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Master Thesis

Spinoffs Impact on the Parent Company

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This study examines the impact of corporate spinoffs on the stock prices of parent companies in the short and long-term, analyzing a dataset of 99 American spinoffs from 2000 to 2020. An event study reveals significant positive abnormal returns around the event dates, indicating initial market optimism. However, longitudinal regression analysis shows that these early gains do not lead to sustained long-term benefits. The findings suggests that while spinoffs initially boost shareholder value, their long-term effects remain inconclusive. This study highlights the complexity of spinoff and their varying impacts on parent companies.

ACKNOWLEDGEMENTS

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Lastly, I dedicate this thesis to my father, who was my greatest support in starting my master's program. His absence is deeply felt, but his influence and belief in my abilities continue to inspire me.

Table of Content

1.0 INTRODUCTION

This thesis examines the impact of corporate spinoffs on the stock prices of their parent companies, analyzing both short-term and long-term effects. For short-term analysis, data from 10 days prior to 10 days after the spinoff event is utilized, while long-term effects are assessed over a six-year period surrounding the event. The study focuses on a sample of 99 spinoffs in the American stock market from 2000 to 2020.

A spinoff, as defined by the Corporate Finance Institute, is a strategic maneuver employed by a company to establish a distinct business subsidiary derived from its parent company. This separation takes place as the parent corporation divides a portion of its business operations, creating a new entity that becomes publicity traded, and subsequently issues shares of this new entity to its existing shareholders (Corporate Finance Institute, n.d.). Spinoffs are undertaken with the expectation that the newly formed entity will achieve greater value and success as a standalone enterprise (Fontinelle, 2023). Notable examples includes the spinoff of PayPal from eBay, and Vipps from DNB, underscoring the strategic importance of such corporate actions (Borison, 2015; Mital, 2017).

Spinoffs are significant corporate events that can potentially lead to substantial shifts in shareholder value. Previous research has mostly examined the effect spinoffs have on stakeholder wealth around the announcement period, revealing a generally positive effect on shareholder wealth (Miles & Rosenfeld, 1983). Linn & Rozeff (1985) also provides evidence that the announcement effects of voluntary spinoffs tend to raise the stock prices of the announcing firm's stocks, aligning with the wealth-maximizing hypothesis. The principle of wealth-maximization revolves around enhancing the value of a business with the aim of boosting the worth of shares held by its stakeholders. This involves a continues effort by the company's management team to seek the optimal returns on invested funds while also managing and minimizing associated risk of potential losses (AccountingTools, 2023).

This thesis extends the existing literature by examining the actual event day of corporate spinoffs, contrasting with previous studies' predominant focus on the announcement day. By delving into both the short-term and long-term impacts, this work offers a more comprehensive understanding of how spinoffs influence parent companies over time. Focusing on the event day provides direct insights into the immediate market reactions to the operational execution of the spinoff, assessing whether its impact mirrors that of the announcement. Additionally, this thesis utilizes a contemporary dataset spanning from 2000 to 2020 to investigate these effects, while most previous studies have relied on data from 1960s to the 1990s. This update allows for an assessment on whether findings from earlier decades still hold in the current economic and corporate environments, offering fresh insights into the strategic outcomes of spinoffs.

To address this issue, the study employs a comprehensive methodology, drawing on quantitative analyses to capture both the immediate and sustained impacts of corporate spinoffs on stock prices. To assess short-term market reaction, an event study is employed, analyzing the abnormal returns of parent companies before and after the spinoff events. Furthermore, to examine the long term effects, different regression models where used. The regression models examines the interplay between spinoffs, broader market conditions and other risk factors affecting stock returns.

Initial findings from the event study indicate significant positive abnormal returns around the spinoff event, specifically the most pronounced positive reaction occur just before and on the day of the spinoff. This suggests that investors could benefit from timely investments in companies before they complete spinoffs. However, long-term effects, assessed trough regression models incorporating Fama-French factors, reveal a more nuanced picture. While the short-term reactions are broadly positive, the long-term analysis does not conclusively support a sustained positive impact on the stock prices of parent companies' post-spinoff. Further analysis under varying market conditions – categorized as "hot" and "cold" based on standard deviations from the S&P 500 returns – shows that these external factors do not significantly influence the post-spinoff performance, pointing towards the intrinsic characteristics of the spinoff and parent companies as the more crucial determinants of success.

The remainder of this thesis is structured as follows to provide a clear and systematic exploration of the research topic:

- Chapter 2: Literature Review – This chapter offers a comprehensive review of the existing literature pertaining to spinoffs and the associated impact on stakeholders' wealth.
- Chapter 3: Research Question and Hypotheses – This chapter outlines the formulation of the research question and develops the hypotheses to be tested.
- Chapter 4: Methodology – This chapter details the proposed methodology for the study, explaining the analytical techniques and processes to be used.
- Chapter 5: Data Collection – This chapter discusses the data collection process, detailing the sources of data and the criteria for data selection and usage.
- Chapter 6: Results – This chapter will present the findings and results derived from the rigorous analysis of the data and discusses the implications of the findings, comparing them with existing literature and examining their relevance to the hypotheses.
- Chapter 7: Conclusion – The final chapter will summarize and concludes the main findings from the study.

2.0 LITERATURE REVIEW

The purpose of the subsequent section is to provide a comprehensive review of the existing literature on the chosen topic. A multitude of studies have been undertaken to explore various aspects of spinoff companies. The forthcoming portion of the paper aims to outline and emphasize key literature associated within the subject.

2.1 Stakeholder wealth

In the realm of stakeholder wealth within the context of spinoffs, numerous prior studies have delved into this subject. However, a prevalent focus in previous research has been predominantly on the stakeholder wealth of the spinoff itself or the changes in stakeholder wealth during the period surrounding the announcement. The majority of these studies are rooted on the time span from 1960 to 1990, with only a limited number of studies utilizing data from more recent years.

Among these investigations, Linn and Rozeff (1985) explored the impact of spinoffs on shareholder wealth, discovering an increase during the announcement period. Their study, encompassing 53 announcements events for 48 distinct firms, spanned the period from 1963 to 1982. They attributed these findings to the wealth-maximizing hypothesis, suggesting alignment with the notion of maximizing stakeholder value.

Continuing on the theme of market reactions, Johnson, Brown & Johnson (1994) focused on the American market during the 1980s and early 1990s, analyzing 113 spinoff announcements. They documented significant abnormal returns immediately around the announcement period, emphasizing the responsiveness of the market to such corporate restructuring events.
Similarly, Janssens de Vroom and Frederikslust (1999) scrutinized the impact of spinoff announcements on shareholder wealth, conducting an analysis of share price movements in a sample of 210 corporate spinoffs during the 1990s. Their results revealed a significant positive abnormal return at the announcement date,

providing evidence of a positive capital market reaction to the spinoff announcement.

Further contributing to this body of knowledge, Schipper and Smith (1983) examined the influence of spinoff announcement on shareholder wealth, identifying a significant share price reaction in 93 spinoff announcements between 1963 and 1981. In a comprehensive study spanning 1963 to 1980, Miles and Rosenfeld (1983) investigated 55 firms where the parent companies had spun off subsidiary common stock to their shareholders. Their findings indicated that spinoff announcement exerted a positive influence on stock prices, strengthening the arguments for the positive impact of spinoffs on stakeholder wealth.

Additionally, Kirchmaier (2003) provided a European perspective by examining 48 spinoffs between 1989 and 1999, noting that while the combined entities and the parent companies alone showed insignificant abnormal returns, the spinoffs alone significantly outperformed the market.

Contributing to the understanding of the positive impact on shareholders' wealth, Ahn and Denis (2001) conducted a study focusing on changes in investment policies. Examining 106 spinoffs during the period from 1981 to 1996, their findings supported the notion that spinoffs enhance value by enhancing investment efficiency.

Moreover, Veld & Veld-Merkoulova (2004) studied the wealth effects of 156 European spinoffs between 1987 and 2000, adding evidence of positive cumulative average abnormal returns during and around the announcement periods, thereby complementing the findings from both American and European contexts.

Furthermore, Andersson and Klepper (2012) conducted a study analyzing the formation rate, characteristics, and performance of various types of new firms in Sweden, covering the period from 1993 to 2005. Consistent with prior research, their study highlighted that spinoffs from incumbents outperform other types of new firms, particularly when the parent firm remains operational. The authors attributed these findings in part to the observation that, on average, spinoffs are larger and initially employ more advanced and experienced workers than other types of new firms. Even after accounting for these differences, the spinoffs still exhibit significantly lower hazards than other types of new firms, particularly when entering the same sector as their parent company. These studies collectively strengthen the understanding of the positive influence of spinoffs on shareholder wealth, emphasizing improvements in investment efficiency and the advantageous performance of spinoffs compared to other forms of new firms.

In alignment with the theme of stakeholder wealth and spinoffs, two notable studies closely resonates with my research question in this paper. Seifert and Rubin (1989) conducted a comprehensive analysis of common stock returns for both parent and spinoff firms upon their separate trading initiation. Their study, which encompassed 51 spinoffs announcements between 1968 and 1983, involving 102 firms in total (including parent companies), revealed that spinoffs tend to incur abnormal losses once they begin to trade independently. Remarkably these findings are similar to the return behavior observed in firms listing on the New York Stock Exchange or American Stock Exchange, suggesting a potentially more generalized post-listing phenomenon. Intriguingly, while spinoffs demonstrated abnormal losses, parent companies appeared to earn normal returns after the ex-dividend day.

In similar vein, but with different results, Cusatis, Miles, and Woolridge (1993) delved into the value created through spinoffs over the period from 1965 to 1988 studying 146 spinoffs. Their approach involved measuring stock returns for spinoffs, their parent firms, and the combined spinoff-parent entities for periods up to three years following spinoff announcements. The researchers assessed stock-return performance over varying timeframes, ranging from ten days to three years post-spinoff announcement. Their findings unveiled significantly positive abnormal returns for both spinoffs and their parent companies. Moreover, the observed abnormal performance was particularly concentrated in firms experiencing an unusually high incidence of takeovers. This study contributes valuable insights by indicating superior long-term investment performance for both spinoffs and parent firms, affirming positive abnormal returns over an extended period. Such findings provide a nuanced perspective on the intricate dynamics of stakeholder wealth within the context of spinoff-related activities.

3.0 RESEARCH QUESTION AND HYPOTHESES

3.1 Research question

This thesis seeks to unravel the dynamic relationship between corporate spinoffs and the financial performance of parent companies, focusing specifically on stock price behavior. While existing research has extensively documented the short-term impacts of spinoffs on shareholder wealth, primarily within data up to the early 2000s, this study extends the analysis to include both the immediate and long-term effects on parent company stock prices using data from the past two decades. The central research question is articulated as follows:

To what extent do spinoffs affect the stock prices of parent companies, both in the short-term and long-term?

The primary objective of this research is to analyze the effects of spinoffs on the stock prices of parent companies by comparing the fluctuations in the stock prices of both the spinoff and parent company. This comparison will leverage the availability of comprehensive historical stock price data for parent companies, which allows for a robust analysis of trends and variations before and after the spinoff event. Investigating these potential correlations and examine differences will provide deeper insights into the economic impacts of spinoffs.

3.2 Hypothesis

Given the focus on the event date, the hypotheses are structured to capture the immediate and lasting financial impacts of spinoffs:

Immediate Impact Hypothesis:

- Null hypothesis (H0): There is no significant impact of spinoffs on the stock prices of parent company around the event date.
- Alternative hypothesis (H1): Spinoffs have a significant effect on the stock prices of parent companies around the event date.

Long-Term Performance Hypothesis:

- Null hypothesis (H0): Spinoffs do not significantly impact the long-term stock prices of parent companies.
- Alternative hypothesis (H1): Spinoffs result in significantly long-term changes in the stock prices of parent companies.

This research will employ empirical methods tailored to the specifics of the event date, using an event study methodology to analyze the immediate impacts, and regression analyses to explore long-term trends.

4.0 METHODOLOGY

4.1 Research Approach

This study adopts a quantitative approach, utilizing historical data to investigate the impact of corporate spinoffs on the stock prices of parent companies. This method aims to assess the implications and magnitude of spinoff transactions in terms of financial performance. All statistical calculations and analyses will be performed using the R programming tool, ensuring a standardized, rigorous and reproducible approach to data processing and statistical analysis.

4.2 Analytical Methods

Ordinary Least Squares (OLS) Regression:

OLS regression is utilized to facilitate hypothesis testing and provide statistical insights into the dynamics between spinoffs and stock prices. This method is chosen for its robustness in statistical inference and is used throughout the analysis to estimate the parameters of both the market model and the extended Fama-French model.

Event study:

An integral component of the methodology involves conducting an event study to capture the immediate effects of spinoffs, meticulous assessing stock price movements before and after the spinoff event. This analysis is pivotal for pinpointing significant market reactions associated with the spinoff event. Daily stock returns are used to study these immediate effects.

Regression Analysis:

This approach provides a nuanced analysis of how spinoff events interact with broader market conditions and other risk factor to affect stock returns. Monthly data for a period of three years before and after the event are used to study the long-term effects. The research incorporates panel data analysis with time-fixed effects to capture the evolving dynamics of stock prices across multiple time periods. This analytical approach allows for the identification and mitigation of potential unobservable factors that may influence the variables under consideration. By also defining “hot” and “cold” markets based on thresholds from the S&P 500 index, gives an additional regression model to assess how such market conditions can impact the spinoffs effect.

4.3 Detailed Analysis Steps

Step 1: Calculation of Market Returns:

The initial step involves calculating the market returns for the S&P 500 index, which serves as a benchmark for comparing stock performance.

$$R_{m,t} = \left(\frac{P_t - P_{t-1}}{P_{t-1}}\right) * 100$$

Where P_t and P_{t-1} represent the index prices at time $t\ and\ t-1$, respectively. This step establishes the baseline for market movements

Step 2: Regression Analysis Using the Market Model:

The market model is applied to estimate expected returns for each stock based on its market exposure:

$$R_{i,t} = \alpha_i + \beta_i * R_{m,t} + \epsilon_{i,t}$$

Where α_i is the intercept (representing the stock-specific expected return independent of the market), β_i measures the stock's sensitivity to market returns, and $\epsilon_{i,t}$ is the error term. This model helps understanding how closely the returns of a particular stock follow the returns of the broader market, providing insights into the stock's market risk exposure.

Expected returns are then derived from the market model using the estimated parameters α_i and β_i:

$$\hat{R}_{i,t} = \alpha_i + \hat{\beta}_i * R_{m,t}$$

These expected returns are generated by applying the linear regression model to historical data, predicting how stock returns would align with movements in the S&P 500 over the same period.

Step 3: Calculation of Abnormal Returns:

Abnormal Returns (AR) are computed by subtracting the expected returns from the actual returns:

$$AR_{i,t} = R_{i,t} - \hat{R}_{i,t}$$

This metric isolates the specific impact of the spinoff from general market movements, critical for the event study analysis.

Step 4: Event Study Analysis:

In the event study, data is analyzed around a defined event window around the event date. The event windows used in this analysis is [-10,+10], [-5,+5], [-3,+3], [-1,+1], days relative to the spinoff event. Average Abnormal Returns (AAR) and Cumulative Average Abnormal Returns (CAAR) are calculated to assess the spinoff impact:

$$AAR = \frac{1}{N}\sum_{t=1}^{N} AR_{i,t}$$

$$CAAR_t = \sum_{\tau=1}^{t} AAR_\tau$$

Statistical tests (t-tests) are performed to evaluate the significance of these measures to confirm the robustness of the spinoff effects:

$$t = \frac{\bar{x} - \mu}{s/\sqrt{n}}$$

Where $\bar{x}$ is the sample mean, μ is the mean expected under the null hypothesis (typically zero), s is the standard deviation of the sample, and n is the sample size. This statistical test helps validate the significance of the findings from the event study analysis, supporting robust conclusions about the impact of events on stock performance.

Step 5: Regression Analysis with Fama-French Factors:

To further analyze the influence of market conditions on spinoff impacts, the study incorporates a more complex regression model that includes interaction terms between the post-spinoff indicator and the Fama-French factors. The model is designed to isolate the effects of spinoffs from broader market movements and specific risk factors associated with market, size, value, profitability, and investment.

$$R_{it} = \alpha_i + \beta_1 * Mkt\_RF_t + \beta_2 * SMB_t + \beta_3 * HML_t + \beta_4 * RMW_t + \beta_5 * CMA_t + \beta_6 * RF_t + \beta_7 * PostSpinoff_{it} + \epsilon_{it}$$

This allows for an examination of how spinoff-related changes interact with broader financial factors. In this equation α_i represent the company-specific intercept or fixed effects, capturing unique characteristics of each company that influenced its returns independent of the market. This can be interpreted as the intrinsic value of the company's stock, reflecting idiosyncratic factors that the market may not recognize or factors inherent to the company's operational and financial structure. The terms $Mkt\_RF_t,\ SMB_t,\ HML_t,\ RMW_t,\ CMA_t$, and RF_t represent the Fama-French five factors and the risk-free rate. These factors account for various risks including market risk, size, value, profitability, and investment risk, alongside the risk-free returns. The variable $PostSpinoff_{it}$ is an indicator variable that takes a value of 1 if the observation occurs after the spinoff event for company i and 0 otherwise. The coefficients β_1 trough β_7 are estimated to reflect the sensitivity of returns to each factor on the specific impact of the spinoff, while ϵ_{it} is the error term, representing unexplained variation in returns.

To delve deeper into the interaction effects of spinoffs with market conditions, the model includes interaction terms between the post-spinoff dummy and the Fama-French factors:

$$R_{i,t} = \alpha_i + \delta * PostSpinoff_{it} + \sum_{j=1}^{k} (\beta_j * F_{jt}) + \sum_{j=1}^{k} (\gamma_j * PostSpinoff_{it} * F_{jt}) + \epsilon_{it}$$

Here, α_i continues to serve as the company-specific fixed effect, representing the unique average return of a company. The variable $PostSpinoff_{it}$ is the dummy variable indicating whether the time t is post-spinoff for company i. The F_{jt} values represent each of the Fama-French factors at time t. The coefficient δ measures the average effect of the spinoff on returns, while β_j indicates the impact of the j-th factor on returns, independent of the spinoff. The γ_j coefficient capture the additional effect of each factor during the post-spinoff period, and ϵ_{it} is the error term.

This regression framework provides a comprehensive analysis of how spinoff affect company performance by examining both the general market conditions and the specific impact of the spinoff. Including individual and interaction terms for the Fama-French factors enables the model to distinguish the differential effects of these factors on returns before and after the spinoff, shedding light on how spinoffs might alter a company's risk profile and market valuation.

Step 6: Panel Data Regression Model:

To examine the influence of market conditions on the impact of spinoffs, this study categorizes market conditions as "hot" and "cold" based on standard deviation thresholds of S&P 500 returns. Specifically, a "hot" market is defined as a period where the S&P 500 returns are above one standard deviation from the mean historical return, and a "cold" market is defined when the returns are below one standard deviation from the mean historical return. These thresholds are chosen because standard deviation is a measure of volatility and provides a clear, quantitative way to define periods of above-average and below-average market performance. (Hargrave, 2024). The regression model incorporates interaction terms between these market conditions and the post-spinoff dummy to assess their combined effects on stock returns. The model is expressed as follows:

$$R_{it} = \alpha_i + \beta_1 PostSpinoff_{it} + \beta_2 HotMarket_t + \beta_3 ColdMarket_t + \beta_4 (PostSpinoff_{it} * HotMarket_t) + \beta_5 (PostSPinoff_{it} * ColdMarket_t) + \sum_{j=1}^{5} \gamma_j F_{jt} + \epsilon_{it}$$

Where R_{it} denotes the returns for company i at time t and α_i represents the company-specific fixed effects. $PostSpinoff_{it}$ is a dummy variable that indicates whether the observation is after the spinoff event. $HotMarket_t$ and $ColdMarket_t$ are dummy variables representing the market conditions, F_{jt} are the Fama-French factors and ϵ_{it} is the error term capturing the unexplained variation in returns.

4.4 Validation of Regression Analyses

A series of diagnostic tests are conducted to verify the robustness of the regression models.

Serial Correlation Test (Breusch-Godfrey for panels):

This test evaluates the residuals from the panel regression models to detect serial correlation, which can impact the efficiency of the estimates and reliability of standard errors. The null hypothesis assumes no serial correlation. (Turner, 2021)

Heteroskedasticity Test (Breusch-Pagan):

This test examines the residuals of the regression models to check for heteroskedasticity, the non-constant variance of residuals, which could affect the efficiency of estimates and the reliability of standard errors. Two tests will be performed: the first evaluates the presence of heteroskedasticity directly from the model's residuals, and the second examines whether the variance of residuals is related to the model's fitted values. The null hypotheses assumes homoscedastic errors.

Cross-sectional Dependence Test:

Essential for identifying common shocks or spillover effects across different entities, which could significantly influence the results of economic studies. The test calculates the average pairwise correlation of the residuals across various cross-sections to check for dependance. The null hypothesis assumes no cross-sectional dependance. (Pesaran, 2004)

Unit Root Test (Panel unit root test):

This test confirms that the data used in the analysis are stationary. Non-stationarity in the data can result in spurious relationships within the regression models. The null hypothesis assumes the presence of a unit root, indicating non-stationarity. (Levin et al., 2002)

4.5 Ethical Considerations and Limitations

Ethical considerations related to data collection and analysis will be carefully managed to ensure integrity of the research. Potential limitations, such as data availability and assumptions in the models, are acknowledged to maintain transparency and rigor in the research process. Furthermore, validation strategies such as sensitivity analysis will be employed if possible. Throughout the entire research process, continuous refinement of the methodology will assist to address any unforeseen challenges, ensuring the rigor and validity of the research outcomes.

5.0 DATA COLLECTION

In pursuit of addressing my research question and performing the methodologies explained previously, various data were collected. This section delineates the sources from which data was gathered, the methods of collection, and the characteristics of the data itself. A primary goal was to assemble a comprehensive dataset comprising historical stock prices and returns accessible through institutional and public channels. These selected databases are distinguished for their high quality and reliability, rendering them supremely suitable for fulfilling the objectives of this research. The acquisition of such robust data facilitated a meticulous cleaning process, followed by its integration with other datasets to enable its utilization in diverse analytical frameworks. Leveraging these platforms enable the extraction of a sizable quantitative dataset, vital for the profound analysis of any substantial changes occurring in the aftermath of a spinoff event.

	Stockanalysis.com	**Validation process**	**WRDS**	**WRDS**	**Investing.com**
Deal type	Spin-off	Spin-off	Spin-off	Spin-off	S&P 500
Country	USA	USA	USA	USA	USA
Time Period	2000-2020	2000-2020	2000-2020	2000-2020	2000-2020
Data type	Companies	Companies	Daily returns	Monthly returns	Daily prices
#Observations	386	154	102	99	1

Table 1: Overview of sample collection

5.1 Sample Collection

The data collection process began with setting specific criteria to ensure the relevance and robustness of the data. The primary temporal constraint imposed was the exclusion of spinoff that were excessively recent. This strategic decision is rooted in the desire to conduct a comprehensive longitudinal analysis, spanning multiple years post-announcement. Additionally, while initially flexible, data collection parameters such as geographical criteria were eventually defined based on the preliminary data available. For this thesis I decided to focus on the American market as that provides the biggest sample. As a lot of the previous literature on this subject had used samples from the late 1900, I focused my data collection to 2000 up to today.

To identify spinoff companies on the American stock market over the last decade, the initial step involved seeking an overview of such companies. This pursuit led to the discovery of Stockanalysis.com, a website hosting comprehensive lists of spinoffs dating back to 1998. Collecting data from 2000 to 2020 from this source yielded a sample size of 386 distinct spinoff companies. Subsequent steps included compiling a list of company names, tickers, and spinoff dates.

Following the compilation, a meticulous verification process ensued to ensure data accuracy. This involved researching each company to confirm its current status and ascertain the availability of additional data. Due to factors such as mergers, delisting, or ticker changes necessitating exclusion, the sample size was substantially reduced to 154 spinoff companies.

With the finalize sample if 154 spinoff companies, the next step involved collecting the actual stock returns data. For this purpose, the Wharton Research Data Services (WRDS) platform for utilized. Daily stock returns for the years of the spinoff event were gathered, along with monthly returns for a period of three years both preceding and following the spinoff event. From the initially identified 154 spinoff companies, data availability for daily returns in WRDS was confirmed for 102 companies, constituting the final sample size.

Additionally, during the collection of monthly data, it was observed that three of the firms had deficient monthly data. Despite efforts to rectify this issue, the reasons for the data deficiency remained unclear. In order to maintain a consistent dataset, it was decided to exclude these firms from the sample, now leaving the final sample size to 99.

It's noteworthy that the final sample comprises 99 spinoff companies and 88 parent companies, reflecting instances where multiple spinoffs were conducted by the same parent company over the specific timeframe. Considering the data collection period spanning from 2000 to 2020, with the available data up to 2023, the analysis was focused on a three-year span both before and after the spinoff event, instead of the initially planned five-year span to stay consistent with the data.

YEAR	#SPIN-OFFS	YEAR	#SPIN-OFFS
2000	2	2013	5
2001	3	2014	10
2005	2	2015	13
2007	2	2016	12
2008	4	2017	9
2009	1	2018	9
2010	1	2019	7
2011	6	2020	11
2012	2	**TOTAL**	**99**

Table 2: Spin-offs by year

5.2 Benchmark and Factors

In addition to individual company data, it was essential to procure historical data for the S&P 500 index to serve as a benchmark in my calculations. Although information regarding the S&P 500 is readily available across various financial platforms, obtaining detailed historical data going far enough back for my time period posed a unique challenge. Ultimately, the historical prices for the S&P 500 index from the period 2000 to 2020 were successfully downloaded from Investing.com. This website provided comprehensive access to the data required to perform my analyses, aligning with the timeline of the spinoff events studied in this research. It’s important to note that these prices reflect only changes in the index’s price levels and do not include dividends. This inclusion of this benchmark allows for a more nuanced evaluation of stock price movements relative to the broader market trends during the specified period.

Lastly, I collected the Fama-French 5 factor model data from the data library of Dartmouth, which hosts the homepage for Kenneth R. French and provides all the research factors available for download. The Fama-French 5 factor model includes the market risk premium, size factor, value factor, profitability factor, and investment factor. These factors are essential for understanding the risk-adjusted performance of the spinoff companies in my sample. By incorporating these factors into my analysis, I can control for various dimensions of risk and better isolate the effects of spinoff events on stock returns. The data was meticulously gathered and verified to ensure it covers the entire study period from 2000 to 2020, allowing for a robust analysis of the financial impacts post-spinoff.

5.3 Descriptive statistics

To provide a clearer picture of the data collected, descriptive statistics were computed. The analysis include the mean, median, standard deviation, minimum and maximum of the daily and monthly returns over the whole time period 2000 – 2020 for the spinoff and parent companies, as well as for the S&P 500 index and the Fama-French five factors. This help provide insights into the volatility and risk associated with spinoff events compared to parent companies. These descriptive statistics are critical as they highlight the differential impacts of spinoffs on company performance, for example, the observed lower average returns and higher volatility for spinoff companies could indicate a period of market adjustment following the spinoff event. This might suggest a higher initial risk but could also point to potential growth opportunities as the new entities stabilize.

The S&P 500 index and broader market returns exhibited significant volatility, aligning with the expected market trends over the two decades covered. This context is essential for comparing the spinoff performance against a backdrop of general market conditions. The wide range and high standard deviations in the Fama-French factors reflect their varying impact on stock returns. The market factor showed the highest variability, underscoring the substantial influence of overall market conditions on the returns of the companies in the sample. Understanding these dynamics are crucial for interpreting the risk-adjusted performance for both spinoff and parent companies.

Variable	Mean	Median	Standard Deviation	Minimum	Maximum
Daily Returns Combined (%)	0.00064	0.00038	0.02770	-0.79500	0.81800
Daily Returns Spinoff (%)	0.00089	0.00000	0.03260	-0.79500	0.75300
Daily Returns Parent (%)	0.00525	0.00055	0.02490	-0.30800	0.81800
Montly Returns Combined (%)	0.01770	0.01090	0.11800	-0.80300	1.11000
Montly Returns Spinoff (%)	0.01270	0.00995	0.14300	-0.80300	1.06000
Montly Returns Parent (%)	0.01110	0.01130	0.10300	-0.57800	1.11000
S&P 500 Returns (%)	0.01370	0.06270	1.24000	-13.60000	10.40000
Fama-French Market	0.68357	1.27000	4.67122	-17.23000	13.65000
Fama-French Size	0.15853	0.07000	3.16880	-15.32000	18.28000
Fama-French Value	0.09053	-0.05000	3.48801	-13.87000	12.75000
Fama-French Profitability	0.36439	0.39000	2.86601	-18.65000	13.07000
Fama-French Investment	0.23395	-0.01000	2.31223	-7.22000	9.07000

Table 3: Summary descriptive statistics (2000 – 2020)

This section has outlined a detailed process of data collection, cleaning, and preparation, ensuring a robust dataset for the analysis, the collected data spans form the year 2000 to 2020 and includes a variety of metrics necessary for a comprehensive analysis of corporate spinoffs and their impact on stock prices. Furthermore, the descriptive statistics provided not only serve to understand the dataset better but also offer preliminary insights into the potential findings of the study. By discussing the variations in returns and the implications of these findings, this section sets the stage for a deeper exploration of the specific effects of spinoff on market performance.

6.0 RESULTS AND ANALYSIS

This section presents the empirical findings derived from the application of the methodologies described earlier to the collected dataset. Initially, the analysis begins with an exploration of the results from the event study, focusing on the immediate effects of the spinoff event dates on stock prices. This review aims to establish a clear understanding of the short-term market reactions surrounding spinoff events. Subsequently, the discussion transitions to a long-term analysis, examining the enduring impacts of spinoffs on their parent companies. This portion of the analysis also considers how varying market conditions influence these long-term effects, providing a comprehensive view of the dynamics at play over extended periods post-spinoff.

6.1 Immediate Impact of Spinoff Events

In the event study, four distinct time windows were employed to assess the immediate impact of spinoff events on parent company stock prices, aiming to determine whether these events significantly affect market perceptions and valuations, the primary focus is on the narrowest window, spanning from one day before to one day after the spinoff event, which is critical for capturing the core market reaction. To gain a comprehensive understanding of the broader implications, additional windows extending three, five and ten days both before and after the event date were also analyzed. These extended periods help illustrate the full scope of the spinoff's impact on the parent company, providing a detailed picture of how market sentiment shifts in response to spinoff events.

Table 3 presents the findings from the event study analyzing the impact of spinoff events on parent companies. The results are reported for a range of days around the spinoff event date, from 10 days before (Day -10) to 10 days after (Day 10). The Average Abnormal Returns (AAR) represent the average return on a specific day relative to what would be expected under normal market conditions, indicating how the market reacted to each specific day around the event. The Cumulative Average Abnormal Returns (CAAR) is the aggregated abnormal return from the start of the event window up to each specific day, illustrating the ongoing effect of the event over time. The percentage indicates how often the returns were positive on each day and the rest of the statistics describe the distribution of abnormal returns, where the median provides a central tendency, and min and max define the range.

DAY	AAR		CAAR		% POSITIVE	MEDIAN	MIN	MAX
-10	0,13%		0,13%		50,00%	-0,01%	-0,05	0,06
-9	-0,55%		-0,42%		40,74%	-0,49%	-0,14	0,08
-8	-0,30%		-0,72%	***	42,53%	-0,29%	-0,14	0,11
-7	-0,29%		-1,01%	***	51,58%	0,07%	-0,10	0,14
-6	0,19%		-0,83%	***	46,25%	-0,11%	-0,05	0,06
-5	0,34%		-0,49%		58,21%	0,21%	-0,04	0,05
-4	0,16%		-0,33%		51,92%	0,19%	-0,04	0,06
-3	-0,07%		-0,40%		40,62%	-0,31%	-0,04	0,08
-2	0,25%		-0,15%		54,55%	0,05%	-0,07	0,08
-1	1,76%	***	1,61%	***	72,52%	1,23%	-0,16	0,37
0	0,66%		2,27%	***	52,53%	0,38%	-0,12	0,15
1	-0,10%		2,17%	***	42,85%	-0,18%	-0,07	0,08
2	-0,24%		1,93%	***	40,63%	-0,40%	-0,05	0,07
3	-0,26%		1,67%	***	52,00%	0,03%	-0,07	0,05
4	-0,41%		1,27%	***	47,06%	-0,27%	-0,11	0,05
5	-0,38%		0,89%	***	45,00%	-0,21%	-0,07	0,08
6	0,07%		0,96%	***	50,00%	-0,02%	-0,05	0,15
7	0,14%		1,10%	***	53,06%	0,07%	-0,05	0,07
8	-0,24%		0,86%	***	45,68%	-0,24%	-0,10	0,06
9	0,17%		1,02%	***	56,92%	0,13%	-0,05	0,04
10	-0,09%		0,93%	***	58,92%	0,30%	-0,07	0,02

****Significant at the .01 level*

Table 3: Parent companies around event date (AAR & CAAR)

The AAR for the parent companies peaked significantly the day before the event (Day -1) at 1.76% and on the event day itself (Day 0) at 0.66%, with Day -1 AAR being notably significant at the 0.01 level. This peak suggest strong anticipatory positive reactions by the market. The CAAR reached a high of 2.27 % on Day 0, also significant at the 0.01 level, indicating a positive market reaction to the spinoff event. This positive response is indicative of investor optimism regarding the potential for these spinoffs to create value. These results aligns with the findings from Janssens de Vroom & Frederikslust (1999) and Veld & Veld-Merkoulova (2004), who reported similar significant positive CAARs – 2.6% and 2.62% respectively – over comparable 3-day event windows around the spinoff announcement. The consistency of these findings across different studies highlights a generally favorable market response to spinoffs, supported further by the high percentage of positive returns (72.52% and 52.53%) and a high median return (1.23% and 0.38%) on these days.

Post-event, the abnormal returns generally trended lower, although days such as Day 6, Day 7, and. Day 9 showed positive AARs, suggesting ongoing market adjustments as new information is assimilated by the market. The consistently positive and significant CAAR from Day -1 trough Day 10 underscores sustained investor confidence.

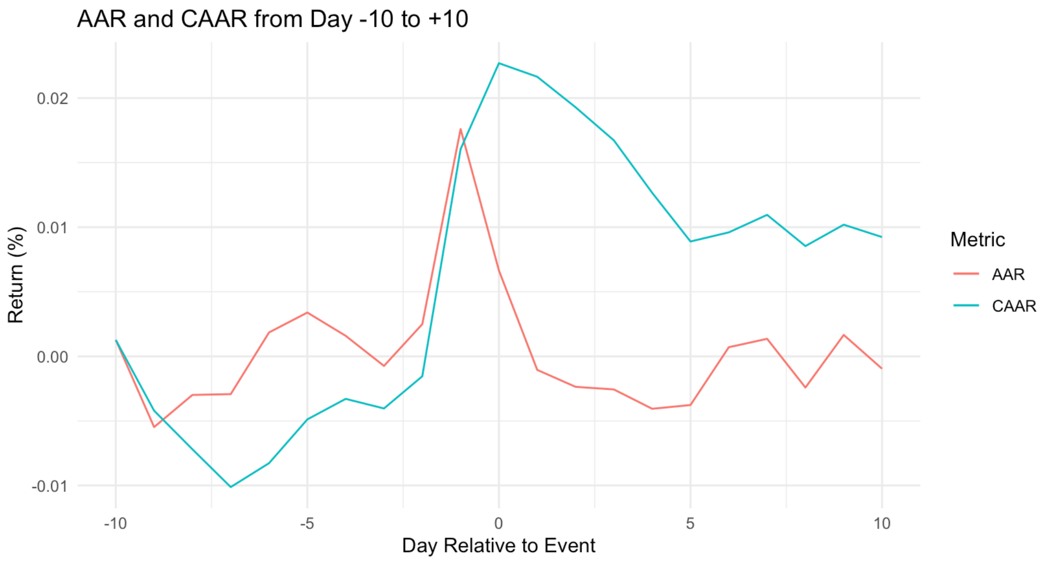

Figure 1: Parent companies around event date (AAR & CAAR)

Figure 1 visualizes the significant peaks and subsequent declines in AAR and CAAR from table 3, highlighting an adjustment phase as the market absorbs the spinoff's implications.

	CAAR				
Event window	**Spin-off companies**		**Parent companies**		**All companies**
[-10, +10]	-0,00465		0,01866	*	0,00708
[-5, +5]	-0,02186	*	0,02206	**	0,00010
[-3, +3]	-0,02836	**	0,02051	**	-0,00393
[-1, +1]	-0,01031		0,02230	***	0,00600

**Significant at the .10 level, **Significant at the .05 level, ***Significant at the .01 level*

Table 4: Cumulative Average Abnormal Returns (CAAR)

Table 4 presents the CAAR for spinoff companies, parent companies, and all companies combined, calculated across various event windows surrounding the spinoff event. It is important to note that for the spinoff companies, all event windows commence at day 0, as these entities do not trade prior the spinoff event. The spinoff companies generally experienced negative CAAR across all event windows, which may indicate that the market may perceive spinoffs as risky or uncertain in the short term. This trend is significant at the 0.10 level in the event window [-5, 5] and significant at the 0.05 level for the event window [-3, 3], underscoring investor caution or skepticism regarding the immediate viability and future prospects of newly independent entities. The negative results align with the findings of Seifert & Rubin (1989), who observed abnormal losses for the spinoff companies once they began to trade separately.

The contrasting CAAR trends between spinoff and parent companies highlight different market perceptions and reaction of corporate restructuring trough spinoffs, consistent with Seifert & Rubin's 1989 study, which reported positive results for the parent companies. The CAAR for the parent companies is positive over all the event windows with all values being significant at various levels. For the smallest event window [-1, 1] the CAAR of 0.0223 is significant at the 0.01 level, indicating that the market often views the restructuring positively for the divesting parent. This could reflect a market perception that spinoffs allows parent companies to streamline operations, focus more on core competencies, or improve financial metrics. Johnson, Brown & Johnson's 1994 study also found significant positive CAAR values in the event windows between Day -10 and Day 10, further supporting the notion that the market generally reacts favorably to parent companies during the spinoff process. The CAAR for all companies combined shows minor variations, with both slight positive and negative trends, indicating mixed market reactions. The values for the combined CAAR is notably smaller than for the spinoff or parent companies alone and has no significant values.

The event study results indicate that spinoff events have a noticeable impact on the stock prices of parent companies, with significant positive reactions both immediately before and on the event day. Given the statistically significant abnormal returns observed, the null hypothesis – that spinoffs have no significant impact on the stock prices of parent companies around the event date – is rejected. This rejection suggests that the market generally views spinoffs as a favorable strategic move in the short term. The positive market reaction provides strong support for the alternative hypothesis, confirming that spinoffs are perceived beneficial for investors. While these findings highlight the immediate benefits, the longer-term effects of spinoffs warrant further analysis to understand their sustained impact. These findings provide valuable insights into investor sentiment and market dynamics associated with corporate restructuring events.

6.2 Long-term Effects on Parent Companies

This section details findings from two regression models used to analyze the long-term effects of spinoffs on parent companies using three years of monthly return data before and after spinoff events. Both models incorporate the Fama-French factors, but they differ in the inclusion of interaction terms and the specific focus of the second model on post-spinoff effects.

	Coefficient	Std. Error	T-value	Pr(>(t))	Significance
Market Risk Premium	0,01163889	0,00024248	48	2,20E-16	***
Size Factor	0,00408308	0,00042461	9,616	2,20E-16	***
Value Factor	0,00159324	0,00040351	3,9484	7,91E-05	***
Profitability	0,00153398	0,00052348	2,9304	0,003392	**
Ivestment Factor	0,00167075	0,00064148	2,6045	0,009211	**
Risk-free Rate	-0,00098893	0,0110746	-0,0893	0,928847	
Post-Spinoff	-0,00371786	0,00229867	-1,6174	0,105819	

Model Fit	R-squared	Adjusted R-squared	F-statisitic	p-value
	0,21893	0,2059	482.622 on 7 and 12053 DF	2,20E-16

Table 5: Regression model

Table 5 presents the results from the first regression model. The R-squared of 0.21893 indicates a substantial explanation of variability in returns, which is noteworthy in financial data given the usual volatility and external influences not captured by the model. The F-statistic is highly significant, underscoring the robustness of the model.

The positive and highly significant coefficient for market risk premium, aligns with economic theory that higher risk should compensate with higher returns. Size and value factors both show positive effects on returns, with size being particularly strong. This might suggest that smaller companies or those with high book-to-market ratios are performing better in the sample, possibly due to higher risk-adjusted returns. Profitability and investment are also positive and significant, indicating that companies with higher profitability and conservative investment strategies tend to yield better returns. Risk-free rate is inversely related but not significantly suggesting minimal impact on returns.

The negative coefficient for the post-spinoff dummy, although not statistically significant, hints at a potentially slight negative adjustment in parent companies returns post-spinoff. This result does not provide sufficient evidence to reject the null hypothesis (H0), suggesting that spinoffs may not significantly impact long-term stock prices of parent companies.

	Coefficient	Std. Error	T-value	Pr(>(t))	Significance
PostSpinoff	-0,00262832	0,0023771	-1,1057	0,2688857	
Mkt_RF	0,01220762	0,00046071	26,4974	2,2E-16	***
SMB	0,00293652	0,00073151	4,0143	0,00005998	***
HML	0,00037823	0,00078714	0,4805	0,630871	
RMW	0,00223759	0,00098045	2,2822	0,022495	*
CMA	0,0045436	0,0012932	3,5135	0,0004439	***
post_Mkt_RF	-0,00074699	0,00054326	-1,375	0,1691519	
post_SMB	0,00167397	0,00089983	1,8603	0,0628644	.
post_HML	0,00152578	0,00092147	1,6558	0,0977848	.
post_RMW	-0,00098265	0,00116391	-0,8443	0,3985381	
post_CMA	-0,00371088	0,00149222	-2,4868	0,0129025	*

Model Fit	R-squared	Adjusted R-squared	F-statisitic	p-value
	0,2198	0,20653	308.597 on 11 and 12049 DF	2,20E-16

Table 6: Regression model with interaction term

Table 6 displays the results from the second regression, where the interaction terms between post-spinoff and the Fama-French factors were implemented. The slightly increased R-squared of 0.2198, further reinforce the model's explanatory power and the high significance of the F-statistic validates its statistical robustness.

The interaction between the post-spinoff period and the market risk factor is negative but not significant, suggesting that the market risk premium influence on returns does not significantly change post-spinoff. There is a positive interaction on size and value, although only size reaches near-significance, suggesting a possible change in how size impacts returns post-spinoff. Investment shows a significant negative interaction, indicating that conservative investments strategies may become less beneficial or more penalized in terms of returns following a spinoff.

In reviewing the impact of spinoffs on parent company stock performance, my research aligns most closely with Kirchmaier (2003), who observed a slight underperformance by parent companies in European demergers. This trend suggests that parent companies may not necessarily benefit as much as the spinoffs in the aftermath of the spinoff event. This finding contrasts with Cusatis, Miles & Woolridge (1993), who reported superior performance for both spinoffs and parent companies. My analysis, which isolates the effect of spinoffs on parent company stock performance trough regression models, indicates that the benefits observed in broader market studies may not directly translate to enhanced stock performance for parent companies.

Unlike the significant positive returns observed in these studies, my analysis suggested a less pronounced impact on stock prices post-spinoff. These differences could stem from different sample periods and methodological approaches used. While I employed regression models to examine the long-term effects, Cusatis, Miles & Woolridge used matched-firm-adjusted returns, and Kirchmaier applied average abnormal returns (AAR) and cumulative average abnormal returns (CAAR).

6.3 Market Conditions: Hot vs. Cold Markets

Understanding how different market conditions affect the post-spinoff performance of companies is crucial for comprehensively evaluating the impact of corporate restructuring. This section delves into the comparative analysis of how spinoffs influence parent companies' stock performance in hot versus cold market environments. By categorizing market conditions as either hot or cold, based on standard deviation thresholds of S&P 500 returns, we can isolate the effects of market sentiment and economic climate on the effectiveness and outcomes of spinoff strategies.

	Coefficient	Std. Error	T-value	Pr(>(t))	Significance
PostSpinoff	-0,0052716	0,0026464	-1,992	0,046393	*
HotMarket	0,0055824	0,0065263	0,8554	0,392363	
ColdMarket	0,011319	0,0063523	1,7819	0,074796	.
PostSpinoff_HotMarket	-8,0553E-06	0,0069904	-0,0012	0,999081	
PostSpinoff_ColdMarket	0,0066651	0,0064933	1,0265	0,304698	
Mkt_RF	0,012298	0,0048941	25,1281	2,2E-16	***
SMB	0,0043829	0,004615	9,4971	2,2E-16	***
HML	0,0018267	0,0042463	4,3019	0,00001707	***
RMW	0,0017221	0,0055888	3,0813	0,002066	**
CMA	0,0020552	0,007201	2,854	0,004325	**
RF	0,0030145	0,0012808	0,2354	0,813937	

Model Fit	R-squared	Adjusted R-squared	F-statisitic	p-value
	0,21588	0,20157	281.173 on 11 and 12049 DF	2,20E-16

Table 7: Regression model with hot and cold markets

Table 7 shows the results from the regression model where market conditions was introduced. The R-squared is consistently strong at 0.21588, indicating good explanatory power. The F-statistic confirms the model's robustness. Neither the Hot-Market nor the Cold-Market conditions show significant standalone impact on post-spinoff returns. This suggest that the intrinsic characteristics of the spinoff and parent company might pay a more crucial role than external market conditions at the time of the spinoff.

6.4 Validation of Analytical Methods

To ensure the rigor and credibility of my study, it is essential to systematically validate the analytical methods employed in my regression analyses. This section outlines the results of diagnostic tests and validation procedures performed across the three different regression models: the base model, the model with interaction terms, and the model analyzing market conditions (hot vs. cold markets).

Breusch-Godfrey/Woolridge Test for Serial Correlation:

This test detects the presence of serial correlation in the residuals of the panel models, which can indicate misspecification in the model such as omitted variables. (Turner, 2021)

Breusch-Godfrey/Wooldridge test for serial correlation in panel models

	CHISQ	DF	P-VALUE
1	216,30	31	< 2.2e-16
2	216,43	31	< 2.2e-16
3	96,25	12	3.007e-15
Alternative hypothesis	Serial correlation in idiosyncratic errors		

Table 8: Breusch-Godfrey/Woolridge Test

Model 1 and 2 both exhibit significant serial correlation with p-values < 2.2e-16, suggesting serial correlation in idiosyncratic errors. Model 3 also with a significant p-value of 3.007e-15, indicating the presence of serial correlation across all models.

Breusch-Pagan Test for Heteroscedasticity:

This test for heteroskedasticity, which occurs when the variance if the residuals is not constant across observations.

Breusch-Pagan test for heteroskedasticity

	BP	DF	P-VALUE
1	698,79	7	< 2.2e-16
2	750,20	11	< 2.2e-16
3	42,70	11	< 2.2e-16

Table 9: Breusch-Pagan Test

Significant heteroskedasticity was detected in all models, indicating that variance of residuals are not constant and robust standard errors might be needed to handle this issue.

Standardized Breusch-Pagan Test for Heteroskedasticity:

This approach also test for heteroskedasticity but provides a refined view using the model's studentized residuals.

Studentized Breusch-Pagan test for heteroskedasticity

	BP	DF	P-VALUE
1	18,65	1	1.573e-05
2	18,53	1	1.677e-05
3	16,36	1	5.241e-05

Table 10: Standardized Breusch-Pagan Test

All three models show significant heteroskedasticity, confirming the earlier test and the need for methods to address or correct this variability in variance.

Pesaran CD Test for Cross-Sectional Dependance:

The purpose of this test is to identify any cross-sectional dependence in panel data, which can occur if there are unobservable common factors affecting the panels. (Pesaran, 2004)

Pesaran CD test for cross-sectional dependance in panels

	Z	P-VALUE
1	9,07	< 2.2e-16
2	8,86	< 2.2e-16
3	9,79	< 2.2e-16
Alternative hypothesis	Cross-sectional dependance	

Table 11: Pesaran CD Test for Cross-Sectional Dependance

All models demonstrate significant cross-sectional dependance (p-values < 2.2e-16), suggesting the influence of common factors across panel entities.

Levin-Lin-Chu Unit-Root Test:

The last test is for stationarity in the panel data, as non-stationary data can lead to spurious regression results. (Levin et al., 2002)

Levin-lin-Chu Unit-Root Test (ex. Var.: Individual Intercepts)

	Z	**P-VALUE**
1	-77,46	< 2.2e-16
2	-150,19	< 2.2e-16
3	-105,24	< 2.2e-16
Alternative hypothesis	Stationary	

Table 12: Levin-Lin-Chu Unit-Root Test

All models are highly stationary with very significant z-values and p-values < 2.2e-16, confirming that the data series used in the models do not exhibit unit roots and are suitable for analysis. This ensured that the regression are not influenced by random walk characteristics of the data series.

7.0 CONCLUSION

This thesis aimed to evaluate the impact of corporate spinoffs on the stock prices of parent companies, focusing both on the immediate and long-term effects within the context of the American stock market from 2000 to 2020. By analyzing a dataset comprising 99 spinoff events, the research sought to determine how these strategic maneuvers influence market perceptions and valuations in both short and extended time frames.

The empirical research began with an event study, which revealed significant positive abnormal returns around the spinoff event dates, particularly one day before and on the day of the spinoff. This suggests that the positive abnormal returns observed reflect a continuation of market reaction initially triggered by the announcement of these spinoffs, aligning with prior studies that noted similar positive reactions around the announcement day. Long-term effects assessed trough regression models incorporating Fama-French factors, however, painted a more nuanced picture. While immediate market reactions were generally positive, the long-term analysis indicated that these benefits might not persist, suggesting a complex interaction between spinoff events and sustained stock performance. Notably, market conditions labeled “hot” and “cold” did not significantly influence long-term outcomes, pointing to the intrinsic characteristics of the spinoff and parent companies as the primary drivers of post-spinoff performance.

The findings of this study highlights the importance of considering both short-term events and long-term trends when evaluating the financial impacts of corporate restructuring. The lack of significant long-term benefits for parent companies suggests that the initial positive market reactions to spinoffs may be driven by short-term speculative behaviors rather than genuine long-term value creation.

Some of the limitations in this research is firstly the reliance on publicly available data and that the constraints of the event study and regression models may overlook some nuanced factors influencing stock prices post-spinoff. Secondly, the inherent complexities of individual spinoff cases, such as sector-specific dynamics, were not fully dissected, potentially affecting the generalizability of the findings.

Future research could build on this work by incorporating analyses to capture the managerial, cultural, and sector-specific elements missing in this work. Additionally, expanding the dataset to include even more spinoffs or international cases could provide a broader perspective on the global applicability on these findings.

In conclusion, while this thesis confirms the short-term value creation of spinoffs trough market reactions, it challenges the previous findings that the benefits is also sustained in the long-term. This work contributes to a more comprehensive understanding of the complex dynamics of corporate restructuring, offering a foundation for future research to explore the nuanced factors that influence the success of spinoffs and their impact on parent company value.

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9.0 APPENDICES

NUMBER	YEAR	SPINOFF TICKER	SPINOFF COMPANY	PARENT TICKER	PARENT COMPANY
1	2000	EW	Edwards Lifesciences Corporation	BAX	Baxter International Inc.
2	2000	VC	Visteon Corporation	F	Ford Motor Company
3	2001	MPX	Marine Products Corporation	RES	RPC, Inc.
4	2001	ZBH (ZMH)	Zimmer Biomet Holdings, Inc.	BMY	Bristol-Myers Squibb Company
5	2001	KAI	Kadant Inc.	TMO	Thermo Fisher Scientific Inc.
6	2005	EXPE	Expedia Group, Inc.	IAC1	IAC Inc.
7	2005	AMP	Ameriprise Financial, Inc.	AXP	American Express Company
8	2007	BR	Broadridge Financial Solutions, Inc.	ADP	Automatic Data Processing, Inc.
9	2007	DFS	Discover Financial Services	MS	Morgan Stanley
10	2008	SATS	EchoStar Corporation	DISH	Dish Network Corporation
11	2008	PM	Philip Morris International Inc.	MO	Altria Group, Inc.
12	2008	TREE	LendingTree, Inc.	IAC2	IAC Inc.
13	2008	CLW	Clearwater Paper Corporation	PCH	PotlatchDeltic Corporation
14	2009	ASPS	Altisource Portfolio Solutions S.A.	OCN	Ocwen Financial Corporation
15	2010	VPG	Vishay Precision Group, Inc.	VSH	Vishay Intertechnology, Inc.
16	2011	HII	Huntington Ingalls Industry, Inc.	NOC	Northrop Grumman Corporation
17	2011	MPC	Marathon Petroleum Corporation	MRO	Marathon Oil Corporation
18	2011	GNE	Genie Energy Ltd.	IDT1	IDT Corporation
19	2011	XYL	Xylem Inc.	ITT	ITT Inc.
20	2011	VAC	Marriott Vacations Worldwide Corporation	MAR	Marriott International, Inc.
21	2011	TRIP	Tripadvisor, Inc.	EXPE	Expedia Group, Inc.
22	2012	PSX	Phillips 66	COP	Conocophillips
23	2012	HY	Hyster-Yale Materials Handling, Inc.	NC1	Nacco Industries Inc
24	2013	ABBV	AbbVie Inc.	ABT	Abbott Labratories
25	2013	MUSA	Murphy USA Inc.	MUR	Murphy Oil Corporation
26	2013	SAIC	Science Applications International Corporation, Inc.	LDOS	Leidos Holdigns, Inc.
27	2013	GLPI	Gaming & Leisure Properties	PENN	Penn Entertainment, Inc.
28	2013	ALLE	Allegion PLC	TT1	Trane Technologies PLC
29	2014	OGS	ONE Gas, Inc.	OKE	Oneok, Inc.
30	2014	KN	Knowles Corporation	DOV1	Dover Corporation
31	2014	NAVI	Navient Corporation	SLM	SLM Corporation
32	2014	DNOW	Now Inc	NOV	NOV Inc.
33	2014	CVEO	Civeo Corporation	OIS	Oil States International, Inc.
34	2014	RYAM	Rayonier Advanced Materials, Inc.	RYN	Rayonier Inc.
35	2014	TMST	TimkenSteel Corporation	TKR	Timken Company
36	2014	SYF	Synchrony Financial	GE	General Electric Company
37	2014	KEYS	Keysight Technologies Inc.	A	Agilent Technologies, Inc.
38	2014	AVNS	Avanos Medical, Inc.	KMB	Kimberly-Clark Corporation
39	2015	UE	Urban Edge Properties	VNO1	Vornado Realty Trust
40	2015	FSV	FirstService Corporation	CIGI	Colliers International Group Inc.
41	2015	GCI	Gannett Co., Inc.	TGNA1	Tegna Inc.
42	2015	BW	Babcock & Wilcox Enterprises, Inc.	BWXT	BWX Technologies, Inc.
43	2015	ENR	Energizer Holdings, Inc.	EPC	Edgewell Personal Care Company
44	2015	CABO	Cable One, Inc.	GHC	Graham Holdings Company
45	2015	BLD	TopBuild Corporation	MAS	Masco Corporation
46	2015	PYPL	PayPal Holdings, Inc.	EBAY	eBay Inc.
47	2015	LITE	Lumentum Holdings Inc.	VIAV	Viavi Solutions Inc.
48	2015	PJT	PJT Partners, Inc.	BX	Blackstone Inc.
49	2015	CSWI	CSW Industrials Inc.	CSWC	Capital Southwest Corporation
50	2015	HPE	Hewlett Packard Enterprise Company	HPQ	HP Inc.
51	2015	FCPT	Four Corners Property Trust, Inc.	DRI	Darden Restaurants, Inc.
52	2016	RACE	Ferrari N.V.	STLA	Stellantis N.V.
53	2016	NGVT	Ingevity Corporation	WRK	WestRock Company
54	2016	ZDGE	Zedge, Inc.	IDT2	IDT Corporation
55	2016	BBU	Brookfield Business Partners L.P.	BN	Brookfield Corporation
56	2016	HRI	Herc Holdings Inc.	HTZ	Hertz Global Holdings, Inc.
57	2016	FTV	Fortive Corporation	DHR	Danaher Corporation
58	2016	APVO	Aptevo Therapeutics Inc.	EBS	Emergent Biosolutions Inc.
59	2016	ASIX	AdvanSix Inc	HON1	Honeywell International Inc.
60	2016	DFIN	Donnelley Financial Solutions, Inc.	RRD	R.R. Donnelley & Sons Company
61	2016	ADNT	Adient PLC	JCI	Johnson Controls International PLC
62	2016	YUMC	Yum China Holdings, Inc.	YUM	Yum Brands, Inc.
63	2016	LW	Lamb Weston Holdings, Inc.	CAG	Conagra Brands, Inc.
64	2017	CNDT	Conduent Incorporated	XRX	Xerox Holdings Corporation
65	2017	HGV	Hilton Grand Vacations	HLT1	Hilton Worldwide Holdings Inc.
66	2017	PK	Park Hotels & Resorts Inc.	HLT2	Hilton Worldwide Holdings Inc.
67	2017	DXC	DXC Technology Company	HPE	Hewlett Packard Enterprise Company
68	2017	CARS	Cars.com Inc.	TGNA2	Tegna Inc.
69	2017	JBGS	JBG SMITH Properties	VNO2	Vornado Realty Trust
70	2017	BHF	Brighthouse Financial, Inc.	MET	MetLife, Inc.
71	2017	HBB	Hamilton Beach Brands Holding Company	NC2	NACCO Industries, Inc.
72	2017	CEIX	CONSOL Energy Inc.	CNX	CNX Resources Corporation
73	2018	RDVT	Red Violet, Inc.	FLNT	Fluent Inc
74	2018	RFL	Rafael Holdings, Inc.	IDT3	IDT Corporation
75	2018	NVT	nVent Electric PLC	PNR	Pentair PLC
76	2018	CHX	ChampionX Corporation	DOV2	Dover Corporation
77	2018	EDRY	EuroDry Ltd.	ESEA	Euroseas Ltd.
78	2018	WH	Wyndham Hotels & Resorts, Inc.	TNL	Travel + Leisure Co.
79	2018	REZI	Resideo Technologies, Inc.	HON2	Honeywell International Inc
80	2018	ACA	Arcosa, Inc.	TRN	Trinity Industries, Inc.
81	2018	ETRN	Equitrans Midstream Corporation	EQT	EQT Corporation
82	2019	ARLO	Arlo Technologies, Inc.	NTGR	Netgear, Inc.
83	2019	DOW	Dow Inc.	DD1	DuPont de Nemours, Inc.
84	2019	CYCN	Cyclerion Therapeutics, Inc.	IRWD	Ironwood Pharmaceuticals, Inc.
85	2019	ALC	Alcon Inc.	NVS	Novartis
86	2019	KTB	Kontoor Brands, Inc.	VFC	VF Corporation
87	2019	CTVA	Corteva, Inc.	DD2	DuPont de Nemours, Inc.
88	2019	PNTG	The Pennant Group, Inc.	ENSG	The Ensign Group, Inc.
89	2020	IR	Ingersoll Rand Inc.	TT2	Trane Technologies PLC
90	2020	BIPC	Brookfield Infrastructure Corporation	BIP	Brookfield Infrastructure Partners L.P.
91	2020	MSGE	Madison Square Garden Entertainment Corporation	MSGS	Madison Square Garden Sports Corporation
92	2020	IAC	IAC Inc.	MTCH	Match Group, Inc.
93	2020	BEPC	Brookfield Renewable Corporation	BEP	Brookfield Renewable Partners L.P.
94	2020	AOUT	American Outdoor Brands, Inc.	SWBI	Smith & Wesson Brands, Inc.
95	2020	MAXN	Maxeon Solar Technologies, Ltd.	SPWR	SunPower Corporation
96	2020	VNT	Vontier Corporation	FTV	Fortive Corporation
97	2020	VTRS	Viatris Inc.	PFE	Pfizer Inc.
98	2020	CNXC	Concentrix Corporation	SNX	TD SYNNEX Corporation
99	2020	AIRC	Apartment Income REIT Corporation	AIV	Apartment Investment & Management Company

Overview of spinoffs and their parent companies

NUMBER	EVENT DATE	SPINOFF TICKER	PARENT TICKER
1	04/04/2000	EW	BAX
2	30/06/2000	VC	F
3	01/03/2001	MPX	RES
4	08/08/2001	ZBH	BMY
5	12/07/2001	KAI	TMO
6	10/08/2005	EXPE	IAC1
7	04/10/2005	AMP	AXP
8	03/04/2007	BR	ADP
9	03/07/2007	DFS	MS
10	03/01/2008	SATS	DISH
11	01/04/2008	PM	MO
12	22/08/2008	TREE	IAC2
13	18/12/2008	CLW	PCH
14	11/08/2009	ASPS	OCN
15	08/07/2010	VPG	VSH
16	01/04/2011	HII	NOC
17	05/07/2011	MPC	MRO
18	02/11/2011	GNE	IDT1
19	01/11/2011	XYL	ITT
20	23/11/2011	VAC	MAR
21	22/12/2011	TRIP	EXPE
22	02/05/2012	PSX	COP
23	02/10/2012	HY	NC1
24	03/01/2013	ABBV	ABT
25	04/09/2013	MUSA	MUR
26	01/10/2013	SAIC	LDOS
27	05/11/2013	GLPI	PENN
28	03/12/2013	ALLE	TT1
29	04/02/2014	OGS	OKE
30	04/03/2014	KN	DOV1
31	02/05/2014	NAVI	SLM
32	03/06/2014	DNOW	NOV
33	03/06/2014	CVEO	OIS
34	01/07/2014	RYAM	RYN
35	02/07/2014	TMST	TKR
36	01/08/2014	SYF	GE
37	04/11/2014	KEYS	A
38	04/11/2014	AVNS	KMB
39	20/01/2015	UE	VNO1
40	03/06/2015	FSV	CIGI
41	30/06/2015	GCI	TGNA1
42	02/07/2015	BW	BWXT
43	02/07/2015	ENR	EPC
44	02/07/2015	CABO	GHC
45	02/07/2015	BLD	MAS
46	21/07/2015	PYPL	EBAY
47	05/08/2015	LITE	VIAV
48	02/10/2015	PJT	BX
49	02/10/2015	CSWI	CSWC
50	03/11/2015	HPE	HPQ
51	11/11/2015	FCPT	DRI
52	04/01/2016	RACE	STLA
53	17/05/2016	NGVT	WRK
54	03/06/2016	ZDGE	IDT2
55	21/06/2016	BBU	BN
56	01/07/2016	HRI	HTZ
57	06/07/2016	FTV	DHR
58	02/08/2016	APVO	EBS
59	04/10/2016	ASIX	HON1
60	04/10/2016	DFIN	RRD
61	01/11/2016	ADNT	JCI
62	02/11/2016	YUMC	YUM
63	11/11/2016	LW	CAG
64	04/01/2017	CNDT	XRX
65	05/01/2017	HGV	HLT1
66	05/01/2017	PK	HLT2
67	03/04/2017	DXC	HPE
68	02/06/2017	CARS	TGNA2
69	19/07/2017	JBGS	VNO2
70	08/08/2017	BHF	MET
71	03/10/2017	HBB	NC2
72	30/11/2017	CEIX	CNX
73	28/03/2018	RDVT	FLNT
74	28/03/2018	RFL	IDT3
75	02/05/2018	NVT	PNR
76	10/05/2018	CHX	DOV2
77	01/06/2018	EDRY	ESEA
78	04/06/2018	WH	TNL
79	30/10/2018	REZI	HON2
80	02/11/2018	ACA	TRN
81	14/11/2018	ETRN	EQT
82	02/01/2019	ARLO	NTGR
83	03/04/2019	DOW	DD1
84	03/04/2019	CYCN	IRWD
85	10/04/2019	ALC	NVS
86	24/05/2019	KTB	VFC
87	04/06/2019	CTVA	DD2
88	02/10/2019	PNTG	ENSG
89	02/03/2020	IR	TT2
90	01/04/2020	BIPC	BIP
91	21/04/2020	MSGE	MSGS
92	01/07/2020	IAC	MTCH
93	31/07/2020	BEPC	BEP
94	26/08/2020	AOUT	SWBI
95	28/08/2020	MAXN	SPWR
96	12/10/2020	VNT	FTV
97	18/11/2020	VTRS	PFE
98	02/12/2020	CNXC	SNX
99	16/12/2020	AIRC	AIV

Overview of the event dates

REGRESSION ANALYSIS

Unbalanced Panel:	**n = 195**	**T = 31 - 124**	**N = 12255**		
Residuals:	**Min**	**1st Qu**	**Median**	**3rd Qu**	**Max**
	-0,8458722	-0,0475586	-0,0030566	0,0428812	1,0542117
Coefficients:					
	Estimate	**Std. Error**	**T-value**	**Pr(>(t))**	
Mkt_RF	0,01163889	0,00024248	48	2,20E-16 ***	
SMB	0,00408308	0,00042461	9,616	2,20E-16 ***	
HML	0,00159324	0,00040351	3,9484	7,91E-05 ***	
RMW	0,00153398	0,00052348	2,9304	0,003392 **	
CMA	0,00167075	0,00064148	2,6045	0,009211 **	
RF	-0,00098893	0,0110746	-0,0893	0,928847	
PostSPinoff	-0,00371786	0,00229867	-1,6174	0,105819	
Signif. Codes:	0(***)	0.001(**)	0.01(*)	0.05(.)	0,1
Total Sum of Squares:	167,31				
Residuals sum of Squares:	130,68				
R-Squared	0,21893				
Adj. R-Squared:	0,2059				
F-statisitic:	482.622 on 7 and 12053 DF		**p-value < 2.22e-16**		

Regression model 1

Breush-Godfrey/Wooldridge test for serial correlation in panel models		
Data: Returns - Mkt_RF + SMB + HML + RMW + CMA + RF + PostSpinoff		
chisq = 216.3	df = 31	p-value < 2.2e-16
Alternative hypothesis: serial correlation in idiosyncratic errors		

Lagrange Multiplier test - (Breush-Pagan)		
Data: Returns - Mkt_RF + SMB + HML + RMW + CMA + RF + PostSpinoff		
chisq = 9.8519	df = 1	p-value = 0.001697
Alternative hypothesis: significant effects		

Breush-Pagan test for heteroskedasticity		
Data: Returns - Mkt_RF + SMB + HML + RMW + CMA + RF + PostSpinoff		
BP = 698.79	df = 7	p-value < 2.2e-16

Studentized Breush-Pagan test for heteroskedasticity		
Data: model using residuals		
BP = 18.647	df = 1	p-value = 1.573e-05

Pesaran CD test for cross-sectional dependance in panels	
Data: Returns - Mkt_RF + SMB + HML + RMW + CMA + RF + PostSpinoff	
z = 9.0669	p-value < 2.2e-16
Alternative hypothesis: cross-sectional dependance	

Levin-lin-Chu Unit-Root Test (ex. Var.: Individual Intercepts)	
Data: Returns - Mkt_RF + SMB + HML + RMW + CMA + RF + PostSpinoff	
z = -77.458	p-value < 2.2e-16
Alternative hypothesis: stationary	

t-test of coefficients				
	Estimate	**Std. Error**	**T-value**	**Pr(>(t))**
Mkt_RF	0,01163889	0,00035281	32,9895	2,20E-16 ***
SMB	0,00408308	0,0005822	7,0132	2,45E-12 ***
HML	0,00159324	0,0005908	2,6967	7,01E-03 **
RMW	0,00153398	0,00066791	2,2967	0,021654 *
CMA	0,00167075	0,00079827	2,093	0,036372 *
RF	-0,00098893	0,01123071	-0,0881	0,929833
PostSPinoff	-0,00371786	0,00167805	-2,2156	0,026739 *

Test of regression model 1

REGRESSION ANALYSIS WITH DUMMY VARIALBE

Unbalanced Panel:	**n = 195**	**T = 31 - 124**	**N = 12255**			
Residuals:	**Min**	**1st Qu**	**Median**	**3rd Qu**	Max	
	-0,8444671	-0,0474039	-0,0028375	0,043007	1,0530034	
Coefficients:						
	Estimate	**Std. Error**	**T-value**	**Pr(>(t))**		
PostSpinoff	-0,00262832	0,0023771	-1,1057	0,2688857		
Mkt_RF	0,01220762	0,00046071	26,4974	2,20E-16	***	
SMB	0,00293652	0,00073151	4,0143	5,998E-05	***	
HML	0,00037823	0,00078714	0,4805	0,630871		
RMW	0,00223759	0,00098045	2,2822	0,022495	*	
CMA	0,0045436	0,0012932	3,5135	0,0004439	***	
post_Mkt_RF	-0,00074699	0,00054326	-1,375	0,1691519		
post_SMB	0,00167397	0,00089983	1,8603	0,0628644	.	
post_HML	0,00152578	0,00092147	1,6558	0,0977848	.	
post_RMW	-0,00098265	0,00116391	-0,8443	0,3985381		
post_CMA	-0,00371088	0,00149222	-2,4868	0,0129025	*	
Signif. Codes:	0(***)	0.001(**)	0.01(*)	0.05(.)		0,1
Total Sum of Squares:	167,31					
Residuals sum of Squares	130,53					
R-Squared	0,2198					
Adj. R-Squared:	0,20653					
F-statisitic:	308.597 on 11 and 12049 DF		**p-value < 2.22e-16**			

Regression model 2

Breush-Godfrey/Wooldridge test for serial correlation in panel models		
Data: Returns - PostSPinoff + Mkt_RF + SMB + HML + RMW + CMA + RF + ...		
chisq = 216.43	df = 31	p-value < 2.2e-16
Alternative hypothesis: serial correlation in idiosyncratic errors		

Lagrange Multiplier test - (Breush-Pagan)		
Data: Returns - PostSPinoff + Mkt_RF + SMB + HML + RMW + CMA + RF + ...		
chisq = 9.769	df = 1	p-value = 0.001775
Alternative hypothesis: significant effects		

Breush-Pagan test for heteroskedasticity		
Data: Returns - PostSPinoff + Mkt_RF + SMB + HML + RMW + CMA + RF + ...		
BP = 750.2	df = 11	p-value < 2.2e-16

Studentized Breush-Pagan test for heteroskedasticity		
Data: model using residuals		
BP = 18.525	df = 1	p-value = 1.677e-05

Pesaran CD test for cross-sectional dependance in panels		
Data: Returns - PostSPinoff + Mkt_RF + SMB + HML + RMW + CMA + RF + ...		
z = 8.8568		p-value < 2.2e-16
Alternative hypothesis: cross-sectional dependance		

Levin-lin-Chu Unit-Root Test (ex. Var.: Individual Intercepts)		
Data: Returns - PostSPinoff + Mkt_RF + SMB + HML + RMW + CMA + RF + ...		
z = -150.19		p-value < 2.2e-16
Alternative hypothesis: stationary		

t-test of coefficients	Estimate	Std. Error	T-value	Pr(>(t))	
PostSpinoff	-0,00262832	0,00180785	-1,4538	0,1460184	
Mkt_RF	0,01220762	0,00060415	20,2064	2,20E-16	***
SMB	0,00293652	0,0008623	3,4054	6,627E-04	***
HML	0,00037823	0,00089571	0,4223	0,6728363	
RMW	0,00223759	0,00105801	2,1149	0,0344579	*
CMA	0,0045436	0,00130587	3,4794	0,0005044	***
post_Mkt_RF	-0,00074699	0,00074244	-1,0061	0,3143759	
post_SMB	0,00167397	0,00097659	1,7141	0,0865361	.
post_HML	0,00152578	0,00111887	1,3637	0,1726932	
post_RMW	-0,00098265	0,00146494	-0,6708	0,5023765	
post_CMA	-0,00371088	0,00156556	-2,3703	0,0177884	*

Tests for regression model 2

HOT AND COLD MAREKTS

Unbalanced Panel:	**n = 195**	**T = 12 - 195**	**N = 11440**		
Residuals:	**Min**	**1st Qu**	**Median**	**3rd Qu**	Max
	-0,8496051	-0,0472428	-0,0030051	0,0429606	1,0416922
Coefficients:					
	Estimate	**Std. Error**	**T-value**	**Pr(>(t))**	
PostSpinoff	-5,27E-03	2,65E-03	-1,992	0,046393	*
HotMarket	5,58E-03	6,53E-03	0,8554	3,92E-01	
ColdMarket	1,13E-02	6,35E-03	1,7819	7,480E-02	.
PostSpinoff_HotMarket	-8,06E-06	6,99E-03	-0,0012	0,999081	
PostSpinoff_ColdMarket	6,67E-03	6,49E-03	1,0265	0,304698	
Mkt_RF	1,23E-02	4,89E-03	25,1281	2,20E-16	***
SMB	4,38E-03	4,62E-03	9,4971	2,20E-16	***
HML	1,83E-03	4,25E-03	4,3019	1,71E-05	***
RMW	1,72E-03	5,59E-03	3,0813	0,002066	**
CMA	2,06E-03	7,20E-03	2,854	0,004325	**
RF	3,01E-03	1,28E-03	0,2354	0,813937	
Signif. Codes:	0(***)	0.001(**)	0.01(*)	0.05(.)	0,1
Total Sum of Squares:	155,21				
Residuals sum of Squares:	121,7				
R-Squared	0,21588				
Adj. R-Squared:	0,20157				
F-statisitic:	281.173 on 11 and 11234 DF		**p-value < 2.22e-16**		

Regression model 3

Breush-Godfrey/Wooldridge test for serial correlation in panel models		
Data: Returns - PostSpinoff + HotMarket + ColdMarket + PostSpinoff_HotMarket		
chisq = 96.253	df = 12	p-value = 3.007e-15
Alternative hypothesis: serial correlation in idiosyncratic errors		

Breush-Pagan test for heteroskedasticity		
Data: Returns - PostSpinoff + HotMarket + ColdMarket + PostSpinoff_HotMarket		
BP = 1042.7	df = 11	p-value < 2.2e-16

Studentized Breush-Pagan test for heteroskedasticity		
Data: Residuals		
BP = 16.359	df = 1	p-value = 5.241e-05

Pesaran CD test for cross-sectional dependance in panels	
Data: Returns - PostSpinoff + HotMarket + ColdMarket + PostSpinoff_HotMarket	
z = 9.7885	p-value < 2.2e-16
Alternative hypothesis: cross-sectional dependance	

Levin-lin-Chu Unit-Root Test (ex. Var.: Individual Intercepts)	
Data: Returns - PostSpinoff + HotMarket + ColdMarket + PostSpinoff_HotMarket	
z = -105.24	p-value < 2.2e-16
Alternative hypothesis: stationary	

t-test of coefficients					
	Estimate	**Std. Error**	**T-value**	**Pr(>(t))**	
PostSpinoff	-5,27E-03	1,71E-03	-3,0811	0,002067	**
HotMarket	5,58E-03	7,49E-03	0,7457	4,56E-01	
ColdMarket	1,13E-02	7,10E-03	1,5943	1,109E-01	
PostSpinoff_HotMarket	-8,06E-06	8,56E-03	-0,0009	0,999249	
PostSpinoff_ColdMarket	6,67E-03	7,25E-03	0,9189	0,35818	
Mkt_RF	1,23E-02	5,62E-04	21,8854	2,20E-16	***
SMB	4,38E-03	6,32E-04	6,9319	4,38E-12	***
HML	1,83E-03	5,87E-04	3,1135	1,85E-03	**
RMW	1,72E-03	6,84E-04	2,5172	0,011845	*
CMA	2,06E-03	9,61E-04	2,1386	0,032492	*
RF	3,01E-03	1,26E-02	0,2388	0,811271	

Tests for regression model 3