UNIVERSIDADE CATÓLICA PORTUGUESA

Value Creation Through Listed Spin-Offs

Portuguese Case Study

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Católica Porto Business School
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Resumo

Esta dissertação explora o potencial de criação de valor dos spin-offs, com foco no caso do spin-off da Greenvolt pela Altri. Os spin-offs, como estratégia de reestruturação corporativa, procuram desbloquear valor para os acionistas ao melhorar o foco da equipa de gestão, reduzir a assimetria de informação e otimizar a alocação de capital. Por meio de uma revisão abrangente da literatura e da aplicação da metodologia de estudo de eventos, esta pesquisa avalia o impacto do spin-off da Greenvolt no valor para os acionistas, utilizando retornos anormais acumulados (CAR) em três modelos estatísticos: o Modelo de Retorno Médio Constante, o Modelo de Mercado e o Modelo Ajustado ao Mercado.

Os resultados demonstram CARs positivos estatisticamente significativos, especialmente em janelas de eventos mais longas, destacando a eficácia dos spin-offs na criação de valor. O caso de estudo salienta a aplicabilidade dessas conclusões no contexto português, e europeu, onde tais estratégias são menos comuns do que nos Estados Unidos. Os resultados enfatizam que os spin-offs, quando alinhados com os objetivos estratégicos e às condições de mercado, são uma ferramenta poderosa para a reestruturação corporativa e para a criação de valor para os acionistas.

Esta investigação contribui para o debate académico ao validar a relevância dos spin-offs em outros mercados e fornece *insights* práticos para os gestores corporativos e os decisores políticos. Além disso, destaca também oportunidades para investigações futuras, particularmente sobre desempenho de longo prazo.

Palavras-chave: spin-off, restruturação empresarial, criação de valor, mercado português, PSI

Abstract

This dissertation explores the potential for value creation through spin-offs, focusing on the case of Greenvolt's spin-off from Altri. Spin-offs, as a corporate restructuring strategy, aim to unlock shareholder value by improving managerial focus, reducing information asymmetry, and optimizing capital allocation. Through a comprehensive literature review and the application of event study methodology, this research evaluates the impact of Greenvolt's spin-off on shareholder value, utilizing cumulative abnormal returns (CAR) across three statistical models: the Constant Mean Return Model, the Market Model, and the Market-Adjusted Model.

The results demonstrate statistically significant positive CARs, particularly in longer event windows, highlighting the effectiveness of spin-offs in value creation. The case study underscores the applicability of these findings in the Portuguese and European contexts, where such strategies are less common compared to the United States. The findings emphasize that spin-offs, when aligned with strategic goals and market conditions, are a powerful tool for corporate restructuring and shareholder value creation.

This research contributes to the academic debate by validating the relevance of spin-offs in different markets and provides practical insights for corporate managers and policymakers. Furthermore, it also highlights opportunities for future research, particularly regarding long-term performance.

Keywords: spin-off, corporate restructuring, value creation, portuguese market, PSI

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List of abbreviations

AI - Artificial Intelligence

CAR - Cumulative Abnormal Return

CMVM - Comissão do Mercado de Valores Mobiliários (Portuguese Securities Market Commission)

EBITDA - Earnings Before Interest, Taxes, Depreciation, and Amortization

ESMA - European Securities and Markets Authority

EU - European Union

GDP - Gross Domestic Product

IPO - Initial Public Offering

KKR - Kohlberg Kravis Roberts & Co.

LLM - Large Language Model

M&A - Mergers and Acquisitions

PSI - Portuguese Stock Index

SEC - Securities and Exchange Commission

US - United States

Introduction

Competitiveness is one of the main hot topics of today's corporate environment, especially in Europe, affecting both individuals, organizations, and even countries. Companies face the need to rapidly change to thrive in a landscape marked by rapid changes and constant challenges. In the last few years, one strategy that has gained prominence in Europe is the corporate spin-offs, which can create new opportunities to increase competitiveness and create shareholder value.

This study addresses value creation through spin-offs in publicly listed companies, exploring the impact these operations may have on market perception. The central research question is: "Can spin-offs create value for shareholders?" This question will be analyzed in the Portuguese specific context of the Greenvolt spin-off by Altri.

To address this question, we will use the event study methodology. Accordingly, we will determine the cumulative abnormal returns (CAR) across three statistical models — the Constant Mean Return Model, the Market Model, and the Market-Adjusted Model — for three different time windows, and evaluate how effective the spin-off was in creating value for Altri's shareholders.

Chapter 1 presents a review of the relevant literature. It begins with an overview of corporate restructuring and the various types of divestitures, focusing on spin-offs. The chapter explores the main motivations and benefits associated with these operations, as well as an analysis of previous studies on the subject, highlighting factors that contribute to value creation.

Chapter 2 contextualizes the companies involved, Altri and Greenvolt, and the event. The analysis includes the characterization of the companies and an event overview of the spin-off and the months that preceded it.

Chapter 3 outlines the methodology adopted, based on the event study approach, which measures abnormal returns associated with the spin-off announcement.

Finally, the dissertation concludes with a discussion of the results obtained, presenting the main findings, and critically evaluating whether the spin-off led to value creation for Altri's shareholders.

1. Literature Review

1.1. Corporate Restructuring and Divestitures

Corporate restructuring includes both growth strategies (such as mergers, acquisitions, and strategic alliances) and exit strategies. These exit strategies, also called divestitures, can take various forms and enable a company to maximize shareholder value by reallocating assets through downsizing or refocusing the parent organization (DePamphilis, 2020). These divestitures are very important and relevant even though not commonly mentioned. According to Deloitte 2024 Global Corporate Divestiture Survey, divestitures in the past six years have made up between 13-17% of the global M&A volume and between 16-22% of the value, with 2021 being an outlier year, were many organizations divested from assets to free up cash after the pandemic slowdown and shuttered business activity.

While some divestitures are driven by financial pressures stemming from high leverage and weak economic demand, most of the volume of divestitures tend to rise with the increases in overall deal activity (Gaughan, 2018). As a result, the volume of divestitures normally mirrors the fluctuations of the economy and the M&A volume.

Another driver for restructuring is when there are drastic changes in the external environment that change the strategic plans of corporations (DePamphilis, 2020). This is especially important in a globalized world marked by constant transformation. We have seen rapid strategic shifts from companies due to new technologies such AI and LLM or electric cars (Hensley et al., 2022). These technologies have been propelling advancements in various fields and increasing dramatically demand in others (e.g. cheap energy). Another reason are the current geopolitical changes (Loeb, 2022), where challenges such as the COVID-19 pandemic, the war in Ukraine, and strained US-China relations have

contributed to significant geopolitical fragmentation. All these changes may lead to a division of a company performing poorly or simply to no longer fit into the firm's strategic plans; because of that, restructuring is necessary to change the strategic plan, to fund companies' new needs or even to undo a previous M&A activity that was unsuccessful.

At last, Gelb et al. (2023) emphasize that institutional long-term investors regard efficient and strategic capital allocation decisions as more important than ever; for this reason, divesting from assets misaligned with a company's strategy is viewed as essential for creating long-term value.

1.2. Types of Divestitures

A divestiture is the sale of a portion of a firm's assets to an external party, such as another company or a buyout fund. The assets sold may include a division, subsidiary, segment, or product line. This transaction typically results in a cash infusion for the parent company, which may be reinvested in the remaining business or distributed to the firm's stakeholders (DePamphilis, 2020) (Eckbo and Thorburn, 2013). These transactions play a central role in corporate finance, allowing firms to sharpen their strategic focus, optimize operational efficiency, and unlock latent value for shareholders (Kengelbach et al. 2021). Among the most common forms of divestitures are sell-offs, carve-outs, split-ups or split-offs, and spin-offs. Each type carries distinct strategic implications and outcomes in terms of corporate restructuring and value creation. In particular, spin-offs have attracted substantial attention due to their ability to potentially deliver significant shareholder returns (Gaughan, 2018, Veld and Veld-Merkoulova, 2008), making them the focal point of this study.

According to DePamphilis (2020), divestitures such as spin-offs, carve-outs, and split-ups or split-offs serve as pivotal mechanisms for corporations to refocus on core competencies and improve operational outcomes. These transactions

allow firms to streamline operations, optimize capital allocation, and unlock value previously trapped in non-core or underperforming business units (Koenig et al., 2021). This section examines the primary types of divestitures, focusing on their strategic rationales and outcomes.

1.2.1. Sell-offs/liquidation

A sell-off is a form of divestiture where a parent firm sells a specific asset or unit to another firm or entity, typically in exchange for cash or securities (Chang and Han, 2023).

This process allows the parent firm to generate liquid assets that can be used to finance working capital or other financial needs. Sell-offs are generally private transactions with limited public disclosure, converting tangible assets into liquid assets (Nixon et al., 2000). Hite et al. (1987) indicate that asset sell-off announcements lead to positive returns for the selling firms. They suggest that these gains are a result of increased efficiency stemming from the reallocation of resources to the acquiring firm's control.

1.2.2. Carve-outs

A carve-out occurs when a parent company sells a minority stake in a subsidiary via an initial public offering (IPO), while retaining majority ownership. Typically, less than 20% of the subsidiary's equity is sold to external investors, transforming the subsidiary into a publicly traded entity while the parent company retains control (Eckbo and Thorburn, 2013). This strategy allows the parent firm to access external capital without relinquishing strategic oversight.

Carve-outs are often pursued when a subsidiary is undervalued, or its growth potential is not fully recognized within the larger corporate structure. By publicly listing the subsidiary, the parent company can highlight its inherent value to the

market, potentially leading to a favorable revaluation of both the parent and the subsidiary. Allen and McConnell (1998) demonstrate that carve-outs are often associated with positive stock price reactions, attributing this to the increased transparency and market focus on the subsidiary's growth prospects. Schipper and Smith (1986) also observed that carve-outs improve market valuations by enhancing the clarity of business operations for both the parent and the subsidiary.

In addition, carve-outs provide strategic flexibility, as the parent company can choose to fully divest its remaining stake in the future, either through a sale or a subsequent spin-off. This option allows the parent firm to gauge market interest in a business unit before committing to a full divestiture. Vijh (2002) highlights that while the short-term market response to carve-outs is typically positive, the long-term success of these transactions depends on the parent company's post-divestiture strategic choices.

1.2.3. Split-offs & Split-ups

A split-off occurs when a parent company offers its shareholders the opportunity to exchange their shares in the parent company for all or a portion of the shares in its subsidiary (DePamphilis, 2020). In this process the subsidiary becomes an independent company, and the parent firm does not receive any new cash from the transaction. While in a spin-off the distribution of shares is on a pro rata basis, in a split-off the shareholders choose whether to participate in the exchange, often leading to a disproportionate shift in ownership structure of the companies (DePamphilis, 2020). Another key difference versus a spin-off is that in a split-off the number of shares outstanding of the parent company are reduced due to the exchange offer and may help to offset the partial reduction of the earnings per share that used to be from the subsidiary (Gaughan, 2018).

A split-up is a form of divestiture where a parent company creates new classes of stocks for each new entity and pays current shareholders a stock dividend. The company then dissolves the remaining corporate shell and goes out of business. This operation typically is composed of a series of spin-offs or split-offs or both. (DePamphilis, 2020) (Gaughan, 2018).

In this type of transaction, shareholders of the original parent company receive proportional shares in the newly created entities, effectively transferring ownership. Split-ups are typically utilized when a company operates across various industries and management believes that each segment could achieve better growth and operational efficiency as an independent entity (Gaughan, 2018). However, due to the complexity and complete dissolution of the parent company, split-ups are less common operation.

1.2.4. Spin-offs

Spin-offs occur when a parent company separates into a subsidiary or division to form an independent, publicly traded entity. Unlike carve-outs, spin-offs do not generate immediate cash flow for the parent company, as no equity is sold. Instead, existing shareholders of the parent firm receive shares in the newly created entity in proportion to their holdings in the parent company, ensuring they retain their ownership stakes across both firms (Eckbo and Thorburn, 2013).

Spin-offs are typically pursued when the divested unit operates in a distinct industry or possesses a business model that warrants independent management. DePamphilis (2020) suggests that spin-offs are particularly effective in unlocking operational synergies by allowing the newly formed entity to benefit from greater managerial autonomy. Furthermore, spin-offs are often tax-free if structured properly, adding to their appeal as a corporate restructuring tool (Schipper and Smith, 1983).

The literature on spin-offs consistently demonstrates that they result in positive abnormal returns for both the parent company and the newly spun-off entity. Cusatis et al. (1993) document significant stock price increases when a company performs a spin-off, which they attribute to factors such as improved managerial focus, optimized capital allocation, and clearer market valuation of the separated business unit. These findings align with earlier research by Hite and Owers (1983), which also found that spin-offs typically lead to favorable market reactions when strategically justified.

Further studies by Desai and Jain (1999) reinforce the conclusion that spin-offs create significant shareholder value, particularly when the parent company and the spun-off entity operate in unrelated industries. The separation allows both firms to pursue focused strategies and optimize their respective operational environments. Moreover, Veld and Veld-Merkoulova (2008) argue that the post-spin-off performance of both the parent and the newly formed entity tends to improve, as management teams can concentrate on their core business activities without the distractions of managing unrelated divisions.

1.2.5. Comparing Divestiture Types

While carve-outs, split-ups, and spin-offs share the overarching goal of enabling companies to refocus their operations, they differ in terms of implementation and strategic outcomes (DePamphilis (2020). Carve-outs provide immediate capital influx while maintaining control over the divested subsidiary, offering a lower-risk option for companies that wish to retain strategic oversight. Split-ups, in contrast, involve the complete dissolution of the parent company, creating multiple independent entities that no longer have ties to the original firm. Spin-offs occupy an intermediate position, creating independent companies while maintaining ownership continuity for existing shareholders. This feature makes spin-offs particularly attractive for firms looking to unlock value without

disrupting their existing ownership structure or incurring significant transaction costs.

Empirical research, such as that by Veld and Veld-Merkoulova (2008), consistently shows that spin-offs generate shareholder value, particularly in the short term driven by enhanced strategic clarity and operational focus, especially when the spin-off aligns with the parent company's broader corporate objectives.

Moreover, studies by Prezas and Simonyan (2015) suggest that spin-offs are often associated with significant improvements in market valuation when announced, but firms selling off assets realize better long-term operating and stock return performance.

1.3. Motivations for Spin-offs

Spin-offs are strategic corporate transactions that involve the separation of a subsidiary or business unit from its parent company, resulting in the creation of an independent, publicly traded entity. The rationale behind these transactions is typically multifaceted, related to focus and specialization, and driven by the desire to unlock shareholder value, improve managerial efficiency, and respond to external market conditions. Understanding the underlying motivations for spin-offs provides critical insight into why firms choose this form of restructuring over other divestiture strategies. This section explores the key drivers of spin-offs, focusing on value creation, managerial incentives, operational efficiency, market pressures, capital structure considerations, and tax efficiency

1.3.1. Enhancing Shareholder Value

One of the primary motivations for spin-offs is the potential to unlock hidden value for shareholders. Companies often operate multiple business units with varying growth prospects, risk profiles, and strategic importance. The presence

of these diverse units within a single corporate structure can lead to a "conglomerate discount", where the market undervalues the parent company due to its complexity and the perceived inefficiencies of managing unrelated business lines (DePamphilis, 2020). By spinning off a subsidiary, each entity can be valued independently, allowing the market to fully appreciate the intrinsic value of both the parent and the spun-off company.

Empirical studies consistently show that spin-offs result in positive abnormal returns for shareholders. Cusatis et al. (1993) found that both the parent and the spun-off entities experience significant stock price appreciation following the announcement of a spin-off, as the market recognizes the value previously obscured by the conglomerate structure. These findings underscore the market's preference for transparency and focused corporate structures, which can lead to a revaluation of both companies (Feldman et al., 2014).

1.3.2. Improving Managerial Focus and Efficiency

A key motivation for spin-offs is the opportunity to enhance managerial focus and operational efficiency. When a company manages multiple business lines, especially those with different strategic objectives, it can be challenging for management to allocate adequate resources and attention to each segment. Spin-offs allow both the parent company and the newly independent entity to concentrate on their respective core businesses, leading to more efficient operations and better strategic execution (Desai and Jain, 1999).

Managerial autonomy is a central factor driving spin-offs, as it enables both the parent and the spun-off entity to pursue clearer strategic objectives. DePamphilis (2020) argues that granting the management team of the spun-off company full control over its operations allows for more effective decision-making and resource allocation. This autonomy often results in enhanced financial performance, as managers can respond more nimbly to industry-

specific challenges and opportunities. Moreover, the separation of businesses typically leads to improved financial transparency, which further drives operational improvements. Gertner et al. (2002) assert that spin-offs mitigate the inefficiencies associated with internal capital markets, forcing both companies to rely on external capital, thereby fostering more disciplined financial management.

1.3.3. Responding to Market Pressures

Spin-offs are frequently undertaken as a response to external market pressures, particularly from activist investors who aim to maximize shareholder returns. Activist investors often target large, diversified firms that are perceived to be undervalued due to their complex structures. These investors may push for spin-offs to simplify the corporate structure and unlock shareholder value (Veld and Veld-Merkoulova, 2008). In such scenarios, spin-offs serve as a tool for management to respond to investor demands and demonstrate a commitment to enhancing shareholder returns (Brav et al., 2015).

In addition to investor activism, changing market conditions or shifts in industry dynamics can motivate spin-offs. For instance, companies operating in declining or highly competitive industries may choose to spin off divisions to focus on higher-growth segments. This realignment allows both entities to pursue distinct growth opportunities and adapt more effectively to evolving market trends. Corsino et al. (2019) suggest that in industries undergoing significant technological change, spin-offs provide the flexibility needed to adapt to new competitive landscapes and foster innovation.

1.3.4. Capital Structure Optimization

While spin-offs do not immediately generate cash for the parent company, they can have significant implications for the firm's capital structure. Companies

may use spin-offs to better manage their debt levels, either by transferring a portion of their debt to the spun-off entity or by restructuring their balance sheets post-spin-off. This can be advantageous for firms seeking to improve their credit ratings or access to capital markets.

DePamphilis (2020) highlights that spin-offs can also help optimize a company's capital structure by separating business units with differing risk profiles. For example, a highly leveraged parent company may spin off a lower-risk division, allowing the new entity to operate with a more conservative capital structure, while the parent firm focuses on riskier, higher-reward activities. This separation can lead to a more efficient allocation of capital, as investors are given the option to invest in the entity that best aligns with their risk tolerance. The resulting capital structure optimization benefits both the parent company and the spun-off entity by aligning their respective financial strategies with their business objectives.

1.3.5. Tax Considerations

Tax efficiency is another critical motivation for spin-offs. Under certain circumstances, spin-offs can be structured as tax-free transactions, provided they meet the criteria set forth by tax authorities. In the United States, for example, Section 355 of the Internal Revenue Code allows for tax-free spin-offs if the transaction serves a legitimate business purpose and is not merely a means of distributing dividends to shareholders. The tax-free nature of spin-offs makes them particularly attractive for companies seeking to restructure without incurring the tax liabilities associated with asset sales or other forms of divestiture (DePamphilis, 2020).

Schipper and Smith (1983) argue that the combination of tax advantages and value creation potential makes spin-offs one of the most efficient forms of corporate restructuring. By avoiding the substantial tax costs that often

accompany traditional divestitures, companies can unlock value for shareholders while preserving capital for reinvestment or growth initiatives.

1.3.6. Managing Agency Conflicts

Spin-offs can also serve as a mechanism to mitigate agency conflicts between management and shareholders. In diversified firms, management may have an incentive to retain underperforming business units to preserve their control or pursue personal objectives, even when divesting these units would maximize shareholder value. Spin-offs reduce such conflicts by allowing each entity to be managed independently, aligning the interests of management with those of shareholders (Desai and Jain, 1999).

Daley et al. (1997) provide evidence that spin-offs can lead to significant improvements in firm value by reducing agency costs. When the management teams of the parent and spun-off companies are held accountable for their respective businesses, they are more likely to make decisions that align with shareholder interests. Moreover, the increased transparency and market scrutiny that accompanies being a publicly traded company further incentivizes managers to maximize performance, ultimately benefiting shareholders.

1.4. Analyzing Value Creation Through Spin-offs

Corporate spin-offs are widely regarded as strategic moves that can generate significant value for shareholders. While the positive effects are often seen in the short term, the long-term value creation drivers are complex and multifaceted. This revaluation stems from increased transparency and autonomy, allowing the market to better assess the value of each standalone company. This section explores how spin-offs generate value, focusing on short-term market reactions, the empirical evidence for abnormal returns, and the drivers of these returns.

Additionally, differences in value creation between the United States and Europe are briefly examined.

1.4.1. Short-term Value Creation

Abnormal returns are a critical measure of value creation in spin-offs. They represent the deviation from expected market returns, adjusted for risk. Empirical studies provide strong evidence of positive abnormal returns, particularly in the short term.

Spin-offs are frequently associated with positive short-term value creation and abnormal returns, particularly around the announcement date. This is evidenced by abnormal returns — returns that exceed the market's expected returns — reflecting the market's optimistic expectations regarding the benefits of separating the parent company from its subsidiary or division.

Studies consistently demonstrate that both the parent company and the spun-off entity experience significant gains. Miles and Rosenfeld (1983) show that voluntary spin-offs result in an average 3% excess return for parent companies. Gaughan (2018) mentions that the average abnormal return from spin-offs is 3.3%. In the Veld and Veld-Merkoulova (2008) literature review, the authors found positive abnormal returns ranging from 0.77% to 5.27%; these values are derived from a large number of research studies over the period of 1962-2007.

Hite and Owers (1983) similarly report stock price increases for both entities post-announcement, attributing these gains to improved investor perceptions of each company's prospects. Spin-offs allow for enhanced managerial focus and operational efficiency, factors that the market recognizes as beneficial (Cusatis et al., 1993). Furthermore, the restructuring aligns managerial incentives, resulting in more efficient decision-making (Desai and Jain, 1999). Hite and Owers (1983) also note that spin-offs are especially value-creating when the parent company

and spun-off entity operate in unrelated industries, reducing inefficiencies from managing diversified business lines.

De Vroom and Van Frederikslust (1999) also studied spin-offs abnormal returns across geographies and reported positive cumulative abnormal returns of 2.6%. The authors also found evidence that spin-offs in English speaking countries provided higher results than spin-offs in other markets.

1.4.2. Reasons Behind Abnormal Returns

The drivers behind abnormal returns in spin-offs are varied, but several key factors consistently emerge in the literature:

1.4.2.1. Managerial Focus

Spin-offs often lead to more focused management, which is a critical driver of value creation. When a company operates across multiple, unrelated business lines, management may struggle to allocate sufficient resources or attention to each unit, leading to suboptimal outcomes. Spin-offs allow management teams to focus exclusively on their respective businesses, improving strategic execution and operational efficiency (Desai and Jain, 1999). Daley et al. (1997) provide empirical support for this, showing that spin-offs of unrelated divisions lead to significant gains in shareholder value.

1.4.2.2. Reduction of Information Asymmetry

Spin-offs reduce the information asymmetry that can exist between a company and its shareholders. Before a spin-off, the consolidated financial statements of the parent company can obscure the true performance of individual business units. By separating into a subsidiary, both companies' financials become more transparent, allowing investors to make more informed assessments of their value (Schipper and Smith, 1983). Gertner et al. (2002) argue that this increased

transparency forces more disciplined financial management, as both the parent and spun-off entities must rely on external capital markets.

1.4.2.3. Improved Capital Allocation

Spin-offs also enhance capital allocation. In a diversified company, resources may be allocated inefficiently across divisions. The separation grants each company autonomy over its capital allocation decisions, leading to a more efficient use of resources (DePamphilis, 2020). Veld and Veld-Merkoulova (2008) emphasize that spin-offs enable both entities to pursue distinct growth strategies, unconstrained by the broader corporate structure, which is often viewed positively by the market.

1.4.2.4. Tax Efficiency

Tax considerations can further drive value creation. In many jurisdictions, spin-offs can be structured as tax-free transactions if certain criteria are met. The tax-efficient nature of spin-offs ensures that value is preserved for shareholders, contributing to a positive market response, while non-taxable spin-offs tend to yield significantly greater positive abnormal returns compared to their taxable counterparts (Copeland and Weston, 1988) (Krishnaswami and Subramaniam, 1999).

1.4.3. Long-term vs. Short-term Performance

While short-term value creation in spin-offs is well-documented, long-term performance is less conclusive. Studies such as those by Cusatis et al. (1993) suggest that spin-offs can continue to outperform the market in the years following the transaction. However, Desai and Jain (1999) find that long-term success is more variable, depending on industry dynamics, management execution, and market conditions. While the short-term benefits — particularly

through abnormal returns — are clear, long-term performance is more challenging and subject to a wider range of factors.

In sum, while short-term value creation through abnormal returns is a common outcome of spin-offs, long-term performance is more difficult to generalize, due to the fact that there are more variables that can influence value creation.

1.4.4. Differences Between the US and Europe

While spin-offs are common in both the United States and Europe, regional differences exist in terms of frequency (Veld and Veld-Merkoulova, 2008) (De Vroom and Van Frederikslust, 1999) and value, as it can be seen in Figure 1.

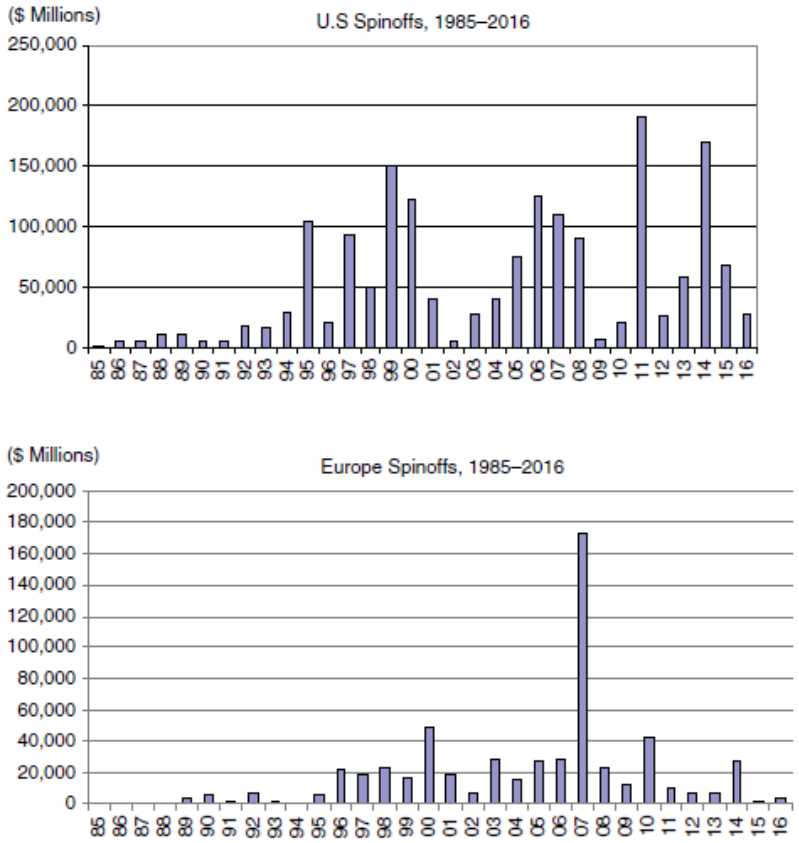


FIGURE 1
Mergers, acquisitions, and corporate restructurings by Patrick A. Gaughan

This discrepancy can be attributed to variations in market structures, regulatory environments, and corporate governance practices (Veld and Veld-Merkoulova, 2003).

In Europe, where corporate governance structures tend to be more rigid and capital markets less developed, market reactions to spin-offs may be relatively subdued. Moerland (1995) highlights that managers in the United States are generally more inclined to prioritize shareholder interests, whereas their counterparts in continental Europe are more likely to balance the interests of a broader range of stakeholders involved in the company.

Recent discussions on European capital markets have underscored the need for deeper integration. Former European Central Bank President Mario Draghi has emphasized that the European Securities and Markets Authority (ESMA) should take on exclusive oversight of major multinational issuers, key regulated markets, and central counterparties. Draghi argues that ESMA must evolve from a coordinating entity into a unified regulator for all EU securities markets — much like the US Securities and Exchange Commission (SEC) — to effectively support and implement a genuine Capital Markets Union.

This drive for capital market unification has been widely studied and is considered crucial for the European Union's future (Radu, 2024). Even though many measures and initiatives are being discussed, the European market remains much smaller in scale compared to its American counterpart. According to the European Central Bank's Occasional Paper Series No. 311, the aggregate market equity capitalization in the EU stands at 81% of GDP, significantly lagging behind the United States' 227%.

These disparities help explain why spin-offs have historically been a more prevalent restructuring tool in the US than in Europe, particularly before 1995 (Veld and Veld-Merkoulova, 2003). As a result, much of the existing research in this field is heavily focused on the US, as illustrated in the following figure.

Study	Country	Research period	Observations	Event window	Cumulative average abnormal return
Schipper and Smith (1983)	United States	1963-1981	93	(-1, 0)	2.84%***
Hite and Owers (1983)	United States	1963-1981	123	(-1, 0)	3.3%***
Miles and Rosenfeld (1983)	United States	1963-1980	55	(0, 1)	3.34%***
Rosenfeld (1984)	United States	1963-1981	35	(-1, 0)	5.56%***
Copeland, Lemgruber, and Mayers (1987)	United States	1962-1982	188	(-1, 0)	3.03%***
Denning (1988)	United States	1970-1982	42	(-6, 6)	2.58%n.r.
Seifert and Rubin (1989)	United States	1968-1983	51	(-1, 0)	3.26%***
Ball, Rutherford, and Shaw (1993)	United States	1968-1990	39	(-1, 0)	2.55%n.r.
Vijh (1994)	United States	1964-1990	113	(-1, 0)	2.90%***
Allen, Lummer, McConnell, and Reed (1995)	United States	1962-1991	94	(-1, 0)	2.15%***
Michaely and Shaw (1995)	United States	1981-1988	9	(-1, 1)	3.19%n.r.
Slovin, Sushka, and Ferraro (1995)	United States	1980-1991	37	(0, 1)	1.32%**
Seward and Walsh (1996)	United States	1972-1987	78	(-1, 0)	2.6%***
Johnson, Klein, and Thibodeaux (1996)	United States	1975-1988	104	(-1, 0)	3.96%***
Daley, Mehrotra, and Sivakumar (1997)	United States	1975-1991	85	(-1, 0)	3.4%***
Desai and Jain (1999)	United States	1975-1991	144	(-1, 1)	3.84%***
Krishnaswami and Subramaniam (1999)	United States	1978-1993	118	(-1, 1)	3.28%***
Mulherin and Boone (2000)	United States	1990-1999	106	(-1, 1)	4.51%***
Maxwell and Rao (2003)	United States	1976-1997	79	(0, 1)	3.59%***
Veld and Veld-Merkoulova (2008)	United States	1995-2002	91	(-1, 1)	3.07%***
Kirchmaier (2003)	Western Europe	1989-1999	48	(-1, 1)	5.4%***
Veld and Veld-Merkoulova (2004)	Western Europe	1987-2000	156	(-1, 1)	2.62%***
Sudarsanam and Qian (2007)	Western Europe	1987-2005	157	(-1, 1)	4.82%***
Murray (2000)	United Kingdom	1992-1998	25	(-1, 1)	-0.19%
Schauten, Steenbeek, and Wycisk (2001)	United Kingdom	1989-1996	23	(-1, 1)	2.13%n.r.
Sin and Ariff (2006)	Malaysia	1986-2002	85	(-1, 0)	1.80%*

FIGURE 2
Studies of wealth effects associated with spin-off announcements by Veld and Veld-Merkoulova, 2008

Despite the difference in the total number of studies, the reported abnormal returns in Europe are in line with the ones in the United States. More recent studies in Europe, such Khorana et al. (2011) and Vollmar (2014), also reported positive abnormal returns. The only exception from the table was Murray (2000), but a study by Schauten et al. (2001) for the same geography and for the same event window shows positive abnormal return.

Despite these regional differences, the value creation and its drivers — enhanced managerial focus, reduced information asymmetry, and improved capital allocation — remain consistent across both regions. Spin-offs continue to serve as an effective restructuring tool for unlocking shareholder value, regardless of geographical context.

2. Brief Overview of Companies and Event

2.1. Greenvolt

2.1.1. Company Profile Summary

In 2021, Greenvolt – Energias Renováveis S.A. was established, succeeding Bioelétrica da Foz as a company dedicated to the development of renewable energy, with a focus on biomass. Bioelétrica da Foz, previously a partnership between Altri and EDP, came under full control of Altri in 2018 after acquiring EDP's 50% stake for €55 million. Specializing in the production of electricity from forest biomass, the company was restructured and rebranded as Greenvolt under the leadership of João Manso Neto, former CEO of EDP Renováveis, with the aim of going public and raising capital to expand its presence in the renewable energy sector.

2.1.2. Financial Performance Summary

In 2023, Greenvolt – Energias Renováveis, S.A. reported revenues of €385.5 million, representing a 59% increase compared to the previous year. This significant growth was primarily driven by expansion in the Utility-Scale and Distributed Generation segments, which offset reduced revenues in the Biomass segment, affected by declining electricity prices in the United Kingdom. EBITDA reached €103.1 million, up 3% from the previous year, although net attributable profit stood at €1.2 million.

During 2023 there was also an issuance of €200 million in convertible bonds subscribed by KKR's global infrastructure fund, with a coupon rate of 4.75% and a 7-year maturity, allowing conversion into shares at a price of €10.0 per share.

2.2. Altri

2.2.1. Company Profile Summary

Altri SGPS S.A. is a Portuguese company positioned as one of Europe's leading producers of cellulosic fibers. Altri was created in 2005 as a result of Cofina's restructuring process through a spin-off of its industrial assets. Currently, Altri specializes in producing pulp from sustainably managed eucalyptus forests. The company operates mainly in Portugal, with an annual production capacity of over 1 million tons of pulp, distributed among its three industrial subsidiaries: Celbi, Celtejo, and Caima. These products are used in various sectors, such as printing paper, textiles, and packaging.

2.2.2. Financial Performance Summary

In 2023, Altri reported revenues of €788.2 million, reflecting a decline from the previous year, mainly due to the drop in cellulosic fiber prices, impacted by the slowdown in demand in Europe and North America, while Asia saw a partial recovery in the second half of the year. EBITDA amounted to €137.3 million, with a margin of 17.4%, also declining due to pricing pressures and high raw material and energy costs. Net profit stood at €42.8 million, a sharp decrease of 71.9% compared to the previous year, reflecting unfavorable market conditions.

2.3. Event overview

Greenvolt – Energias Renováveis, S.A. embarked on its journey toward the capital markets in 2021.

At the beginning of 2021, Altri, that owned Greenvolt, began planning the spin-off of its renewable energy business unit, including commissioning Lazard Frères Banque to conduct a feasibility study, as per a CMVM communication on

March 18, 2021. Until then, Greenvolt was a wholly-owned subsidiary of Altri, but had experienced substantial growth in recent years.

In July of that year, the company set the price of its IPO at €4.25 per share, the lower end of the indicative range of €4.25 to €5 (Jornal de Negócios, 2021). This IPO resulted in a capital increase of approximately €186 million, with the issuance of 30,588,235 new shares. On July 15, 2021, Greenvolt was admitted to listing on Euronext Lisbon, after successfully completing the IPO. The operation was coordinated by BNP Paribas and CaixaBank.

In the quarterly financial report released on November 18, 2021, Altri announced it would conduct a study on optimizing its stake in Greenvolt. In March 2022, Altri announced that the study supported the separation of its renewable energy and paper businesses, and intended to proceed with a spin-off of the Greenvolt shares it still directly held, a stake corresponding to 43.27% (consisting of 52,523,229 shares) of Greenvolt's capital. This decision was positively received by analysts, who believed the separation could attract new investors to Greenvolt (Jornal de Negócios, 2022) to finance its growth potential. On April 29, 2022, the annual general meeting approved the spin-off of the shares. Following this approval, Altri distributed 25 Greenvolt shares for every 100 Altri shares held on May 25, 2022, thus completing the spin-off.

2.4. Recent developments

More recently, in December 2023, a public acquisition offer was made by KKR (Kohlberg Kravis Roberts) after they had acquired 200 million euros in convertible debt earlier that same year. The offer was highly successful, with KKR acquiring 97.64% of Greenvolt's shares. In November 2024, KKR launched a Potestative Public Acquisition Operation to execute a squeeze-out for the remaining 2.36% of shareholders.

3. Methodology, Research Hypothesis, and Results

3.1. Methodology

3.1.1. Event study

In order to understand whether there is a perception of value creation by the stock market associated with the announcement of a financial restructuring operation, the 'event study' methodology was chosen. The field of event studies aims to assess the impact of a specific event on the securities prices of companies or on financial markets. This methodology allows to evaluate whether a given event influences the market's perception of a company's market value by analyzing actual stock returns in comparison to expected risk-adjusted returns. In this study, the event is the announcement of the spin-off of Greenvolt's capital held by Altri.

This methodology has a long-standing history in finance. While Fama et al.'s 1969 paper — which examines the effects of stock splits on equity prices — is widely regarded as the first comprehensive event study, earlier works also explored similar topics. For example, Dolley (1933) conducted an early event study analyzing stock price reactions to stock splits. MacKinlay (1997) references several other studies (Myers and Bakay, 1948; Barker, 1956, 1957, 1958; Ashley, 1962), suggesting that by the 1960s, event studies were relatively common. However, it was Fama et al. (1969) who formalized the event study methodology, shaping it into the approach we use today. It is also worth noting that this period marked the beginning of a paradigm shift in corporate finance, initiated by seminal works such as Modigliani and Miller (1958), Sharpe (1964), and Fama (1970).

Since these authors, this methodology is widely accepted and has been applied in various research areas, such as studying the impact of celebrity endorsements (Agrawal and Kamakura, 1995), the impact of new product launches (Chaney et al., 1991), long term performance of a company following a spin-off (Desai and Jain 1999), study if busy boards are effective monitors (Fich and Shivdasani, 2006), and even to examine the influence of sports sentiment on stock returns across various countries (Edmans et al. 2007). It has also been extended outside the traditional stock market context, with Campbell et al. (2011) analyzing the effects of forced sales on house prices.

To apply this methodology, certain assumptions must be made. According to McWilliams and Siegel (1997), the event study methodology rests on three key assumptions:

(1) markets are efficient.

(2) the event was unanticipated.

(3) there were no confounding effects during the event window.

3.1.2. Abnormal returns

Abnormal returns (AR) are calculated as the difference between the actual observed return (R) and the expected normal return (ER). This can be expressed with the following formula:

$$AR = R - ER$$

To estimate the expected normal returns, this dissertation will follow some of the models proposed by MacKinlay (1997) and utilize three statistical models: the Constant Mean Return Model, the Market Model, and the Market-Adjusted Model.

i. Constant Mean Return Model

In the constant mean return model, the abnormal return in the event window is the return of observation *i* on day *t* minus the average return of the observation *i* in the estimation window. We get the abnormal returns as follows:

$$AR_{it} = R_{it} - \overline{R}_i$$

where: $\overline{R}_i = \frac{1}{T_1 - T_0} \sum_{t \in [T_0, T_1]} R_{it}$

ii. Market Model

In the market model, we assume that the return follows a single-factor market model:

$$R_{it} = \alpha_i + \beta_i \cdot R_{mt} + \varepsilon_{it}$$

Where R_{it} is the return of the stock of observation *i* (e.g. firm) on day *t*, R_{mt} is the return of the reference market on day *t*, ε_{it} is the error term with expectation zero. The regression coefficient βi is a measure of the sensitivity of R_{it} on the reference market. The abnormal return is calculated as follows:

$$AR_{it} = R_{it} - (\alpha_i + \beta_i \cdot R_{mt})$$

iii. Market Adjusted Model

The market-adjusted return model can be viewed as a restricted market model with α_i constrained to be zero and β_i constrained to be one. So, the observed return of the reference market on day *t* R_{mt} is subtracted from the return R_{it} of the observation *i* on day *t*. We get for the abnormal return as follows:

$$AR_{it} = R_{it} - R_{mt}$$

3.1.3. Parametric and Nonparametric tests

For the parametric analysis, standard t-tests were utilized (MacKinlay, 1997) to evaluate both abnormal returns and cumulative abnormal returns. Specifically, the t-test was conducted to determine whether the abnormal returns

deviate significantly from zero. Under the null hypothesis Ho, it is assumed that the event in question does not exert any significant impact on the returns. Thus, the t-test for abnormal returns serves to assess whether observed deviations can be attributed to the event or are simply the result of random fluctuations in the data.

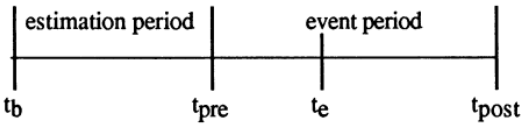
The parametric tests previously described rely on specific assumptions about the probability distribution of abnormal returns. To enhance the robustness of analysis, nonparametric tests were used as a supplement. These tests do not require distributional assumptions and are less sensitive to outliers (Cowan, 1992), thereby improving the reliability of the analysis. Specifically, the sign test will be applied (Cowan, 1992) (MacKinlay, 1997) alongside parametric tests to provide a more thorough evaluation of abnormal returns, ensuring a comprehensive assessment of the event's impact.

3.1.4. Estimation and event window

Regarding the estimation period, we will use 120 trading days prior to the considered event period, as recommended by MacKinlay (1997). Although Peterson (1989) suggests using 200 days, the meta-analysis conducted by Holler (2014) concludes that the length of the estimation window does not significantly impact the results as long as it exceeds 100 days. Additionally, Corrado and Zivney (1992) reached the same conclusion regarding the robustness of statistical tests.

The event window will be divided into pre-event and post-event periods. For the post-event period, multiple windows will be explored to enhance the robustness of the analysis, starting with a post 5-day window and progressively extending it to 15 and 30 days. The focus on the 5-day post-event window and the limit at 30 days is guided by findings from Oler et al. (2007), which indicate that 76% of studies utilize a 5-day post-event window, while windows exceeding

30 days are employed in fewer than 10% of cases. The pre-event period will match the same number of days of the post-event, so it will be a 5-, 15-, and 30-day window. This will help to assess the possibility of information leakage prior to the announcement.



where

t_b = The first period used in the estimation of a normal security return;
t_{pre} = The first period used in the calculation of abnormal returns;
t_e = The event period; and
t_{post} = The last period used in the calculation of abnormal returns.

FIGURE 3
The timeline for an event study by Peterson, 1989

3.1.5. Data

The data used in this analysis consist of daily observations, from 2020 to 2022, of Altri's stock prices and a representative European market index, specifically the STOXX Europe 600 from 2020. This data was sourced from Yahoo Finance. The Charts 1 and 2 illustrate the daily price evolution of Altri's stock and the STOXX 600, respectively, showing that the Altri stock had a slightly positive performance in this time frame, while the STOXX 600 remained somewhat flat.

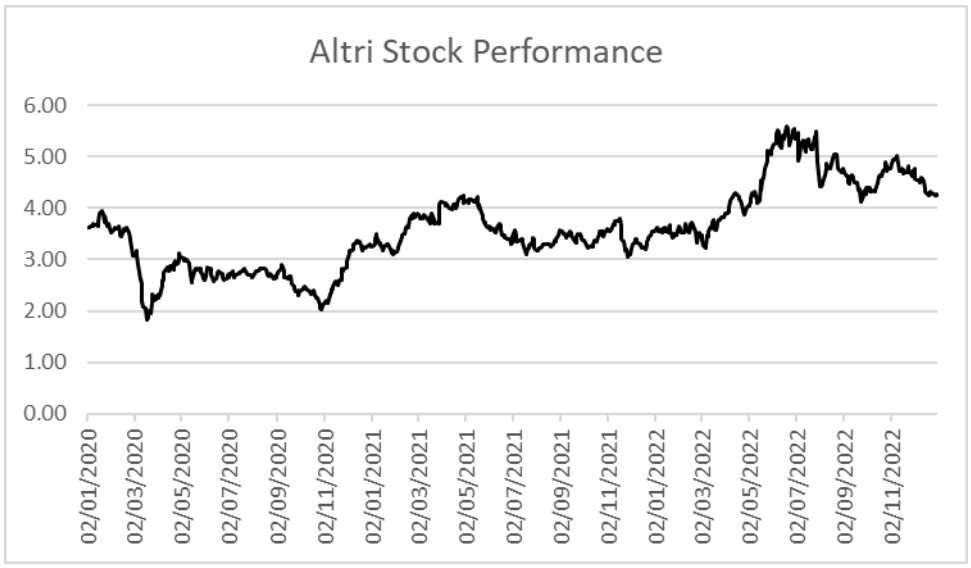


FIGURE 4
Evolution of the daily price of the Altri stock

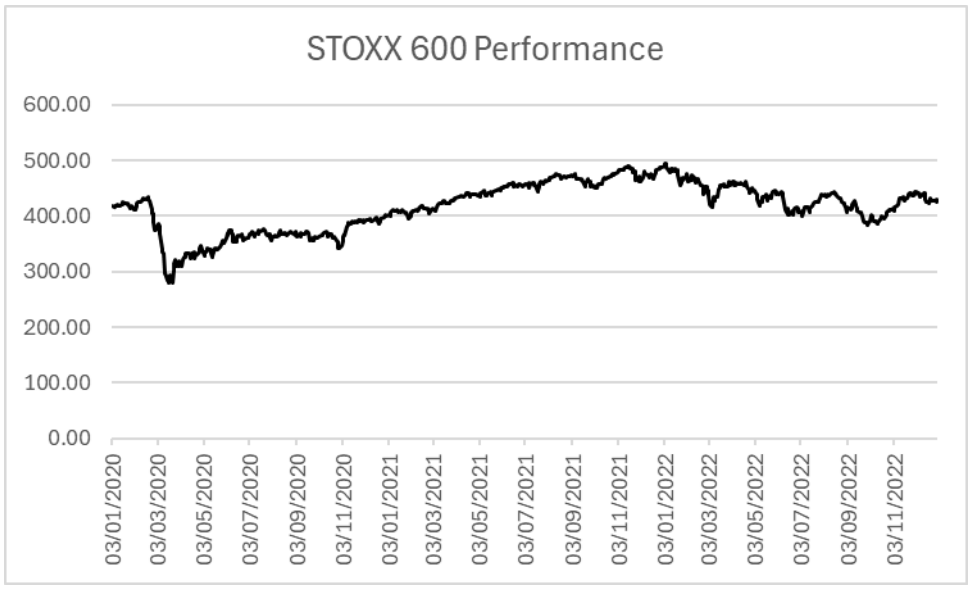


FIGURE 5
Evolution of the daily value of the STOXX 600 index

Additionally, Table 1 provides descriptive statistics, including the mean, standard deviation, median, minimum, and maximum, for the daily returns of the stock and market index, derived from the daily price changes.

	Year	Average	Std. Deviation	Median	Min.	Max.
Altri	2020	0.00%	2.80%	0.00%	-13.65%	11.55%
	2021	0.05%	1.85%	0.00%	-6.84%	10.01%
	2022	0.10%	2.31%	0.17%	-10.90%	9.94%
STOXX 600	2020	0.00%	1.77%	0.13%	-11.48%	8.40%
	2021	0.08%	0.78%	0.13%	-3.67%	2.45%
	2022	-0.05%	1.20%	0.04%	-3.81%	4.68%

TABLE 1
Descriptive Statistics of Altri and STOXX 600 returns

The table shows that Altri's daily stock returns were, on average, lower in 2020 and 2021, but higher in 2022, whereas the STOXX 600 recorded negative average returns. Moreover, Altri's shares displayed greater volatility, reflected in the higher standard deviation of returns and the wider range between daily highs and lows.

3.1.6. Research hypothesis

This dissertation seeks to assess whether the announcement of Greenvolt's spin-off by Altri created shareholder value, resulting in cumulative abnormal returns (CAR) greater than zero, or destroyed value, leading to CAR less than zero. Alternatively, it will explore whether the event had no significant impact, meaning the returns generated are not statistically different from zero.

To address this, the hypothesis to be tested is H_0: CAR = 0. This hypothesis represents the absence of value creation for shareholders and if rejected, it would indicate that the returns generated are significantly different from zero.

3.1.7. Main results

	Event Window [-5;+5]		
	Market Model	**Market adjuted model**	**Constante Mean Return Model**
CAR	10.22%	10.95%	2.19%
Stand. Dev.	4.99%	5.05%	7.02%
T-stat	2.05	2.17	0.31
P-value	0.043	0.032	0.756
Sign-test	0.065	0.089	0.076
	Event Window [-15;+15]		
	Market Model	**Market adjuted model**	**Constante Mean Return Model**
CAR	20.10%	23.67%	11.22%
Stand. Dev.	8.20%	8.34%	11.78%
T-stat	2.45	2.84	0.95
P-value	0.016	0.005	0.343
Sign-test	0.302	0.340	0.183
	Event Window [-30;+30]		
	Market Model	**Market adjuted model**	**Constante Mean Return Model**
CAR	39.72%	47.90%	32.50%
Stand. Dev.	10.65%	10.90%	16.01%
T-stat	3.73	0.01	0.02
P-value	0.000	0.000	0.045
Sign-test	0.027	0.079	0.005

TABLE 2
Results from each model for the 3 different event windows

Table 2 presents the cumulative abnormal returns (CAR) for Altri's stock across three different event windows. During the observation period, the CAR ranged from 2.19% to 47.90%, depending on the model and event window analyzed.

For the first event window, [-5; +5], both the market model and the market adjusted model exhibit high CARs, with the adjusted model showing a higher value of 23.67%. Both models reject the null hypothesis at the 5% significance level, as their p-values are below 5%. In contrast, the constant mean return model yields a much lower CAR of only 2.19% and does not reject the null hypothesis. The nonparametric sign test indicates statistical significance at the 10% level across all three models.

In the second event window, [-15; +15], all three models show relatively high CARs, with the constant mean return model producing the lowest at 11.22% and the market adjusted model the highest at 23.67%. While the constant mean return model is not statistically significant, with a p-value of 0.34, the market model rejects the null hypothesis at the 5% level, and the market-adjusted model does so at the 1% level. However, the nonparametric test provides contradictory results, failing to demonstrate statistical significance across all three models.

Finally, in the [-30; +30] event window, all three models report high CARs: the market model at 39.72%, the market adjusted model at 47.90%, and the constant mean return model at 32.50%. All three models reject the null hypothesis, with the market and market-adjusted models achieving significance at the 1% level. The nonparametric test reinforces these findings, with the market model and constant mean return model rejecting the null hypothesis at the 5% level, while the market adjusted model rejects it at the 1% level.

These results demonstrate substantial robustness and allow for the rejection of the null hypothesis, H_0: CAR = 0. Consequently, there is evidence of value creation for Altri's shareholders, with the CAR being significantly different from zero.

4. Conclusion

All in all, our paper sought to fill in the gap of actual research and contribute to the ongoing debate about value creation potential of corporate spin-offs in Portugal and Europe. We used the case of Altri's spin-off of Greenvolt as a focal point, in a well-established event study methodology, and an analysis of cumulative abnormal returns (CAR) across the most popular statistical models and explored different event windows to have a nuanced understanding of the dynamics and implications of the event.

The findings unequivocally support the premise that spin-offs can unlock significant shareholder value. The results revealed statistically significant positive CARs across all tested models and event windows, with the market-adjusted model producing the most robust results, especially over the longer observation periods. Even from a price perspective we can see an impact from the spin-off in Figure 2.

From a strategic standpoint, the spin-off represents a logical decision. Greenvolt gains an independent shareholder and management structure, enabling it to pursue growth opportunities with fewer constraints and explore new segments within the renewables industry. The spin-off also enhances stock liquidity and attracts new investors while allowing pulp and paper-focused shareholders to divest from the renewables sector. For Altri, the distribution of an extraordinary dividend to shareholders and the ability to redirect cash flow toward other initiatives, such as the Gama project in Galicia.

Interestingly, the 30-day event window produced more significant results than the shorter ones. This suggests that the market may not have been entirely efficient in pricing the restructuring operation; it would be interesting to analyze

the value creation in a longer-term perspective, but because that demands more complex models it was left out of the scope of this analysis.

This case also illustrates the applicability of restructuring strategies to the Portuguese and European markets, where the regulatory and market structures differ from the US. These differences clearly have a big impact in how companies and the management operate, leading to less market or shareholders-focused management and a more stakeholders-focused one; maybe because of that there are less companies prone to restructuring their businesses in a fast-changing world. Restructuring will always have some pain points from a short-term price perspective and from a stakeholder perspective, but that cannot be impediment for the management teams and for the European market. Nevertheless, we unfortunately have seen that is the case in, for example, the EU auto industry and in The Draghi Report.

Management teams across Europe can draw lessons from this case and recognize that restructuring needs to be a tool in their portfolio; this especially critical in Portugal, were we once had an index with 20 companies called PSI 20; now there are only 15 companies (since the take private of Greenvolt by KKR). Policymakers and regulators in Europe can also gain insights from this case and recognize that deeper capital market integration could further enhance the feasibility and benefits of such strategies within the region.

In conclusion, this research demonstrates that spin-offs are a highly effective tool for corporate value creation when strategically executed and should be a tool in every management team. However, despite its contributions, this study has certain limitations, some already mentioned. The main one is that focusing on a single case gives the opportunity for deeper qualitative and quantitative research, but it restricts the generalizability of the findings. Additionally, the study only focused on short-term returns and would be a valuable contribution in the future to research the long-term performance of spin-offs, particularly in

this operation. This becomes a more interesting topic to explore if we consider that Greenvolt has been taken private by KKR (Kohlberg Kravis Roberts) and since November of 2024 is no longer a listed company in the Lisbon stock exchange. This makes Greenvolt a very special case in the corporate restructuring world.

Statement: During the preparation of this work the author(s) used ChatGPT in order improve phrasing and wording in English, ensure grammatical accuracy, and streamline complex ideas. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

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