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Spinning Gold: Unraveling the Secrets of Value Creation from Spin-offs

A quantitative approach to exploring drivers for value creation in corporate spin-offs

Abstract

This thesis explores the dynamics of value creation in American corporate spin-offs between 1995-2019 from the dual perspectives of the corporate focus and optimal leverage hypotheses. The research employs a comprehensive dataset of 164 cases, examining the impacts of spin-offs on long-term abnormal stock returns and both unadjusted and industry-adjusted operating performance. The results reveal contrasting stock market performance, with parent companies experiencing a significant long-term decline while subsidiaries gain from notable short-term abnormal returns. In terms of operating performance, the impacts are predominantly insignificant in the long run. While supporting evidence for the corporate focus hypothesis is observed, the results from the overall spin-off transactions challenge the findings of prior literature. Interestingly, the study uncovers that spin-offs with less difference in leverage between spun-off entities and their parent companies outperform their leverage-diversified counterparts, implying an inverse relationship to the optimal leverage hypothesis prediction. The findings contribute to the broader corporate finance literature, shedding new light on corporate spin-off value creation.

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1. Introduction

1.1 Background

Companies are dynamic organizations that continuously evolve in response to market forces, competitive pressures, and strategic objectives. A common strategic action organizations employ is corporate divestiture which involves separating a part of the business' operations, typically a business segment or subsidiary. Interestingly, while divestitures represent a considerable portion of yearly deal values, the academic focus tends to lean heavily toward mergers and acquisitions, leaving divestitures less explored (Feldman & McGrath, 2016).
Deloitte (2022), emphasizes the importance of developing our understanding of corporate divestitures, noting a doubling in the number of divestitures between 2020 and 2021. The report suggests that businesses are taking a more defensive stance by cautiously evaluating their business portfolio mix, considering which business segments will continue contributing to shareholder value and which should be separated from the core business. Deloitte (2022) argues that the significant increase in transactions is attributed to the disruptive economic shifts brought about by the pandemic. This suggests that corporate divestitures will likely continue to be a prevalent and relevant topic amid the ongoing recession.

A corporate spin-off is a common method of divestiture that has attracted considerable attention both in academic and business worlds, as it has been recognized as a significant driver for value creation. For example, from the perspective of capital markets, a global literature review of 26 studies concluded that spin-offs are consistently associated with significant abnormal returns with a median return of 3.02% on the announcement day of a spin-off (Veld & veld-Merkoulova, 2009).

An extensive amount of research has been conducted on the value accretive perspectives of stock market and operating performance, aiming to explain the evident value creation associated with spin-offs, and most researchers agree that spin-offs create value (Daley et al., 1997; Desai & Jain, 1999; Cusatis et al., 1993; Feng et al., 2015). However, the existing literature is divided on how spin-offs create value; thus, that is what we aim to explore. To explain the value creation of spin-offs, several theories have been examined. The most noteworthy hypotheses are (1) the Corporate Focus Hypothesis, which finds evidence of significant value creation from focus-increasing spin-offs (Daley et al., 1997; Desai & Jain,

1993), and (2) the Information Asymmetry Hypothesis, which finds evidence of significant abnormal returns on the announcement day for firms with higher levels of information asymmetry (Krishnaswami & Subramaniam, 1999).

The Information Asymmetry Hypothesis mainly measures value as announcement-day returns (Krishnaswami & Subramaniam, 1999). In contrast, the corporate focus hypothesis also measures value creation from the perspective of long-term operating and stock market performance (Desai & Jain, 1999). Another lesser-researched explanation for long-term value creation from spin-offs is the Optimal Leverage Hypothesis, suggesting that some business units in a diversified firm operate below their potential due to the inefficiency of internal capital markets (John, 1993). While the corporate focus hypothesis is often used to explain value creation from spin-offs, there are still unanswered questions. Thus, in this thesis, we aim to develop a new methodology to investigate the optimal leverage hypothesis and integrate it with the methodology of researching the corporate focus hypothesis to shed more light on why previous tests on corporate focus have found such success.

1.2 Purpose and Contribution

The purpose of this thesis is to investigate value creation in corporate spin-offs. More specifically, our aim is to extend the existing research on the optimal leverage hypothesis. Consequently, our research question is:

Does the relationship between the capital structure of the parent and spun-off entities influence the value creation of spin-offs?

Value creation is analyzed from the two perspectives of operating and stock market performance for parent and spun-off entities over the three years following the spin-off. Our contribution expands on prior research by developing a unique methodology to test the optimal leverage hypothesis based on our critique of Veld and Veld-Merkoulova's (2008) research methodology for examining John's (1993) optimal leverage hypothesis model. Further, we challenge the assumptions previously made based on the corporate focus hypothesis by investigating whether shared characteristics can explain the results obtained from tests based on the corporate focus hypothesis.

To the best of our knowledge, our approach to studying the optimal leverage hypothesis has not been previously tested. Therefore, we argue that this research could contribute with valuable insight to the existing body of knowledge.

2. Literature Review & Theoretical Framework

This section of the article begins by presenting an overview of the existing literature on value creation associated with spin-offs. The discussion commences by summarizing the research on the relationship between spin-offs and value creation and proceeds to examine two theoretical frameworks: the corporate focus hypothesis and the optimal leverage hypothesis. Finally, this section ends by presenting our research question and hypotheses.

2.1 Literature Review

During the 1950s and 1960s, massive diversification programs became a prominent trend in the corporate world, leading to the rise of large conglomerate firms. However, the subsequent 15 years witnessed a shift towards divestment (Berger & Ofek, 1995). This trend sparked interest in understanding the benefits and costs of diversification, with Berger & Ofek's influential research paper playing a significant role. They estimated the effect of diversification on firm value by assigning stand-alone values to individual business segments based on SIC codes. Their findings revealed that diversified firms experienced a 13-15% decrease in valuation compared to their stand-alone valuations. This intriguing finding aligned with the ongoing divestment trend and prompted further research.

A company can divest portions of its business in several ways, the most common being equity carve-outs, asset sales, or spin-offs. According to Slevin et al. (1995), an equity carve-out is a form of corporate restructuring in which a parent company sells a minority interest in a subsidiary or division through an initial public offering (IPO). The parent company retains majority ownership and control, while the subsidiary becomes an independent, publicly-traded entity with its own stock listing. In asset sales, a company divests specific assets, such as property, machinery, or business units, by selling them to a third party. Conversely, a spin-off involves a parent company separating a subsidiary or division to create a new, independent company. This is accomplished by distributing the spun-off entity shares to the parent entity's existing shareholders on a pro-rata basis; thus, no

cash is exchanged. Post-spin-off, shareholders hold shares in the parent company and the newly established independent subsidiary (Slovin et al., 1995).

In this thesis, we aim to contribute to existing divestment research by investigating the divestiture method of spin-offs. While all three divestiture methods may create value, spin-offs offer advantages in terms of research environment. Both asset sales and equity carve-outs, which involve cash transactions, are frequently driven by liquidity constraints or debt reduction, making them a means of obtaining liquidity for financially distressed firms (Shleifer & Vishny, 1992; Lang et al., 1995). Following a spin-off, the parent company and the spun-off entity operate as independent entities, enabling researchers to analyze their individual performance over time. This is more challenging for asset sales or equity carve-outs, as divested assets are integrated into other organizations and carved-out business units remain under the parent company's control. Since spin-offs are not subject to these underlying conditions, they offer a more isolated environment to research value creation.

The three primary perspectives of value creation from spin-offs most commonly researched include operational performance in terms of change in return on assets (Daley et al., 1997), long-term stock performance (Cusatis et al. 1993), and announcement-day stock market returns (Desai & Jain, 1999). The comprehensive review of 26 earlier studies on spin-off value creation by Veld and Veld-Merkoulova (2009), and the more recent study by Feng et al. (2015), conclude that spin-offs generate abnormal returns at the time of announcement and in the long run. Numerous theories have been explored to account for these abnormal returns. The two leading theories in spin-off value creation research are the corporate focus hypothesis and the information asymmetry hypothesis. First, the corporate focus hypothesis suggests that by divesting non-core business segments, a company allows its management to prioritize core operations, resulting in greater value creation (Daley et al., 1997; Desai & Jain, 1999). Second, the information asymmetry hypothesis posits that diversification discounts arise from the knowledge gap between a firm's management and external capital markets, which can be partially reduced by spinning off business units, as it generates separate financial statements (Krishnaswami & Subramaniam, 1999).

The corporate focus hypothesis is frequently cited in the literature as a primary reason for conducting spin-offs, which is understandable given the consistent significant support it has received (Veld & Veld-Merkoulova, 2009). Typically, researchers examine this hypothesis by

identifying cases where the spun-off subsidiary operates in a different two-digit SIC code than the parent, using it as a proxy for a "focus-increasing" spin-off (Daley et al., 1997). However, we believe there is more to uncover beyond this approach, and our study aims to expand on the current understanding of spin-off value creation provided by the corporate focus hypothesis by integrating the lesser-explored optimal leverage hypothesis.

The corporate focus hypothesis suggests that managers may fail to make necessary investments when overseeing a diverse range of business segments, resulting in underinvestment from a lack of focus. The optimal leverage hypothesis also attempts to explain underinvestment in diversified firms but from a leverage perspective. It posits that each business unit has an optimal leverage level suited to its specific segment, and diversified firms struggle to accommodate an internal capital market optimal to all its business segments. Thus diversified firms tend to inhibit necessary investment decisions and enable poor investment choices, ultimately leading to less efficient operations (John, 1993).

Our research contribution, therefore, aims to further nuance the findings of the corporate focus hypothesis by investigating the relationship between value creation, spin-off transactions across industries, and whether these spin-offs adapt to a different capital structure.

2.2 Theoretical Framework

2.2.1 Corporate focus hypothesis

Berger & Ofek's (1995) research on "the diversification discount" identified a positive correlation between the number of business segments operating in different two-digit SIC codes with value loss. Thus, Daley et al. (1997) hypothesized that the positive effect of spin-offs on shareholder wealth may stem from increased corporate focus as they argued that business segments operating in different two-digit SIC codes likely have very different strategic needs. They, therefore, used Berger & Ofek's variable of SIC codes as a proxy when grouping focus-increasing and non-focus-increasing spin-offs.

Daley et al.'s (1997) study measured the announcement-day stock performance and the long-term operating performance of the respective post-spin-off entities, split by

cross-industry and intra-industry. Specifically, they found significant stock market returns at the announcement date of cross-industry spin-offs but none for intra-industry spin-offs. The same results were observed in the long-term operating performance measure. The results confirmed that value creation in spin-offs, at least partially, stems from the separation of different business units and the opportunity for managers to concentrate on the business units they are most fit to run. The rationale is that in the case of diversified firms, managers may be proficient at operating the firm's core business but inefficient in terms of the firm's non-core business. Thus, separating the non-core business units as independent entities allows managers to focus on the operations they are best suited to manage.

Desai and Jain (1999) add the perspective of long-term stock performance, and their results reinforce the conclusion of Daley et al. (1997). They found that focus-increasing spin-offs exhibit significantly greater long-term abnormal stock returns and operating performance than non-focus-increasing spin-offs. In contrast to Daley et al. (1997), Desai and Jain (1999) use three alternative methods to measure focus in spin-offs: (1) change in Herfindahl index, which is computed using segment sales revenue proportions, (2) change in the number of segments reported by the firm, and (3) comparing the two-digit SIC codes of the subsidiary and the parent. For the vast majority of cases, these three alternative methods aligned, and thus, the most prevalent approach for identifying focus-enhancing spin-offs continued to rely on SIC codes. (Veld & Veld-Merkoulova 2004).

The research mentioned above does not explicitly investigate the origin of enhanced operating performance and abnormal returns beyond whether the spun-off entity operates in a different industry from its parent. Daley et al. (1997) hypothesized that the improved operating performance might result from the possibility of better constructing management incentive plans to fit the subsidiary's industry. However, further research found no correlation between improved performance, increased business focus, and incentive plans (Pyo, 2007).

Another explanation is presented by Ahn et al. (2004), who observed a significantly different impact of leverage on investment efficiency for non-core segments than for core segments within diversified firms. The results from Ahn et al's research suggest that the disciplinary debt benefits in a diversified firm may be undermined by its constraining implications on investment policies within non-core business segments. This finding aligns with the corporate focus hypothesis, indicating a tendency for inefficient capital allocation for non-core

segments in diversified firms. To further explore this area, this thesis will examine the effects of capital allocation on the performance of cross- and intra-industry spin-offs.

2.2.2 Optimal leverage hypothesis

The optimal leverage hypothesis, developed by John (1993), proposed that corporate spin-offs can create shareholder value by reducing investment inefficiency through spinning-off business segments with contrasting optimal leverage levels to the current conglomerate leverage. The theory is based on the assumption that the individual business segments of a firm with multiple business segments will likely have different optimal leverage levels. As a result, a company with varying business segments will not be able to cover all of its business segments' leverage needs optimally, and the consequent investment inefficiency will inhibit the company from operating at its full potential.

To illustrate this, John adopts a project net present value evaluation approach to showcase how inefficient debt allocation distorts corporate insiders' decisions. A simplified example of John's mathematical illustration can be shown as follows:

$C = Company$

$I = Investment$

$n = New\ Projects$

$V(n) = NPV\ of\ new\ projects$

$F = Pure\ Discount\ Bond\ of\ Promised\ Payment$

$PC = Parent\ Entity$

$SC = Spun\text{-}off\ Entity$

$C = \{I, F, (V(n_1), V(n_2), V(n_3))\}$

A company's decision to invest in a new project can be depicted as C = {I, F, (V(n1),V(n2),V(n3))}, where project managers invest in new projects in states where V(n) > I + F. A numerical example is the pre-forma company C that can invest in three potential projects with two units (I = 2) and have a promised payment of the debt at the end of the time horizon for all projects of 3 units (F = 3). Its investment decision can thus be depicted as C = {2, 3, (1.1, 4.2, 5.2)} with the criteria that V(n) > 5 (2 + 3), and thus, the company would only invest in project three which generates a net present value of 3.2 (5.2 - 2).

However, suppose company C would spin-off one of its business units, creating two components of its former self (PC and SC). The partition of debt, investment capital, and NPV projections of projects are as follows: PC = {1, 1, (1.1,1.2, 2.1)} and SC = {1, 2, (0,3.0, 3.1)} then, PC will invest in V(n) > 2 (1+1) which leads to the investment of V(n3), thus generating a net present value of 1.1 (2.1-1) and SC will invest in V(n) > 3 (1+2), thus generating a net present value of 2 (3-1) + 2.1 (3.1-1) amounting to a total of 4.1. In conclusion, the Pro-forma parent and spun-off subsidiary companies generated a positive NPV of 5.2 (1.1+4.1). In contrast, the pro-forma company generated a positive NPV of 3.2.

The findings of Ahn et al. (2004) reinforce the hypothesis laid out by John (1993), as they observed significantly different effects of leverage on investment efficiency between business segments within diversified firms. Ahn et al. (2004) further argue that diversified firms tend to take on debt due to its disciplinary benefits for their core business. However, they tend to overlook the potential negative impact of a higher debt burden on other business segments within the company with different prerequisites, ultimately resulting in investment inefficiency. Rajan et al. (2000) present reinforcing evidence, suggesting that firms redistribute capital across their business segments based on each segment's cash flows and that diversified firms' allocation is carried out inefficiently, leading to investment inefficiency and shareholder wealth destruction. Together, the findings of Rajan et al. (2000) and Ahn et al. (2004) support the notion that value can be created by spinning off a business segment in order for it to access capital markets and adopt an independent leverage ratio to facilitate an increased investment efficiency.

Ahn and Denis (2004) aimed to explain spin-off value creation by examining changes in investment policy following spin-offs by measuring the portion of investments made by the pre-spin-off entity in its business segments with high Tobin's q compared to those with low

Tobin’s q. Tobin's q measures a company's market value relative to its book value. A positive correlation between the measure of investment efficiency and the growth in firm value was observed, thus presenting evidence that diversified firms allocate investment funds inefficiently. To further explore the optimal leverage hypothesis, Veld and Veld-Merkoulova (2008) hypothesized that firms with lower pre-spin-off investment expenditures are more susceptible to underinvestment issues. To test their hypothesis, they group spin-off transactions based on the pre-spin-off company’s investment expenditure level and test it against the announcement-day stock market return. Their findings revealed no correlation between company investment expenditures and spin-off announcement day abnormal returns.

Upon investigating the optimal capital structure, Bradley et al. (1983) observed an impact of industry factors on company leverage ratios. The cross-sectional regression that included industry dummy variables found that industry accounted for 54% of the variance in leverage ratios, suggesting that industries exhibit significantly different lrage ratios. This inspired the idea that the earlier results from research on the corporate focus hypothesis, which is widely based on the difference in parent and subsidiary industries, might be partially explained by the optimal leverage hypothesis.

2.3 Research Question & Hypotheses

To evaluate the value created from spin-offs, we reason that changes in operating- and stock market performance are the two most robust approaches. To account for both of these approaches, we will assess long-term stock market returns of the post-spin-off entities, which act as indicators of value creation in capital markets, and we will measure changes in the accounting metric return on assets (ROA) and return on equity (ROE) as they function as proxies for value creation from an internal corporate standpoint. We denote the year of the spin-off’s completion as year 0 and examine the stock market performance of the parent and subsidiary, and the operating performance of the combined post-spin-off firm.

Numerous hypotheses attempt to explain the evident value creation of spin-offs, with the corporate focus hypothesis amassing the most extensive academic backing. However, this hypothesis leaves many questions unresolved. To further investigate the value creation from spin-offs, we complement prior research on the corporate focus hypothesis by incorporating the less-established optimal leverage hypothesis. Thus, our formal research question is:

Does the relationship between the capital structure of the parent and spun-off entities influence the value creation of spin-offs?

While there are studies that investigate the optimal leverage hypothesis, the primary distinguishing aspect of this thesis lies in the unique methodology that captures leverage developments between the parent and spun-off entities, as well as value creation, over an extended time horizon. To the best of our knowledge, this specific research question has not been explored in the same way before.

First, we conduct multiple tests to analyze the effects of spin-offs and connect them to the aforementioned theories. Tests on long-term stock performance are performed on both the parent company and the spun-off subsidiary while operating performance is performed on the combined post-spin-off firm. We start by performing tests independently of our theoretical hypotheses. First, we execute a test on the long-term stock market performance. Our hypothesis for this test is:

H1: *The mean abnormal long-term stock market return for parents and subsidiaries are above zero* (Hyp. 1)

Second, we observe the changes in operating performance. We examine the change in operational efficiency, and performance, by examining ROA. Our hypotheses is:

H2: *The mean growth rates of asset-based operational performance for parents and subsidiaries are above zero* (Hyp. 2)

Third, to complement the change in asset-based operational performance, changes in operating performance by examining ROE are observed. Our hypotheses is:

H3: *The mean growth rates of equity-based operational performance for parents and subsidiaries are above zero* (Hyp. 3)

2.3.1 Corporate Focus Hypothesis

The corporate focus hypothesis suggests that spin-offs can create long-term shareholder value through increased focus. Increased focus is generally thought to be achieved when the spun-off subsidiary has different needs than the core business of the pre-spin-off firm. The value creation is thus attributed to the strategic clarity the spun-off subsidiary gains by concentrating on its core operations. To differentiate between focus and non-focus increasing spin-offs, Daley et al. (1997) compared if the spun-off subsidiary operated in the same two-digit SIC code as its parent as a proxy. This suggests that subsidiaries operating in different two-digit SIC codes to their parents are focus-increasing and vice versa. Reinforcing the corporate focus hypothesis, Daley et al. (1997) observed significant positive changes in ROA following focus-increasing spin-offs, while the results for non-focus-increasing spin-offs exhibited no significant improvements. Thus, from the perspective of the corporate focus hypothesis, we predict that focus-increasing (cross-industry) spin-offs will exhibit a median growth rate above 0 in hypotheses 2 and 3. However, non-focus-increasing (intra-industry) spin-offs will exhibit a median growth rate of 0, as the benefits of the corporate focus hypothesis should not apply to non-focus-increasing spin-offs.

Desai and Jain (1999) followed this approach but examined the effects on long-term stock market returns and found significant positive abnormal returns over the three-year holding period for focus-increasing spin-offs and none for non-focus-increasing spin-offs. Thus, from the perspective of the corporate focus hypothesis, we predict that in hypothesis 1, spin-offs of focus-increasing (cross-industry) nature will achieve abnormal long-term stock market returns. Contrary, non-focus-increasing (intra-industry) spin-offs are predicted not to create abnormal long-term stock market returns.

Table 1. Predictions on the Effects on Stock- and Operating Performance Attributable to Spin-offs in Cross- Contra Intra-industry Cases

	Abnormal Stock Market Return		Change in Operating Performance	
	Cross-industry	Intra-industry	Cross-industry	Intra-industry
Subsidiary	+	+/-	N/A	N/A
Parent	+	+/-	N/A	N/A

Combined Entity	N/A	N/A	+	+/-

Note: this table consists of our predictions on the subsidiary and parent entities' long-term stock market return and the combined entity's change in long-term operating performance after a spin-off.

2.3.2 Optimal Leverage Hypothesis

In our examination of the optimal leverage hypothesis on value creation of spin-offs, we will initially test the hypothesis independently from the corporate focus hypothesis to later combine the two theories.

The optimal leverage theory suggests that diversified firms cannot accommodate the optimal level of leverage for all of their business segments which fosters an investment inefficiency that inhibits the diversified firm's true potential. Therefore, a diversified firm can create shareholder wealth by spinning off business segments that have a different optimal leverage level than the core business. Based on this line of reasoning, we argue that there are two fundamental issues with Veld and Veld-Merkoulova's (2008) research methodology on the optimal leverage hypothesis. First, pre-spin-off firms tend to have multiple business segments of varying sizes and optimal levels of leverage, thus, using the pre-spin-off firm's level of investment expenditure does not necessarily disclose if the spun-off subsidiary had different leverage needs in relation to the other business segments of the diversified firm. Secondly, we argue that the process of developing an optimal leverage level and capitalizing on it takes time. Therefore, the value creation resulting from the spun-off subsidiary's opportunity to access capital markets and enhance its operating performance by more effectively investing in new projects may not be captured in the announcement day returns. To address these concerns, we will examine the difference in leverage between the subsidiary and its parent company at the three-year mark to assess whether the spun-off subsidiary has developed a different leverage ratio to its pre-spin-off firm's remaining business segments. We will subsequently group the spin-off transactions based on the distinctions developed from their parent companies' leverage ratios and examine the impact these different leverage needs have had on the long-term stock market returns and changes in operating performance.

In terms of our hypotheses (1, 2 & 3), from the perspective of the optimal leverage hypothesis, we predict that spin-offs whose leverage has diverged from their parent's leverage ratio will have performed better both in regards to long-term stock performance and growth

in operating performance, as those subsidiaries will likely have been constrained in terms of underinvestment from the internal capital market of their pre-spin-off firms. However, those spin-offs that have not exhibited larger changes in leverage to their parent cannot be assumed to have been inhibited from reaching their full potential in the internal capital market. Therefore, we predict that those spin-offs will not perform better than the industry median ROA and ROE growth and the market index. The rationale behind this prediction is that diversified firms will benefit from the opportunity to allocate debt service optimally, and the offset created by disciplinary effects of debt on investment efficiency is not present when business segments have similar capital needs.

Table 2. Effects on Stock Market and Operating Performance Based on the Difference in Leverage Between Subsidiary and Parent

	Abnormal Stock Market Return		Change in Operating Performance	
	Large Leverage Difference	Small Leverage Difference	Large Leverage Difference	Small Leverage Difference
Subsidiary	+	+/-	N/A	N/A
Parent	+/-	+/-	N/A	N/A
Combined Entity	N/A	N/A	+	+/-

Note: this table consists of our predictions on the subsidiary and parent entities' long-term stock market return and the combined entity's change in long-term operating performance depending on the difference in leverage ratio after a spin-off.

To integrate the concepts of optimal leverage and corporate focus effectively, we will utilize the groups of focus-increasing and non-focus-increasing spin-offs. Subsequently, we will divide them into two new groups based on the spun-off subsidiaries' difference in leverage ratio to their parent. Ultimately, four groups have been created. The previously mentioned studies on corporate focus have used cross-industry and intra-industry spin-offs as proxies for "focus-increasing" and "non-focus-increasing" spin-offs, respectively. We believe that the neutral value-enhancing performance observed in intra-industry spin-offs has been positively affected by spin-offs with differing leverage needs to their parents. Consequently, we anticipate that intra-industry spin-offs with large differences in leverage ratio to their parent will generate positive value creation. In contrast, those without such differentiation will destroy value, exhibiting median abnormal long-term stock returns and changes in operating performance below zero (hyp. 1,2 & 3).

Aligned with previous research findings, we anticipate that all cross-industry spin-offs will create value above zero for the value creation metrics. However, we predict that the value creation will be greater for cross-industry spin-offs with large differentiations in leverage ratios than those without. This prediction is based on the implication provided by the corporate focus hypothesis, that cross-industry spin-offs were not part of the core business segment and that managers might not have devoted sufficient effort to comprehend the needs of these subsidiaries. Consequently, we believe that these subsidiaries have experienced increased neglect within the company's internal capital markets, and thus underinvestment

became more prevalent in these cases. Table 3 illustrates our predictions by integrating the corporate focus and optimal leverage hypotheses.

Table 3. Predictions on the Effect of Level of Leverage Difference on Subsidiary and Parent Entity

	Abnormal Stock Market Return				Change in Operating Performance			
	Cross-industry		Intra-industry		Cross-industry		Intra-industry	
	Large Leverage Difference	Small Leverage Difference	Large Leverage Difference	Small Leverage Difference	Large Leverage Difference	Small Leverage Difference	Large Leverage Difference	Small Leverage Difference
Subsidiary	++	+	+	–	N/A	N/A	N/A	N/A
Parent	++	+	+	–	N/A	N/A	N/A	N/A
Combined Entity	N/A	N/A	N/A	N/A	++	+	+	–

Note: this table consists of our predictions on the subsidiary and parent entities' long-term stock market return and the combined entity's change in long-term operating performance depending on the difference in leverage ratio after a cross-industry spin-off.

3. Research Design

This thesis aims to explore the value-enhancing attribute of spin-offs across capital structures and industries. Spin-offs are defined as the carve-out of a business segment from a company through the distribution of a number of subsidiary shares to the existing shareholders of the parent company on a pro-rata basis. To examine value creation, the performance of the spin-off entities is tested from two perspectives, (1) the long-term stock market performance of the parent and subsidiary stocks, and (2) the change in operational performance of the combined post-spin-off firm. The research approach for stock market performance is based on tests conducted by Cusatis et al. (1993), and the change in operational performance is inspired by the methodology of Daley et al. (1997).

To employ the corporate focus hypothesis, we use the approach outlined by Daley et al. (1997) to differentiate between focus-enhancing and non-focus-enhancing spin-offs. Our sample is thus divided into two categories: cross-industry spin-offs (presumed to increase focus) and intra-industry spin-offs (presumed not to increase focus). In prior literature, Standard Industry Classification (SIC) codes were utilized to differentiate between cross-industry and intra-industry spin-offs, however, in this thesis, we substituted the old

industry classification system of SIC codes with Fama-French 48. The primary motivation for transitioning to the Fama-French 48 industry classification system stems from its more frequent and current updates, compared to SIC codes, which have not been updated since 1987. This ensures a more accurate reflection of the ever-evolving industry landscape. For instance, the technology sector is not allocated its specific code under SIC codes. Instead, technology companies are broadly categorized under generic classifications such as service or manufacturing. In contrast, the annually updated Fama-French classification system offers a more nuanced and accurate representation of industries like technology.

When implementing the Optimal Leverage Hypothesis, our methodology is a product of our criticism of Veld and Veld-Merkoulova's (2008) research approach to John's (1993) model and is thus our unique contribution. Our criticism addressed the absence of a time component and the disregard for variations in leverage needs between spun-off subsidiaries and their parent companies. To address these issues, our study analyzes the leverage difference between a subsidiary and its parent firm in the third year after the spin-off transaction, determining whether the subsidiary has established a distinct leverage ratio from its parent. We then categorize spin-off transactions into subgroups based on each case's difference in leverage compared to the median difference in leverage between subsidiaries and their parents. Consequently, spin-off transactions with relatively diverged leverage ratios are referred to as *Leverage-Diversified Spin-Offs,* and those with similar leverage ratios are referred to as *Leverage-Aligned Spin-Offs*.

To investigate the influence of the optimal leverage hypothesis on the corporate focus hypothesis outcomes, we will employ the cross-industry and intra-industry groupings and further subdivide these groups according to our optimal leverage hypothesis division previously described. In the end, four groups are formed.

Table 4. Division of Groups Analyzed

Cross-industry		Intra-industry	
Large Leverage Difference	Small Leverage Difference	Large Leverage Difference	Small Leverage Difference

Note: this table consists of the grouping of the dataset.

To evaluate the significance of our sample data, we employ standard t-tests on both the overall average of the complete sample and the average obtained after applying a 90 percent winsorization. Winsorization is utilized to eliminate outliers, improving the statistical robustness of our analysis of relationships.

3.1 Long-term Abnormal Stock Performance

To examine the long-term abnormal stock performance, we draw inspiration from the methodology of Cusatis et al. (1993). The first step involves collecting the share price of the parent and subsidiary at four distinct time points. The event window is defined as [0, 1, 2, 3], where 0 denotes the first trading day of the spun-off subsidiary, and 1, 2, and 3 denotes the trading date closest to the anniversary of the closing date for the following three years. Secondly, the compound annual growth rate (CAGR) is calculated to evaluate the performance of the spin-off entities over the one-, two- and three-year periods. Lastly, the CAGR of the S&P 500 will be applied as a benchmark to allow stock performance comparison over different periods as our sample extends over several years and acts as a reference point when evaluating the abnormality of the spin-off entities' return abnormality. Consistent with the methodology of Cusatis et al. (1993), the returns are calculated under the assumption of a buy-and-hold investment strategy, mitigating the impact of any bias and transaction costs that might arise from portfolio rebalancing.

The procedure of calculating Adjusted Compounded Annual Growth Rate (ACAGR) can be described as follows:

Firstly, the return of the individual stock of the parent and spun-off subsidiary is calculated and denoted as $r_{i,t}$:

$$r_{i,t} = \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}} \qquad \text{Eq. 1}$$

where *i* denotes the individual firm and *t* denotes the time interval.

Secondly, using equation 1, the CAGR of the parent and spun-off subsidiary is calculated:

$$CAGR_{i,t} = (1 + r_{i,t})^{\frac{1}{t}} - 1 \qquad \text{Eq. 2}$$

Thirdly, equation 1 is reapplied, but in this instance, it is utilized to compute the return of the market over the same time period, using the S&P 500 as a representative for market growth:

$$CAGR_{m,t} = (1 + r_{m,t})^{\frac{1}{t}} - 1 \quad \text{Eq. 3}$$

where $r_{m,t}$ denotes the return of the market during the time interval t.

Finally, the abnormal CAGR (ACAGR) for the individual stock is determined by computing the difference between the outputs of Equation 2 and Equation 3:

$$ACAGR = CAGR_{i,t} - CAGR_{m,t} \quad \text{Eq. 4}$$

where $ACAGR$ denotes the abnormal compound annual growth rate.

3.2 Change in Operational Performance

In evaluating operational performance following a spin-off, we use two distinct parameters: Return on Assets (ROA) and Return on Equity (ROE). ROA is the conventionally preferred measure of operating performance in prior literature due to its comprehensive nature, capturing both profit margin and asset turnover changes. This dual-faceted characteristic makes ROA suitable for assessing performance in diverse contexts. However, we argue that ROA may not be the optimal measure for the high-leverage business models found in our sample, such as insurance, real estate, and financial firms. To account for this, we add the perspective of ROE, known for its sensitivity to risk-return trade-offs. We argue that the addition of ROE provides a complementary viewpoint for a well-rounded analysis. To further address possible evaluation biases of operating performance, we will adjust ROA and ROE by median industry levels.

We will first compute ROA for the pre-spin-off entity year [-1] with the fiscal year of the spin-off transaction as year 0 and the ROA for the parent and spun-off subsidiary for years [+1, +2, +3]. Then, analyze the performance from a parent/subsidiary portfolio perspective to determine the combined change in operational improvement on an unadjusted basis. Lastly, the change in ROA will be adjusted on an industry basis to account for industry biases on ROA to measure fair comparisons between spin-off transactions on operational performance.

Integrating parent and subsidiary performance data into a single portfolio is a straightforward process. Spin-offs are recorded at book value, ensuring that the total assets reported by the parent and subsidiary immediately after the spin-off equal the parent's total book value of assets right before the spin-off. To compute combined financial statement values, excluding per-share amounts, reported values of the parent and subsidiary are added. For instance, combined assets or operating income are the sums of the parent's and subsidiary's respective assets or operating incomes. However, Daley et al. (1997) note that this method does not account for inter-corporate transactions. When the parent and subsidiary functioned as a single entity, consolidated financial reporting would eliminate the effects of inter-corporate exchanges on revenue and costs. Profits from such exchanges would be recognized over time but not necessarily in the exchange period. While this may introduce an upward bias in metrics like revenue, it should not significantly impact measures such as ROA.

ROA is calculated by dividing the operating income by the total assets of an entity:

$$ROA_{i,t} = \frac{Operating\ Income_{i,t}}{Total\ Assets_{i,t}} \quad \text{Eq. 7}$$

where *i* denotes the individual firm and *t* denotes the time interval.

The change in ROA is calculated by subtracting the previous fiscal year's ROA from the current year's ROA:

$$\Delta ROA_{i,t} = ROA_{i,t} - ROA_{i,t-1} \quad \text{Eq. 8}$$

To adjust the changes in ROA on an industry basis, we first establish a benchmark by calculating the median ROA (IROA) for all firms, excluding the spin-off firm, that shares the same Fama-French 48 industry classification:

$$IAROA_{i,t} = ROA_{i,t} - IROA_{i,t} \quad \text{Eq. 9}$$

where IROA is the median ROA in the parent's industry.

And lastly, the change in the industry-adjusted ROA is calculated by subtracting the current fiscal year's IAROA from the prior year's IAROA:

$$\Delta IAROA_{i,t} = IAROA_{i,t} - IAROA_{i,t-1} \quad \text{Eq. 10}$$

The operational performance analysis based on ROE is computed using the same methodology as ROA, due to the similar composition of these ratios, whereby an income statement item is divided by a balance sheet item. ROE is conventionally calculated by dividing net or pre-tax profit, as it captures the bottom-line profit associated with equity growth. In this case, net income is used due to limited access to data on pre-tax profit. The equations for the calculations related to ROE are presented below:

$$ROE_{i,t} = \frac{Net\ Income_{i,t}}{Total\ Equity_{i,t}} \quad \text{Eq. 11}$$

$$\Delta ROE_{i,t} = ROE_{i,t} - ROE_{i,t-1} \quad \text{Eq. 12}$$

$$IAROE_{i,t} = ROE_{i,t} - IROE_{i,t} \quad \text{Eq. 13}$$

$$\Delta IAROE_{i,t} = IAROE_{i,t} - IAROE_{i,t-1} \quad \text{Eq. 14}$$

3.3 Difference in Leverage Ratio

To differentiate spin-off transactions between those that display a significantly different need for leverage than their parent company and those that do not, the difference in leverage ratio between the spun-off subsidiary and the parent is calculated. To account for the time that a newly independent company may need to adjust to the open capital market environment and consequently modify its leverage ratio to what it perceives as optimal, the difference in leverage will not be assessed until the third year after the spin-off transaction.

The process for creating these subsamples is demonstrated below:

First, the subsidiary's leverage ratio at year three is calculated

$$SLR_{i,t} = \frac{Total\ Debt_{i,t}}{Total\ Assets_{i,t}} \quad \text{Eq. 15}$$

where t represents three years following the spin-off transaction.

Second, the parent's leverage ratio at year three is calculated

$$PLR_{i,t} = \frac{Total\ Debt_{i,t}}{Total\ Assets_{i,t}} \quad \text{Eq. 16}$$

where t represents three years following the spin-off transaction.

Third, the leverage difference between the parent and spun-off subsidiary is calculated

$$LEVDIFF = \left|PLR_{i,t} - SLR_{i,t}\right| \quad \text{Eq. 17}$$

where the absolute value is used to make a representative median of difference

Fourth, the median is calculated

$$MDLEVDIFF = MEDIAN\sum\left|PLR_{i,t} - SLR_{i,t}\right| \quad \text{Eq. 18}$$

and is then used to form two groups: the group where the difference in leverage ratio is above the median is referred to as *Leverage-Diversified Spin-Offs* and the group where the difference in leverage ratio is below the median is referred to as *Leverage-Aligned Spin-Offs*.

4. Data

To collect the data used in this thesis, a combination of data sources was utilized. Capital IQ acted as the primary data collection tool, where we sourced the spin-off transactions and obtained the respective entity's balance sheet and income statement items. Historical share prices were obtained from the database Refinitiv by utilizing Microsoft Excel's data function. Compustat and Wharton Research Data Services (WRDS) were utilized to gather data pertaining to Fama-French 48 industry classification codes, the industry median ROA and ROE, as well as complementing data not available in Capital IQ and Refinitiv related to historical share price and balance sheet items.

The sample dataset initially included 655 spin-off transactions executed between 1990 and 2023. S&P 500 was used as the benchmark index representing the market portfolio during the abovementioned period. This timeframe was chosen for two reasons. First, in consideration of increasing generalizability from observing natural fluctuations in the economic climate, with data encompassing both market upturns and downturns. Second, in order to increase statistical power, by ensuring that each subsample included at least thirty observations.

Several adjustments were made to ensure the data's relevance to our research question. Firstly, spin-offs that were announced but subsequently canceled or not yet closed were excluded. Secondly, instances where either the parent or subsidiary did not trade on any of the major US exchanges (NYSE, NYSEAM, NasdaqCM, NasdaqGM, and NasdaqGS) were eliminated due to low trading volumes and liquidity of smaller markets, and in recognition of the stability and reliability of companies with significant market presence. Thirdly, firms trading on a US exchange but not of American origin were excluded to mitigate the risk of institutional and geographical factors influencing results. Fourthly, spin-offs completed after 2019 were disregarded due to the necessity of financial data up to three years past the closing date for analysis of the hypotheses. Fifthly, several instances of spin-offs were excluded due to a lack of data pertaining to share prices, financial statement items, or other relevant data.

Table 5. Sample of Spin-offs

Initial Sample of Spin-offs	655	Δ
Less unclosed transactions	535	-120
Less not trading on major US exchange	301	-234
Less non-Amerian firms	248	-53
Less transactions closed post-2019	206	-42
Less missing necessary data	164	-42
Final	*164*	*-491*

Note: this table contains the elimination procedure and the final number of observations from the initial dataset.

In the end, the sample consists of 164 spin-off transactions conducted between 1995 and 2019. The final sample has been segmented as follows:

1. 70 intra-industry spin-offs and 94 cross-industry spin-offs;
2. 82 leverage-diversified spin-offs and 82 leverage-aligned spin-offs;
3. 50 cross-industry leverage-diversified spin-offs, 44 cross-industry leverage-aligned spin-offs, 32 intra-industry leverage-diversified spin-offs, and 38 intra-industry leverage-aligned spin-offs.

Table 6. Distribution of the Dataset by Year and Real Distribution Value Per Year (mUSD)

Year	Closed deals	Distribution value	Year	Closed deals	Distribution value
1995	4	13980.91	2008	6	109812.34
1996	0	0	2009	3	3637.81
1997	2	5420.26	2010	2	140.91*
1998	3	569.37*	2011	9	34168.46
1999	5	1911.87	2012	6	24939.35*
2000	6	37432.55	2013	7	56670.75**
2001	6	8660.43*	2014	12	30263.29
2002	5	13506.04*	2015	20	91805.4**
2003	3	1245.69	2016	11	43419.98*
2004	4	7297.84	20	12	2771.05*
2005	4	21098.43	2018	13	20496.71****
2006	3	9147.01	2019	9	41261.38
2007	9	86708.87	*Total*	*164*	*666236.7*

Note: this table contains observations per year the spin-off transactions were conducted and the sum of distribution values of each year. "" refers to the number of spin-offs with missing distribution values in the corresponding year.*

Table 7. Distribution Table of the Dataset by Industry

Fama-French Code	Industry	Parents	Spin-offs	Fama-French Code	Industry	Parents	Spin-offs
1	Agriculture	0	1	25	Shipbuilding, Railroad Equipment	1	2
2	Food Products	3	2	26	Defense	1	0
3	Candy & Soda	0	0	27	Precious Metals	0	0
4	Beer & Liquor	1	0	28	Non-Metallic and Industrial Metal Mining	0	0
5	Tobacco Products	2	1	29	Coal	2	1
6	Recreation	0	0	30	Petroleum and Natural Gas	5	5
7	Entertainment	1	1	31	Utilities	5	5
8	Printing and Publishing	1	1	32	Communication	10	6
9	Consumer Goods	2	2	33	Personal Services	3	0
10	Apparel	1	2	34	Business Services	12	16
11	Healthcare	2	1	35	Computers	5	5
12	Medical Equipment	3	5	36	Electronic Equipment	6	7
13	Pharmaceutical Products	8	8	37	Measuring and Control Equipment	2	3
14	Chemicals	7	12	38	Business Supplies	3	2
15	Rubber and Plastic Products	1	1	39	Shipping Containers	1	0
16	Textiles	0	0	40	Transportation	5	5

Fama-French Code	Industry	Parents	Spin-offs	Fama-French Code	Industry	Parents	Spin-offs
17	Construction Materials	3	1	41	Wholesale	2	3
18	Construction	0	1	42	Retail	6	8
19	Steel Works Etc	1	3	43	Restaurants, Hotels, Motels	7	7
20	Fabricated Products	1	0	44	Banking	5	5
21	Machinery	14	9	45	Insurance	4	4
22	Electrical Equipment	2	1	46	Real Estate	2	4
23	Automobiles and Trucks	1	4	47	Trading	17	19
24	Aircraft	2	1	48	Almost Nothing	4	0

Note: this table depicts the distribution of spin-off and parent entities per industry.

5. Results & Analysis

In this section of the thesis, we present the results from the performed standard t-tests on long-term abnormal stock performance and the change in operating performance. The total sample mean as well as the winsorized mean, are presented in each table.

5.1 Long-term Abnormal Stock Performance

To test hypothesis 1, we conduct tests on the long-term stock performance of the parent and spun-off entities at [+1, +2, +3] years following the completion of the spin-off transaction, adjusted for the market portfolio return. Both the arithmetic and winsorized mean are presented for the full sample, cross- versus intra-industry spin-offs, and leverage-diversified versus leverage-aligned spin-offs.

Table 8. Long-term Stock Performance of Spin-offs

	Full sample			Intra-industry			Cross-industry		
	Y1	Y2	Y3	Y1	Y2	Y3	Y1	Y2	Y3
Panel A: Spun-off entities									
Mean	15.58%***	3.43%	-1.10%	3.66%	-1.37%	-5.19%	24.60%***	7.02%*	1.95%
p-value	(0.009)	(0.245)	(0.651)	(0.586)	(0.760)	(0.191)	(0.008)	(0.081)	(0.529)
Winsorized mean	11.20%***	2.55%	-0.85%	3.50%	-1.25%	-3.82%	16.94%***	5.37%	1.36%
p-value	(0.008)	(0.319)	(0.694)	(0.568)	(0.751)	(0.258)	(0.004)	(0.109)	(0.629)
N	164	164	164	70	70	70	94	94	94
Panel B: Parent entities									
Mean	-1.27%	-6.71%***	-6.83%***	-6.63%	-9.90%***	-8.27%***	2.78%	-4.33%	-5.77%***
p-value	(0.771)	(0.002)	(<.001)	(0.199)	(0.002)	(0.002)	(0.680)	(0.159)	(0.002)
Winsorized mean	-3.99%	-7.18%***	-7.02%***	-6.47%	-8.50%***	-7.78%***	-2.15%	-6.19%***	-6.45%***
p-value	(0.138)	(<.001)	(<.001)	(0.123)	(0.001)	(<.001)	(0.544)	(0.003)	(<.001)
N	164	164	164	70	70	70	94	94	94

**** implies significance at the 1% level, ** implies significance at the 5% level, * implies significance at the 10% level*

Note: this table contains the results of the test on long-term stock performance for spun-off and parent entities following a spin-off. Columns (1) through (3) show change for the full sample, (4) through (6) for intra-industry spin-offs, and (7) through (9) for cross-industry spin-offs.

The full sample reveals significant positive abnormal stock returns for the spun-off entities during the first year and significant negative abnormal stock returns for the parent company in years two and three following the spin-off transaction. No significant results are found for intra-industry spun-off entities; however, cross-industry spun-off entities exhibit significant positive abnormal returns for the first year at the 1%-significance level and significant p-values at the 10%-level for the arithmetic mean in the second year. On the other hand, parent companies involved in intra-industry spin-offs experienced significant negative abnormal returns in the second and third years. Parent companies in cross-industry spin-off transactions also reported negative abnormal returns in the second and third years, although to a lesser extent.

From the perspective of the corporate focus hypothesis, spin-offs add value by enhancing the focus on non-core business segments within diversified firms. In this context, intra-industry spinoffs act as proxies for non-core business segment spin-offs. The separation of non-core business segments allows managers to concentrate on their areas of expertise instead of managing a variety of business segments. Consequently, managers are positioned to oversee operations where their skills are most effectively utilized. This increased focus on business

needs should generate value in theory. From the optimal leverage hypothesis perspective, a firm with multiple business segments is likely to have different optimal leverage levels for each segment. Therefore, a company with diverse business segments may not be able to ideally accommodate all its segments, leading to investment inefficiencies that inhibit the segments from operating at their full potential. Consequently, if a leverage-diversified spin-off occurs, both the parent and the spun-off subsidiary stand to generate value. To summarize, neither of the theoretical hypotheses indicates that spin-offs could potentially lead to value destruction. Instead, they propose only enhanced value. Therefore, we predicted that spin-off transactions would result in positive abnormal returns (Hypothesis 1) for both the parent companies and their spun-off entities.

Out of the 12 full sample test results, six demonstrate statistical significance at the 1%-level, allowing us to accept a signficiant relationship (Hypothesis 1) for spun-off entities in their first year and for parent companies in their second and third years. However, our prediction regarding performance trajectory only holds true for significant results found for spun-off entities in the initial year, while the parent companies' results in the second and third years deviate entirely from our predictions. Furthermore, we find evidence in support of the corporate focus hypothesis as the positive significant returns from the spun-off entities are accredited to the cross-industry spin-offs, which align with the findings of Desai & Jain (1999). Similarly, while both cross- and intra-industry spin-off parents exhibit significant negative abnormal returns, the cross-industry spin-offs experience relatively reduced negative abnormal returns.

Table 9. Long-term Stock Performance in Relation to Spin-off when the Spun-off Entity has Developed a Different Leverage to its Parent

	Full sample			Leverage-diversified			Leverage-aligned		
	Y1	Y2	Y3	Y1	Y2	Y3	Y1	Y2	Y3
Panel A: Spun-off entities									
Mean	15.58%***	3.43%	-1.10%	12.24%*	1.51%	-1.34%	19.09%*	5.37%	-0.86%
p-value	(0.009)	(0.245)	(0.651)	(0.074)	(0.692)	(0.681)	(0.057)	(0.247)	(0.816)
Winsorized mean	11.20%***	2.55%	-0.85%	9.74%*	1.69%	-0.28%	12.67%**	3.40%	-1.42%
p-value	(0.008)	(0.319)	(0.694)	(0.085)	(0.611)	(0.922)	(0.048)	(0.384)	(0.662)
N	164	164	164	82	82	82	82	82	82
Panel B: Parent entities									
Mean	-1.27%	-6.71%***	-6.83%***	-5.83%	-10.57%***	-9.79%***	3.35%	-2.84%	-3.88%*
p-value	(0.771)	(0.002)	(<.001)	(0.172)	(<.001)	(<.001)	(0.668)	(0.407)	(0.084)
Winsorized mean	-3.99%	-7.18%***	-7.02%***	-4.59%	-8.94%***	-9.01%***	-3.40%	-5.41%**	-5.02%***
p-value	(0.138)	(<.001)	(<.001)	(0.207)	(<.001)	(<.001)	(0.397)	(0.022)	(0.008)
N	164	164	164	82	82	82	82	82	82

**** implies significance at the 1% level, ** implies significance at the 5% level, * implies significance at the 10% level*

Note: this table contains the results of the test on long-term stock performance grouped by difference in leverage for spun-off and parent entities following a spin-off. Columns (1) through (3) show change for the full sample, (4) through (6) for leverage-diversified spin-offs, and (7) through (9) for leverage-aligned spin-offs.

Significant positive abnormal returns at the 10%- and 5%-level are observed for both leverage-diversified and leverage-aligned spun-off entities in the initial year. On the contrary, parents present significant negative results at the 10%-, 5%- and 1%-level for the second and third years for both leverage-diversified and leverage-aligned spin-offs.

We find no evidence in support of the optimal leverage hypothesis. Rather, there appears to be an inverse relationship between the developed difference in leverage between parent companies and their spun-off entities, compared to what we predicted. Specifically, while both groups of spun-off entities demonstrate a significant positive abnormal return after the first year, those with leverage-aligned spin-offs present a comparatively higher return. A similar pattern is observed with parent companies, as both groups show significant negative abnormal returns in the second and third years, but those with leverage-aligned spin-offs experience a less severe negative abnormal return.

Table 10. Long-term Stock Performance of Cross-industry Spin-offs with Different Leverage Between Parent and Spun-off Subsidiary

	Full sample of cross-industry			Leverage-diversified			Leverage-aligned		
	Y1	Y2	Y3	Y1	Y2	Y3	Y1	Y2	Y3
Panel A: Spun-off entities									
Mean	24.60%***	7.02%*	1.95%	18.05%*	4.80%	1.94%	32.04%*	9.54%	1.95%
p-value	(0.008)	(0.081)	(0.529)	(0.058)	(0.306)	(0.564)	(0.056)	(0.162)	(0.721)
Winsorized mean	16.94%***	5.37%	1.36%	13.17%*	3.76%	1.69%	21.22%**	7.21%	0.99%
p-value	(0.004)	(0.109)	(0.629)	(0.071)	(0.355)	(0.607)	(0.025)	(0.193)	(0.836)
N	94	94	94	50	50	50	44	44	44
Panel B: Parent entities									
Mean	2.78%	-4.33%	-5.77%***	0.57%	-7.41%**	-8.84%***	5.29%	-0.82%	-2.28%
p-value	(0.680)	(0.159)	(0.002)	(0.914)	(0.012)	(<.001)	(0.689)	(0.885)	(0.466)
Winsorized mean	-2.15%	-6.19%***	-6.45%***	0.06%	-6.97%***	-8.72%***	-4.65%	-5.31%	-3.87%
p-value	(0.544)	(0.003)	(<.001)	(0.990)	(0.008)	(<.001)	(0.388)	(0.120)	(0.115)
N	94	94	94	50	50	50	44	44	44

**** implies significance at the 1% level, ** implies significance at the 5% level, * implies significance at the 10% level*

Note: this table contains the results of the test on long-term stock performance grouped by difference in leverage for spun-off, compared to what we predicted and parent entities following a cross-industry spin-off. Columns (1) through (3) show change for the full sample, (4) through (6) for leverage-diversified spin-offs, and (7) through (9) for leverage-aligned spin-offs.

Positive significant abnormal returns at the 10%- and 5%-level are found for both leverage-diversified and aligned spun-off entities in the initial year. Conversely, leverage-diversified spin-off parents experience significant negative abnormal returns in the second and third years at the 1%- and 5%-level whilst no significance is observed in the leverage-aligned spin-off parent test.

We predicted that cross-industry spin-offs that are leverage-diversified would partially explain our prediction of great cross-industry spin-off abnormal returns for both parents and spin-offs (Table 3). However, our results indicate that leverage-diversified spin-offs reduce returns of cross-industry spun-off entities as well as increase the loss stemming from cross-industry parent companies. Consequently, our findings once more reveal a contradicting relationship to our predictions, and we do not provide any evidence in support of John's (1993) optimal leverage hypothesis.

Table 11. Long-term Stock Performance of Intra-industry Spin-offs with Different Leverage Between Parent and Spun-off Subsidiary

	Full sample of intra-industry			Leverage-diversified			Leverage-aligned		
	Y1	Y2	Y3	Y1	Y2	Y3	Y1	Y2	Y3
Panel A: Spun-off entities									
Mean	3.66%	-1.37%	-5.19%	3.15%	-3.63%	-6.46%	4.09%	0.54%	-4.11%
p-value	(0.586)	(0.760)	(0.191)	(0.739)	(0.580)	(0.321)	(0.672)	(0.932)	(0.407)
Winsorized mean	3.50%	-1.25%	-3.82%	4.37%	-1.54%	-3.36%	2.76%	-1.01%	-4.21%
p-value	(0.568)	(0.751)	(0.258)	(0.631)	(0.790)	(0.536)	(0.745)	(0.855)	(0.330)
N	70	70	70	32	32	32	38	38	38
Panel B: Parent entities									
Mean	-6.63%	-9.90%***	-8.27%***	-15.82%**	-15.52%***	-11.27%***	1.10%	-5.17%	-5.75%**
p-value	(0.199)	(0.002)	(0.002)	(0.028)	(0.006)	(0.009)	(0.880)	(0.135)	(0.081)
Winsorized mean	-6.47%	-8.50%***	-7.78%***	-11.84%**	-12.02%***	-9.47%***	-1.95%	-5.54%*	-6.36%**
p-value	(0.123)	(0.001)	(<.001)	(0.037)	(0.004)	(0.006)	(0.750)	(0.091)	(0.031)
N	70	70	70	32	32	32	38	38	38

**** implies significance at the 1% level, ** implies significance at the 5% level, * implies significance at the 10% level*

Note: this table contains the results of the test on long-term stock performance grouped by difference in leverage for spun-off and parent entities following an intra-industry spin-off. Columns (1) through (3) show change for the full sample, (4) through (6) for leverage-diversified spin-offs, and (7) through (9) for leverage-aligned spin-offs.

No significant returns are observed for both leverage-diversified and aligned spun-off entities. However, leverage-diversified spin-off parents experience significant negative abnormal returns for all three years at the 5%- and 1%-significance level, while leverage-aligned spin-off parents only present significant negative abnormal returns for the second and third years at the 10%- and 5%-level.

Our initial prediction that intra-industry spin-offs with diversified leverage would yield positive abnormal returns, and that leverage-aligned intra-industry spin-offs would diminish value for both parent and spun-off entities, is incorrect (Table 3). This is evident as the leverage difference does not impact the returns of intra-industry spun-off entities. Moreover, while both leverage-diversified and aligned parent entities of spin-offs exhibit negative abnormal returns, those from intra-industry spin-offs with diversified leverage display larger negative abnormal returns. Thus, consistent with conclusions drawn from Tables 9 and 10, these results offer no supporting evidence for the optimal leverage hypothesis.

An intriguing observation, however, is that intra-industry leverage-aligned parents experience significant negative abnormal returns, whereas parent entities of cross-industry spin-offs with aligned leverage do not show any significant results (Table 10). This suggests that the significant negative abnormal returns observed in Table 9 of leverage-aligned spin-offs are primarily attributed to the parents of intra-industry spin-offs with aligned leverage.

Table 12. Summary of Predictions and Results (1)

	Full sample		Full sample	
	Cross-industry	Intra-industry	Leverage-diversified	Leverage-aligned
Subsidiary	+ (n.s)	+ / - (n.s)	+ (n.s)	+ / - (–)
Parent	+ (–)	+ / - (–)	+ / - (n.s)	+ / - (–)
Combined Firm	N/A	N/A	N/A	N/A
	Cross-industry		Intra-industry	
	Leverage-diversified	Leverage-aligned	Leverage-diversified	Leverage-aligned
Subsidiary	++ (n.s)	+ (n.s)	+ (n.s)	– (n.s)
Parent	++ (–)	+ (n.s)	+ (–)	– (–)
Combined Firm	N/A	N/A	N/A	N/A

Note: this table shows the predictions presented in 2.3.1 and 2.3.2 with the corresponding winsorized test results presented in parentheses. N/A denotes no prediction, (+) denotes a positive change, (–) denotes a negative change, and (n.s) denotes insignificant results.

5.2 Change in Operational Performance

To test hypotheses 2 and 3, we conduct tests on the operating performance of the combined post-spin-off firm for the [-1, 0], [0, 1], [1, 2] and [2, 3] periods where 0 denotes the year of the spin-off completion. Results are presented in both unadjusted and adjusted numbers. The arithmetic and winsorized mean are presented for the full sample, cross- and intra-industry spin-offs, and leverage-diversified and leverage-aligned spin-offs.

Table 13. Unadjusted and Adjusted Change in Operational Performance for the Combined Post-spin-off Entity

	Full sample				Intra-industry				Cross-industry			
	[-1,0]	[0,1]	[1,2]	[2,3]	[-1,0]	[0,1]	[1,2]	[2,3]	[-1,0]	[0,1]	[1,2]	[2,3]
Panel A: Unadjusted Change in ROA												
Mean	0.11969	0.00196	-0.00274	-0.00051	0.01031**	-0.00013	-0.00110	-0.00231	0.20115	0.00351	-0.00397	0.00083
p-value	(0.252)	(0.672)	(0.434)	(0.873)	(0.031)	(0.982)	(0.821)	(0.578)	(0.271)	(0.603)	(0.423)	(0.856)
Winsorized mean	0.01689***	0.00067	-0.00194	-0.00104	0.01105***	-0.00105	-0.00308	-0.00101	0.02124***	0.00195	-0.00110	-0.00105
p-value	(<.001)	(0.807)	(0.403)	(0.664)	(0.009)	(0.807)	(0.436)	(0.758)	(<.001)	(0.585)	(0.696)	(0.756)
N	164	164	164	164	70	70	70	70	94	94	94	94
Panel B: Adjusted Change in ROA												
Mean	0.11805	-0.12803	0.11513	-0.12396	0.00842	-0.02324	0.01180*	-0.00411	0.19969	-0.20607	0.19207	-0.21321
p-value	(0.259)	(0.221)	(0.271)	(0.236)	(0.112)	(0.106)	(0.091)	(0.857)	(0.274)	(0.259)	(0.293)	(0.241)
Winsorized mean	0.01538***	-0.03386***	0.01203***	-0.02335***	0.00927**	-0.03254***	0.01225*	-0.01260	0.01993***	-0.03484***	0.01186**	-0.03136***
p-value	(<.001)	(<.001)	(0.005)	(0.005)	(0.046)	(<.001)	(0.061)	(0.38)	(<.001)	(<.001)	(0.041)	(0.002)
N	164	164	164	164	70	70	70	70	94	94	94	94
Panel C: Unadjusted Change in ROE												
Mean	-0.13095	-0.079596	-0.17032	-0.15083	-0.27085	-0.21533	0.57196	-0.19296	-0.02678	0.02148	-0.72308	-0.11946
p-value	(0.333)	(0.781)	(0.753)	(0.830)	(0.393)	(0.749)	(0.315)	(0.267)	(0.263)	(0.387)	(0.393)	(0.922)
Winsorized mean	-0.01999	0.04310***	-0.00758	-0.02617**	-0.02417	0.08855***	-0.01802	-0.06181**	-0.01687	0.00926	0.00020	0.00037
p-value	(0.189)	(0.010)	(0.579)	(0.101)	(0.361)	(0.003)	(0.444)	(0.023)	(0.348)	(0.611)	(0.990)	(0.985)
N	164	164	164	164	70	70	70	70	94	94	94	94
Panel D: Adjusted Change in ROE												
Mean	-0.16965	0.09692	-0.04229	0.03653	-0.18736	0.09437	0.59520	-0.73790	-0.15647***	0.09881**	-0.51701	0.61324
p-value	(0.239)	(0.794)	(0.939)	(0.974)	(0.578)	(0.914)	(0.297)	(0.219)	(<.001)	(0.028)	(0.550)	(0.749)
Winsorized mean	-0.12273***	0.09430***	-0.08429***	0.00492	-0.09453**	0.12664**	-0.09861***	-0.00590	-0.14373***	0.07021**	-0.07363***	0.01297
p-value	(<.001)	(<.001)	(<.001)	(0.855)	(0.028)	(0.014)	(<.001)	(0.897)	(<.001)	(0.020)	(0.007)	(0.692)
N	164	164	164	164	70	70	70	70	94	94	94	94

**** implies significance at the 1% level, ** implies significance at the 5% level, * implies significance at the 10% level*

Note: this table contains the results of the test on long-term operational performance for spun-off and parent entities following a spin-off. Columns (1) through (3) show change for the full sample, (4) through (6) for intra-industry spin-offs, and (7) through (9) for cross-industry spin-offs.

In terms of the arithmetic mean unadjusted change in ROA, we only find statistical significance for intra-industry spin-offs between the year prior to the spin-off and the year of the closing date. All other findings concerning the long-term mean change in unadjusted ROA lack statistical significance. This contradicts the prior literature on the effects on the operating performance of spin-offs that find significant improvements in ROA for cross-industry spin-offs (Daley et al., 1997; Desai & Jain, 1999). The overall trend of the mean unadjusted change is, while insignificant, positive for all tested groups, that cross-industry spin-offs demonstrate superior performance to intra-industry spin-offs. By shifting focus to the results of the winsorized sample, statistical significance is observed at the 1%-level for all groups in terms of the unadjusted change in the time span [-1, 0],

although none are significant in the long term. All except for two results for the adjusted change in ROA are significant at the 5%- or 1%-level. The disparity between the arithmetic and winsorized mean implies the presence of outliers that affect the significance level without affecting the general trend, as they move in the same direction for each year. Adjusted change in ROA is found to be significantly negatively impacted by spin-offs which contradict both our expectations and previous literature. Based on the corporate-focus hypothesis, we anticipated cross-industry spin-offs to exhibit a significant positive change in ROA over the long term (Daley et al., 1997; Desai & Jain, 1999). However, the initial negative impact on ROA remains significantly negative in the long term.

We find initial negative change in adjusted ROA for both intra- and cross-industry spin-offs whereas Daley et al. (1997) found that cross-industry spin-offs would have a significant positive adjusted change in operating performance and intra-industry spin-offs would have insignificant negative adjusted change in operating performance. Furthermore, the results also contradict the findings of Daley et al. (1997) by revealing that the long-term impact on intra-industry firms is less negative than that on cross-industry firms.

The analysis of the unadjusted change in ROE reveals a similar pattern to that observed in the unadjusted change in ROA, where outliers impact the significance level. However, when considering the winsorized sample, we find contrasting results compared to the unadjusted change in ROA. Specifically, we can observe significant positive development of the unadjusted change in ROE during the first year of separate operations both for the full sample and intra-industry spin-offs. Nevertheless, the initial upturn in ROE transitions into a negative trend in the long term, once again contradicting our expectations of the impact on ROE for intra-industry firms being insignificant. As for the results obtained from the tests on unadjusted change in ROE for cross-industry spin-offs, all are insignificant, making a comparison between the groups difficult to do with accuracy. Statistical significance at the 5%- and 1%-level are found for all years except between years 2 and 3 for all tests on adjusted change in ROE.

Whereas ROE has not been tested as an operational metric in prior literature, the results, just as with ROA, contradict our expectations of enhanced performance for cross-industry spin-offs. Keeping the insignificance of the change between the second and third year for intra-industry spin-offs in mind, it is revealed that cross-industry spin-offs exhibit

significantly poorer long-term performance compared to intra-industry spin-offs. The results indicate a negative trajectory of the adjusted change in ROE for all groups and also that cross-industry spin-offs are more adversely affected than both intra-industry spin-offs and the overall sample, once again contradicting the assumptions made at the outset of this thesis.

While the unadjusted winsorized change in ROA is insignificant, the adjusted winsorized change in ROA is significant and contradicts hypothesis 2 as the development of the operating performance is negative.

In terms of hypothesis 3, both the unadjusted and the adjusted change in ROE is significant. Whereas negative long-term change in unadjusted ROE is found for the full sample, a comparison between intra- and cross-industry spin-offs is unfeasible due to the insignificant results found for cross-industry spin-offs. The adjusted change in ROE is significantly less than zero for all the tested groups, allowing us accept a contradiction to hypothesis 3.

Table 14. Unadjusted and Adjusted Change in Operational Performance in Relation to Spin-off when Spun-off Entity has Different Leverage to Parent

	Full sample				Leverage-diversified				Leverage-aligned			
	[-1,0]	[0,1]	[1,2]	[2,3]	[-1,0]	[0,1]	[1,2]	[2,3]	[-1,0]	[0,1]	[1,2]	[2,3]
Panel A: Unadjusted Change in ROA												
Mean	0.11969	0.00196	-0.00274	-0.00051	0.23188	0.00104	0.00332	-0.00276	0.00750	0.00287	-0.00881**	0.00175
p-value	(0.252)	(0.672)	(0.434)	(0.873)	(0.268)	(0.888)	(0.554)	(0.605)	(0.146)	(0.610)	(0.035)	(0.610)
Winsorized mean	0.01689***	0.00067	-0.00194	-0.00104	0.02345***	-0.00349	0.00371	-0.00376	0.01033**	0.00483	-0.00759**	0.00168
p-value	(<.001)	(0.807)	(0.403)	(0.664)	(<.001)	(0.384)	(0.271)	(0.290)	(0.011)	(0.197)	(0.017)	(0.600)
N	164	164	164	164	82	82	82	82	82	82	82	82
Panel B: Adjusted Change in ROA												
Mean	0.11805	-0.12803	0.11513	-0.12396	0.23114	-0.24165	0.23306	-0.23186	0.00496	-0.01442	-0.00281	-0.01606
p-value	(0.259)	(0.221)	(0.271)	(0.236)	(0.270)	(0.249)	(0.266)	(0.268)	(0.380)	(0.230)	(0.637)	(0.219)
Winsorized mean	0.01538***	-0.03386***	0.01203***	-0.02335***	0.02265***	-0.04367***	0.02555***	-0.02665**	0.00811*	-0.02404***	-0.00150	-0.02006*
p-value	(<.001)	(<.001)	(0.005)	(0.005)	(<.001)	(<.001)	(<.001)	0.030	(0.07)	(0.006)	(0.789)	(0.082)
N	164	164	164	164	82	82	82	82	82	82	82	82
Panel C: Unadjusted Change in ROE												
Mean	-0.13095	-0.079596	-0.17032	-0.15083	-0.26192	-0.19444	-0.46773	0.83121	0.00002	0.03525	0.12709	-1.13287
p-value	(0.333)	(0.781)	(0.753)	(0.830)	(0.333)	(0.735)	(0.665)	(0.399)	(0.999)	(0.173)	(.319)	(0.260)
Winsorized mean	-0.01999	0.04310***	-0.00758	-0.02617**	-0.03494	0.05783**	-0.01937	-0.03424	-0.00503	0.02837	0.00421	-0.01810
p-value	(0.189)	(0.010)	(0.579)	(0.101)	(0.144)	(0.027)	(0.366)	(0.158)	(0.791)	(0.172)	(0.806)	(0.389)
N	164	164	164	164	82	82	82	82	82	82	82	82
Panel D: Adjusted Change in ROE												
Mean	-0.16965	0.09692	-0.04229	0.03653	-0.27321	0.10741	-0.22608	1.31744	-0.06610	0.08642**	0.14151	-1.24437
p-value	(0.239)	(0.794)	(0.939)	(0.974)	(0.340)	(0.885)	(0.837)	(0.511)	(0.116)	(0.029)	(0.271)	(0.228)
Winsorized mean	-0.12273***	0.09430***	-0.08429***	0.00492	-0.15898***	0.11334***	-0.08043***	0.01654	-0.08648***	0.07525**	-0.08815***	-0.00671
p-value	(<.001)	(<.001)	(<.001)	(0.855)	(<.001)	(0.010)	(0.003)	(0.687)	(0.005)	(0.027)	(0.001)	(0.849)
N	164	164	164	164	82	82	82	82	82	82	82	82

**** implies significance at the 1% level, ** implies significance at the 5% level, * implies significance at the 10% level*

Note: this table contains the results of the test on long-term operational performance grouped by difference in leverage for spun-off and parent entities following a spin-off. Columns (1) through (3) show change for the full sample, (4) through (6) for leverage-diversified spin-offs, and (7) through (9) for leverage-aligned spin-offs.

Introducing leverage ratio in the analysis of operating performance yields the results presented in Table 14. As in the previous testing on operating performance, the winsorized mean of adjusted change in ROA and ROE consistently demonstrates significance. Specifically, we find significant unadjusted growth in ROA for leverage-aligned spin-offs and insignificant unadjusted growth in ROA for leverage-diversified spin-offs. These findings contradict our expectations derived from the optimal leverage hypothesis, which states that leverage-diversified firms would have significant positive development of operating performance, while those with aligned leverage would be insignificantly impacted by a spin-off (John 1993). Instead, our findings indicate that leverage-aligned spin-offs display significant long-term positive operational performance, whereas the results for

leverage-diversified spin-offs are insignificant. Moreover, the unadjusted change in ROE is statistically insignificant for both groups. However, when adjusting the change by the market median, we find significant change in both ROA and ROE for leverage-diversified spin-offs and negative change in ROE for leverage-aligned spin-offs.

The adjusted winsorized negative growth observed in both leverage-diversified and leverage-aligned spin-offs contradict hypothesis 2 and 3.

Table 15. Unadjusted and Adjusted Change in Operational Performance in Relation to Cross-industry Spin-off when the Spun-off Entity has Different Leverage to Parent

	Cross-industry				Leverage-diversified				Leverage-aligned			
	[-1,0]	[0,1]	[1,2]	[2,3]	[-1,0]	[0,1]	[1,2]	[2,3]	[-1,0]	[0,1]	[1,2]	[2,3]
Panel A: Unadjusted Change in ROA												
Mean	0.20115	0.00351	-0.00397	0.00083	0.37241	0.00289	0.00148	-0.00198	0.00652	0.00421	-0.01016	0.00403
p-value	(0.271)	(0.603)	(0.423)	(0.856)	(0.28)	(0.766)	(0.837)	(0.789)	(0.400)	(0.656)	(0.134)	(0.443)
Winsorized mean	0.02124***	0.00195	-0.00110	-0.00105	0.03029***	-0.00289	0.00511	-0.00535	0.01095**	0.00745	-0.00816*	0.00383
p-value	(<.001)	(0.585)	(0.696)	(0.756)	(<.001)	(0.539)	(0.136)	(0.267)	(0.037)	(0.173)	(0.071)	(0.420)
N	94	94	94	94	50	50	50	50	44	44	44	44
Panel B: Adjusted Change in ROA												
Mean	0.19969	-0.20607	0.19207	-0.21321	0.37343	-0.38333	0.36965	-0.38601	0.00225	-0.00464	-0.00973	-0.01686
p-value	(0.274)	(0.259)	(0.293)	(0.241)	(0.279)	(0.266)	(0.284)	(0.261)	(0.776)	(0.787)	(0.252)	(0.225)
Winsorized mean	0.01993***	-0.03484***	0.01186**	-0.03136***	0.03138***	-0.05192***	0.02924***	-0.04462***	0.00692	-0.01542	-0.00788	-0.01629
p-value	(<.001)	(<.001)	(0.041)	(0.002)	(<.001)	(<.001)	(<.001)	(0.002)	(0.239)	(0.192)	(0.313)	(0.235)
N	94	94	94	94	50	50	50	50	44	44	44	44
Panel C: Unadjusted Change in ROE												
Mean	0.00002	0.03525	0.12709	-1.13287	-0.04612	0.02493	-1.57739	1.61512	-0.00479	0.01756	0.24773	-2.09057
p-value	(0.999)	(0.173)	(.319)	(0.260)	(0.232)	(0.483)	(0.319)	(0.313)	(0.858)	(0.617)	(0.297)	(0.267)
Winsorized mean	-0.00503	0.02837	0.00421	-0.01810	-0.02456	0.01361	-0.01933	0.00230	-0.00814	0.00431	0.02239	-0.00182
p-value	(0.791)	(0.172)	(0.806)	(0.389)	(0.344)	(0.606)	(0.414)	(0.936)	(0.746)	(0.865)	(0.315)	(0.943)
N	94	94	94	94	50	50	50	50	44	44	44	44
Panel D: Adjusted Change in ROE												
Mean	-0.06610	0.08642**	0.14151	-1.24437	-0.22177***	0.11878	-1.19406	3.19750	-0.08227**	0.07612	0.25237	-2.32342
p-value	(0.116)	(0.029)	(0.271)	(0.228)	(<.001)	(0.103)	(0.462)	(0.315)	(0.048)	(0.132)	(0.291)	(0.228)
Winsorized mean	-0.08648***	0.07525**	-0.08815***	-0.00671	-0.19952***	0.07989*	-0.06435*	0.03299	-0.08034**	0.05920	-0.08417**	-0.00977
p-value	(0.005)	(0.027)	(0.001)	(0.849)	(<.001)	(0.082)	(0.083)	(0.507)	(0.044)	(0.123)	(0.040)	(0.816)
N	94	94	94	94	50	50	50	50	44	44	44	44

**** implies significance at the 1% level, ** implies significance at the 5% level, * implies significance at the 10% level*

Note: this table contains the results of the test on long-term operational performance grouped by difference in leverage for spun-off and parent entities following a cross-industry spin-off. Columns (1) through (3) show change for the full sample, (4) through (6) for leverage-diversified spin-offs, and (7) through (9) for leverage-aligned spin-offs.

The results presented in Table 15 do not reveal any significant mean unadjusted changes in operational performance. However, significant results are obtained for cross-industry spin-offs with diversified leverage, indicating a negative adjusted change in ROA, and for cross-industry spin-offs with aligned leverage, indicating a negative adjusted change in ROE, contradicting our expectations.

Table 16. Unadjusted and Adjusted Change in Operational Performance in Relation to Intra-industry Spin-off when the Spun-off Entity has Different Leverage to Parent

	Intra-industry				Leverage-diversified				Leverage-aligned			
	[-1,0]	[0,1]	[1,2]	[2,3]	[-1,0]	[0,1]	[1,2]	[2,3]	[-1,0]	[0,1]	[1,2]	[2,3]
Panel A: Unadjusted Change in ROA												
Mean	0.01031**	-0.00013	-0.00110	-0.00231	0.01231*	-0.00186	0.00620	-0.00399	0.00862	0.00132	-0.00725	-0.00089
p-value	(0.031)	(0.982)	(0.821)	(0.578)	(0.072)	(0.872)	(0.499)	(0.599)	(0.203)	(0.810)	(0.116)	(0.837)
Winsorized mean	0.01105***	-0.00105	-0.00308	-0.00101	0.01277**	-0.00442	0.00151	0.00143	0.00961	0.00179	-0.00694	-0.00080
p-value	(0.009)	(0.807)	(0.436)	(0.758)	(0.020)	(0.545)	(0.826)	(0.808)	(0.134)	(0.726)	(0.122)	(0.851)
N	70	70	70	70	32	32	32	32	38	38	38	38
Panel B: Adjusted Change in ROA												
Mean	0.00842	-0.02324	0.01180*	-0.00411	0.00881	-0.02027	-0.18092**	0.00900	0.00810	-0.02574	-2.00576	-0.01515
p-value	(0.112)	(0.106)	(0.091)	(0.857)	(0.171)	(0.413)	(0.015)	(0.830)	(0.325)	(0.126)	(0.342)	(0.519)
Winsorized mean	0.00927**	-0.03254***	0.01225*	-0.01260	0.00902	-0.03079**	0.01979*	-0.00127	0.00948	-0.03402**	0.00590	-0.02442
p-value	(0.046)	(<.001)	(0.061)	(0.38)	(0.140)	(0.022)	(0.065)	(0.947)	(0.173)	(0.010)	(0.464)	(0.210)
N	70	70	70	70	32	32	32	32	38	38	38	38
Panel C: Unadjusted Change in ROE												
Mean	-0.27085	-0.21533	0.57196	-0.19296	-0.59912	-0.53720	1.26612	-0.39366	0.00559	0.05572	-0.01260	-0.02395
p-value	(0.393)	(0.749)	(0.315)	(0.267)	(0.391)	(0.719)	(0.313)	(0.300)	(0.890)	(0.152)	(0.679)	(0.617)
Winsorized mean	-0.02417	0.08855***	-0.01802	-0.06181**	-0.05116	0.12692**	-0.01942	-0.09134**	-0.00144	0.05624*	-0.01684	-0.03694
p-value	(0.361)	(0.003)	(0.444)	(0.023)	(0.273)	(0.016)	(0.639)	(0.033)	(0.961)	(0.100)	(0.528)	(0.291)
N	70	70	70	70	32	32	32	32	38	38	38	38
Panel D: Adjusted Change in ROE												
Mean	-0.18736	0.09437	0.59520	-0.73790	-0.35359	0.08965	1.28639	-1.62016	-0.04738	0.09834	0.01314	0.00505
p-value	(0.578)	(0.914)	(0.297)	(0.219)	(0.632)	(0.963)	(0.307)	(0.219)	(0.544)	(0.122)	(0.680)	(0.936)
Winsorized mean	-0.09453**	0.12664**	-0.09861***	-0.00590	-0.09563	0.16561*	-0.10555***	-0.00915	-0.09360*	0.09383	-0.09277**	-0.00316
p-value	(0.028)	(0.014)	(<.001)	(0.897)	(0.207)	(0.063)	(0.010)	(0.900)	(0.053)	(0.114)	(0.012)	(0.958)
N	70	70	70	70	32	32	32	32	38	38	38	38

**** implies significance at the 1% level, ** implies significance at the 5% level, * implies significance at the 10% level*

Note: this table contains the results of the test on long-term operational performance grouped by difference in leverage for spun-off and parent entities following an intra-industry spin-off. Columns (1) through (3) show change for the full sample, (4) through (6) for leverage-diversified spin-offs, and (7) through (9) for leverage-aligned spin-offs.

The results related to the change in operating performance of intra-industry spin-offs classified as either leverage-diversified or leverage-aligned are found in Table 16. Due to the lack of significant results, this test showed no correspondence of leverage ratio and change in

operating performance for intra-industry spin-offs. We found significant results solely in the leverage-diversified firms experiencing long-term negative unadjusted change in ROE and because of this, we cannot accept any of our hypotheses.

Table 17. Summary of Predictions and Results (2)

	Unadjusted Change in ROA		Adjusted Change in ROA	
	Cross-industry	Intra-industry	Cross-industry	Intra-industry
Subsidiary	N/A	N/A	N/A	N/A
Parent	N/A	N/A	N/A	N/A
Combined Firm	+ (n.s)	+ / - (n.s)	+ (–)	+ / - (n.s)
	Unadjusted Change in ROA		Adjusted Change in ROA	
	Leverage-diversified	Leverage-aligned	Leverage-diversified	Leverage-aligned
Subsidiary	N/A	N/A	N/A	N/A
Parent	N/A	N/A	N/A	N/A
Combined Firm	+ (n.s)	+ / - (+)	+ (–)	+ / - (n.s)

Note: this table shows the predictions presented as "Change in operating performance" in 2.3.1 and 2.3.2 with the corresponding winsorized test results in parentheses. N/A denotes no prediction, (+) denotes a positive change, (–) denotes a negative change, and (n.s) denotes insignificant results.

Table 18. Summary of Predictions and Results (3)

	Unadjusted Change in ROE		Adjusted Change in ROE	
	Cross-industry	Intra-industry	Cross-industry	Intra-industry
Subsidiary	N/A	N/A	N/A	N/A
Parent	N/A	N/A	N/A	N/A
Combined Firm	+ (n.s)	+ / - (–)	+ (–)	+ / - (–)
	Unadjusted Change in ROE		Adjusted Change in ROE	
	Leverage-diversified	Leverage-aligned	Leverage-diversified	Leverage-aligned
Subsidiary	N/A	N/A	N/A	N/A
Parent	N/A	N/A	N/A	N/A
Combined Firm	+ (n.s)	+ / - (n.s)	+ (–)	+ / - (–)

Note: this table shows the predictions presented as "Change in operating performance" in 2.3.1 and 2.3.2 with the corresponding winsorized test results in parentheses. N/A denotes no prediction, (+) denotes a positive change, (–) denotes a negative change, and (n.s) denotes insignificant results.

Table 19. Summary of Predictions and Results (4)

	Unadjusted Change in ROA				Unadjusted Change in ROE			
	Cross-industry		Intra-industry		Cross-industry		Intra-indsutry	
	Leverage-diversified	Leverage-aligned	Leverage-diversified	Leverage-aligned	Leverage-diversified	Leverage-aligned	Leverage-diversified	Leverage-aligned
Subsidiary	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Parent	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Combined Firm	++ (n.s)	+ (n.s)	+ (n.s)	– (n.s)	++ (n.s)	+ (n.s)	+ (–)	– (n.s)
	Adjusted Change in ROA				Adjusted Change in ROE			
	Cross-industry		Intra-indsutry		Cross-industry		Intra-indsutry	
	Leverage-diversified	Leverage-aligned	Leverage-diversified	Leverage-aligned	Leverage-diversified	Leverage-aligned	Leverage-diversified	Leverage-aligned
Subsidiary	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Parent	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Combined Firm	++ (–)	+ (n.s)	+ (n.s)	– (n.s)	++ (n.s)	+ (–)	+ (n.s)	– (n.s)

Note: this table shows the predictions presented as "Change in operating performance" in 2.3.1 and 2.3.2 with the corresponding winsorized test results in parentheses. N/A denotes no prediction, (+) denotes a positive change, (–) denotes a negative change, and (n.s) denotes insignificant results.

6. Discussion

Our analysis of the findings from the previous section reveals significant correlations between spin-off transactions and the creation and destruction of value. From the stock market perspective, spun-off entities generate significant abnormal returns during their first year of independence, while their parents exhibit significantly negative abnormal returns in the second and third years. The positive abnormal returns of the spun-off entities primarily stem from cross-industry, leverage-aligned, and, more specifically, leverage-aligned cross-industry spin-offs. The significant abnormal negative returns in parent companies are largely associated with intra-industry, leverage-diversified, and more specifically, cross-industry leverage-diversified and intra-industry leverage-diversified spin-offs.

In contradiction to the long-term abnormal returns observed in previous studies (Feng et al., 2015; Desai & Jain, 1999; Cusatis et al., 1993), we only observe positive abnormal returns for the spun-off entities in the initial year whilst parents experience negative abnormal returns in the second and third years. As the abnormal returns of spun-off entities only appear significant during the first year, this may be attributed to Krishnaswami & Subramanium's (1999) findings, which propose that the decreased information asymmetry between management and capital markets following spin-offs leads to a reduction in the diversification discount identified by Berger & Ofek (1995). If this is the case, our findings align with Daley et al. (1997), who report significant abnormal returns on the announcement day. Regardless, the observation of spun-off entities supports the corporate focus hypothesis in the short term as the generated abnormal return is attributed to the cross-industry spin-offs. In the long-term, the cross-industry parents exhibit relatively less negative returns than the intra-industry parents, which further supports the corporate focus hypothesis.

The considerable divergence between our findings and the previously reported abnormal returns of spin-off entities could be attributed to the difference in the sample time frame. Our thesis incorporates more recent spin-off transactions compared to the earlier referenced research. The negative abnormal returns we observe may be attributed to shifts in the underlying reasons why a company initiates a spin-off. Berger & Ofek (1995) noted that spin-offs during the 1980s were primarily conducted as a reaction to the extensive diversification programs of the 1950s and 1960s. In contrast, Deloitte (2022) suggests that

spin-offs are now more commonly seen in struggling companies, thus, implying the development of an endogenous issue over time.

Similarly to Veld and Veld-Merkoulova (2008), we find no general evidence supporting the optimal leverage hypothesis. Instead, our findings indicate a negative correlation between leverage-diversified spin-offs and long-term stock performance. A plausible explanation for why leverage-diversified spin-off parents generate negative returns might stem from scenarios where parent companies spin-off subsidiaries with lesser leverage requirements. This would inevitably cause the parent company's leverage ratio to increase, which could be viewed unfavorably by the capital market. Investors often perceive high leverage as a sign that a company relies on debt to finance its operations, thereby escalating the risk of default. As the company's financial risk heightens, investors might require higher returns to offset this increased risk, potentially leading to a decline in the parent company's stock price. This situation could also impact the company's credit rating, making it more difficult to secure loans in the future. Such financial constraints could lead to additional operational challenges, further contributing to the company's underperformance in the long term.

An interesting observation is that the significant negative returns of leverage-aligned spin-off parents are solely attributable to leverage-aligned intra-industry spin-offs. Given that both leverage-aligned and intra-industry spin-offs can serve as indicators for businesses similar to, or forming part of, the parent company's core operations, this outcome suggests that spin-offs too similar to the parent company can result in negative stock market performance. This aligns with the corporate focus hypothesis. However, if we follow this line of reasoning, the opposite should hold true as well. Leverage-diversified cross-industry spin-offs, representing the most dissimilar business needs to the core business, would be expected to create the most value. However, this is not the case, as we find that leverage-aligned cross-industry spin-off parents perform the best. This suggests that either a combination of dissimilarities and similarities is optimal or, in accordance with the corporate focus hypothesis, the difference in leverage is a poor indicator of non-core business segments.

From an operational perspective, combined post-spin-off firms significantly decrease ROA during their first two years while ROE exhibits a significant rise during the [0, 1] period with significantly decreasing ROE in [-1, 0] and [1, 2] periods. Although the changes in ROA and ROE do not notably differ depending on whether the spin-off occurred intra-industry or

cross-industry, our findings indicate that leverage-diversified spin-offs play a substantial role in driving both the significant positive and negative shifts in ROA and ROE.

Our findings reveal that non-focus-increasing spin-offs exhibit less feeble adjusted development of ROA than focus-increasing spin-offs, while the tests on unadjusted change in ROA turned out insignificant. According to the corporate focus hypothesis, separating non-core business divisions, where cross-industry spin-offs represent non-core business, allows for appointing suitable managers more proficient in handling the non-core operations. As intra-industry spin-offs do not benefit in such a way, the hypothesis suggests that cross-industry spin-offs should outperform intra-industry spin-offs. Based on this line of reasoning, to explain our contradicting results of the corporate focus hypothesis, the cross-industry spin-offs might have experienced difficulties in recruitment, and/or the time required for new management to adapt is longer than our observed timespan.

The absence of statistically significant long-term positive unadjusted development in ROA, combined with the long-term negative adjusted change in ROA, suggests that the observed entities perform worse performance than their industry peers. A potential reason for this could be the previously discussed endogeneity concern, implying that modern spin-offs may be more likely to be associated with inherently underperforming parent firms. Another interpretation is that the influence of non-recurring restructuring costs associated with the spin-off may contribute to the decrease in ROA. However, if this effect is significant, it would be expected that a subsequent reactive and significant increase in ROA would follow in the subsequent years.

We observe significant negative changes in adjusted ROA and ROE across cross-industry and leverage-diversified spin-offs, which challenges the ideas of the optimal leverage and corporate focus hypotheses. However, when examining intra-industry and leverage-aligned samples, there is a distinction. In these cases, ROA shows insignificant changes, while ROE reveals significantly negative outcomes. As ROE complements ROA to accommodate the high-leverage business models, such as financial firms, we infer the possibility that non-high-leverage business models are less negatively impacted by intra-industry and leverage-aligned spin-offs. This implies notable differences in how performance is affected based on the industries involved in the spin-off transaction.

Time is an important component in understanding value creation in spin-offs. The corporate focus hypothesis suggests that a new management team will be appointed with a heightened focus on improving the operations of the spin-off subsidiary. On the other hand, the optimal leverage hypothesis posits that the spun-off subsidiary will adjust to a new optimal leverage level, leading to increased investment efficiency and, subsequently, improved operational performance. Suggestively, time is an essential factor in these hypotheses. In this thesis, the performance of the spin-off is analyzed during the three years following the spin-off. This decision was primarily based on the precedent set by prior studies, but it also stems from concerns that the longer the observation period, the greater the number of factors that may influence performance. Nevertheless, it would be intriguing to explore the possibility of extending the time horizon of observation to shed light on whether different results emerge over a longer duration and contribute to a deeper understanding of spin-off value creation.

7. Conclusion

In this thesis, we aimed to answer the research question, “How do corporate spin-offs create value?”. To answer this question, we approached value creation from two perspectives: operational and stock market performance. However, our results present a complex picture conflicting with prior literature. We observe stock market value creation in the short term for spun-off entities while observing abnormally negative returns for parent companies in the long term following spin-off transactions. From an operational perspective, our findings reveal negative impacts on performance. To further understand how spin-offs create value, we performed replication tests on the corporate focus hypothesis and developed a methodology for testing the optimal leverage hypothesis to explain prior findings from the corporate focus hypothesis. Nevertheless, our results support the corporate focus hypothesis only in stock market performance, where cross-industry spun-off entities display marginally higher abnormal returns than intra-industry spin-offs. While the parent companies exhibit significant abnormal negative returns, the cross-industry sample exhibits a relatively decreased negative return.

We found no evidence supporting the optimal leverage hypothesis; rather, our results contradict its prediction, implying that spun-off entities with lesser leverage differences from their parents perform better in terms of stock market performance. Consequently, we found no evidence that the optimal leverage hypothesis could explain the findings of the corporate focus hypothesis tests. Instead, we observed that leverage-diversified spin-off transactions

negatively impacted cross- and intra-industry samples. This further implies that leverage-aligned spin-off transactions create or retain more value than leverage-diversified spin-offs.

In conclusion, given that we could not identify a general explanation for how spin-offs create value, we acknowledge the limitations of our research in capturing all potential aspects of value creation a spin-off can offer. Our conflicting results suggest that this is a multilayered question.

8. Further Research

The combination of the presentation of contradicting findings to previous research and the introduction of a new methodology to further test the optimal leverage hypothesis contributes to the existing knowledge base in the field of corporate spin-offs. The discrepancies found compared to earlier literature are likely due to a shift in the motivations behind conducting spin-off transactions in recent years. Consequently, exploring the reasons behind performing spin-offs and their relation to the performance would be an intriguing area for future investigation. In relation to this, when we observed each year's total distribution value of spin-offs, as presented in Table 5, an increase in average distribution value for the years 2000, 2007, 2008, and 2013 revealed itself. Notably, three out of these four years are typically linked with periods of macroeconomic downturn.

We acknowledge that our developed methodology has inherent limitations that could be addressed in future research. For instance, our approach assumes that spun-off subsidiaries strive to achieve optimal leverage after separating from their parent company. However, we do not provide a clear definition of what constitutes optimal leverage, thus leaving us unable to confirm whether a spun-off entity has attained this goal. In this way, future research could refine our model to test the optimal leverage hypothesis more effectively. Lastly, expanding the duration of the observed timeframe could add nuance to the implications of the corporate focus and optimal leverage hypotheses. While there are many factors driving value creation left unexplored, it is our aspiration that this thesis can provide the substantive groundwork for further research into how spin-offs create value.

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10. Appendices

Appendix A: Definitions

- **Abnormal Compound Annual Growth Rate (ACAGR)**
  - The excess return of a firm entity compared to the S&P500 benchmark index for the observed time interval. Equation:

    $ACAGR = CAGR_{i,t} - CAGR_{m,t}$

    where $CAGR_{i,t}$ denotes the CAGR of entity *i* in the time interval *t* and $CAGR_{m,t}$ the CAGR of the market *m* in the time interval *t.*
- **Closing date**
  - The date on which shares of the spun-off entity are distributed to the shareholders of the parent entity and the spin-off transaction is finalized.
- **Cross-industry spin-off**
  - A spin-off where the parent and subsidiary have different Fama-French 48 Industry Classification after the spin-off is finalized. Can be used interchangeably with *focus-increase spin-offs.*
- **Distribution value**
  - The value of the common stock of the subsidiary distributed by the parent company in relation to the spin-off.
- **Fama French 48 Industry classification**
  - A method of classifying a firm's primary industry of operations into one of 48 industries, developed by French, R. Kenneth, and Fama, Eugene.
- **Intra-industry spin-off**
  - A spin-off where the parent and subsidiary have the same Fama-French 48 Industry Classification after the spin-off is finalized. Can be used interchangeably with *non-focus-increase spin-offs.*
- **Leverage-aligned**
  - Subsidiaries and parents with a small difference in leverage ratio.
- **Leverage-diversified**
  - Subsidiaries and parents with a large difference in leverage ratio.
- **Leverage ratio**

- A financial ratio describing a firm's level of debt compared to its assets. Equation: $LR_{i,t} = \frac{Total\ Debt_{i,t}}{Total\ Assets_{i,t}}$

  where $LR_{i,t}$ denotes the leverage ratio of entity *i* in the time interval *t*.

- **Parent entity**
  - The combined firm that executes the spin-off.
- **Return on Assets (ROA)**
  - A financial ratio describing how profitable a company is in relation to its assets. Equation:

    $ROA_{i,t} = \frac{Operating\ Income_{i,t}}{Total\ Assets_{i,t}}$

    where $ROA_{i,t}$ denotes the return on assets of entity *i* in the time interval *t*.
- **Return on Equity (ROE)**
  - A financial ratio describing how profitable a company is in relation to its equity. Equation:

    $ROE_{i,t} = \frac{Net\ Income_{i,t}}{Total\ Equity_{i,t}}$

    where $ROE_{i,t}$ denotes the return on equity of entity *i* in the time interval *t*.
- **Standard Industry Classification (SIC) code**
  - A six-digit code defining a firm's primary industry of operations.
- **Spin-off**
  - In a Spin-Off, the parent company distributes a certain number of subsidiary shares to each of its existing shareholders.
- **Spin-off entity**
  - The subsidiary spun off by the parent firm into a newly established firm of which shares are distributed to the current shareholders.

Appendix B: Dataset

Subsidiary	Parent	Closing date	Cross- or intra-industry
Baudax Bio, Inc.	Societal CDMO, Inc.	2019-11-21	Intra-industry
Ashford Inc.	Ashford Hospitality Trust, Inc.	2019-11-05	Intra-industry
The Pennant Group, Inc.	The Ensign Group, Inc.	2019-10-01	Intra-industry
IAA, Inc.	KAR Auction Services, Inc.	2019-06-28	Cross-industry

Subsidiary	Parent	Closing date	Cross- or intra-industry
Corteva, Inc.	DuPont de Nemours, Inc.	2019-06-01	Cross-industry
Kontoor Brands, Inc.	V.F. Corporation	2019-05-22	Intra-industry
Cyclerion Therapeutics, Inc.	Ironwood Pharmaceuticals, Inc.	2019-04-01	Intra-industry
Dow Inc.	DuPont de Nemours, Inc.	2019-04-01	Cross-industry
Livent Corporation	FMC Corporation	2019-03-01	Intra-industry
Arlo Technologies, Inc.	NETGEAR, Inc.	2018-12-31	Intra-industry
Newmark Group, Inc.	BGC Partners, Inc.	2018-11-30	Cross-industry
AgeX Therapeutics, Inc.	Lineage Cell Therapeutics, Inc.	2018-11-28	Intra-industry
Equitrans Midstream Corporation	EQT Corporation	2018-11-12	Intra-industry
Arcosa, Inc.	Trinity Industries, Inc.	2018-11-01	Cross-industry
Resideo Technologies, Inc.	Honeywell International Inc.	2018-10-29	Cross-industry
Garrett Motion Inc.	Honeywell International Inc.	2018-10-01	Cross-industry
Retail Value Inc.	SITE Centers Corp.	2018-07-01	Intra-industry
Veoneer, Inc.	Autoliv, Inc.	2018-06-29	Intra-industry
Wyndham Hotels & Resorts, Inc.	Travel + Leisure Co.	2018-05-31	Cross-industry
ChampionX Corporation	Dover Corporation	2018-05-08	Intra-industry
Rafael Holdings, Inc.	IDT Corporation	2018-03-26	Cross-industry
Red Violet, Inc.	Fluent, Inc.	2018-03-26	Intra-industry
CONSOL Energy Inc.	CNX Resources Corporation	2017-11-28	Cross-industry
Granite Point Mortgage Trust Inc.	Two Harbors Investment Corp.	2017-11-01	Intra-industry
Black Knight, Inc.	Fidelity National Financial, Inc.	2017-09-29	Cross-industry
Hamilton Beach Brands Holding Company	NACCO Industries, Inc.	2017-09-29	Cross-industry
Brighthouse Financial, Inc.	MetLife, Inc.	2017-08-04	Intra-industry
JBG SMITH Properties	Vornado Realty Trust	2017-07-17	Intra-industry
SEACOR Marine Holdings Inc.	SEACOR Holdings Inc.	2017-06-01	Intra-industry
Cars.com Inc.	TEGNA Inc.	2017-05-31	Cross-industry
Valvoline Inc.	Ashland Inc.	2017-05-12	Cross-industry
Varex Imaging Corporation	Varian Medical Systems, Inc.	2017-01-28	Intra-industry
Hilton Grand Vacations Inc.	Hilton Worldwide Holdings Inc.	2017-01-03	Cross-industry
Park Hotels & Resorts Inc.	Hilton Worldwide Holdings Inc.	2017-01-03	Cross-industry
Conduent Incorporated	Xerox Holdings Corporation	2016-12-30	Cross-industry

Subsidiary	Parent	Closing date	Cross- or intra-industry
Lamb Weston Holdings, Inc.	Conagra Brands, Inc.	2016-11-09	Intra-industry
Yum China Holdings, Inc.	Yum! Brands, Inc.	2016-10-31	Intra-industry
Alcoa Corporation	Alcoa Inc.	2016-10-27	Cross-industry
Versum Materials, Inc.	Air Products and Chemicals, Inc.	2016-10-03	Intra-industry
AdvanSix Inc.	Honeywell International Inc.	2016-10-01	Cross-industry
Aptevo Therapeutics Inc.	Emergent BioSolutions Inc.	2016-08-01	Intra-industry
Fortive Corporation	Danaher Corporation	2016-07-02	Intra-industry
Zedge, Inc.	IDT Corporation	2016-06-01	Cross-industry
Ingevity Corporation	WestRock Company	2016-05-15	Cross-industry
Welbilt, Inc.	The Manitowoc Company, Inc.	2016-03-04	Intra-industry
OncoCyte Corporation	Lineage Cell Therapeutics, Inc.	2015-12-31	Intra-industry
The RMR Group Inc.	Office Properties Income Trust	2015-12-14	Cross-industry
The RMR Group Inc.	Service Properties Trust	2015-12-14	Cross-industry
Four Corners Property Trust, Inc.	Darden Restaurants, Inc.	2015-11-09	Cross-industry
Exterran Corporation	Archrock, Inc.	2015-11-03	Cross-industry
Hewlett Packard Enterprise Company	HP Inc.	2015-11-01	Intra-industry
CSW Industrials, Inc.	Capital Southwest Corporation	2015-10-01	Cross-industry
Madison Square Garden Sports Corp.	MSG Networks Inc.	2015-09-30	Cross-industry
SPX FLOW, Inc.	SPX Technologies, Inc.	2015-09-26	Intra-industry
Barnes & Noble Education, Inc.	Barnes & Noble, Inc.	2015-08-02	Intra-industry
Lumentum Holdings Inc.	Viavi Solutions Inc.	2015-08-01	Intra-industry
PayPal Holdings, Inc.	eBay Inc.	2015-07-17	Intra-industry
Cable One, Inc.	Graham Holdings Company	2015-07-01	Cross-industry
Energizer Holdings, Inc.	Edgewell Personal Care Company	2015-07-01	Cross-industry
Babcock & Wilcox Enterprises, Inc.	BWX Technologies, Inc.	2015-06-30	Intra-industry
Horizon Global Corporation	TriMas Corporation	2015-06-30	Cross-industry
TopBuild Corp.	Masco Corporation	2015-06-30	Cross-industry
Xenia Hotels & Resorts, Inc.	InvenTrust Properties Corp.	2015-02-03	Intra-industry
Patriot Transportation Holding, Inc.	FRP Holdings, Inc.	2015-01-30	Cross-industry
Urban Edge Properties	Vornado Realty Trust	2015-01-15	Intra-industry
Ashford Inc.	Ashford Hospitality Trust, Inc.	2014-11-12	Intra-industry

Subsidiary	Parent	Closing date	Cross- or intra-industry
Keysight Technologies, Inc.	Agilent Technologies, Inc.	2014-11-03	Intra-industry
Avanos Medical, Inc.	Kimberly-Clark Corporation	2014-10-31	Cross-industry
Kimball Electronics, Inc.	Kimball International, Inc.	2014-10-31	Cross-industry
Liberty TripAdvisor Holdings, Inc.	Qurate Retail, Inc.	2014-08-27	Cross-industry
TimkenSteel Corporation	The Timken Company	2014-06-30	Cross-industry
Rayonier Advanced Materials Inc.	Rayonier Inc.	2014-06-27	Cross-industry
CareTrust REIT, Inc.	The Ensign Group, Inc.	2014-06-01	Cross-industry
NOW Inc.	NOV Inc.	2014-05-30	Cross-industry
Navient Corporation	SLM Corporation	2014-04-30	Intra-industry
Knowles Corporation	Dover Corporation	2014-02-28	Cross-industry
ONE Gas, Inc.	ONEOK, Inc.	2014-01-31	Intra-industry
Braemar Hotels & Resorts Inc.	Ashford Hospitality Trust, Inc.	2013-11-19	Intra-industry
Gaming and Leisure Properties, Inc.	PENN Entertainment, Inc.	2013-11-01	Cross-industry
Science Applications International Corporation	Leidos Holdings, Inc.	2013-09-27	Intra-industry
Straight Path Communications Inc.	IDT Corporation	2013-07-25	Intra-industry
CST Brands, Inc.	Valero Energy Corporation	2013-05-01	Cross-industry
Silver Bay Realty Trust Corp.	Two Harbors Investment Corp.	2013-04-24	Intra-industry
AbbVie Inc.	Abbott Laboratories	2013-01-02	Cross-industry
Front Yard Residential Corporation	Altisource Portfolio Solutions S.A.	2012-12-21	Cross-industry
MEI Pharma, Inc.	Kazia Therapeutics Limited	2012-12-03	Intra-industry
Hyster-Yale Materials Handling, Inc.	NACCO Industries, Inc.	2012-09-28	Cross-industry
Alexander & Baldwin, Inc.	Matson, Inc.	2012-06-29	Cross-industry
Phillips 66	ConocoPhillips	2012-05-01	Intra-industry
Fiesta Restaurant Group, Inc.	Carrols Restaurant Group, Inc.	2012-04-26	Intra-industry
WPX Energy, Inc.	The Williams Companies, Inc.	2011-12-31	Cross-industry
Tripadvisor, Inc.	Expedia Group, Inc.	2011-12-20	Cross-industry
Marriott Vacations Worldwide Corporation	Marriott International, Inc.	2011-11-21	Intra-industry
Exelis Inc.	ITT Inc.	2011-10-31	Cross-industry
Xylem Inc.	ITT Inc.	2011-10-31	Intra-industry
Genie Energy Ltd.	IDT Corporation	2011-10-28	Cross-industry
AMC Networks Inc.	Altice USA, Inc.	2011-06-30	Intra-industry

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Marathon Petroleum Corporation	Marathon Oil Corporation	2011-06-30	Intra-industry
Huntington Ingalls Industries, Inc.	Northrop Grumman Corporation	2011-03-31	Cross-industry
Vishay Precision Group, Inc.	Vishay Intertechnology, Inc.	2010-07-06	Intra-industry
MSG Networks Inc.	Altice USA, Inc.	2010-02-09	Intra-industry
IDW Media Holdings, Inc.	IDT Corporation	2009-09-15	Cross-industry
CareFusion Corporation	Cardinal Health, Inc.	2009-09-01	Cross-industry
Aviat Networks, Inc.	L3Harris Technologies, Inc.	2009-05-27	Intra-industry
Clearwater Paper Corporation	PotlatchDeltic Corporation	2008-12-05	Cross-industry
LendingTree, Inc.	Match Group, Inc.	2008-08-20	Cross-industry
John Bean Technologies Corporation	FMC Technologies, Inc.	2008-07-31	Intra-industry
Hillenbrand, Inc.	Hill-Rom Holdings, Inc.	2008-03-31	Cross-industry
Philip Morris International Inc.	Altria Group, Inc.	2008-03-28	Intra-industry
EchoStar Corporation	DISH Network Corporation	2008-01-02	Intra-industry
Zep, Inc.	Acuity Brands, Inc.	2007-10-31	Cross-industry
Teradata Corporation	NCR Corporation	2007-09-30	Intra-industry
PharMerica Corporation	AmerisourceBergen Corporation	2007-08-01	Intra-industry
Discover Financial Services	Morgan Stanley	2007-07-02	Cross-industry
Broadridge Financial Solutions, Inc.	Automatic Data Processing, Inc.	2007-03-30	Cross-industry
Mondelez International, Inc.	Altria Group, Inc.	2007-03-30	Cross-industry
Titanium Metals Corporation	Valhi, Inc.	2007-03-26	Cross-industry
TravelCenters of America Inc.	Service Properties Trust	2007-01-31	Cross-industry
Spectra Energy Corp	Duke Energy Corporation	2007-01-02	Intra-industry
Sally Beauty Holdings, Inc.	Alberto Culver Company	2006-11-16	Cross-industry
Hanesbrands Inc.	The Hillshire Brands Company	2006-09-05	Cross-industry
Travel + Leisure Co.	Avis Budget Group, Inc.	2006-07-31	Cross-industry
Ameriprise Financial, Inc.	American Express Company	2005-09-30	Cross-industry
GSE Systems, Inc.	GP Strategies Corporation	2005-09-30	Cross-industry
Expedia Group, Inc.	Match Group, Inc.	2005-08-09	Cross-industry
Warner Bros. Discovery, Inc.	Qurate Retail, Inc.	2005-07-21	Cross-industry
Neenah, Inc.	Kimberly-Clark Corporation	2004-11-30	Intra-industry
GameStop Corp.	Barnes & Noble, Inc.	2004-11-12	Intra-industry

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MoneyGram International, Inc.	Viad Corp	2004-06-30	Cross-industry
Hospira Inc.	Abbott Laboratories	2004-04-30	Cross-industry
Piper Sandler Companies	U.S. Bancorp	2003-12-31	Cross-industry
Kronos Worldwide, Inc.	NL Industries, Inc.	2003-12-08	Cross-industry
Hudson Global, Inc.	Monster Worldwide, Inc.	2003-03-31	Intra-industry
RRI Energy, Inc.	CenterPoint Energy, Inc.	2002-09-30	Intra-industry
Saia, Inc.	Yellow Corporation	2002-09-30	Intra-industry
The Travelers Companies, Inc.	Citigroup Inc.	2002-08-20	Cross-industry
Westwood Holdings Group, Inc.	SWS Group, Inc.	2002-06-28	Intra-industry
EnPro Industries, Inc.	Goodrich Corporation	2002-05-31	Cross-industry
FMC Technologies, Inc.	FMC Corporation	2001-12-31	Cross-industry
Curtiss-Wright Corporation	Kemper Corporation	2001-11-29	Cross-industry
Zimmer Biomet Holdings, Inc.	Bristol-Myers Squibb Company	2001-08-06	Cross-industry
Certegy Inc.	Equifax Inc.	2001-07-07	Intra-industry
Marine Products Corporation	RPC, Inc.	2001-02-28	Cross-industry
Global Payments Inc.	NDCHealth Corp.	2001-01-31	Cross-industry
Axcelis Technologies, Inc.	Eaton Corporation plc	2000-12-29	Cross-industry
eFunds Corporation	Deluxe Corporation	2000-12-29	Cross-industry
Florida East Coast Industries, LLC	The St. Joe Company	2000-10-10	Cross-industry
Agilent Technologies, Inc.	HP Inc.	2000-06-02	Cross-industry
Edwards Lifesciences Corporation	Baxter International Inc.	2000-03-31	Cross-industry
Sabre Holdings Corporation	American Airlines Group Inc.	2000-03-15	Cross-industry
Teledyne Technologies Incorporated	ATI Inc.	1999-11-29	Cross-industry
Diversified Healthcare Trust	Equity Commonwealth	1999-10-12	Intra-industry
OMNOVA Solutions Inc.	Aerojet Rocketdyne Holdings, Inc.	1999-10-01	Cross-industry
Tween Brands, Inc.	Bath & Body Works, Inc.	1999-08-23	Intra-industry
Arch Chemicals, Inc.	Olin Corporation	1999-02-08	Intra-industry
Abercrombie & Fitch Co.	Bath & Body Works, Inc.	1998-06-01	Intra-industry
Innospec Inc.	Great Lakes Chemical Corporation	1998-05-22	Intra-industry
W. R. Grace & Co.	Sealed Air Corporation	1998-03-31	Cross-industry
Yum! Brands, Inc.	PepsiCo, Inc.	1997-10-06	Cross-industry

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Choicepoint, Inc.	Equifax Inc.	1997-08-07	Cross-industry
Starwood Hotels & Resorts Worldwide, LLC	ITT Inc.	1995-12-19	Cross-industry
The Hartford Financial Services Group, Inc.	ITT Inc.	1995-12-19	Cross-industry
Darden Restaurants, Inc.	General Mills, Inc.	1995-05-28	Cross-industry
Capital One Financial Corporation	Signet Banking Corp.	1995-02-28	Intra-industry