02	0.35	-0.19	36 Months	1.02***	0.70***	0.40**	0.40**	-0.18
48 Months	1.17***	0.72***	0.04	0.34*	-0.11	48 Months	1.02***	0.77***	0.36**	0.36**	-0.12
60 Months	1.18***	0.71***	0.07	0.40**	-0.12	60 Months	1.02***	0.72***	0.42***	0.39**	-0.14

Panel C: P/B Portfolios, 01.07.1990 - 31.12.2020, using approach #1 and #2

	Lower Half P/B Portfolio Approach #1						Upper Half P/B Portfolio Approach #1				
	MktRF	SMB	HML	RMW	CMA		MktRF	SMB	HML	RMW	CMA
12 Months	1.17***	1.13***	0.54*	0.45	-0.41	12 Months	1.29***	1.06***	0.13	0.32	-0.53
24 Months	1.08***	0.91***	0.49**	0.38*	-0.32	24 Months	1.16***	0.69***	-0.11	0.25	-0.23
36 Months	1.03***	0.83***	0.41**	0.31*	-0.27	36 Months	1.14***	0.63***	-0.18	0.24	-0.08
48 Months	1.04***	0.81***	0.36**	0.30*	-0.18	48 Months	1.13***	0.54***	-0.16	0.18	-0.04
60 Months	1.05***	0.83***	0.37***	0.37**	-0.20	60 Months	1.14***	0.50***	-0.13	0.25	0.00

	Lower Half P/B portfolio Approach #2						Upper Half P/B Portfolio Approach #2				
	MktRF	SMB	HML	RMW	CMA		MktRF	SMB	HML	RMW	CMA
12 Months	1.17***	0.95***	0.53	0.52	-0.22	12 Months	1.09***	1.06***	-0.18	-0.10	-0.48
24 Months	1.12***	0.86***	0.48**	0.59***	-0.21	24 Months	1.12***	0.86***	-0.19	-0.05	-0.25
36 Months	1.06***	0.80***	0.38**	0.43**	-0.15	36 Months	1.11***	0.71***	-0.19	0.08	-0.19
48 Months	1.05***	0.78***	0.34**	0.38**	-0.06	48 Months	1.10***	0.61***	-0.16	0.03	-0.18
60 Months	1.07***	0.77***	0.33**	0.40***	-0.03	60 Months	1.11***	0.59***	-0.10	0.15	-0.19

Panel D: Size Portfolios using approach #1 (01.09.1991 - 31.12.2020) and #2 (01.08.1990 - 31.12.2020)

	Lower Half Approach #1						Upper Half Approach #1				
	MktRF	SMB	HML	RMW	CMA		MktRF	SMB	HML	RMW	CMA
12 Months	1.19***	1.02***	0.22	0.22	-0.69	12 Months	1.12***	0.70***	0.16	0.33	-0.01
24 Months	1.21***	1.14***	0.03	0.27	-0.51	24 Months	1.10***	0.53***	0.25	0.40**	-0.06
36 Months	1.17***	1.12***	-0.02	0.15	-0.50	36 Months	1.07***	0.50***	0.19	0.38**	0.02
48 Months	1.14***	1.01***	-0.07	0.15	-0.30	48 Months	1.07***	0.52***	0.16	0.32**	0.12
60 Months	1.13***	1.03***	0.03	0.18	-0.36	60 Months	1.09***	0.46***	0.15	0.40***	0.13

	Lower Half Approach #2						Upper Half Approach #2				
	MktRF	SMB	HML	RMW	CMA		MktRF	SMB	HML	RMW	CMA
12 Months	1.16***	1.05***	-0.14	0.23	-0.38	12 Months	1.17***	0.78***	0.54*	0.63**	-0.42
24 Months	1.06***	1.13***	0.01	0.20	-0.53	24 Months	1.17***	0.55***	0.39**	0.57***	-0.11
36 Months	1.04***	1.01***	0.01	0.17	-0.52	36 Months	1.14***	0.54***	0.26*	0.48***	0.05
48 Months	1.04***	0.94***	0.01	0.13	-0.41	48 Months	1.12***	0.49***	0.21	0.41***	0.11
60 Months	1.06***	0.96***	0.09	0.20	-0.43	60 Months	1.12***	0.46***	0.20	0.45***	0.13

Table 2: Fama-French equally weighted calendar time portfolio sorted by approach #1 and approach #2

The table presents the monthly average abnormal returns and t-statistic for the equally weighted calendar-time portfolios sorted by US$ market capitalization and P/B ratios for our two sorting approaches. The calendar time portfolio approach creates a portfolio every calendar month including each spinoff in the portfolio on the 1st of the month following completion, rebalances to equal weightings each month and holds each spinoff for 12-, 24-, 36-, 48- and 60-month event windows. The portfolios excess returns, calculated by subtracting the risk free-rate from the portfolio return, is then regressed on Fama-French's five factors. The intercept from the regression is the monthly average abnormal return. Panel A shows size portfolios sorted based on approach #1 where the entire sample is ranked based on US$ market cap and then divided into two portfolios, and approach #2 where the two portfolios are created by sorting spinoffs each year based on US$ market cap ranking relative to spinoffs during the same year. Panel B shows P/B portfolios sorted based on approach #1, where the entire sample is ranked based P/B ratios and then divided into two portfolios, and approach #2 where two portfolios are created by sorting spinoffs each year based on P/B ranking relative to spinoffs during the same year. *, ** and *** represents significance levels of 10%, 5% and 1% respectively.

Panel A: Fama French Calendar Time Portfolio Approach sorted by US$ Market Cap

	Portfolios sorted by ranking over entire sample (Approach #1)				Portfolios sorted by ranking in each year (Approach #2)			
	Lower Half		Upper Half		Lower Half		Upper Half	
	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic
12 months	1.43%	2.23**	0.08%	.22	1.14%	2.04**	0.19%	0.49
24 months	1.55%	3.52***	0.35%	1.35	1.50%	3.75***	0.52%	1.93**
36 months	1.52%	4.00***	0.34%	1.79*	1.51%	4.58***	0.43%	2.05**
48 months	1.26%	3.94***	0.33%	1.83*	1.21%	4.17***	0.46%	2.42**
60 months	1.11%	3.83***	0.26%	1.53	1.05%	3.89***	0.39%	2.29**

Panel B: Fama French Calendar Time Portfolio Approach sorted by P/B ratios

	Portfolios sorted by ranking over entire sample (Approach #1)				Portfolios sorted by ranking in each year (Approach #2)			
	P/B Lower Half		P/B Upper Half		P/B Lower Half		P/B Upper Half	
	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic
12 months	1.11%	2.31**	0.20%	0.37	1.09%	2.27**	0.61%	1.27
24 months	0.90%	2.90***	1.10%	3.06***	0.94%	3.03***	1.00%	2.86***
36 months	1.07%	4.28***	0.87%	3.00***	1.15%	4.60***	0.72%	2.48**
48 months	0.83%	3.77***	0.74%	2.96***	0.95%	4.32***	0.69%	2.65***
60 months	0.79%	3.95***	0.58%	2.42**	0.86%	4.30***	0.58%	2.42**

Table 3: Long-run abnormal returns in spinoff portfolios from 1990-2020 and chosen 10-year intervals

The table presents the average monthly abnormal returns and t-statistics for the equally weighted calendar time portfolios over the period July 1990 to December 2020 and chosen 10-year intervals. The approach creates a portfolio every calendar month including each spinoff in the portfolio on the 1st of the month following completion, rebalance to equal weightings each month and holds each spinoff for 12-, 24-, 36-, 48- and 60-month event windows. The portfolios excess returns, calculated by subtracting the risk free-rate from the portfolio return, is then regressed on Fama-French's five factors. The intercept from the regression is the monthly average abnormal return. Panel A shows the total spinoff sample. Panel B shows small cap portfolios sorted by approach #2 where the portfolios are created by including the lower half of the spinoff sample based on US$ market cap ranking within each year. Panel C shows large cap portfolios sorted by approach #2 where the portfolios are created by including the upper half of the spinoff sample based on US$ market cap ranking within each year. Panel D shows Low P/B portfolios sorted by approach #2 where the portfolios are created by including the lower half of the spinoff sample based on P/B ranking within each year. Panel E shows High P/B portfolios sorted by approach #2 where the portfolios are created by including the upper half of the spinoff sample based on P/B ranking within each year. *, ** and *** represents significance levels of 10%, 5% and 1% respectively.

Panel A: Total Sample

	07.1990 - 12.2020		07.1990 - 06.2000		07.1995 - 06.2005		07.2000 - 06.2010		07.2005 - 06.2015		07.2010 - 12.2020	
	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic
12 months	0.92%	2.14**	3.05%	2.63***	1.03%	1.36	-0.06%	0.12	0.42%	0.89	0.07%	0.15
24 months	0.97%	3.73***	1.75%	3.02***	1.29%	2.26**	1.00%	2.38**	1.05%	2.84***	0.34%	1.03
36 months	0.95%	4.52***	1.60%	3.33***	1.14%	2.43**	0.73%	2.03**	1.04%	3.06***	0.66%	2.28**
48 months	0.83%	4.37***	1.44%	3.35***	0.96%	2.23**	0.59%	1.79*	0.96%	3.20***	0.52%	2.36**
60 months	0.71%	4.18***	1.23%	2.93***	0.80%	2.00**	0.47%	1.52	0.85%	3.15***	0.48%	2.29**
Average Number of firms in 60 month portfolio	33.8		16.4		42.7		55		42.1		30.1	

Panel B: Small Cap portfolio sorted using Approach #2

	07.1990 - 12.2020		07.1990 - 06.2000		07.1995 - 06.2005		07.2000 - 06.2010		07.2005 - 06.2015		07.2010 - 12.2020	
	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic
12 months	1.14%	2.04**	3.54%	2.62**	1.14%	0.92	-0.23%	0.29	1.05%	1.33	0.51%	0.65
24 months	1.50%	3.75***	2.59%	2.78***	1.74%	1.85*	1.57%	2.388**	1.58%	2.77***	0.73%	1.38
36 months	1.51%	4.58***	2.60%	3.38***	1.40%	1.84*	1.04%	1.96*	1.71%	3.35***	1.17%	2.54**
48 months	1.21%	4.17***	2.21%	3.20***	1.13%	1.63	0.79%	1.61	1.42%	3.38***	0.81%	2.31**
60 months	1.05%	3.89***	1.92%	2.87***	0.90%	1.41	0.65%	1.44	1.20%	3.00***	0.72%	2.18**
Average Number of firms in 60 month portfolio	16.4		8.3		20.2		26		20.3		14.7	

Table 3
(Continued)

Panel C: Large Cap portfolio sorted using Approach #2

	07.1990 - 12.2020		07.1990 - 06.2000		07.1995 - 06.2005		07.2000 - 06.2010		07.2005 - 06.2015		07.2010 - 12.2020	
	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic
12 months	0.19%	0.49	0.53%	0.93	0.26%	0.43	0.63	0.91	0.14%	0.23	-0.61%	1.00
24 months	0.52%	1.93**	0.92%	0.84*	1.01%	2.02**	0.50	1.11	0.56%	1.33	0.08%	0.22
36 months	0.43%	2.05**	0.67%	1.72*	0.90%	2.50**	0.44	1.22	0.38%	1.09	0.16%	0.57
48 months	0.46%	2.42**	0.71%	2.09**	0.88%	2.67***	0.40	1.21	0.49%	1.53	0.23%	0.92
60 months	0.39%	2.29**	0.51%	1.59	0.70%	2.50**	0.34	1.06	0.52%	1.86*	0.26%	1.13
Average Number of firms in 60 month portfolio	17.4		8.1		20.4		29		22.8		14.9	

Panel D: Low P/B Portfolio, sorted using Approach #2

	07.1990 - 12.2020		07.1990 - 06.2000		07.1995 - 06.2005		07.2000 - 06.2010		07.2005 - 06.2015		07.2010 - 12.2020	
	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic
12 months	1.09%	2.27**	2.23%	1.97*	0.95%	1.40	0.41%	0.69	1.29%	1.84*	0.99%	1.21
24 months	0.94%	3.03***	1.64%	2.83***	1.12%	2.04**	1.17%	2.44**	1.12%	2.43**	0.25%	0.50
36 months	1.15%	4.60***	1.64%	3.35***	1.29%	2.69***	1.23%	3.00***	1.32%	2.93***	0.80%	1.95*
48 months	0.95%	4.32***	1.42%	3.16***	1.13%	2.63**	1.04%	2.74***	1.21%	3.36***	0.50%	1.61
60 months	0.86%	4.30***	1.17%	2.66***	0.91%	2.17	0.91%	2.68***	1.22%	3.94***	0.59%	2.03**
Average Number of firms in 60 month portfolio	17		8.5		20.9		27.8		21.4		14.9	

Panel E: High P/B portfolio sorted using Approach #2

	07.1990 - 12.2020		07.1990 - 06.2000		07.1995 - 06.2005		07.2000 - 06.2010		07.2005 - 06.2015		07.2010 - 12.2020	
	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic
12 months	0.61%	1.27	2.64**	2.49**	1.01%	0.99	-0.27%	0.38	-0.09%	0.14	-0.28%	0.47
24 months	1.00%	2.86***	1.87**	2.40**	1.50%	1.97**	0.79%	1.39	0.98%	2.00**	0.44%	1.05
36 months	0.72%	2.48**	1.42**	2.18**	1.05%	1.78*	0.24%	0.52	0.76%	1.81*	0.56%	1.47
48 months	0.69%	2.65***	1.44**	2.44**	0.81%	1.50	0.14%	0.33	0.64%	1.68*	0.54%	1.74*
60 months	0.58%	2.42**	1.28**	2.29**	0.71%	1.51	0.04%	0.10	0.48%	1.33	0.40%	1.43
Average Number of firms in 60 month portfolio	16.7		7.9		21.9		27.2		20.7		15.2	

Table 4: **Long Short portfolios for P/B and Size**

The table presents the average monthly abnormal returns and t-statistics for the long-short portfolios for the period July 1990 to December 2020 and chosen 10-year intervals. Panel A shows the Small Cap Minus Large Cap long-short portfolio where we go long the small cap portfolio sorted by Approach #2, where the portfolios are created by including the lower half of the spinoff sample based on US$ market cap ranking within each year and go short the large cap portfolio sorted by approach #2 where the portfolios are created by including the upper half of the spinoff sample based on US$ market cap ranking within each year. The long-short portfolios excess returns, calculated by subtracting the excess return of the large cap portfolio from the excess returns of the small cap portfolio, is then regressed on Fama-French's five factors. The intercept from the regression is the monthly average abnormal return. Panel B shows the Low Minus High P/B long-short portfolio where we go long the low P/B portfolios sorted by approach #2, where the portfolios are created by including the lower half of the spinoff sample based on P/B ranking within each year and go short the high P/B portfolios sorted by approach #2 where the portfolios are created by including the upper half of the spinoff sample based on P/B ranking within each year. The long-short portfolios excess returns, calculated by subtracting the excess return of the high P/B portfolio from the excess returns of the low P/B portfolio, is then regressed on Fama-French's five factors. The intercept from the regression is the monthly average abnormal return. *, ** and *** represents significance levels of 10%, 5% and 1% respectively.

Panel A: Small cap Minus Large cap Long-Short Portfolio

	07.1990 - 12.2020		07.1990 - 06.2000		07.1995 - 06.2005		07.2000 - 06.2010		07.2005 - 06.2015		07.2010 - 12.2020	
	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic
12 months	0.95%	1.46	3.01%	2.17**	0.88%	0.77	-0.87%	0.86	0.91%	0.88	1.12%	1.11
24 months	0.98%	2.23**	1.67%	1.72*	0.73%	0.78	1.07%	1.49	1.03%	1.58	0.65%	1.08
36 months	1.08%	3.18***	1.93%	2.57**	0.50%	0.69	0.60%	1.15	1.33%	2.66***	1.01%	2.15**
48 months	0.75%	2.42**	1.51%	2.29**	0.25%	0.37	0.38%	0.78	0.94%	2.14**	0.58%	1.45
60 months	0.66%	2.28**	1.41%	2.20**	0.20%	0.33	0.31%	0.67	0.68%	1.66	0.46%	1.21

Panel B: Low Minus High P/B Long-Short Portfolio

	07.1990 - 12.2020		07.1990 - 06.2000		07.1995 - 06.2005		07.2000 - 06.2010		07.2005 - 06.2015		07.2010 - 12.2020	
	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic
12 months	0.48%	0.77	-0.42%	0.32	-0.07%	0.07	0.69%	0.85	1.38%	1.42	1.27%	1.20
24 months	-0.06%	0.15	-0.23%	0.31	-0.38%	0.56	0.38%	0.59	0.13%	0.21	-0.19%	0.29
36 months	0.43%	1.30	0.22%	0.35	0.25%	0.47	0.99%	1.98**	0.56%	1.06	0.23%	0.43
48 months	0.26%	0.93	-0.02%	0.03	0.33%	0.70	0.89%	2.02**	0.57%	1.29	-0.04%	0.09
60 months	0.28%	1.04	-0.12%	0.22	0.20%	0.48	0.88%	2.20**	0.74%	1.80*	0.19%	0.49

5.1 Factor coefficients

Table 1 present the Fama-French 5 factor coefficients for the different portfolios. For the market factor we observe that all the estimated beta coefficients are significant at the 1% level with coefficients ranging from the lowest of 1.02 (for the non-focus increasing portfolio) to the highest of 1.35 (for the focus-increasing portfolio). For the other portfolios the estimated market beta coefficient is roughly 1.1 suggesting a slightly higher volatility than the overall market portfolio. As shown in the data description section the majority of spinoffs in our sample are generally smaller companies, and thus higher volatility than the market should be expected.

The small minus big (SMB) factor is significant at the 1% level for all the different portfolios and holding periods. As expected, we observe the highest estimated coefficients for the portfolios sorted by smallest market cap, indicating that the portfolio captures the SMB factor and that our portfolio performs well in times where small companies outperform larger companies. Overall, the lowest estimated coefficient is observed in the portfolio consisting of relatively larger companies which was expected due to what SMB measures.

In general, we observe that the high minus low factor is insignificant regardless of portfolio and holding period, except for the lower half P/B portfolio. This makes sense since the portfolio was created with the purpose of capturing that factor. However, we would have expected a higher coefficient than the observed range of 0.33 to 0.54. For the robust minus weak (RMW) factor, we generally observe insignificant estimated coefficients, except for the portfolios consisting of larger companies and the non-focus increasing. For the larger companies this observation is as expected, since larger companies in general are expected to have more robust profitability as in order to become a large company you need high and stable return on invested capital to be able to grow organically at a high rate. For the non-focus increasing portfolio we cannot identify any obvious explanation, so this can be due to sample characteristics. We observe no significant estimated coefficient for the conservative minus aggressive (CMA) factor.

5.2 Long-run abnormal returns

Due to limited observations at the beginning of our sample, some of the 12-month portfolios have some gaps in their times series. In these instances, we extend the times series of the last completed spinoff to fill this gap. As an example, if there is a 4-month gap between the final month of the last completed spinoff and the next, we simply include the last completed spinoffs times series return for 16 months. This only occur a handful of times in the 12-month portfolios and only affect 4 of the 24-month portfolios at the beginning of the sampled period. We therefore argue that its effect on the test results should be limited. However, the 12-month portfolio are also very concentrated at certain times, making the resulting portfolio returns high variance and unreliable. We therefore don't draw conclusions and don't comment based on the 12-month portfolios and recommend readers do the same. Also due to the limited number of observations from 1990-1995 we show portfolio returns from different 10-year periods to separate out any effect this period may have on the sample.

In table 2 we present the monthly average abnormal returns from the calendar time portfolio approach for small cap and large cap in panel A and low and high P/B in panel B using sorting approach #1 and #2, as both sorting approaches have their flaws. For the size portfolios approach #1 doesn't adjust for inflation and currency movements. This might bias the small cap portfolio towards earlier observations and the larger cap portfolios towards later observations. For the P/B portfolios approach #1 might bias the low P/B portfolios to companies spun of following cyclical lows in market wide P/B ratios like after market crashes and bias the large P/B portfolio towards spinoffs from market booms. On the other hand, approach #2 ends up including some stocks that on a standalone basis should be classified in the other portfolio compared to the entire sample, but since the sorting is relative to the spinoff in the same year includes them anyway. We focus our discussion and further analysis on approach #2 as we expect this approach to be less biased but report the results on both portfolios to show that the results for both approaches are very similar.

Table 3 presents the monthly average abnormal returns (intercepts) of the time series regression of the equally weighted calendar time portfolios regressed on the Fama-French's 5 factor model. Panel A show the results for the entire spinoff sample where we observe significant monthly average abnormal return of 0.97%, 0.95%, 0.83% and 0.71% for the 24-, 36-, 48- and 60-month event windows. Converted into annual compounded numbers the spinoff portfolio outperformed the Fama-French 5 factors by 12.3%, 12%, 10.4% and 8.9% annually for the respective holding periods. The highest monthly average abnormal returns are observed in 24-

and 36-month event windows, suggesting that the abnormal returns are highest in year 2 and 3 following the spinoff completion. Based on these findings we can confirm the overall research question that spinoffs in Europe in the time period 1990 - 2020 has provided shareholders with long-run abnormal returns following completion. These results are in line with, but higher than Boreiko & Murgia (2010, p. 24) results, who find monthly average abnormal returns of 0.7% for a 36-month event window for spun off firms following their completion.

Dividing the 30-year sample into 10-year intervals with 5-years overlap between each interval allows us to take a closer look at the return pattern occurring in the different time periods. In table 3 panel A for the entire spinoff sample, we observe a fluctuating pattern of monthly average abnormal returns. Starting with a "peak" during the 1990 to 2000 period where the spinoff portfolio generates the highest monthly average abnormal returns of 1.75%, 1.60%, 1.44% and 1.23% for 24-, 36-, 48- and 60-month event windows all significant at the 1% level. However, it is important to mention that the portfolio covering this time period was a lot more concentrated compared to the other time period portfolios. The average number of spinoffs in the 60-month event window portfolio over this time period was only 16.4, which is roughly half of the entire sample portfolio. This can potentially make the results less reliable. This 10-year period also happens to be favorable due to the fact that it ends close to the peak of the bull market that ended in the second half of 2000. The next sampled 10-year period from 1995-2005 show significant monthly average abnormal returns of 1.29%, 1.14%, 0.96% and 0.80% for 24-, 36-, 48- and 60-month event window. So, an overall decrease in abnormal returns, but abnormal returns are still substantial and significant at the 5% level. The 2000–2010 period show monthly average abnormal returns of 1.0%, 0.73%, 0.59% and 0.47% for 24-, 36-, 48- and 60-month event windows, and only the 24- and 36-month portfolios are significant at the 5% level. For the 2005–2015 period we observe a significant upswing in abnormal returns with 1.05%, 1.04%, 0.96% and 0.85% for 24-, 36-, 48- and 60-month event windows, all significant at the 1% level. The return series ends with a decrease in returns over the 2010 – 2020 but still 5% level significant monthly average abnormal returns of 0.66%, 0.52% and 0.48% for 36-, 48- and 60-month event windows. Overall, we observe a fluctuation in the magnitude of abnormal returns during different 10-year periods, but all time periods show evidence of spinoffs generating significant long-run abnormal returns.

This fluctuating return pattern might suggest two things: (1) that the magnitude of abnormal returns of spinoffs are somewhat cyclical. Our sample show that spinoffs have outperformed during bull markets (1990-2000 and 2010-2020) but also during periods where the markets have performed less well (2000-2010), however at a less impressive rate. This might suggest that spinoffs show abnormal returns over most periods but generally show the greatest outperformance when markets experience strong performance. (2) That the potential abnormal returns of spinoffs have declined as this type of transaction have been more common and publicized and therefore potential abnormal returns have been arbitraged away. If this is the case, it is in line with the expectations of efficient markets and how the value of information fades away as it becomes available for everyone (Sewell, 2011, p. 3). However, the 0.66%, 0.52% and 0.48% monthly average abnormal returns for 36-, 48- and 60-month event periods from 2010 – 2020 all significant at the 5% level suggest that the abnormal returns are still present, just that the magnitude of alpha and significance have decreased compared to the earlier periods where spinoffs where a relatively new transaction in Europe.

5.2.1 Size portfolios

Panel B in table 3 present monthly average abnormal returns for the small cap portfolio sorted by approach #2 over the entire time-period and for chosen 10-year intervals. For the entire period we observe significant abnormal returns of 1.50%, 1.51, 1.21% and 1.05% for the small cap portfolio for 24-, 36-, 48- and 60-month event windows, all significant at the 1% level. The fluctuation of returns is even greater for the small cap portfolio compared to the total spinoff sample with the 1990-2000, 2005 – 2015 and 2010 – 2020 periods showing the highest monthly average abnormal returns, with insignificant abnormal returns for most event windows during the 1995-2005 and 2000 – 2010 periods, except for the 24-month portfolio during 2000 – 2010.

Panel C in table 3 present the monthly average abnormal returns for the large cap portfolio sorted by approach #2 over the entire period and for chosen 10-year intervals. For the entire period we observe monthly average abnormal returns of 0.52%, 0.43%, 0.46% and 0.39% monthly average abnormal returns for 24-, 36-, 48- and 60-month event windows, all significant at the 5% level. We observe fluctuation in abnormal returns, somewhat countercyclical to the small cap portfolio with significant abnormal returns for the 1990-2000 and 1995-2005 periods with no significant monthly average abnormal returns for 2000 – 2010, 2005-2015 and 2010-2020 time periods.

Overall, we observe that the smaller capitalization portfolios outperform the larger ones by a large margin. To test whether the difference in returns between the small and large capitalization portfolios are significant we create long-short portfolio. Here we go long the small cap portfolio from approach #2 and short the large cap portfolio from approach #2 and regress the resulting times series returns on the Fama-French 5 factors. The results can be seen in panel A in table 4. The small cap minus large cap long-short portfolio for the entire period generates monthly average abnormal returns of 0.98%, 1.08%, 0.75% and 0.66% for 24-, 36-, 48- and 60-month event windows, all significant at the 5% level with the 36-month portfolio significant at the 1% level. This suggests that the small cap portfolios outperformance versus the large cap portfolio over the entire period is significant, and we can confirm our first sub-hypothesis that the smaller capitalization spinoffs explain a significant part of the abnormal returns of spinoffs in our sample during the sampled period 1990 - 2020. Panel A in table 4 also show the abnormal return of the small cap minus large cap long-short portfolio over different 10-year period. The long-short portfolio generally tracks the small cap portfolios fluctuations with the highest abnormal returns generated during the 1990-2000 period with monthly average abnormal returns of 1.93%, 1.51% and 1.41% for 36-, 48- and 60-month event windows all significant at the 5% level. There are no significant abnormal returns during 1995 – 2005 and 2000 – 2010, but significant average abnormal returns of 1.33% and 0.94% for 36- and 48-month event window in 2005 – 2015 and 1.01% for 36-month event window during 2010-2020.

We recognize that our long-short portfolio method might be flawed due to the fact that the number of positions in each portfolio differ at certain times due to the uneven distribution of spinoff transactions over our sampled period. The assumption of normally distributed returns for the long-short portfolio might not be accurate if one portfolio contains more securities than the other due to the diversification effect and thus differing degrees of variation. However, we argue that the potential effect from this on our test should be limited considering the fact that the average number of companies in each portfolio are very similar. Panel B and C in table 3 show the average number of companies in 60-month event window portfolio for both the small cap and large cap portfolio. Looking at 10-year periods we observe the following small vs big portfolio average number of positions: 8.3 vs 8.1 for 1990 - 2000, 20.2 vs 20.4 for 1995 – 2005, 26 vs 29 for 2000 – 2010, 20.3 vs 22.8 for 2005 – 2015, and 14.65 vs 14.9 for 2010 – 2020.

Our findings are in line with the size premium anomaly, as our smaller portfolio has outperformed the larger one significantly over our sampled period. This is also in line with findings by Banz (1981, p. 3) who found that smaller firms on average have outperformed larger firms, measured in risk-adjusted returns. Information asymmetry may be one aspect that could affect the valuation of companies. Lean & Tucker (2001) presents a case of information asymmetry where they consider issues small firms face regarding financing. They point at the fact that it's harder for e.g., a bank to monitor the small company if they are considering lending for a project, rather than a large company. Regarding spinoff events, Boreiko & Murgia (2010, p. 7) mentions that reduction of firm size can reduce information asymmetry, i.e., when a firm is spun out, it should be more transparent regarding information. If we also take into consideration the findings of Horowitz et al (2000) we could be facing a potential explanation for why the overall average abnormal returns for the spinoff portfolios has been cyclical over time, as they claim that the anomaly has disappeared over the years.

One of the weaknesses regarding these results are the creation of our portfolios. We divided our sample in half based on market capitalization and this makes the cutoff unclear regarding which portfolio a company is assigned to (i.e., companies with quite similar market cap can be in different portfolios due to the cutoff at N/2). It's reasonable to believe that we would have more reliable results if we did it in a similar way as we observe from Kenneth French's website, where he defines large stocks as the top 90% sorted by market capitalization and the small stocks as the ones in the lower 10% (French, 2021). Due to our sample size that was relatively small considering a time period of 30 years we were not able to assign the companies in the same way as French do. This is because our data set has very few observations in some time series and consequently our portfolios would be even more concentrated which would have made the test results less reliable.

5.2.3 P/B portfolios

Panel D in table 3 present the monthly average abnormal returns for the low P/B portfolio sorted by approach #2 over the entire period and for chosen 10-year intervals. We observe monthly average abnormal returns for the entire period of 0.94%, 1.15%, 0.95% and 0.86% for 24-, 36-, 48- and 60-month event windows, all significant at the 1% level. Compared to the small and large cap portfolios the abnormal returns of the low P/B portfolio fluctuate less with high and significant abnormal returns for certain event windows for all time periods except the 2010 – 2020 period.

Panel E in table 3 present the monthly average abnormal returns for the high P/B portfolio sorted by approach #2 over the entire period and for chosen 10-year intervals. We observe monthly average abnormal returns for the entire period of 1.00%, 0.72%, 0.69% and 0.58% for 24-, 36-, 48- and 60-month event windows, with 24-month and 48-month significant at the 1% level and 36- and 60 significant at the 5% level. Compared to the low P/B portfolio the abnormal returns primarily stem from the 1990 – 2000 period with monthly average abnormal returns of 1.87%, 1.42%, 1.44% and 1.28% for 24-, 36-, 48- and 60-month event windows, all significant at the 5% level.

For the entire time period the lower P/B portfolios show higher monthly average abnormal returns compared to the higher P/B portfolio for all event windows except the 24-month window. However, the outperformance by the lower half portfolio is not as large as we expected, with higher average abnormal returns of 0.43%, 0.26% and 0.28% for 36-, 48- and 60-month event window. These results can be seen as relatively small compared to Dhatt et al. (1999, p. 60) who found that value stocks outperformed growth stocks with an average of 5.28% - 8.40% per year in the time period 1979-1997. Annualized our average outperformance are 5.28%, 3.17% and 3.41% for 36-, 48- and 60-month event windows. To test whether the outperformance of the low P/B portfolio are significant we create a long-short portfolio from the P/B Portfolios derived from approach #2, where we go long the low P/B portfolio and short the high P/B portfolio and regress the return of the portfolio on the Fama-French 5 factors. The results of the low minus high P/B long-short portfolio regression can be seen in Panel B in table 4.

Except for the period 2000 – 2010 we observe no significant abnormal returns from the low minus high long-short portfolio over the sampled period, which suggest that the observed outperformance of the low P/B portfolio versus the high P/B is not significant. We therefore fail to confirm our second sub-hypothesis that undervaluation defined as low P/B multiples is an explanation for the observed long-run abnormal returns of spinoffs. Again, we recognize the potential flaws of our long-short portfolios due to differing number of securities in each portfolio at certain times and its effect on standard errors but argue that the potential effect from this on our test should be limited considering the fact that the average number of companies in each portfolio over time are almost identical. Looking at 10-year periods in panel D and E in table 3 we observe the following average positions for the low P/B vs high P/B portfolios: 8.5 vs 7.9 for 1990 - 2000, 20.9 vs 21.9 for 1995 – 2005, 27.8 vs 27.2 for 2000 – 2010, 21.4 vs 20.7 for 2005 – 2015, and 14.9 vs 15.2 for 2010 – 2020.

Potential explanations for why our reported abnormal return are not as large as Dhatt et al. (1999) could be that the effect of sorting stocks by P/B ratio has faded out, which would be similar to the size premium anomaly. If this is the case it is in line with market efficiency regarding the value of information becoming available for everyone.

5.2.3 Focus-increasing

In addition to testing for size and undervaluation we wanted to replicate one of the tests that previously has been done in several studies in relation to spinoffs. We divided the sample by a criterion: if the spinoff increased corporate focus in the parent firm or not. If so, it is defined as a focus-increasing transaction. Previous studies have found abnormal returns related to focus-increasing spinoffs (see Veld & Veld-Merkoulova, 2004; Daley et al, 1997). Previous studies primarily use the SIC code to identify whether the transaction increased corporate focus or not. We on the other hand, used DataStream's mid industry description as the cutoff. This should have little effect on our results as one would expect large overlap between the two classifications. Due to a limited amount of non-focus increasing observations from 1990-1996, we run the calendar time portfolios from 1996-2020 to compare returns over the same time periods.

Table 5: Focus-Increasing and Non-Focus increasing portfolios

The table presents the monthly average abnormal returns and t-statistic for the equally weighted calendar-time portfolios sorted by the focus-increasing and non-focus increasing classifications for the time period 06.1996 – 31.12.2020. The calendar time portfolio approach creates a portfolio every calendar month including each spinoff in the portfolio on the 1st of the month following completion, rebalance to equal weightings each month and holds each spinoff for 12-, 24-, 36-, 48- and 60-month event windows. The portfolios excess returns, calculated by subtracting the risk free-rate from the portfolio return, is then regressed on Fama-French's five factors. The intercept from the regression is the monthly average abnormal return. Panel A shows the focus-increasing portfolio which include firms whose DataStream mid industry classification differed from its parents, and non-focus increasing spinoffs whose DataStream mid industry classification was identical to its parents. *, ** and *** represents significance levels of 10%, 5% and 1% respectively.

Panel A: Fama French Calendar Time Portfolio Approach, Focus and Non-Focus Increasing Portfolios

	Focus Increasing Portfolio		Non-Focus Increasing Portfolio	
	Monthly Average AR	T-statistic	Monthly Average AR	T-statistic
12 months	0.33%	0.58	0.60%	1.28
24 months	0.57%	1.58	1.16%	3.22***
36 months	0.65%	2.24**	1.03%	3.32***
48 months	0.48%	1.85*	0.95%	3.28***
60 months	0.43%	1.87*	0.88%	3.26***

Table 5 presents the monthly average abnormal returns generated from focus and non-focus increasing portfolios over the entire sampled period. We observe that only the 36-month event window for the focus-increasing portfolio is significant at the 5% level, with a monthly average abnormal return of 0.65%. The non-focus increasing portfolio on the other hand generate monthly average abnormal returns of 1.16%, 1.03%, 0.95% and 0.88% for 24-, 36-, 48- and 60-month event windows, all significant at the 1% level. Our results are in line with Boreiko & Murgia (2010) results who don't find any abnormal monthly returns for focus-increasing spinoff firms. We therefore fail to confirm our third sub-hypothesis that focus-increasing spinoffs outperform non-focus increasing spinoffs.

6 Conclusion

The purpose of this thesis was to investigate whether spinoffs completed in Europe during the time period 1990 - 2020 have provided long-run abnormal returns for shareholders. The sample consisted of 265 companies headquartered in 22 European countries that were spun out of publicly listed parent companies. For the entire sample we observe that spinoffs have provided average abnormal returns of 0.97%, 0.95%, 0.83% and 0.71% for 24-, 36-, 48- and 60-month event windows, all significant the 1% level. We therefore can confirm our main research question that European spinoffs have generated long-run abnormal returns for shareholders during the sampled time period. We find the magnitude and significance of abnormal returns varying over different 10-year periods within the sampled period.

We used market capitalization as a measure of size to sort our sample into small and large cap portfolios and then regressed the time series returns of each portfolio on Fama-French's 5 factor model. We observed a large margin of outperformance for the small cap portfolio versus the large cap portfolio. Through implementing a long-short portfolio where we go long the small cap portfolio and short the large cap, we find monthly average abnormal returns of 0.98%, 1.08%, 0.75% and 0.66% for 24-, 36-, 48- and 60-month periods, all significant at the 5% level for the entire time period. We can therefore confirm that the smaller spinoffs significantly outperform the larger spinoffs, and therefore can explain a significant portion of the observed abnormal returns in spinoffs during our sampled period.

Further we created portfolios based on P/B ratio rankings. This was done with the purpose of testing for undervaluation as a potential explanation for abnormal returns in spinoffs. Considering the findings of Dhatt et al. (1999, p. 60) we expected to see outperformance by the companies that was in the lower P/B portfolio compared to the high P/B portfolio. We find that the low P/B portfolio generated higher abnormal returns than the high P/B portfolio over the sampled period. However, through implementing a long-short portfolio where we go long the low P/B portfolio and short the high P/B portfolio and regress the resulting return on Fama-French's 5 factors we fail to obtain significant outperformance. We therefore fail to confirm our second sub-questions that low P/B spinoffs outperform high P/B spinoffs.

We created portfolios based on the spinoffs that increased corporate focus versus those who did not. This was in order to compare our results to earlier studies. The test of performance in light of corporate focus has been well documented previously (see Veld & Veld-Merkoulova, 2004; Daley et al, 1997). Our results are different from these previous studies, as we don't identify any significant outperformance by the divested units that were spun out of a parent firm operating in a different industry. However, our findings are in line with Boreika & Murgia (2010) who used the same method as we did. This might be explained by the fact that we have a different sample than previous studies and that most of the previous studies use a different testing method.

We have highlighted some weaknesses regarding our testing methods and results. Our sample is quite small considering the time period. We study 30 years of data and unfortunately the spinoff transactions are not spread out equally over the period. This makes portfolio sorting difficult and leaves us with some periods where the portfolios are exposed to very few companies.

We suggest that further research should dig deeper into potential explanations of the long-run abnormal returns we have observed related to spun out companies in Europe. In addition to this, one could study if there are differences in return and characteristics of spinoffs in Europe and the US. One way to improve on our research could be to potentially find a better way to test for undervaluation, using a more refined approach than grouping firms based on P/B ratios and size.

References

A. Quayyum Khan, D. R. M. (1996). Volunary Divestitures and the Choice Between Sell-Offs and Spin-Offs. *The Financial Review, 31*(4), 885-912. doi:https://doi.org/10.1111/j.1540-6288.1996.tb00902.x

Aggarwall, R., & Rivoli, P. (1990). Fads in the Initial Public Offering Market? *Financial Management, 19*(4), 45-57. doi:https://doi.org/10.2307/3665609

Ahn, S., & Walker, M. D. (2007). Corporate governance and the spinoff desicion. *Journal of corporate finance, 13*(1), 76-93. doi:https://doi.org/10.1016/j.jcorpfin.2006.03.001

Allen, J. W., & McConnell, J. J. (2002). Equity Carve-Outs and Managerial Discretion. *The journal of Finance, 53*(1), 163-186. doi:https://doi.org/10.1111/0022-1082.65022

Baker, M., Ruback, R., & Wurgler, J. (2004). Behavioral Corporate Finance: A survey. doi:http://dx.doi.org/10.2139/ssrn.602902

Bank, T. W. (1990-2019). Market capitalization of lsited domestic companies (current US$). Retrieved from https://data.worldbank.org/indicator/CM.MKT.LCAP.CD?end=2019&name_desc=false&start=1990

Banz, R. W. (1981). The relationship between return and market value of common stocks. *Journal of Financial Economics, 9*(1), 3-18. doi:https://doi.org/10.1016/0304-405X(81)90018-0

Bello, Z. Y. (2008). A statistical comparison of the CAPM to the Fama-French Three Factor Model and the Cahart's model. *Global Journal of Finance and Banking Issues, 2*(2). Retrieved from https://ssrn.com/abstract=1536149

Bernstein, W. J. (2001). Rolling Your Own: Three-Factor Analysis. Retrieved from http://www.efficientfrontier.com/ef/101/roll101.htm

Bessembinder, H., & Zhang, F. (2013). Firm characteristics and long-run stock returns after corporate events. *Journal of Financial Economics, 109*(1), 83-102. doi:https://doi.org/10.1016/j.jfineco.2013.02.009

Boreiko, D., & Muriga, M. (2010). European Spin-Offs: Origin, Value Creation, and Long Term Performance. doi:http://dx.doi.org/10.2139/ssrn.1554267

Carhart, M. M. (1997). On Persistence in Mutual Funds Performance. *The journal of Finance,* *52*(1), 57-82. doi:https://doi.org/10.2307/2329556

Chiah, M., Chai, D., Zhon, A., & Li, S. (2016). A Better Model? An Empirical Investigation of the Fama-French Five-factor Model in Australia. *International Review of Finance, 16*(4), 595-638. doi:https://doi.org/10.1111/irfi.12099

Chung, Y. P., Johnson, H., & Schill, M. J. (2006). Asset Pricing When Returns Are Nonnormal: Fama-French Factors versus High-Order Systematic Comoments. *The Journal of Business, 79*, 923-940. doi:10.1086/499143

Cursatis, P. J., Miles, J. A., & Woolridge, J. R. (1993). Restructuring through spinoffs: The stock market evidence. *The journal of Financial Economics, 33*(3), 293-311. doi:https://doi.org/10.1016/0304-405X(93)90009-Z

Dhatt, M. S., Kim, Y. H., & Mukherji, S. (1999). The Value Premium for Small-Capitalization Stocks. *Financial Analysts Journal, 55*(5), 60-68. doi:https://doi.org/10.2469/faj.v55.n5.2300

Dimson, E., & Mussavian, M. (2002). A brief history of market efficiency. *European Financial Management, 4*(1), 91-103. doi: https://doi.org/10.1111/1468-036X.00056

Dutta, A., & Dutta, P. (2015). Measuring long-run security price performance: a review. *Investment Management and Financial Innovations, 12*(2), 26-32.

Eckbo, B. E. (2009). Handbook of corporate finance : empirical corporate finance. In *Handbooks in finance,* (1st ed., pp. v.). Amsterdam ; Boston: Elsevier/North-Holland.

Eckbo, B. E., & Thorburn, K. S. (2008). Corporate Restructuring: Breakups and LBOs. In B. E. Eckbo (Ed.), *Handbook of Empirical Corporate Finance* (pp. 431-495).

Fama, E. F. (1998). Market efficiency, long-term returns, and behavioral finance. *Journal of Financial Economics, 49*(3), 283-306. doi:https://doi.org/10.1016/S0304-405X(98)00026-9

Fama, E. F., & French, K. R. (2004). The Capital Asset Pricing Model: Theory and Evidence. *Journal of Economic Perspectives, 18*(3), 25-46. doi:0895330042162430

Fama, E. F., & French, K. R. (2015). A five-factor asset pricing model. *Journal of Financial Economics, 116*(1), 1-22. doi:https://doi.org/10.1016/j.jfineco.2014.10.010

French, K. (2021). Description of Fama/French Factors for Developed Markets. http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/f-f_developed.html

Habib, M. A., Johnsen, D. B., & Naik, N. Y. (1997). Spinoffs and Information. *Journal of*

Financial Intermediation, 6(2), 153-176. doi:https://doi.org/10.1006/jfin.1997.0212

Hayes, A. (2020). Carve-Out. Retrieved from https://www.investopedia.com/terms/c/carveout.asp

Horowitz, J. L., Loughran, T., & Savin, N. E. (2000). The disappearing size effect. *Research in Economics, 54*(1), 83-100. doi:https://doi.org/10.1006/reec.1999.0207

Horowitz, J. L., Loughran, T., & Savin, N. E. (2000). Three analyses of the firm size premium. *Journal of Empirical Finance, 7*(2), 143-153. doi:https://doi.org/10.1016/S0927-5398(00)00008-6

Ikenberry, D., Lakonishok, J., & Vermaelen, T. (1995). Market underreaction to open market share repurchases. *Journal of Financial Economics, 39*(2-3), 181-208. doi:https://doi.org/10.1016/0304-405X(95)00826-Z

Krishnaswami, S., & Subramaniam, V. (1998). Information Asymmetry, Valuation, and the Corporate Spin-Off Decision. doi:https://dx.doi.org/10.2139/ssrn.123088

Krogdahl, T., & Nicolaisen, U. (2014). *Value Creation Through Corporate Restructuring: A Case study of the spin-off of REC Solar ASA.* (Master). NHH, Retrieved from https://openaccess.nhh.no/nhh-xmlui/bitstream/handle/11250/223273/Masterthesis.PDF?sequence=1&isAllowed=y

Ljungqvist, A. (2007). IPO Underpricing. In B. E. Eckbo (Ed.), *Handbook of Empirical Corporate Finance* (pp. 375-422).

Lutz, S. (1994). Ramsay forms a managed-care spinoff. *Mod Healthc, 24*(44), 8. Retrieved from https://www.ncbi.nlm.nih.gov/pubmed/10138160

LYON, J. D., BARBER, B. M., & TSAI, C.-L. (1999). Improved Method for Tests of Long-Run Abnormal Stock Returns *The journal of Finance, 54*(1). doi:https://doi.org/10.1111/0022-1082.00101

M.Barber, B., & D.Lyon, J. (1997). Detecting long-run abnormal stock returns: The empirical power and specification of test statistics. *Journal of Financial Economics, 43*(3), 341-372. doi:https://doi.org/10.1016/S0304-405X(96)00890-2

Malkiel, B. G. (2003). The Efficient Market Hypothesis and its Critics. *Journal of Economic Perspectives, 17*, 59-82. doi:10.1257/089533003321164958

Mitchell, M. L., & Stafford, E. (2000). Managerial Decisions and Long-Term Stock Price Performance. *The Journal of Business, 73*(2), 287-329. doi:https://doi.org/10.1086/209645

Nichol, E., & Dowling, M. (2014). Profitability and investment factors for UK asset pricing models. *Economic Letters, 125*(3), 364-366. doi:https://doi.org/10.1016/j.econlet.2014.10.013

Peyer, U., & Vermaelen, T. (2009). The Nature and Persistence of Buyback Anomalies. *The Review of Financial Studies, 22*(4), 1693-1745. doi:https://www.jstor.org/stable/30225707

Pham, D., Nguyen, T., & Adhikari, H. (2015). Determinants of divestiture methods for US firms: asset sell-off versus equity carve-out. *Review of Accounting and Finance, 17*(4), 41-57. doi:10.1108/RAF-11-2015-0173

Rao, S. P. U., & Boudreaux, D. (2008). Evaluation of Size and book-to-market Factors in Health Related Mutual Funds. Retrieved from http://swer.wtamu.edu/sites/default/files/Data/139-152-40-142-1-PB.pdf

Schnee, E. J., Knight, L. G., & Knight, R. A. (1998). Corporate Spin-Offs. *A well-planned prescription for ailing companies.* Retrieved from https://www.journalofaccountancy.com/issues/1998/jun/schnee.html

Sewell, M. (2011). History of the Efficient Market Hypothesis Retrieved from https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.232.4181&rep=rep1&type=pdf

Sudarsanam, P., & Qian, B. (2006). Catering Theory of Corporate Spinoffs : Empirical Evidence from Europe. doi:http://dx.doi.org/10.2139/ssrn.891101

Veld, C., & Veld-Merkuoulova, Y. V. (2004). Do spin-offs really create value? The european case. *Journal of Bank & Finance, 28*(5), 1111-1135. doi:https://doi.org/10.1016/S0378-4266(03)00045-1

Veld, C., & Veld-Merkoulova, Y. V. (2009). Value creation through spin-offs: A review of the empirical evidence. *International Journal of Management Reviews, 11*(4), 407-420. doi: https://doi.org/10.1111/j.1468-2370.2008.00243.x

Wagner, H. F. (2005). The Equity Carve-Out Decision doi:http://dx.doi.org/10.2139/ssrn.524723

Weston, J. F. (1989). Divestitures: Mistakes or Learning? *Journal of applied corporate finance, 2*(2), 68-76. doi:https://doi.org/10.1111/j.1745-6622.1989.tb00180.x

Womack, K., & Zhang, Y. (2003). Understanding Risk and Return, the CAPM, and the Fama-French Three-Factor Model. Retrieved from

https://www.researchgate.net/publication/228169038_Understanding_Risk_and_Return_the_CAPM_and_the_Fama-French_Three-Factor_Model