LUISS

Degree Program in Corporate Finance

Course of Advanced Corporate Finance

Value creation and Sustainability in M&A: An Empirical Analysis of FCA-PSA Merger

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INTRODUCTION

Mergers and acquisitions (M&A) represent one of the most powerful tools available to companies to accelerate growth, acquire new skills and improve their competitive position in an increasingly dynamic global market. Over the years, the M&A phenomenon has evolved, becoming a crucial element for corporate expansion and value creation. However, this complexity is accompanied by significant challenges, both strategic and operational, that make each operation unique and strongly influenced by the economic, financial and regulatory context[1].

This thesis aims to explore the world of mergers and acquisitions, analyzing their main theoretical and practical aspects. Furthermore, specific attention is given to the automotive industry, a sector undergoing profound transformation due to the challenges posed by the transition to electrification and the need to address the effects of the Covid-19 pandemic.

The first chapter offers a general overview of the M&A phenomenon, with a clear definition of the main concepts, an analysis of the types of operations and the motivations that drive companies to undertake these strategies. The importance of ESG dynamics, increasingly central in guiding strategic decisions and influencing the success of operations, is also explored.

The second chapter focuses on the valuation methods of companies involved in M&A operations. The main approaches will be analyzed, such as relative and intrinsic valuation techniques, the impact of financial leverage and the valuation of synergies, with an in-depth look at the risks associated with unsuccessful operations.

In the third chapter, the focus shifts to the automotive industry, outlining its history, main characteristics and current challenges, such as the crisis linked to the pandemic and the transition to electric mobility. The main trends influencing the sector and the growth opportunities through M&A operations will be analyzed.

The fourth chapter is dedicated to the case study of the merger between FCA and PSA, an operation that gave birth to Stellantis, one of the largest automotive groups worldwide. The main phases of the operation, the financial performances and the future prospects of the new group will be examined.

Finally, the fifth chapter presents an empirical analysis articulated in two research questions:

1) Did M&A transactions in the automotive industry create value for the companies involved?

2) Did the market react positively to FCA-PSA merger?

[1] https://winnerge.com/strategie-mergers-and-acquisitions/massimizzare-vantaggi-fusioni-acquisizioni/

Through a rigorous methodology and quantitative analysis, significant insights will be provided to understand the effectiveness of M&A operations in the current context.

This thesis, therefore, aims to provide an integrated and in-depth vision of M&A, combining theory, sectoral analysis and empirical investigations with the objective of offering a significant contribution to the academic and practical debate on one of the most relevant topics in contemporary economics.

CHAPTER 1: M&A OVERVIEW

1.1 DEFINITION OF M&A

Mergers and Acquisitions (M&A) refer to a spectrum of strategic business transactions aimed at consolidating companies or transferring ownership of assets. These transactions play a pivotal role in the corporate world, enabling companies to achieve growth, enhance competitiveness and adapt to ever-changing market dynamics. From an academic perspective, M&A is often defined as a corporate restructuring strategy aimed at enhancing business efficiency, optimizing resource allocation and achieving economies of scale. In contrast, consulting firms and financial analysts tend to focus on the practical implications of M&A, emphasizing their role in generating shareholder value, market expansion and synergies (McKinsey, 2023). A merger occurs when two or more companies come together to form a single new entity pooling their resources, expertise and markets. Mergers can be executed in two distinct ways:

- Merger by Union: this involves the dissolution of the merging companies' legal-economic existence and the formation of a new company that inherits their combined assets. Shareholders of the original companies receive new shares or equity stakes based on a predetermined exchange ratio tied to the financial instruments held in the original firms. A notable case is the 1998 merger between Daimler-Benz and Chrysler, which resulted in the creation of DaimlerChrysler. However, due to cultural and operational integration issues, the merger ultimately failed, leading to the companies splitting apart in 2007. This demonstrates how merger by union, despite its potential advantages, can be highly challenging in terms of corporate alignment and strategic execution.
- Merger by Incorporation: unlike a merger by union, this process does not involve the creation of a new company. Instead, one company (the incorporator) retains its legal identity and absorbs the others, which cease to exist. In this scenario, the incorporating company typically increases its share capital and allocates new shares or units to the shareholders of the absorbed companies[2]. An example of merger by incorporation is the merger between Fiat Chrysler Automobiles (FCA) and Groupe PSA which resulted in the creation of Stellantis. FCA was absorbed into the new entity without forming an entirely new company from scratch, but instead restructuring under a unified corporate umbrella.

The selection between these types of mergers is influenced by a range of factors, such as legal regulations, financial considerations and strategic objectives. In Italy, mergers by incorporation are particularly common, largely due to their tax benefits and they are sometimes facilitated through a Leverage Buyout (LBO) which involves purchasing a company (the target) by leveraging substantial amounts of debt, that typically accounts for 60-70% of the total financing required for the acquisition. This debt is supported by the target company's projected cash flow and asset base, enabling the buyer, often a private equity firm or financial sponsor, to contribute a relatively smaller equity investment, usually in the range of 30-40% of the purchase price[3]. A

[2] Gaughan, P. A. (2017). Mergers, Acquisitions, and Corporate Restructurings. Wiley.
[3] Damodaran, A. (2002). Corporate Finance: Theory and Practice. Wiley.

classic case of LBO is KKR's acquisition of RJR Nabisco in the late 1980s, which became a landmark deal in the history of private equity.

In contrast, an acquisition involves one company purchasing another, either by acquiring its assets (asset deal) or shares (share deal), with the acquired company often becoming a subsidiary or being fully integrated into the acquiring firm. While mergers are often seen as collaborations between equals, acquisitions typically imply a more dominant role by the buyer. Depending on the percentage of the stakes acquired, acquisitions can be categorized as:

- Totalitarian Stakes: acquiring 100% of the target company's assets.
- Majority Stakes: acquiring more than 50% of the target company's share capital.
- Non-Majority Stakes: in cases involving large public companies with widely distributed shareholdings, a minority stake may suffice to exercise control[4].

The rationale behind M&A transactions is deeply rooted in the concept of value creation. Companies pursue these strategies to realize synergies—both operational and financial—that can lead to cost efficiencies, revenue growth and competitive advantages. These synergies may stem from economies of scale, expanded market access, shared resources or enhanced innovation capabilities[5]. M&A also enables firms to diversify their portfolios, reduce dependence on specific markets and mitigate risks associated with industry volatility. For example, acquisitions often serve as a rapid entry strategy into new geographic markets or industries, bypassing the time and investment required for organic growth. From a strategic perspective, M&A transactions allow firms to navigate industry shifts, address globalization challenges, and stay ahead in technological innovation. They also provide opportunities to acquire critical resources, such as intellectual property, talent or supply chain networks, which may be difficult or time-consuming to develop internally. Moreover, M&A can be a defensive move, such as acquiring competitors to secure market leadership or prevent potential threats from emerging. A notable example is Microsoft's acquisition of Activision Blizzard in 2022, a strategic response to growing competition from Sony and an effort to strengthen its position in the gaming industry. By acquiring one of the world's largest video game publishers, Microsoft not only expanded its content portfolio but also gained a competitive advantage in the race for dominance in cloud gaming and the metaverse. Similarly, major technology companies have used M&A as a mechanism to neutralize potential market disruptors. Facebook's acquisitions of WhatsApp (2014) and Instagram (2012) exemplify this strategy, as they allowed the company to consolidate its dominance in the social media space and prevent emerging competitors from gaining traction. By integrating these platforms into its ecosystem, Facebook (now Meta) effectively eliminated threats that could have challenged its market leadership.

[4] Gaughan, P. A. (2017). Mergers, Acquisitions and Corporate Restructurings. Wiley.
[5] Sudarsanam, S. (2010). Creating Value from Mergers and Acquisitions: The Challenges. Financial Times/Prentice Hall.

M&A processes are highly complex and require rigorous planning and execution. Key steps include identifying suitable targets, conducting thorough due diligence to assess financial health, legal compliance and operational fit, as well as negotiating terms that align with the strategic objectives of the deal. The integration phase, where the entities combine their operations, is often considered the most challenging aspect, as it involves aligning corporate cultures, systems and management practices. While the potential benefits of M&A are significant, these transactions are not without risks. Failed integrations, overvaluation of targets or misalignment of strategic goals can result in substantial financial losses and reputational damage[6]. Additionally, the regulatory and legal landscape, including antitrust laws and shareholder approval requirements, plays a critical role in shaping the feasibility and execution of such deals.

In conclusion, M&A represents a dynamic and multifaceted tool for corporate growth and transformation. While traditional drivers such as financial synergies and market expansion remain central, new macroeconomic and technological forces are reshaping the landscape of mergers and acquisitions. One of the emerging factors influencing M&A strategies is the increasing focus on ESG (Environmental, Social, and Governance) criteria. Investors and companies are now integrating sustainability considerations into deal-making, favouring acquisitions that align with decarbonization goals, ethical supply chains and social responsibility. Geopolitical tensions are also playing a crucial role in shaping global M&A activity. Regulatory scrutiny has intensified, particularly concerning foreign acquisitions of strategic assets. In the US and Europe, governments have imposed stricter controls on Chinese investments in technology and infrastructure, reflecting a broader trend of economic protectionism and national security concerns. As a result, cross-border M&A strategies are becoming increasingly complex, requiring companies to anticipate and adapt to shifting regulatory environments. Furthermore, the rise of artificial intelligence (AI) and Big Data is transforming the M&A process itself. AI-powered analytics are enhancing target identification, valuation models and due diligence, allowing firms to make more data-driven acquisition decisions. Predictive algorithms are improving risk assessment, helping companies anticipate post-merger challenges and maximize deal synergies.

The subsequent sections will delve into the classifications of M&A, the step-by-step process involved and the challenges that companies face in maximizing the potential of these transactions. This foundational understanding is crucial to grasp the strategic implications and complexities of M&A activities in today's interconnected business environment.

[6] Cartwright, S., & Schoenberg, R. (2006). "Thirty Years of Mergers and Acquisitions Research: Recent Advances and Future Opportunities." British Journal of Management.

1.2 CLASSIFICATION OF M&A

Mergers and Acquisitions can be classified based on several criteria, depending on their strategic intent, market impact and structural execution. While traditional classifications focused primarily on industry relationships and corporate control mechanisms, modern M&A frameworks have evolved to incorporate financial structuring, regulatory compliance and digital transformation. Understanding these classifications is crucial, as they help businesses and investors assess risk, unlock synergies and determine the long-term viability of an acquisition or merger.

A widely used method for categorizing M&A activities involves examining the connection between the industries or business sectors of the companies participating in the transaction:

- Horizontal Mergers: These occur when two or more companies operating within the same industry decide to merge. The primary goals are to expand market share, eliminate competition and gain new skills or technologies. Additionally, horizontal mergers often enhance the variety of related products and services offered to the same customer base. However, such transactions can potentially reduce market competition, which is why antitrust authorities frequently evaluate their impact[7]. One notable example is the 2015 merger between Anheuser-Busch InBev and SABMiller, which created the world's largest beer company. The deal allowed AB InBev to dominate global markets while streamlining production and distribution costs. However, regulatory scrutiny forced the company to divest key assets to maintain fair competition.
- Vertical Mergers: These involve the consolidation of companies at different stages of the same supply chain. A vertical merger can either be forward (towards customers) or backward (towards suppliers). This type of transaction aims to create synergies and reduce dependency on external suppliers[8]. A key example is Amazon's acquisition of Whole Foods in 2017, which allowed Amazon to integrate a physical retail network into its e-commerce ecosystem, optimizing logistics and last-mile delivery while expanding its customer data analytics capabilities.
- Conglomerate Mergers: Conglomerate mergers occur when companies operating in completely unrelated industries join forces. The main goal is usually to diversify, enabling the newly formed company to expand into different markets and offer a broader range of products. Conglomerate mergers can be further divided into product expansion mergers, geographic market expansion mergers and pure conglomerate mergers.

Another way to distinguish M&A transactions is by examining the governance changes involved in the deal; this perspective highlights the power dynamics and the level of consent or resistance during the transaction:

[7] Prager, A. (1992). Antitrust and Horizontal Mergers in the 1990s.
[8] Chen, C. (2001). "Vertical Integration and Firm Performance." Journal of Business Research.

- Friendly Mergers: These occur when the target company's management and board of directors support the deal.
- Hostile Mergers: The acquirer proceeds with the transaction despite resistance from the target company's management or board. These operations often involve the use of defensive tactics by the target to deter the acquirer[9]. A prime example is the attempted hostile takeover of Airgas by Air Products in 2010, where Airgas used the "poison pill" defence to block the acquisition, ultimately leading to a prolonged legal battle.
- Bailout Mergers: This type of merger occurs when a financially stable entity—such as a government or a stronger company—acquires a struggling firm to prevent its liquidation. Bailout mergers are particularly common in the financial and banking sectors[10].

M&A transactions can also be categorized based on their structural and strategic approach. This perspective emphasizes the legal and operational mechanisms of the merger or acquisition:

- Merger by Incorporation (Absorption): This involves one company absorbing another, with the latter ceasing to exist as a legal entity. The acquiring company issues new shares to the absorbed company's shareholders in exchange for their previous ownership stakes.
- Merger by Union: In this type of merger, two or more companies combine to form an entirely new entity, resulting in the dissolution of their original legal identities.
- Reverse Merger: A reverse merger is a cost-effective method for a private company to go public by merging with a dormant public entity. This approach allows the private company to bypass the lengthy initial public offering (IPO) process[11]. A well-known example is the 2019 reverse merger of Virgin Galactic with Social Capital Hedosophia, which enabled the space tourism company to go public without a traditional IPO. This case highlights how reverse mergers are increasingly being used in emerging industries where rapid access to capital is essential.
- Cash-Out Merger: This occurs when the shareholders of the target company opt to receive cash in exchange for their shares, rather than participating in the ownership of the new merged entity.
- De Facto Merger: In this scenario, the transaction is structured as an acquisition but effectively functions as a merger, achieving similar results in terms of integration.
- Leveraged Buyout (LBO): LBO involves the acquisition of a company using significant amounts of borrowed funds, with the expectation that the target company's assets and cash flows will support the debt[12].

[9] Weston, J. F., Mitchell, M. L., & Mulherin, J. H. (2004). Takeovers, Restructuring, and Corporate Governance. Pearson.
[10] https://www.mckinsey.com/capabilities/strategy-and-corporate-finance/our-insights/the-six-types-of-successful-acquisitions
[11] https://www.investopedia.com/terms/m/mergersandacquisitions.asp
[12] Damodaran, A. (2002). Corporate Finance: Theory and Practice. Wiley.

In conclusion, the strategic categorization of M&A transactions highlights the multifaceted nature of corporate restructuring and expansion. Each type serves a distinct purpose, shaped by the unique objectives and constraints of the involved entities. These transactions are not merely legal or financial maneuvers but strategic tools that redefine industries, unlock synergies and foster innovation. However, their success hinges on meticulous planning, alignment with overarching business goals and adaptability to the complexities of market dynamics. As businesses continue to evolve in response to globalization, regulatory pressures, and shifting economic landscapes, the ability to strategically navigate these diverse M&A structures will be critical for sustaining growth and market leadership. The increasing role of regulatory scrutiny and ethical considerations in M&A transactions reflects a broader shift in corporate governance, requiring companies to align deal-making with transparency, sustainability, and competitive fairness. In particular, the rise of stricter antitrust regulations and growing ESG-driven M&A strategies is reshaping how companies approach mergers and acquisitions. Governments worldwide are intensifying scrutiny over monopolistic consolidations, as seen in the increased regulatory challenges faced by tech giants attempting large-scale acquisitions. At the same time, the emphasis on sustainability and ethical business practices is influencing deal structures, with investors prioritizing acquisitions that align with environmental and social governance principles. This shift is evident in the surge of green mergers, where companies seek to integrate renewable energy firms or carbon-neutral businesses into their portfolios to meet sustainability targets. As M&A strategies become more intertwined with compliance, ethics and global policy shifts, understanding these classifications will be essential for firms aiming to maintain resilience and competitive positioning in an increasingly complex corporate environment.

1.3 THE M&A PROCESS

The M&A process is a meticulously organized yet inherently dynamic sequence of actions, encompassing both buy-side (acquisitions) and sell-side (partial or complete sales) transactions. These operations are typically intricate and high-stakes, requiring advanced expertise, meticulous planning and the guidance of experienced professionals like investment banks or consulting firms. These advisors play a critical role in achieving core transaction goals, such as optimizing value, ensuring swift execution and guaranteeing deal closure, all while addressing the unique challenges that emerge during the process[13]. In the context of M&A operations, auctions represent one of the most structured methods for marketing a company or asset to multiple potential buyers. The main purpose is to create a competitive environment among potential buyers to secure the highest possible return for the seller. Auctions generally fall into two categories: broad and targeted. Broad auctions cast a wide net, reaching out to numerous prospective buyers, including both strategic investors and financial backers, to encourage intense bidding. In contrast, targeted auctions concentrate on a limited number of well-vetted, high-potential buyers who are most likely to complete a successful transaction. This method prioritizes confidentiality and minimizes disruptions but may exclude potentially higher offers from non-included participants. Regardless of the type chosen, the M&A process is divided into several structured phases:

1) M&A Strategy Development: M&A process begins with strategic planning, a phase where senior leaders and advisors evaluate whether an acquisition or merger aligns with the overarching goals of the company. This preparatory stage includes extensive sector analysis, competitive landscape evaluation and an understanding of the company's internal weaknesses and potential. A well-defined strategy is essential to guide the entire process and ensure alignment with long-term objectives. Advisors often create key marketing materials during this phase, including teasers and management presentations, which articulate the strategic intent behind the transaction. These materials introduce key considerations, such as potential value creation, market positioning and alignment with future growth prospects. This stage also requires identifying the synergies the deal is expected to generate, whether through operational efficiencies, market expansion, or financial optimization. A classic example is Disney's acquisition of Pixar in 2006, where Disney identified the need to revitalize its animation division and leveraged Pixar's technology and creative talent to achieve long-term synergy. This demonstrates how strategic planning must be data-driven and aligned with long-term business transformation objectives.

2) Target Screening: once the strategy is defined, the focus shifts to identifying potential acquisition targets that align with the predefined objectives. The selection process involves applying specific criteria related to the target's size, profitability, business model, market positioning, distribution channels and brand presence. In cases where the buyer and seller are already familiar with one another, this phase may be abbreviated. However, in most transactions, target screening is an extensive process involving industry analyses, competitor

[13] Rosenbaum, J., & Pearl, J. (2021). Investment Banking: Valuation, Leveraged Buyouts and Mergers and Acquisitions. Wiley Finance Series.

evaluations and database reviews. Advisors compile long lists of potential targets, which may include dozens of candidates and subsequently narrow these down to short lists of five to ten firms. This refinement process is guided by both quantitative metrics (e.g., revenue, profitability, growth potential) and qualitative considerations (e.g., cultural compatibility, strategic fit).

3) Valuation Phase: Valuation is a critical phase of the M&A process, as it provides the foundation for decision-making regarding pricing and negotiation. The valuation of the target company is conducted using various methodologies to ensure a comprehensive understanding of its worth. These methodologies include:

- Comparable Companies Analysis: Compares the target's financial and operational metrics to those of similar publicly traded companies to determine a market-driven valuation.
- Precedent Transactions Analysis: Examines valuation multiples from recent M&A transactions involving comparable companies to establish benchmarks.
- Discounted Cash Flow (DCF) Analysis: Projects the target's future cash flows and discounts them to present value, offering an intrinsic valuation.
- Leveraged Buyout (LBO) Analysis: Calculates the potential returns for financial sponsors based on a target's cash flow generation and debt capacity[14].

This phase also involves sensitivity analyses to account for potential variations in assumptions, ensuring a realistic range of valuation outcomes.

4) Preliminary Contacts and Preparatory Activities: in this phase, preliminary contact is established with target companies. A key tool at this stage is the "teaser", an anonymized profile providing essential information about the deal while maintaining confidentiality. Concurrently, the parties sign a Non-Disclosure Agreement (NDA), ensuring that sensitive information remains protected. NDAs often include detailed clauses defining confidential material, non-solicitation terms and penalties for breaches of confidentiality. During this phase, the target company prepares an Information Memorandum, which contains a detailed business plan and preliminary valuation analysis. This document is shared with interested parties to provide a comprehensive view of the target's operations, financial health and strategic outlook. At this point, the process culminates in a Non-Binding Offer (NBO), which outlines the preliminary terms of the deal, such as valuation criteria, purchase price and transaction timing, without committing either party to proceed.

5) Due Diligence: This step involves a thorough examination of the target company to validate its valuation and assess its strategic, operational and financial viability. Buyers, often referred to as bidders in this phase, analyze company information to confirm their interest in the transaction or, alternatively, identify reasons to renegotiate or withdraw. A failure in due diligence can lead to disastrous outcomes, as seen in Daimler's

[14] Rosenbaum, J., & Pearl, J. (2021). Investment Banking: Valuation, Leveraged Buyouts and Mergers and Acquisitions. Wiley Finance Series.

acquisition of Chrysler (1998). The cultural and operational misalignment between the two firms was overlooked during due diligence, ultimately resulting in one of the most infamous M&A failures in corporate history. Due diligence includes various categories[15]:

- Financial Due Diligence: focuses on verifying the target's financial health, including a detailed examination of EBITDA. Normalization of EBITDA is critical to remove distortions caused by extraordinary or non-recurring items, ensuring an accurate assessment of profitability.
- Tax Due Diligence: ensures compliance with statutory and tax regulations, examining past tax filings, liabilities and inspections.
- Legal Due Diligence: reviews contracts, litigation risks, intellectual property and regulatory compliance.
- Operational Due Diligence: assesses operational efficiency, supply chain reliability and integration readiness.
- Environmental Due Diligence: evaluates potential environmental liabilities or compliance issues.

6) Transaction Execution and Deal Structuring: Upon completing due diligence, the transaction enters the execution phase, where the deal structure is finalized. The advancement of AI-driven analytics and machine learning has greatly enhanced this stage allowing buyers to conduct instant risk evaluations and streamline parts of the valuation process through automation. AI-driven platforms, such as DealCloud and Palantir Foundry, are now being integrated into M&A workflows to optimize decision-making and enhance data-driven negotiation strategies. This phase involves decisions on whether to proceed with an asset or share purchase, each with distinct implications. Asset purchases allow buyers to selectively acquire specific assets, minimizing liability risks. In contrast, share purchases involve acquiring ownership of the entire company, including all assets and liabilities. At this stage, the parties draft and sign the Share/Asset Purchase Agreement, a binding document outlining the transaction terms, including price, guarantees, payment methods and regulatory clauses. Negotiations during this phase are crucial to resolving any outstanding issues identified during due diligence. Disagreements, particularly over price or terms, are common and can result in deal termination. The Purchase Consideration can be structured in different ways, depending on the strategic and financial objectives of the parties involved:

- All cash transactions: in this type of transaction, the acquirer offers to purchase all or a portion of the target’s outstanding shares exclusively in cash. Equity value is calculated as cash offer price per share multiplied by the number of fully diluted shares outstanding.

[15] Jimenez, M., & Sindik, A. (2022). Role of Due Diligence in M&A Transactions.

- Stock for stock transactions: in this case equity value is calculated based on a fixed exchange ratio or a floating exchange ratio ("fixed price"). The exchange ratio is calculated as offer price per share divided by the acquirer's share price[16].
- Cash and stock transaction: the acquirer offers a combination of cash and stock, the cash component represents a fixed value per share, while the stock component can be determined using either a fixed or a floating exchange ratio. Offer price per share and Equity value can be calculated as

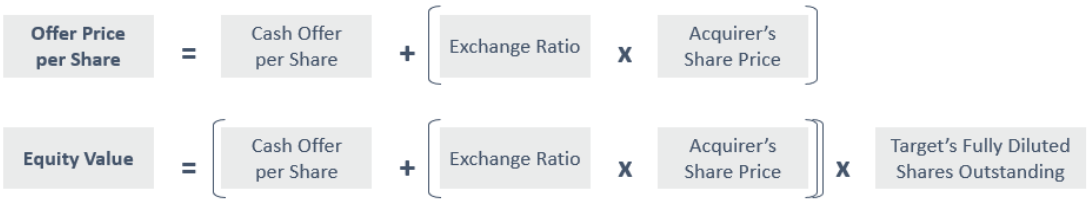

Figure 1.1: Rosenbaum, J., & Pearl, J. (2021). Investment Banking: Valuation, Leveraged Buyouts, and Mergers and Acquisitions. Wiley Finance Series.

7) Integration: This is the most complex phase of the M&A process. Post-merger integration involves unifying the operations, cultures and resources of the two entities to achieve the synergies identified during the strategic planning phase. Early integration planning is critical to ensure seamless execution and maximize value creation. Key activities during integration include: developing a Target Operating Model to guide the combined organization; aligning teams across the two entities to ensure cultural compatibility; establishing non-financial outcomes such as improved customer experience or enhanced innovation capacity; monitoring progress against integration goals and adjusting strategies as needed.

Figure 1.2: https://corporatefinanceinstitute.com/resources/valuation/mergers-acquisitions-ma-process/

[16] Rosenbaum, J., & Pearl, J. (2021). Investment Banking: Valuation, Leverage Buyouts and Mergers and Acquisitions. Wiley Finance Series.

1.4 RATIONALE BEHIND M&A

M&A are no longer just financial transactions; they have evolved into strategic instruments for business transformation. Companies leverage M&A to achieve a range of objectives, from accelerating growth to enhancing competitiveness and operational efficiency. The motivations driving these transactions are multifaceted, encompassing economic, strategic and managerial dimensions. Several economic theories provide a framework for understanding the motivations behind M&A:

- Efficiency Theory: it suggests that mergers add value by making the combined company work better than the individual firms could on their own. Savings on costs, better use of resources and smoother operations are key reasons behind this approach[17].
- Free Cash Flow Hypothesis: companies with extra cash might use it for acquisitions as a way to spend surplus money. However, this can be risky because not all deals made with excess funds are focused on increasing shareholder value.
- Market Power Hypothesis: M&A can help companies gain more control over their market by reducing competition. This strategy is especially common in industries where competing is tough and merging offers a chance for more stable profits.
- Agency Theory: this theory looks at conflicts between managers and shareholders. Managers might push for acquisitions to fulfill personal goals or expand the business, even if those decisions do not always benefit the company's overall performance.

Empirical evidence underscores the long-term benefits of M&A for companies that execute these transactions strategically. For instance, a report by Bain & Company (2023) analyzed approximately 3,000 firms and found that companies engaging in acquisitions during economic downturns outperformed their peers over the long term[18]. The study highlighted higher average total shareholder returns for these firms, reinforcing the resilience and value creation potential of M&A during challenging periods.

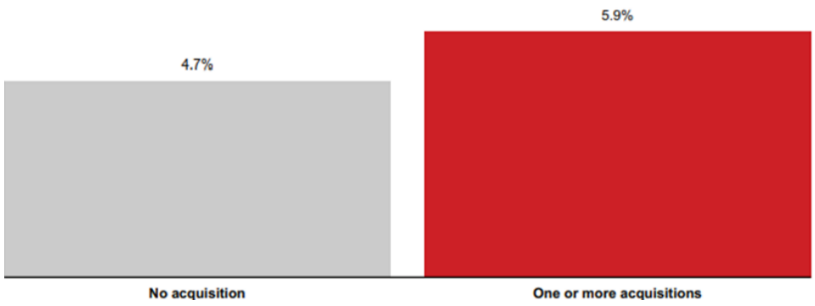

Figure 1.3: Bain & Company, M&A Report 2023

[17] Barney, J.B. (1988). Returns to Bidding Firms in Mergers and Acquisitions: Reconsidering the Relatedness Hypothesis. Strategic Management Journal, 9(S1), 71–78.
[18] Bain & Company. M&A Report 2023

It is important to define which are the main rationales discussed in literature research leading the choice of M&A and how these translate into value creation for the acquirer:

1) Operational Synergies: they lead to a rise in operating profits and/or an acceleration in growth rates. Within the context of M&A, four distinct categories of operational synergies can be identified:

- Economies of Scale: larger production volumes reduce per-unit costs by spreading fixed expenses across a higher output.
- Economies of Scope: Cost efficiencies arise when complementary resources, such as production facilities or marketing teams, are used to produce different goods or services jointly.
- Vertical Integration: By acquiring suppliers or distributors, firms reduce procurement costs, control the supply chain and eliminate intermediaries.
- Learning Economies: in certain sectors, learning can become a significant source of competitive advantage. A more experienced company can achieve lower unit production costs due to its expertise leading to enhanced efficiency and greater labour specialization which reduces operating expenses. These cost savings stem from streamlining operations by eliminating redundant activities, processes, and functions.

2) Financial Motives: M&A transactions can lead to significant financial advantages by improving capital structure, reducing risks and unlocking access to cheaper financing options. These benefits include:

- Lower Cost of Capital: the weighted average cost of capital (WACC) reflects the degree of corporate risk as perceived by the market. When a financially distressed company merges with a solvent one, it benefits from enhanced credibility among creditors and various stakeholders, leading to a decrease in perceived risk and a subsequent reduction in the cost of capital[19].
- Restructuring Opportunities: acquiring financially distressed companies provides opportunities to restructure and unlock value, as seen in turnaround strategies.
- Tax Synergies: these synergies allow firms to leverage tax advantages, such as offsetting taxable income with losses from the acquired company or benefiting from investment allowances.

3) Competitive Motives: they refer to the advantages gained through mergers and acquisitions that enhance a company's market position, improve its competitive edge and strengthen its ability to operate effectively in its industry. They include:

- Revenue Synergies: they represent the enhanced potential to generate additional income as a result of the M&A transaction. These synergies arise from opportunities such as cross-selling, where the merged

[19] Modigliani, F., & Miller, M.H. (1958). The Cost of Capital, Corporation Finance and the Theory of Investment.

entity can leverage its combined product portfolio to drive increased sales. For instance, one company may introduce its products to the established customer base of the acquired entity, thereby boosting revenue. Additionally, the transaction can improve market reach by enabling the company to access a broader audience through shared distribution networks, unified marketing strategies and enhanced brand visibility. Another critical benefit is the ability to achieve faster market entry. By acquiring an established entity, the buyer can bypass bureaucratic delays and regulatory hurdles, allowing rapid access to new markets. This advantage is particularly valuable in industries where local competition or compliance challenges could otherwise slow down expansion efforts[20].

- Market Expansion: it enables companies to strengthen their presence and grow in new territories or industries. M&A facilitates rapid entry into previously untapped markets by overcoming traditional barriers such as cultural differences, local regulations and competition. Compared to greenfield investments, which require building operations from the ground up, M&A provides immediate access to several strategic advantages. The acquiring company gains an existing customer base, accelerating revenue generation by leveraging an established clientele. It also benefits from integration into pre-existing distribution networks, ensuring efficient and seamless market penetration. Furthermore, the target company's expertise in local markets and conditions reduces risks and increases the likelihood of success. These advantages are particularly valuable in industries with high entry barriers, such as pharmaceuticals, telecommunications and financial services, where navigating complex regulations and competition poses significant challenges[21].
- Diversification: it provides significant competitive advantages by reducing a company's reliance on specific markets, products, or industries, thereby mitigating risks associated with economic volatility, market saturation or changing consumer preferences. Diversification can take the form of related diversification, where expansion into complementary sectors enhances operational alignment and creates synergies. For instance, when an automobile producer acquires a tire manufacturer, it can optimize its supply chain and lower operational expenses. Alternatively, unrelated diversification involves entering entirely new industries, enabling firms to spread risks across unrelated revenue streams, such as a technology company investing in renewable energy ventures. Empirical evidence suggests that related diversification typically yields higher shareholder returns compared to unrelated diversification. This is because related acquisitions align more effectively with a company's existing operations, resources and expertise, resulting in smoother integration and greater operational synergies.
- Enhanced Competitive Position: it involves improving the merged entity’s ability to operate effectively within its industry by leveraging competitive synergies. One key advantage is the consolidation of market share, where acquiring or merging with competitors reduces competition and enables the combined entity to dominate the market. Additionally, the larger scale of the merged company

[20] McKinsey & Company. The Opportunity for Revenue Synergies in M&A, 2018.

increases its bargaining power, allowing it to negotiate more favourable terms with suppliers and customers. Furthermore, the integration of two strong brands strengthens overall market presence and enhances customer loyalty, creating a more robust foundation for long-term success.

Figure 6_Three dimension for revenue synergies (McKinsey,2018)

Figure 1.4: McKinsey 2018, The opportunity for revenues synergies

4) Managerial Motives: they arise from the enhanced effectiveness of leadership, decision-making and operational oversight within the combined entity. These synergies reflect the ability of the acquiring company to introduce superior management practices, optimize resource allocation and implement strategic initiatives that improve overall performance. While often less tangible than operational or financial synergies, managerial synergies play a critical role in unlocking the full potential of the merger. One of the primary sources of managerial synergies is the integration of expertise and leadership. When two companies merge, the acquiring firm often brings in a more experienced management team with proven capabilities in strategic planning, innovation and operational efficiency. Optimized resource allocation is another key aspect of managerial synergies. By leveraging the combined entity's resources, the management team can streamline operations, prioritize high-growth areas and eliminate redundancies. This results in a more efficient use of financial, human and operational assets, driving higher productivity and profitability. This virtuous process can bring added value to the enterprise and so a competitive advantage: "Human capital interfaces with customer capital and structural capital to create knowledge value capital"[22].

[22] R. Tamosiuniene, E. Duksaite. "The importance of Mergers and Acquisitions in Today's Economy", p. 76, 2009

1.5 CHALLENGES AND CRITICAL SUCCESS FACTORS IN M&A

M&A transactions represent a significant opportunity to create value and achieve competitive advantages but also involve substantial challenges that must be carefully managed. Through accurate strategic planning, effective management of cultural differences, comprehensive due diligence and strong leadership, companies can significantly increase the likelihood of success. In this regard, companies should be aware that more than 10% of all large mergers and acquisitions fail, according to McKinsey (2019)[23]. The failure rate increases significantly when considering smaller and mid-sized deals. To navigate these challenges effectively, companies must develop a strategic approach that integrates rigorous planning, cultural adaptability and disciplined financial execution.

Possible challenges in M&A are:

1) Overvaluation and Overpayment: companies often base their valuation on projected synergies and growth estimates that turn out to be overly optimistic. According to Shiller (2000)[24], the irrational exuberance of some executives can lead to undisciplined decisions, increasing the risk of failure. This dynamic is exacerbated by competition among bidders, which can drive prices to unsustainable levels (Kumar & Sharma, 2019)[25].

2) Cultural Differences: they represent one of the most significant challenges in M&A, especially in cross-border acquisitions. Each company has a unique organizational culture and the confrontation between different cultures can generate conflicts in terms of processes, leadership styles and employee expectations (Bauer, Matzler & Wolf, 2016)[26]. If these differences are not managed effectively, they can hinder the integration process and compromise value creation. However, as highlighted by the same authors, effective management of cultural differences can transform them into an opportunity for complementarity and innovation. The 2005 merger of Daimler-Benz and Chrysler is a textbook example of cultural clashes in M&A. While Daimler operated with a rigid, hierarchical management style, Chrysler had a more relaxed, risk-taking culture. These fundamental differences led to severe operational inefficiencies, employee dissatisfaction, and ultimately, the demerger of the two companies in 2007.

3) High Debt Levels: another critical element is the use of high-cost debt to finance acquisitions. Leveraged buyouts (LBOs) are a prime example, where the acquirer incurs significant loans to fund the transaction. This strategy can generate substantial financial pressure on the acquiring company, negatively affecting overall performance and investor confidence (Jindal, 2015)[27].

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[23] https://www.mckinsey.com/capabilities/strategy-and-corporate-finance/our-insights/a-blueprint-for-m-and-a-success
[24] Shiller, R. J. (2000). Irrational Exuberance.
[25] Kumar, R., & Sharma, S. (2019). Reasons for M&A Failure.
[26] Bauer, M., Matzler, K., & Wolf, S. (2016). Impact of Cultural Differences on M&A Success.
[27] Jindal, P. (2015). High-Cost of Debt in Leverage Buyouts.

4) Unclear Strategic Intentions: many executives undertake M&A without a clear strategic vision, driven by motivations related to company growth or their personal reputation, as evidenced by the agency theory of Jensen & Meckling (1976)[28]. This lack of strategic focus can lead to disappointing results for both the company and its stakeholders.

5) Insufficient Due Diligence: a flawed due diligence process is one of the primary causes of M&A failure. Companies, attracted by the target company's brand, may overlook fundamental aspects such as financial data verification, risk analysis and cultural integration assessment (Jimenez & Sindik, 2022)[29]. A thorough due diligence process is essential to ensure informed and realistic decisions.

6) Overestimating Synergies: companies often overestimate the synergistic benefits arising from the transaction. This tendency, linked to excessive optimism among executives, leads to decisions that do not align with reality. A careful assessment of synergies is crucial to avoid calculation errors and ensure an accurate evaluation of growth prospects (Shiller, 2000)[30].

Despite the numerous challenges, several key factors can significantly increase the likelihood of a successful M&A transactions:

1) Accurate Strategic Plan: a clear strategic vision is fundamental to guide the entire M&A process. This includes defining specific objectives, identifying achievable synergies and evaluating financial and operational implications.

2) Managing Cultural Differences: Cultural integration is crucial for M&A success. Creating a shared identity and promoting employee satisfaction from both organizations can facilitate a smooth transition. Targeted strategies, such as intercultural workshops and integration programs, can reduce conflicts and leverage cultural diversity.

3) Comprehensive Due Diligence: an in-depth analysis of the target company is essential to identify risks and opportunities. Due diligence must cover financial, operational, legal and cultural aspects, ensuring a clear and transparent view of the transaction's potential.

4) Effective Communication: clear and transparent communication with all stakeholders is a key element of M&A success. Actively involving employees, investors and other interested parties can reduce uncertainties and foster acceptance of the change.

[28] Jensen, M. C., & Meckling, W. H. (1976). Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure.
[29] Jimenez, M., & Sindik, A. (2022). Role of Due Diligence in M&A Transactions.
[30] Shiller, R. J. (2000). Irrational Behavior

5) Strong and Engaging Leadership: strong leadership is indispensable to guide the entire M&A process. Leaders must be able to make quick decisions, manage conflicts and motivate teams during critical phases of integration.

6) Realistic Evaluation of Synergies: Using reliable valuation methods, such as the discounted cash flow (DCF) or multiples method, can help realistically estimate synergies and avoid overestimation errors.

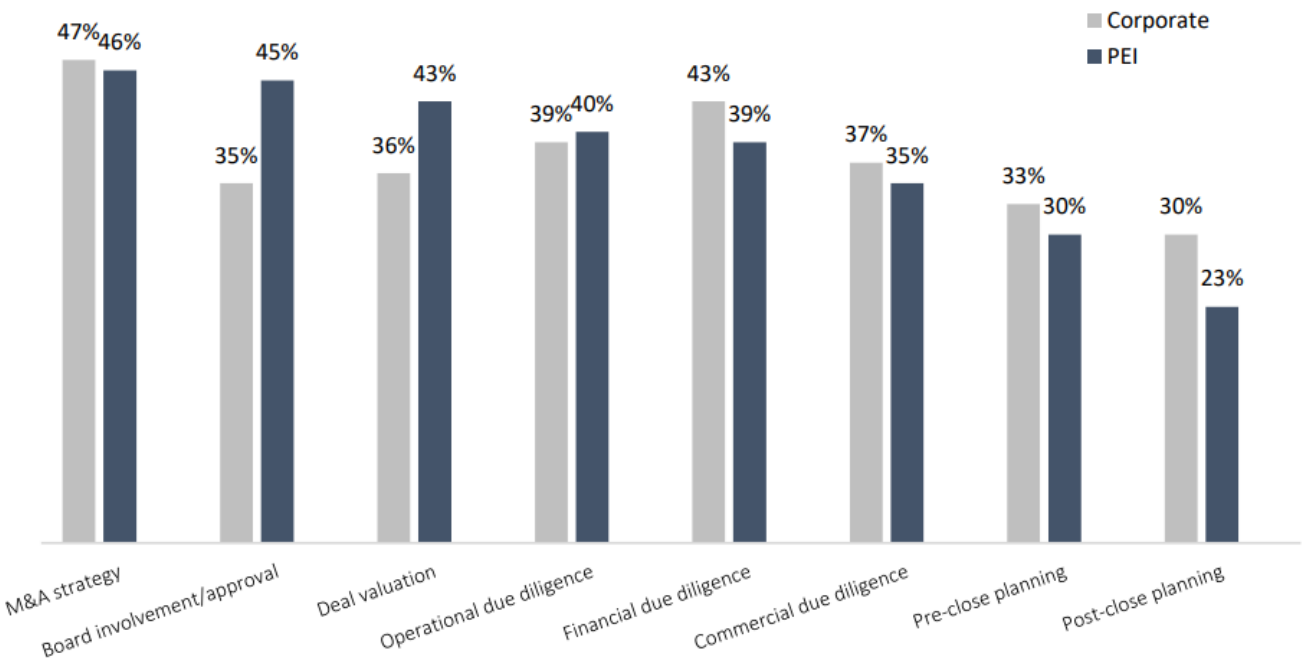

Figure 1.5: Deloitte (2022), 2022 M&A Trends Survey

A recent survey conducted by Deloitte (2022) underscores the importance of board involvement throughout the M&A deal lifecycle. A lack of oversight and a poorly defined acquisition strategy are cited as primary reasons for unsuccessful outcomes. Furthermore, the study highlights that assessing the true value of the target and its potential synergies, alongside thorough due diligence, are pivotal elements for success. Neglecting these aspects or failing to implement a robust integration strategy often jeopardizes the entire process. Companies must allocate sufficient resources, prioritize comprehensive research and craft an actionable plan to secure a favourable outcome in mergers or acquisitions.

1.6 HISTORICAL M&A TRENDS

The phenomenon of M&A has been a subject of significant study, as market consolidation often reflects the conditions of the external environment. Historically, M&A activity has exhibited a cyclical pattern closely tied to the broader economic system. Periods of heightened transaction volume and value often cluster within specific industries and sectors, defining what are known as "merger waves"[31]. These waves are driven by economic, regulatory and technological shocks that create new opportunities for growth and transformation. According to Harford (2005), such shocks explain the fluctuating nature of M&A activity, with periods of intense consolidation followed by quieter phases[32]. During economic recovery phases, companies often seek rapid growth strategies to capitalize on an expansive economic cycle, as M&As allow for faster expansion compared to organic development. From a regulatory standpoint, changes such as deregulation or adjustments to antitrust policies can remove barriers and facilitate new waves of mergers. Additionally, technological advancements often disrupt industries, expand market boundaries, or create entirely new sectors, prompting companies to respond swiftly through extraordinary transactions.

The first recorded instances of M&A activity emerged in the United States in the late 19th century, giving rise to what we now recognize as merger waves. From 1897 to the present, researchers have identified seven major waves, each characterized by unique features influenced by the prevailing economic, regulatory and technological landscape. While the earliest waves were largely confined to the U.S., subsequent waves have had broader global implications, including Europe. In Europe, M&A activity gained traction after World War II but Italy did not see significant developments until the 1990s, with the phenomenon gaining prominence in the early 2000s. The recurring patterns of M&A activity highlight their tendency to move in sync with the broader economic cycle. Periods of economic expansion typically see increased transaction volumes and values, while recessions lead to a decline in activity.

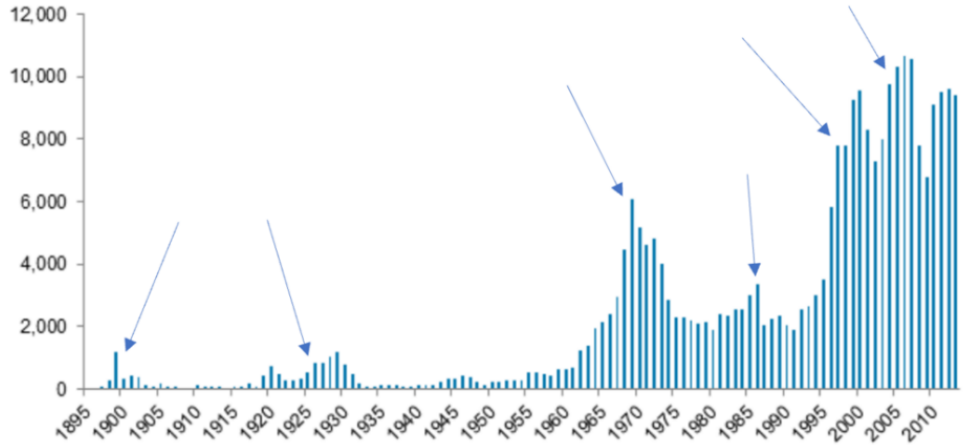

Figure 1.6: https://amsa-network.com/amsanews/search/2019/1/17/market-basics-merger-waves

[31] Gaughan, P. A. (2017). Mergers, Acquisitions, and Corporate Restructurings. Wiley.
[32] Harford, J. (2005). What drives merger waves? Journal of financial economics, 77(3).

1.6.1 M&A WAVES

First Wave (1897-1904)

The First Merger Wave, also known as *Great Merger Movement* or *Merger for Monopoly*, was a period of intense corporate consolidation in the United States, characterized by the creation of monopolies and industrial giants. This phenomenon emerged after the economic depression of 1883, in a context of falling prices, increased investments and the development of the first securities markets, which facilitated mergers between companies. The lack of effective antitrust regulations, combined with the expansion of transportation and communication networks, enabled a wave of horizontal integrations[33], involving companies operating in the same sector. The mergers during this period primarily affected the manufacturing and mining sectors, with high concentrations in industries such as oil, steel, metals, food and transportation. The main goal of these operations was to increase company size, exploit economies of scale, reduce production costs, and strengthen competitive positioning. These consolidations led to the creation of oligopolies and monopolies that dominated the market. Companies such as DuPont, General Electric and Eastman Kodak became emblematic examples of this wave, emerging as industrial giants. This phase, often referred to as "merger for monopoly," saw firms aiming to achieve market dominance and maximize revenues by establishing monopolistic positions. However, despite the growth of many industries, a significant number of deals failed to achieve their intended goals, resulting in unsuccessful outcomes. The Sherman Antitrust Act of 1890, one of the first laws designed to protect competition, partially intervened to limit industrial concentration. Although its enforcement was initially weak, it began to slow the formation of new monopolies.

Second Wave (1919-1929)

The Second Merger Wave emerged in the aftermath of the First World War and marked a significant shift from the previous wave, transitioning from the creation of monopolies to the consolidation of oligopolies. This phase, often referred to as the "*merger of oligopoly*", was defined by vertical integrations, where companies expanded operations along their supply chains to enhance efficiency, reduce costs and strengthen their bargaining power. Unlike the First Wave, which focused on horizontal mergers to create monopolies, this wave saw a strategic shift toward vertical mergers aimed at optimizing operations and improving supply chain management. Companies such as General Motors, IBM, John Deere and Union Carbide Corporation adopted these strategies to integrate suppliers or customers, ensuring better control over production and distribution while adapting to stricter regulatory frameworks that restricted monopolistic consolidations. These vertical transactions also helped companies expand their market reach and maintain competitive positions in increasingly regulated markets. The regulatory environment during this period was shaped by key legislative measures such as the Clayton Act of 1914 and the Federal Trade Commission Act, which sought to prevent uncompetitive practices and curb the power of monopolies. These laws arose in response to the monopolistic excesses of the First Wave, such as the landmark 1911 Supreme Court decision that declared Standard Oil an

[33] N. Fligstein (1990). The transformation of Corporate Contol. Harvard University Press

illegal monopoly. The regulatory changes prompted companies to pursue vertical rather than horizontal integrations, resulting in the creation of more efficiency-driven oligopolies. The industries most impacted during this wave included automotive, oil and gas, railroads, chemicals and food production. This period of accelerated M&A activity came to an abrupt halt with the Wall Street crash on October 29, 1929, which triggered the Great Depression. The economic collapse not only ended the Second Merger Wave but also revealed the vulnerabilities of many of the deals, which failed to deliver their intended benefits in the face of the market downturn.

Third Wave (1965-1970)

The Third Merger Wave emerged during a period of economic prosperity in the United States and the global economy, fuelled by the economic boom of the 1960s. This wave was primarily characterized by conglomerate mergers, in which companies from unrelated industries consolidated to diversify their business portfolios and reduce risk. This strategy was a response to stricter antitrust regulations, such as the Celler-Kefauver Act of 1950, which limited horizontal and vertical mergers within the same industry. Companies took advantage of abundant liquidity and the robust economic environment to pursue mergers and acquisitions, focusing on diversification to reduce dependency on single sectors and mitigate company-specific risks. This era saw the rise of holding companies and conglomerates, with General Electric standing out as a prominent example of successful diversification. The financing of these mergers initially relied heavily on the capital of the acquiring companies, with limited involvement from banks. However, as the wave progressed, overvaluations of target companies and increased leverage began to attract speculative investments. While the strategy of diversification seemed promising, many conglomerate mergers yielded unsatisfactory results due to a lack of synergies between the merged entities. The Third Wave ultimately came to an end with the oil crisis of the early 1970s, which triggered a sharp economic downturn and a collapse in stock prices.

Fourth Wave (1981-1989)

The Fourth Merger Wave marked a significant shift in the landscape of mergers and acquisitions, characterized by the rise of hostile takeovers, leveraged buyouts (LBOs) and the emergence of corporate raiders. This period, often referred to as the "*wave of megamergers*", coincided with economic prosperity in the mid-1980s, enabling large-scale transactions driven by sophisticated strategies, increased bank involvement and higher debt levels. Unlike previous waves, the Fourth Wave saw a notable increase in the size of target companies, often involving major U.S. firms across industries such as oil and gas, pharmaceuticals, banking and airlines. Hostile takeovers became a widespread tactic, where acquirers targeted underperforming conglomerates to break them apart and sell their business units for a profit. This speculative approach was amplified by the activities of corporate raiders, investors who purchased large shares in undervalued companies to gain control, often against the will of the existing management and subsequently pushed for changes to increase share value. Investment banks played a crucial role in facilitating these deals, providing substantial funding and strategic advice to their clients, including corporate raiders. This era also saw the rise of the junk bond market, which

provided high-yield but high-risk financing for these leveraged transactions. Junk bonds became an essential tool for funding acquisitions, particularly for companies with lower credit ratings. The volume and value of transactions during this wave were unprecedented, surpassing previous merger waves and extending beyond the U.S. to include significant activity in Europe. However, the wave's aggressive reliance on debt and speculative strategies ultimately led to its downfall. The stock market crash of 1987 and the subsequent collapse of overleveraged banks and financial institutions in 1989 exposed the risks inherent in excessive credit disbursement and unsustainable capital structures. High inflation and borrowing costs further exacerbated the situation, forcing many companies to fail and bringing the Fourth Merger Wave to an end.

Fifth Wave (1992-2000)

The Fifth Merger Wave arose in the wake of the 1990–91 economic recession and was defined by the rise of mega-deals[34] and cross-border transactions. This wave was driven by globalization, deregulation, privatization and technological innovation, which enabled companies to pursue economies of scale and strengthen their global competitiveness. Unlike the hostile takeovers of previous waves, mergers during this period were predominantly friendly and aimed at strategic expansion. A trademark of this wave was the increasing prevalence of cross-border mergers, where companies from different countries consolidated despite the regulatory and cultural complexities involved. These transactions became essential for businesses aiming to enter foreign markets and establish dominance on a global scale. In Europe, the impact of the European Union's integration process further encouraged cross-border operations, making the continent a significant player in the global M&A market. For the first time, in 1999, the number of deals in Europe surpassed those in the United States. The fifth wave also marked an era of strategic consolidation in industries such as telecommunications, oil and gas, automotive and pharmaceuticals. Iconic transactions included Vodafone AirTouch's acquisition of Germany's Mannesmann, the merger of Exxon and Mobil to form ExxonMobil and the Daimler-Chrysler merger in the automotive industry. Unlike the debt-heavy transactions of the Fourth Wave, the fifth wave relied more on equity financing, reflecting the era's stock market boom. However, this wave concluded abruptly in 2000, triggered by the collapse of the dot-com bubble[35] and major corporate scandals involving companies like Enron and WorldCom. These events led to significant bankruptcies and a loss of investor confidence, concluding an era of expansive globalization and cross-border activity that redefined the corporate landscape.

Sixth Wave (2003-2008)

The Sixth Merger Wave arose in the early 2000s, following the recovery from the dot-com bubble burst and was stimulated by globalization, private equity and shareholder activism. This wave was characterized by cross-border transactions, large-scale deals and the increasing role of institutional investors and operators from

[34] The term "mega-deals" refers to mergers and acquisitions worth one billion U.S. dollars or more.
[35] The dot-com bubble was a stock market bubble caused by excessive speculation of internet-related companies in the late 1990s.

emerging economies. The focus on globalization paved the way for foreign direct investments (FDI) and multinational mergers, as companies sought to expand their market presence and consolidate their core businesses. Governments also supported these processes through favourable policies and incentives. A defining feature of this wave was the surge in private equity investments and the widespread use of leveraged buyouts (LBOs), enabled by low interest rates following central banks' efforts to stimulate the economy. Private equity firms played a crucial role by injecting capital into companies and facilitating acquisitions aimed at achieving economies of scale and increasing efficiency. Shareholder activism also grew during this period, with shareholders exerting greater influence over corporate decisions, appointing management participants and playing an active role in board discussions. This trend shifted corporate governance dynamics and highlighted the importance of aligning management and shareholder interests. The wave's reliance on debt-financed acquisitions was driven by low borrowing costs and the speculative growth of the real estate market, which further boosted LBO activity. However, this speculative environment contributed to the formation of a bubble, particularly in the real estate sector. The bubble burst in 2007, triggering the subprime mortgage crisis, which led to a global financial meltdown and a sharp downturn in M&A activity. The economic recession of 2007–2009 marked the end of the Sixth Wave, as the collapse of over-leveraged deals and corporate failures halted the momentum of mergers and acquisitions.

Seventh Wave (2011-onwards)

The years immediately following the end of the Sixth Wave were challenging for the M&A landscape. The situation was further worsened by the disastrous fallout from the AOL Time Warner merger, which resulted in an almost $100 billion loss within just a year. This merger, often referred to as the "*biggest mistake in corporate merger history*"**,** became a cautionary tale for future deals. By 2004, M&A activity had reached a particularly low point, reflecting the broader economic downturn of the time. However, optimism began to return by 2011, as signs of renewed M&A activity hinted at the possible onset of a Seventh Wave. This new wave sees the BRICS nations[36] emerging as key players. These countries, which are either developing economies or newly industrialized nations, also represent some of the most populous countries in the world, collectively accounting for over 40% of the global population as of 2015. Their growing economic cooperation and increasing emphasis on corporate and commercial activities suggest that future M&A activity may be heavily concentrated in these regions and their respective continents. The rise of the BRICS countries highlights a shift in global economic power, placing them at the forefront of corporate consolidation and cross-border transactions in the years to come.

[36] BRICS is an acronym used in international economics to refer to the following leading developing countries: Brazil, Russia, India, China, South Africa.

CHAPTER 2: VALUATION METHODS

2.1 INTRODUCTION TO BUSINESS VALUATION

Business valuation is the systematic process of determining the economic worth of a company, its assets or its shares. This process is central to M&A where understanding the intrinsic value of a business is essential for determining a fair transaction price. Valuation methodologies consider quantitative elements, such as revenue streams, cost, and balance sheet figures, alongside qualitative aspects, such as market positioning, brand reputation and growth potential. The objective is to provide an informed estimate of value that facilitates decision-making, whether for buyers, sellers or other stakeholders involved in the transaction[37]. The valuation process in M&A transactions aims to achieve several critical objectives, which include:

Determining the Fair Market Value: The concept of fair market value represents the price at which an asset would change hands between a willing buyer and a willing seller in an open and competitive market. In M&A, establishing this value ensures that the agreed transaction price reflects the company's underlying worth, accounting for both its current performance and future potential.

Providing a Basis for Price Negotiations: The valuation acts as a reference point in price negotiations, helping buyers and sellers converge on a mutually acceptable transaction value. For buyers, it prevents overpayment for an asset, while for sellers, it ensures they receive fair compensation for their business. This aspect is particularly critical in competitive bidding scenarios or cross-border M&A, where market dynamics may introduce pricing volatility.

Identifying Synergies and Strategic Value: Beyond standalone valuation, M&A often involves assessing the additional value generated through synergies. These synergies can take the form of cost reductions (e.g., economies of scale, improved supply chain efficiency) or revenue enhancements (e.g., cross-selling, market expansion). Accurately identifying and quantifying these benefits is essential for justifying the transaction premium often included in M&A deals.

Despite its importance, business valuation is inherently challenging due to the interplay of various complex factors:

- Uncertainty in Future Cash Flows: Predicting a company's future financial performance often involves making assumptions about revenue growth, market share, operating margins and capital expenditures. These projections can be highly sensitive to changes in economic conditions, competitive pressures or unexpected market disruptions. Small deviations in assumptions can lead to significant variations in valuation outcomes.
- Sector-Specific Risks: Each industry has unique characteristics and risk factors that influence valuation. For example, in the automotive industry—characterized by high capital intensity and

[37] Damodaran, A. (2012). Investment Valuation: Tools and Techniques for Determining the Value of Any Asset. Wiley.

technological disruption—factors such as the shift toward electric vehicles, regulatory changes and supply chain constraints play a critical role in shaping a company's value. Accurately incorporating these factors into a valuation model requires deep sector expertise.

- Subjectivity in Key Assumptions: Many valuation models rely on inputs that involve a degree of subjectivity, such as the discount rate used in Discounted Cash Flow (DCF) models or the selection of comparable companies in market multiples. These inputs can reflect biases or divergent perspectives among stakeholders, leading to discrepancies in the final valuation. For instance, the Weighted Average Cost of Capital (WACC) can vary based on assumptions about market risk premium, beta or debt-equity ratios, all of which are subject to interpretation.
- External Market Volatility: Economic cycles, interest rate fluctuations and geopolitical events can introduce volatility that impacts valuation models, especially those reliant on market-based approaches. For instance, the valuation of companies in sectors tied to cyclical demand, such as automotive, may swing dramatically based on global demand forecasts or commodity price changes.

2.2 THE THEORETICAL RATIONALE FOR THE VALUATION OF M&A TRANSACTIONS

The theoretical rationale behind M&A operations often highlights a significant difference between the stand-alone theoretical value of the acquired company, which represents the intrinsic value the company would have on its own, and the actual price paid for the acquisition. This difference, known as the "acquisition premium," can be attributed to various factors, such as the revenue and cost synergies generated by the transaction, the attempt to modify the competitive equilibrium or the market risk or other specific motivations pursued by the acquirer. Within the context of a transaction, the parties involved have divergent objectives. On one hand, the acquirer aims to minimize the price, while on the other hand, the seller seeks to maximize it. The determination of the price, therefore, depends on the nature of the acquisition. In a friendly acquisition, the price reflects the final result of negotiations between the parties, whereas in a hostile takeover, the market determines its value.

In order to better understand the dynamics related to the valuation and determination of the acquisition price in an M&A transaction, it is helpful to define the key terms involved in the analysis. The Purchase Price (P) represents the price paid by the acquirer to purchase the target company; the Value of Acquirer Before Acquisition (V_a) refers to the value of the acquirer prior to the transaction while the Value of Acquirer After Acquisition (V_a') represents the overall value of the acquirer following the completion of the acquisition. Finally, the Value of Target Before Acquisition (V_b) represents the intrinsic value of the target, considered on a stand-alone basis, that is, without considering any synergies or other benefits generated by the transaction.

The valuation of M&A transactions is based on three main concepts:

- Price max: The maximum price that a buyer is willing to pay for a target company can be expressed as the sum of the intrinsic value of the target (stand-alone) and the value generated by the difference between the post-acquisition value and the pre-acquisition value of the acquirer. $P_{max} = V_b + (V_{a'} - V_a)$
- Value creation: Value creation occurs when the difference between the purchase price and the maximum price is negative, indicating that the price paid is lower than the maximum sustainable based on the expected benefits. $\Delta P = P - P_{max} < 0$
- Value destruction: Value destruction occurs when the purchase price exceeds the maximum price, indicating that the transaction has resulted in a loss in terms of overall value. $\Delta P = P - P_{max} > 0$

The theoretical value analysis focuses on both the stand-alone value of the target company and the impact that the acquisition has on the overall value of the acquirer (theoretical value = $V_b + \Delta V_a$). The stand-alone value of the target is determined using standard valuation techniques while the value generated by the acquisition arises from revenue and cost synergies, strategic options acquired and changes in the risk profile achieved through the transaction.

From the acquirer's perspective, they must estimate the appropriate price for acquiring the target using the value creation principle. According to this approach, the price paid is considered fair and appropriate if the transaction leads to an increase in the acquirer's overall value. If the transaction does not change the acquirer's stand-alone value, value is created when the price paid is less than or equal to the stand-alone value of the target. $P <= V_b$.

However, the acquisition also has a direct impact on the acquirer's overall value and the necessary condition to ensure value creation for shareholders, as shown earlier, is that the price paid is less than the sum of the stand-alone value of the target and the value increment generated for the acquirer by the transaction. $P < V_b + (V_a' - V_a)$.

2.3 DCF METHOD

The Discounted Cash Flow (DCF) method is one of the cornerstones of modern corporate valuation. Based on the idea that the value of a company derives from the future cash flows it can generate, appropriately discounted, the DCF provides an analytical and quantitative perspective. This approach reflects both the time value of money and the risks associated with future estimates. DCF method is based on the theory developed by Modigliani and Miller (1956-1963).

M&M Proposition I: "In a perfect capital market, the total value of a firm is equal to the market value of the total cash flows generated by its assets and is not affected by its choice of capital structure"[38].

M&M Proposition II: "The cost of capital of levered equity increases with the firm's market value debt-equity ratio"[39].

The DCF method assumes that a company has a potentially unlimited lifespan, but to simplify calculations, cash flows are divided into two main components: explicit forecast period, a time frame (usually 3 – 10 years) during which detailed projections of cash flows are made, and terminal value, the residual value of the company at the end of the explicit period estimated based on assumptions of perpetual growth or market multiples.

Calculating the Net Present Value (NPV) of these cash flows allows for determining the value of the company. Future cash flows are the heart of the DCF method. These are calculated as free operational cash flows (unlevered), meaning net of investments and changes in net working capital, but before deducting financial charges.

The basic formula is: Free Cash Flow = EBIT * (1 – τ) + Depreciation – CapEx – ΔNWC[40]

Where:

EBIT: Earnings Before Interest and taxes

τ: marginal corporate tax rate

CapEx: capital expenditure

ΔNWC: Change in Net Working Capital

[38] https://www.academia.edu/8708434/The_Modigliani_and_Miller_Capital_Structure_of_Corporations
[39] https://www.academia.edu/8708434/The_Modigliani_and_Miller_Capital_Structure_of_Corporations
[40] Berk, J., & DeMarzo, P. (2023). Corporate Finance. Pearson.

The Terminal Value represents a significant portion of a company's total value, as it reflects the company's ability to generate cash flows beyond the explicit forecast period. It is an essential component of the valuation method based on Discounted Cash Flow as it accounts for long-term value creation. The terminal value can be computed in two ways, depending on the presence or not of growth. One of the most common method is represented by Gordon formula which assumes the stable growth of cash flows[41]:

$$TV = FCF_n \times \frac{(1+g)}{(r-g)}$$

Where:

n: last year of the given time horizon

g: growth rate

r: discount rate

FCF: normalised cash flow

In deriving normalized free cash flows, two critical assumptions are typically made to simplify the calculation:

- Capital Expenditures = Depreciation: This assumes that the company's reinvestment needs for maintaining its operations align with the depreciation charge.
- Change in Net Working Capital (NWC) = 0: This reflects the assumption that there is no additional investment or release of funds from working capital over the long term, effectively stabilizing the company's operations.

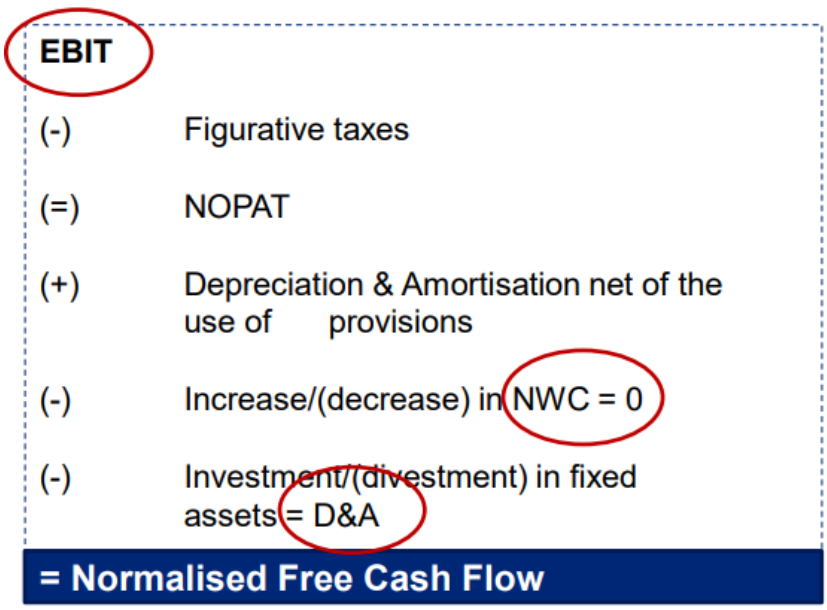

Figure 2.1: Vulpiani, M. (2014). Special Cases of Business Valuation. McGraw Hill.

If the perpetual growth rate is assumed to be g = 0, the terminal value is computed as follow:

[41] Berk, J., & DeMarzo, P. (2023). Corporate Finance. Pearson.

$$TV = \frac{FCF_n}{r}$$

The growth rate represents the constant rate at which a company's normalized cash flows are expected to grow each year during its indefinite residual life. A key principle to consider is that the stable growth rate cannot exceed the long-term economic growth rate, as this would imply an unrealistic assumption of perpetual growth surpassing the overall economic context. A consolidated approach to determine the growth rate involves assuming it to be equal to the inflation rate expected for the final year of the plan, as forecasted by reliable sources, such as the Economist Intelligence Unit. This method ensures a prudent and consistent estimate aligned with long-term economic trends.

The growth rate can be also estimated on the basis of Reinvestment Rate Formula[42] according to which:

g = Reinvestment Rate * ROC

Where:

$$\text{Reinvestment Rate} = \frac{\text{Capital expenditure} - \text{Depreciation} + \Delta\text{Noncash WC}}{\text{EBIT} * (1 - \text{Tax Rate})}$$

$$\text{Return on Capital} = \frac{\text{EBIT} * (1 - \text{Tax Rate})}{(\text{BV of equity} + \text{BV of debt} - \text{Cash})}$$

ROC is determined as the ratio between NOPAT (Net Operating Profit After Taxes) and NIC (Net Invested Capital) while the Reinvestment Rate[43] reflects the proportion of a company's earnings that is reinvested to drive future growth.

2.3.1 DETERMINATION OF ENTERPRISE VALUE AND EQUITY VALUE

The DCF method is a fundamental tool for business valuation as it allows the estimation of a company's value based on its ability to generate future cash flows. This approach is grounded in the principle of the Time Value of Money which states that a sum of money available today is worth more than the same amount received in the future due to the potential returns it could generate and the risks associated with future cash flows. In the DCF method, expected cash flows are discounted to their present value using a discount rate that reflects the risk and cost of capital. Through this methodology, the Enterprise Value (EV) is determined representing the overall value of a company, including both equity and net debt. EV is essential for analyzing the total value of

[42] Damodaran, A. (2012). Investment Valuation: Tools and Techniques for Determining the Value of Any Asset. Wiley.

[43] Reinvestment Rate is commonly derived from the company's latest financial statements. For companies with sporadic large investments, such as major projects or acquisitions, an average Reinvestment Rate calculated over several years might provide a more accurate representation. In cases in which a firm has recently undertaken significant investments, industry benchmarks for the Reinvestment Rate could serve as a more reliable indicator than historical company averages.

the business from the perspective of all its financiers, offering an integrated view of the company's economic performance.

$$\text{Value of Company} = \sum_{t=1}^{N} \frac{FCFF_t}{(1 + \text{WACC})^t} + \text{TV}$$

Where:

FCFFt: Free Cash Flow to the Firm generated in period t

WACC: Weighted Average Cost of Capital used as discount rate

TV: Terminal Value

N: Explicit forecast period

The Enterprise Value is calculated as the sum of the present value of explicit cash flows and the present value of the Terminal Value. This measure reflects the overall value of the company, independent of its capital structure. Importantly, the DCF method, when applied to Enterprise Value, focuses on unlevered cash flows which exclude the effects of financial debt. These are the residual cash flows after covering operating costs and taxes, but before accounting for interest and financial expenses. By discounting these unlevered cash flows to the Weighted Average Cost of Capital (WACC), the method provides a comprehensive valuation of the company as a whole, separate from the impact of financial leverage.

While the Enterprise Value represents the total value of the company, including both equity and net debt, the Equity Value represents the value of a company's shareholders' equity, i.e., the residual value available to shareholders after accounting for all financial obligations.

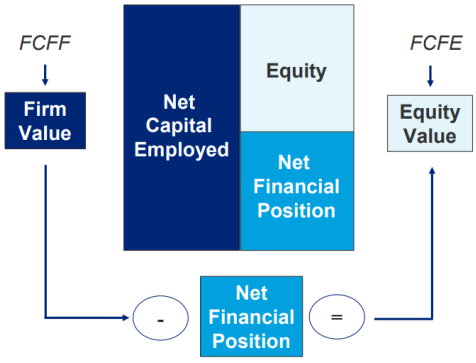

Figure 2.2: Vulpiani, M. (2014). Special Cases of Business Valuation. McGraw Hill.

The figure shows that the Equity Value can be calculated as the difference between enterprise value and NFP. The NFP (Net Financial Position) is an indicator that reflects the balance between net debt and the company's available liquidity. It is calculated as: NFP = Total Financial Debt – (Cash + Liquid Financial Assets) where Total Financial Debt includes all short and long-term debt, such as bank loans, bonds, financial leases and other financial liabilities while Cash and Liquid Financial Assets include available cash, bank deposits and other short-term investments that can be easily converted into cash.

If NFP > 0: the company has a net debt position, meaning the value of its debts exceeds its available liquidity. In this case, debt reduces the residual value available to shareholders.

If NFP < 0: the company has a net cash position, meaning its liquidity exceeds its debts. In this scenario, the net cash increases the value available to shareholders.

Another method to calculate the Equity Value is through Free Cash Flow to Equity (FCFE) Approach according to which the Equity Value is determined by discounting the future cash flows available to shareholders. These cash flows, referred to as residual cash flows, are calculated after deducting operating costs, taxes, and financial expenses. The discounting is done using the Cost of Equity, which reflects the return expected by the shareholders for their investment in the company.

$$\text{Value of Equity} = \sum_{t=1}^{N} \frac{\text{FCFE}_t}{(1+K_e)^t} + \text{TV}$$

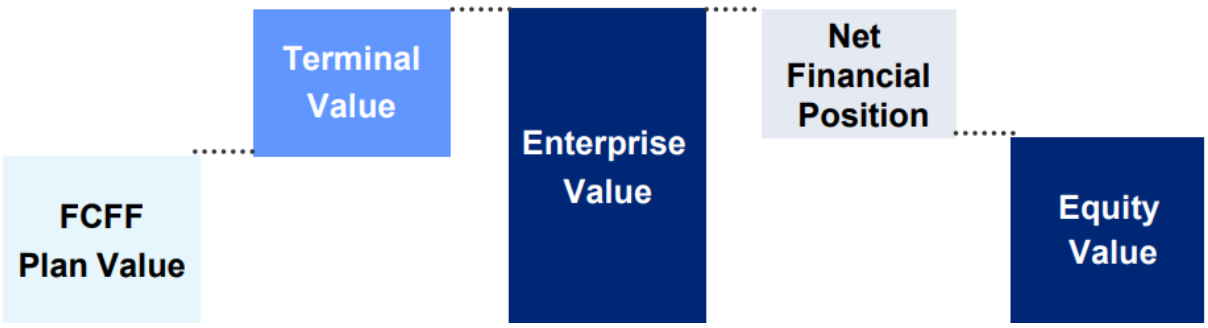

Figure 2.3: Vulpiani, M. (2014). Special Cases of Business Valuation. McGraw Hill.

2.3.2 THE WEIGHTED AVERAGE COST OF CAPITAL

WACC is one of the key concepts of the Discounted Cash Flow method as it is the discount rate used to calculate the present value of cash flows. The WACC represents the average of a firm's equity cost and after-tax cost of debt weighted by the proportion of the firm's enterprise value that corresponds to the sum of both equity and debt[44]. It is essential that the discount rate used is consistent with the risk and type of cash flow being discounted.

If the cash flows considered are those destined for shareholders (FCFE), the appropriate discount rate is the Cost of Equity. Conversely, if the cash flows are those intended for the entire enterprise (FCFF), the WACC is the correct choice, as it represents a rate that reflects the weighted average cost of capital for all financiers, including both shareholders and creditors.

Another key distinction is between nominal and real cash flows. If the discounted cash flows are nominal (i.e., they include expected inflation), the discount rate must also be nominal. Similarly, for real cash flows (excluding inflation), a real discount rate must be used. Ensuring consistency between the type of cash flow and the discount rate guarantees that the present values are homogeneous and comparable.

The WACC is calculated using the following formula:

$$\mathbf{r = WACC^{(*)} = \frac{E}{(D+E)} * K_e + \frac{D}{(D+E)} * K_d * (1 - t)}$$

Where:

E: Market Value of Equity

D: Market Value of Debt

Ke: Cost of Equity

Kd: Cost of Debt

t: marginal corporate tax rate

[44] Berk, J., & DeMarzo, P. (2023). Corporate Finance. Pearson.

2.3.3 THE COST OF DEBT

The cost of debt reflects the effective cost of financing through debt and includes the tax benefit derived from the deductibility of interest expenses. It is estimated based on the actual ratio of financial costs to debt. However, there are some limitations when it comes to discounting the company's future cash flows, as it is not directly tied to the expected future financial structure. In general, the formula to calculate Kd is given by:

Kd = Rf + Default Spread

Where:

Rf: risk free rate estimated based on the yield of government bonds with matching maturity

Spread: additional risk premium, which varies depending on the company's creditworthiness and the industry in which it operates. More specifically, it is estimated on the basis of financial rating of the company. The ICR index (Interest Coverage Ratio = EBIT/Financial Expenses) can be considered a good proxy to measure the capability to repay financial expenses.

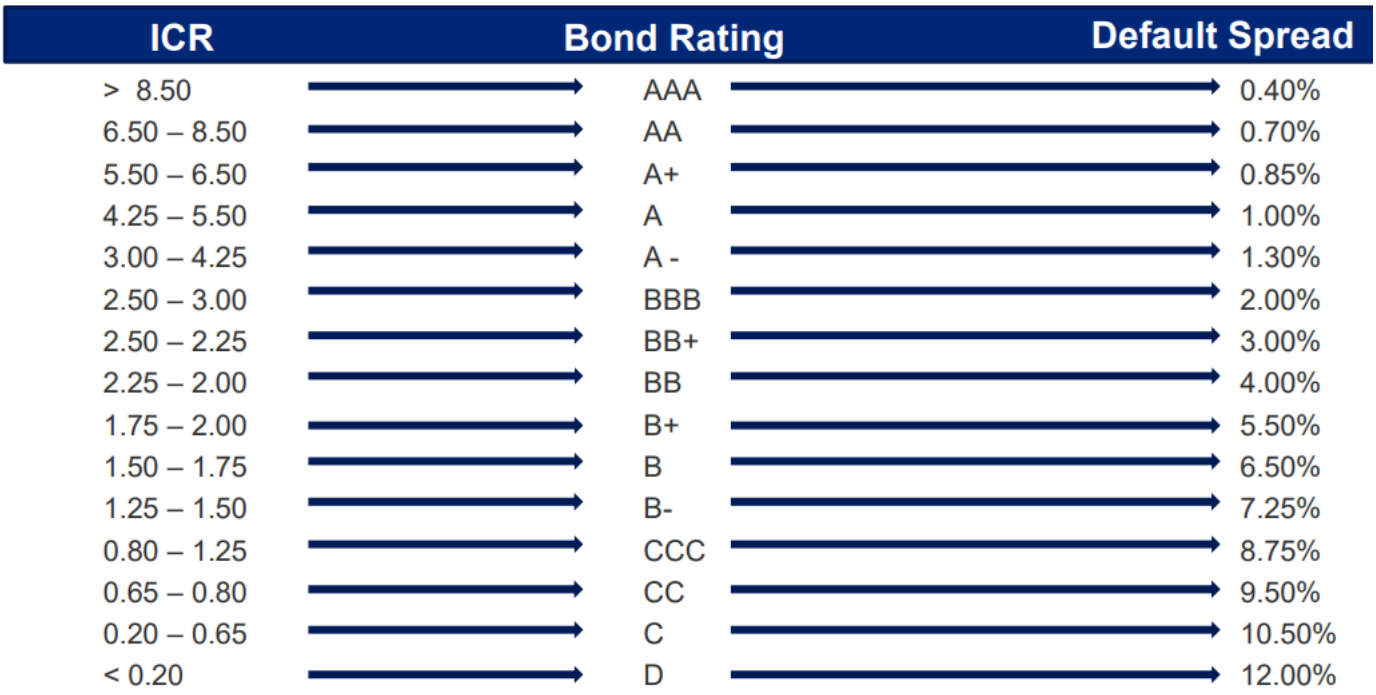

Figure 2.4: Damodaran, A (2014): Ratings. Interest Coverage Ratios and Default Spread

In the case of non-listed companies or those without a public credit rating, the cost of debt can be estimated using average market conditions or the historical yield of bonds issued by similar companies, taking into account their size and industry. For some companies, particularly those with complex financial structures, an iterative approach may be required to accurately estimate Kd. This involves continuous reassessment of the cost of debt, considering changes in credit ratings, market rates and future business strategies.

2.3.4 THE COST OF EQUITY

The Cost of Equity Capital reflects the rate of return that shareholders expect to earn on their equity investment. Investments with higher risk should offer greater expected returns compared to those with lower risk. The most commonly used model to calculate the Cost of Equity (Ke) is the Capital Asset Pricing Model (CAPM), which is based on the following formula:

$$K_e = R_f + \beta_l * MRP$$

Where:

Rf: risk free rate which represents the rate of return available on a risk-free security as of the valuation date. Typically, analysts use the yield to maturity on government securities as a proxy for the risk-free rate, given their perception as being free of default risk. The specific maturity chosen depends on the purpose of the valuation, with common references being government bonds of 5, 10 or 30 years. In professional practice, the selection of government bonds for the risk-free rate is not arbitrary. Analysts generally choose long-term government bonds from the country in which the firm operates to account for country risk within the risk-free rate. The components of the risk free rate include:

- Rental Rate: the real return for lending the funds for ongoing operations
- Inflation Expectations: the expected rate of inflation on maturity of the risk free investments
- Maturity Risk or Investment Rate: the risk of the investment value resulting from changes in the level of interest rates

βl: beta levered that measures the level of market or systematic risk, representing how sensitive the excess returns of a specific security or portfolio (returns above the risk-free rate) are to the excess returns of the overall market. It measures the degree to which the performance of an individual security or portfolio fluctuates in response to movements in the broader market.

MRP: Market Risk Premium that represents the additional return an investor expects to earn above the risk-free rate by investing in a diversified portfolio of common stocks. This premium compensates investors for taking on the higher risk associated with equity investments compared to risk-free securities. Mathematically, MRP is expressed as the difference between Rm (expected market return based on historical data or forward-looking estimates, often considering market indices such as the S&P 500) and Rf. The MRP is a forward-looking concept, meaning it reflects investors' expectations for future returns. However, since these

expectations are not directly observable, analysts rely on various methodologies to estimate the MRP. These approaches fall under the forward-looking or ex-ante[45] framework and include:

- Bottom-up approach: it is a methodology based on detailed and specific data collected from various authoritative sources such as Merrill Lynch publications, Value Line projections and the Cost of Capital Yearbook.
- Top-down approach: this method analyzes historical relationships between market variables, such as earnings growth, price-to-earnings ratios, dividend yields, changes in interest rates and real stock returns.

The Cost of Equity can be further understood by analyzing the key concepts of risk that influence the expected return; the Capital Market Theory divides the overall risk into three main components:

- Maturity risk: risk that the value of an investment may rise or fall due to fluctuations in overall interest rates. The maturity risk tends to be greater for investments with longer maturities.
- Market or Systematic risk: risk resulted from unexpected impacts on the market value of assets and liabilities. The market risk is not diversifiable and it should be rewarded.
- Firm-specific or Idiosyncratic risk: risk caused by the uncertainty of expected returns due to factors unrelated to the overall market. These factors can include specific characteristics of the industry or the individual company. This risk can be eliminated through diversification.

The most relevant element in calculating the cost of equity is the beta that, as already highlighted, measures the market or systematic risk. In addition, beta is defined as the ratio of covariance between benchmark market return and security returns divided by the variance of the benchmark market return, according to the following formula:

$$\beta_i = \frac{\sigma_{i,m}}{\sigma^2_m}$$

β_i = estimated beta based on historical data;
$\sigma_{i,m}$ = covariance between individual security and benchmark market return;
σ^2_m = variance of benchmark market return

Beta can be estimated using the regression method, according to which beta is estimated by comparing the excess return on an individual security and the excess return on the market index. The implicit assumption in this approach is that the future reflects the past. The formula used is:

$$(R - R_f) = \alpha + \beta * (R_m - R_f) + \varepsilon$$

R = historical return for publicly traded stock
R_f = risk free rate
α = regression constant
β = estimated beta based on historical data
R_m = historical return on market portfolio
ε = regression error term

[45] Pratt S. P. & Grabowski R. J., 2010

The regression method requires the application of the OLS (Ordinary Least Squares) and the slope of the best-fit line represents the estimated beta.

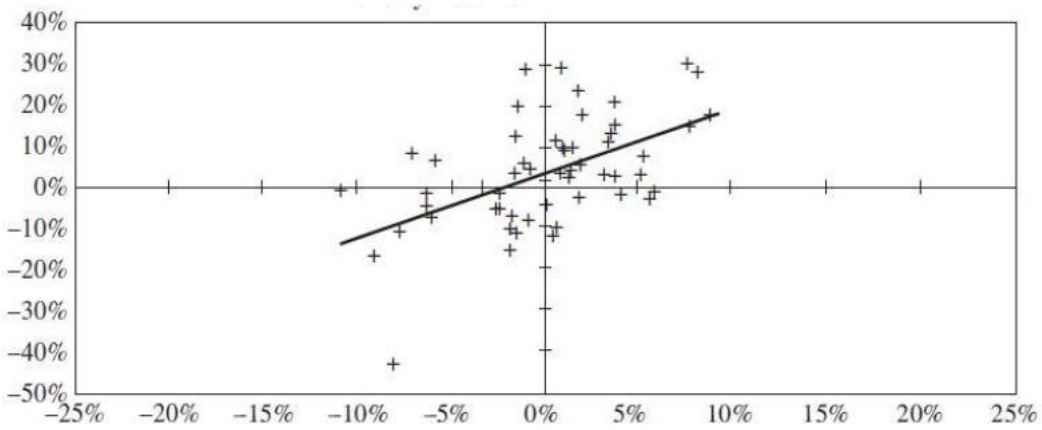

Figure 2.5: Vulpiani, M. (2014). Special Cases of Business Valuation. McGraw Hill.

Regarding the values assumed by the beta:

- $\beta>1$: the stock moves in the same direction of the market and it is more volatile than market
- $\beta=1$: the stock has the same market risk
- $0<\beta<1$: the stock moves in the same direction of the market but it is less volatile than market
- $\beta=0$: there is no correlation between the stock and the market
- $-1<\beta<0$: the stock is inversely correlated to the market but with reduced intensity
- $\beta=-1$: the stock is inversely correlated to the market
- $\beta<-1$: the stock moves in the opposite direction of the market and fluctuates more than the market itself

Companies with greater beta are riskier: they are typically start-ups with high financial risk and extremely volatile profits and cash flows; on the other hand, companies with low beta are considered moderately risky.

Another way to deduce beta is represented by the Bottom-up approach according to which the beta is estimated by considering a panel of comparable companies. The estimation is divided into four main steps:

- Step 1: composition of a panel of comparables according to industry, size, profitability, capital structure
- Step 2: removing the financial risk component caused by leverage to obtain the unlevered beta which represents the pure operational risk of a company, assuming it is fully equity-financed. Hamada's formula is used:

$$\beta_l = \beta_u + \beta_u * (1 - t) * D/E = \beta_u * [\, 1 + (1 - t)\, D/E \,]$$

$$\beta_u = \beta_l / [\, 1 + (1 - t)\, D/E \,]$$

- Step 3: calculation of the average of comparables' beta unlevered
- Step 4: re-levering process which consists of calculating the levered beta considering the structure financial of the specific firm by applying again Hamada's formula.

The bottom-up approach reduces beta volatility as it uses aggregated data from multiple comparable companies, thereby minimizing distortions related to company-specific factors or short-term fluctuations in market data. This approach is also adaptable to the specificity of the target company due to the ability to recalculate the levered beta based on the target company's financial structure, ensuring a tailored analysis and allowing for the separation of systematic risk (measured by the unlevered beta) from specific risk, providing a clearer view of market risk. On the other hand, identifying a set of comparable companies that reliably represent the systematic risk of the target company can be subjective and challenging. Moreover, it requires market data related to comparable companies and the industry. If the data used is incomplete, outdated or inaccurate, the results may be compromised.

2.3.5 STRENGTHS AND WEAKNESSES OF THE DCF METHOD

DCF method has both strengths and weaknesses that should be carefully considered[46]. As for key advantages:

- Flexibility: The DCF method is highly flexible and can be adapted to a wide range of business contexts, regardless of size, industry, or the company's life cycle stage. This makes it particularly useful for both start-ups with growth potential and established businesses operating in mature markets.
- Forward-Looking Analysis: It means that the company's value is estimated based on expected future cash flows so the method is particularly suitable for evaluating growing or transforming businesses.
- Quantitative Approach: The DCF method is grounded in rigorous analysis, integrating key financial and operational variables such as projected cash flows, the weighted average cost of capital (WACC) and the perpetual growth rate (g). This quantitative approach enables the consideration of specific factors like the risk level associated with the business, capital structure and interest rate fluctuations.

[46] https://fastercapital.com/it/domande-dell-imprenditore/come-valutare-i-punti-di-forza-e-i-limiti-del-dcf-come-tecnica-di-capital-budgeting.html

Additionally, the model can be tailored to include alternative scenarios or stress tests, enhancing its ability to manage uncertainty.

Regarding disadvantages:

- Sensitivity to Assumptions: The DCF method is highly dependent on the assumptions used to estimate key parameters. Even small variations in these estimated values can lead to significantly different results. For example, overestimating the growth rate or inaccurately forecasting future revenues could artificially inflate the company's value, compromising the reliability of the evaluation.
- Model Complexity: Building an accurate DCF model requires a deep understanding of both the industry and the specific characteristics of the company being analyzed. Analysts must consider numerous factors, such as competitive dynamics, regulatory changes, economic fluctuations and the peculiarities of the cost structure.
- Dependence on Future Projections: The DCF method is inevitably subject to errors arising from inaccurate forecasts or changes in market conditions. Unforeseen events, such as an economic crisis, shifts in consumer preferences or legislative changes, can invalidate the initial assumptions, making the results less reliable. Moreover, the difficulty in precisely predicting long-term events increases the risk of errors in the calculation of the terminal value, which often represents a dominant component in the model.

2.4 APV METHOD

The Adjusted Present Value (APV) is an intrinsic method of business valuation that stands out for its flexibility in separately addressing the components of value related to a company's financial structure. The APV is particularly useful in scenarios where a company's financial structure undergoes significant changes, such as acquisitions, leveraged buyouts (LBOs) or restructurings as it allows for a detailed and flexible assessment of the impact of financial decisions on the overall value.

2.4.1 DESCRIPTION OF THE METHOD

In the APV method, the value of a firm is calculated as the sum of the unlevered value (value of the firm if financed solely by equity) plus the value of the tax savings.

$$V_l = V_u + V_{TS}$$

Where:

Vl: value levered of the firm

Vu: value unlevered of the firm

VTS: tax benefits of the debt (tax shield)

Valuation through APV method is divided into six main steps:

1) Estimation of the Cash Flows: the cash flows used to calculate the unlevered value in the APV method are the same as in the DFC method[47].

2) Estimation of the Discount Rate: the discount rate applied to the unlevered cash flows is the unlevered cost of equity. This assumption aligns with the goal of determining the enterprise value under the scenario where the company is entirely financed through equity capital. To estimate the "unlevered" cost of equity, similar procedures are followed as in the DCF method, with particular reliance on the CAPM model.

$Ke = Rf + \beta u + MRP$

The beta must be unlevered and it is calculated using Hamada's formula[48].

[47] CF = EBIT – Taxes + D&A +/- Decrease/Increase in NWC - CapEx
[48] $\beta u = \beta l / [1 + D/E * (1-t)]$

3) Estimation of the Terminal Value: in the APV method, as in the DCF method, the firm's value is determined by combining the total value of discounted "unlevered" cash flows with the terminal value. The most commonly applied formula is the growing perpetuity formula, which calculates the terminal value based on the assumption that the normalized cash flow will grow at a constant rate ("g") annually throughout its remaining lifespan. This formula can also be applied in the APV method, using the unlevered cost of equity as the discount rate.

$$\textbf{Terminal Value} = \frac{\mathbf{FCF}_{n+1}}{\mathbf{K}_{eu} - \mathbf{g}}$$

Where:

FCF n+1: Normalized Cash Flow

Keu: Cost of unlevered equity

g: expected growth rate

4) Calculation of the Unlevered Value: it is obtained from the sum of the value in the specific period and the terminal value, both calculated as “unlevered”.

5) Calculation of the Tax Benefits Value: the tax benefit is valued as the sum of the suitably discounted projected annual tax benefits. The discount rate to be used for discounting the tax benefits is a subject of debate among scholars and two main positions exist: cost of debt and cost of unlevered equity.

- Cost of Debt: scholars supporting this position argue that, because the tax advantages stem from the financial costs linked to the debt structure, the appropriate rate to apply should correspond to the cost of debt. Particularly, Modigliani and Miller adopt this perspective in their analysis of companies with no growth and those experiencing positive growth rates.
- Cost of Unlevered Equity: academics supporting this position suppose that, in the absence of tax benefits (such as when there is no taxable income) and with income being exposed to enterprise risk, the appropriate discount rate for pre-tax income should be the unlevered cost of equity.

6) Calculation of the Firm Value: $V_L = V_U + V_{TS}$

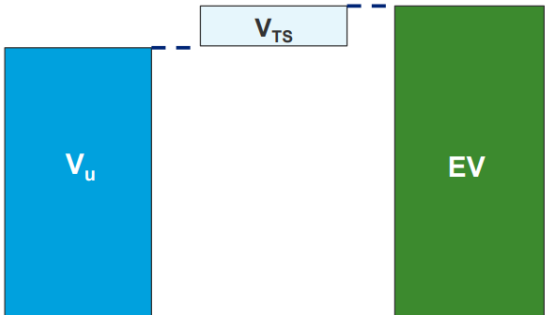

Figure 2.6: Vulpiani, M. (2014). Special Cases of Business Valuation. McGraw Hill.

2.4.2 COMPARISON WITH THE DCF

	DCF	APV
• **Cash Flows**	Unlevered	Unlevered
• **Discount rate**	WACC	Cost of Equity unlevered
• **Terminal Value**	Gordon Formula	Gordon Formula
• **Tax Shield**	Implicit in WACC calculation	Sum of suitably discounted projected annual tax benefits
• **Firm value**	V_L	$V_u + V_{TS}$

Figure 2.7: Vulpiani, M. (2014). Special Cases of Business Valuation. McGraw Hill.

The Discounted Cash Flow method relies on a simplified assumption: the relationship between the value of debt and the value of equity (referred to as "market leverage" or simply "leverage") remains constant throughout the company's life. In contrast, the Adjusted Present Value method does not rely on this assumption as it separates the financial value into two distinct components: Unlevered Firm Value and Tax Shield.

The Discounted Cash Flow method faces practical challenges because the values of equity and net financial debt used to calculate the debt-to-equity (D/E) ratio must ideally be represented using market values. However, during a valuation process, these market values are often unknown, making the application of the method more complex. Conversely, APV does not rely on the constant D/E ratio assumption so it circumvents the need for precise market values of equity and debt during the valuation process.

The Discounted Cash Flow method encounters additional practical difficulties because a company’s debt levels are likely to vary year after year. This introduces complexity in representing a constant financial structure throughout the company’s life, as assumed in the DCF approach. The Adjusted Present Value method incorporates the concept of target leverage more effectively.

2.5 RELATIVE VALUATION TECHNIQUES

Relative valuation is a method used to estimate the value of an asset by comparing it to the market values of similar or comparable assets. The relative valuation process is articulated in three phases:

1) Identify of comparable assets and gather their market values;

2) Standardize these market values into ratios or multiples as absolute values are not directly comparable;

3) Compare the standardize values of the asset with the standardized values of comparable assets in order to determine whether the asset is undervalued or overvalued.

In the context of the relative valuation, standardized values are called multiples. Multiples are ratios which relate a market value like the price of a stock or the value of a firm) to a relevant performance metric (such as earnings, revenue, cash flow or book value).

2.5.1 COMPS

The Comps (Comparable Companies) method is a widely used valuation approach that determines the value of a company by comparing it to a peer group of similar businesses. The steps involved in the application of the comps method are as follows:

1) Comparable Companies Identification: comparable companies are selected according to some factors such as sector, size, profitability or competitive conditions. The selection process for determining comparable companies can be highly subjective and dependent on individual judgment. Consequently, the valuation results derived from the multiples method may, in certain cases, be less dependable compared to those obtained through more analytical or financial-based approaches.

2) Calculation and Selection of the Multiples: the two types of multiples most frequently used for company valuation through the market approach are Asset Side multiples, also known as Enterprise Value multiples, and Equity Side multiples, also known as Equity Value multiples. Asset Side multiples are calculated taking into account the total value of the company (enterprise value), which estimates the value of the capital indirectly while Equity Side multiples take into account the market value of equity alone (P), allowing a direct estimate of the equity value. There is a key difference between these two types of multiples as Equity Side multiples are influenced by a company's financial structure and leverage which can distort the valuation and potentially lead to misleading conclusions while Asset Side multiples are more neutral and have the advantage of being easily comparable across companies with varying levels of financial leverage, making them a more reliable basis for comparison.

Fundamental multiples are[49]:

- P/E = Price per share / Earnings per share
- P/B = Price per share / Book value per share
- EV/EBIT
- EV/Sales

In addition to fundamental multiples, there are also "derived" multiples which are employed by the analysts to mitigate the impact of differences in depreciation and provisioning practices among the selected companies. Examples are:

- P/CE = Price per share / Cash earning = Market price per share / Net Income + D&A per share
- EV/EBITDA

Multiples can be also distinguished according to the nature of the performance parameter:

- Multiples based on economic-financial parameters such as Net Income, Income before Tax, Cash Flow for Shareholders, EBIT, EBITDA, Operational Cash Flow, etc.
- Multiples based on non-economic-financial parameters such as the number of branches (for banks), the number of customers (for gas distribution companies), the number of pages visited (for internet-based companies), etc.

Depending on the reference period, it is possible to distinguish:

- Historical multiples derived by comparing current market prices (and corresponding market capitalizations) with the financial results from the most recent available company financial statements.
- Trailing multiples calculated by comparing current stock prices or market capitalizations with the company's financial performance over the twelve months preceding the date on which the prices are recorded.
- Leading multiples which link current stock prices or market capitalizations to the company's projected financial results for the upcoming year or to an average of the forecasts for the next two to three years. The projections used for these multiples are typically based on consensus forecasts published by financial analyst associations[50].

3) Determination of the Valuation: the trading multiples of comparable companies form the foundation for determining a suitable valuation range for the target. This is achieved by using the averages and medians of

[49] ASSOCIAZIONE ITALIANA DEGLI ANALISTI E CONSULENTI FINANZIARI - AIAF, Rivista AIAF on line, available on the website http://www.aiaf.it.
[50] In Europe, for example, International Brokers Estimate Service (IBES) and Datastream.

the most relevant sector-specific multiples (e.g., EV/EBITDA or P/E) to establish a reasonable range of multiples. Additionally, the highest and lowest multiples within the comparable set offer further insight. However, the multiples of the closest and most comparable companies are generally used as benchmarks to define the most precise and appropriate range.

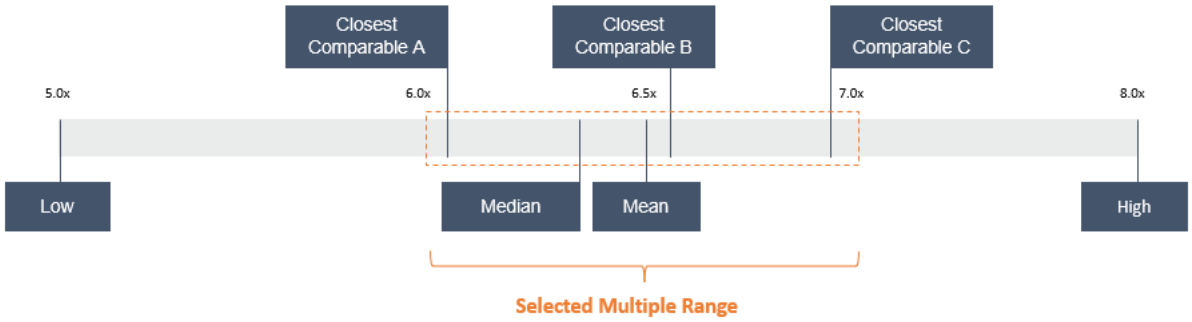

Figure 2.8: Rosenbaum, J., & Pearl, J. (2021). Investment Banking: Valuation, Leveraged Buyouts and Mergers and Acquisitions. Wiley Finance Series.

4) Eventual application of Discounts or Premiums: adjust the valuation, if necessary, by applying appropriate discounts or premiums based on factors like lack of marketability, control or other specific circumstances.

2.5.2 COMPAQ

The Comparable Transaction Analysis (Compaq) method is a valuation approach that involves analyzing past transactions of similar companies to estimate the value of a target company. Unlike the Comparable Companies Analysis method, which focuses on trading multiples of public companies, the Compaq method derives its valuation metrics from acquisition or merger transactions within the same industry or involving businesses with similar characteristics.

The method follows the same steps of the Comps method with the difference that in the first step are selected the comparable acquisition instead of companies. In addition, the type of prices used to calculate the multiple differs as Compaq multiples reflect he values negotiated in specific deals. These prices are those observed in private negotiations involving the acquisition of controlling stakes in comparable companies.

This method has some critical issues:

- The collection of transaction prices for equity stakes in comparable companies can be challenging due to the limited public disclosure typically associated with the corporate control market.
- It is essential to verify that market conditions have remained stable during the time gap between when the transaction prices were collected and when the valuation analysis is conducted.
- The infrequency of transactions of a similar nature often necessitates extending the observation period for relevant transactions, which increases the risk of incorporating outdated or inconsistent valuation data.

CHAPTER 3: THE AUTOMOTIVE INDUSTRY

3.1 HISTORY AND EVOLUTION OF THE AUTOMOTIVE INDUSTRY

The automotive sector has a history that dates back to the late 19th century, with the creation of the first automobiles powered by internal combustion engines. The first vehicle recognized as a modern automobile was the Benz Patent-Motorwagen, developed by Karl Benz in 1886, followed shortly by other innovators such as Gottlieb Daimler and Wilhelm Maybach. In the early 20th century, the industry was still artisanal and automobiles were a luxury for the few. However, everything changed with Henry Ford and the introduction of the assembly line in 1913, which enabled large-scale production, reducing costs and making cars accessible to the middle class[51]. From the 1920s to the 1950s, the sector expanded rapidly with the rise of iconic brands such as General Motors, Chrysler and Volkswagen. Meanwhile, World War II accelerated technological innovations, leading to the development of more powerful and reliable engines. After the war, mass production flourished in Europe and Japan, with companies like Fiat, Renault, Toyota and Honda becoming major players in the global market. During the 1970s and 1980s, the oil crisis pushed manufacturers to improve engine efficiency and develop smaller, fuel-efficient models. At the same time, electronics began to revolutionize the sector, with the introduction of electronic fuel injection, ABS and airbags. The 1990s marked the rise of the Japanese automotive industry with Toyota and Honda leading in reliability and efficiency while Europe and the United States focused on design and safety innovations. The early 21st century witnessed a transformational shift as sustainability and emissions reduction gained increasing attention. Toyota led the way with the Prius, the first mass-produced hybrid vehicle, while Tesla revolutionized the market with its high-performance electric cars. Today, the automotive sector is in the midst of a new revolution, with electrification, autonomous driving and connectivity reshaping the very concept of automobiles. The industry is investing billions in the development of advanced batteries, more efficient electric motors and driver assistance systems, marking the beginning of a new era of mobility.

As the automotive sector has evolved, globalization has played a crucial role in reshaping production and distribution strategies. Global supply chains have become increasingly complex, with suppliers, manufacturers and distributors operating on an international scale. The search for cost efficiency has led to shifts in production hubs, with many car manufacturers establishing plants in emerging countries such as China and India, which have become key markets for both production and demand. The expansion into emerging markets has enabled exponential growth in the industry, with China now being the world's largest automotive market. Meanwhile, economic cycles have had a significant impact on automotive demand, with periods of growth and recession heavily influencing sales and investments. Automotive companies have had to adapt to

[51] The transformation taking place today with electric vehicles recalls the revolution of the early 20th century when the internal combustion engine replaced steam. At that time, the main issue was the lack of fuel infrastructure, just as it is today with charging stations for electric vehicles. However, as history has shown, technological progress and economies of scale have always accelerated the widespread adoption of new technologies.

fluctuations in demand, financial crises and changing consumer trends, developing more flexible strategies to navigate an increasingly dynamic market. These factors have made the automotive sector highly competitive, pushing manufacturers to diversify their product portfolios and invest in technological innovations to keep up with global demands. Today, the combination of globalization, digitalization and the transition to electric vehicles is shaping the future of the automotive industry.

3.1.1 ITALIAN AUTOMOTIVE INDUSTRY

The Italian automotive industry has a rich and prestigious history, dating back to the early 20th century. The first major name in the Italian automotive sector was FIAT (Fabbrica Italiana Automobili Torino), founded in 1899 by Giovanni Agnelli and other entrepreneurs. In the early decades of the 20th century, FIAT dominated the Italian market and laid the foundations for the industrialization of the sector. During the Fascist era, automobile production further developed with the government promoting the creation of affordable models for the population such as the Fiat 508 Balilla and, later, the Fiat 500 Topolino, considered one of the first city cars in history. After World War II, Italy underwent a period of economic reconstruction and the automotive sector played a crucial role in the so-called "Economic Miracle" of the 1950s and 1960s. During this period, FIAT launched iconic models such as the Fiat 500 and the Fiat 600, making cars more accessible to the middle class and driving the country's mass motorization. In addition to mass production, a key factor in the success of the Italian automotive industry has been design. Italy has created some of the world's most iconic cars, thanks to legendary designers like Giorgetto Giugiaro and Pininfarina, who redefined automotive aesthetics. At the same time, motorsport has played a crucial role in strengthening the industry's reputation for excellence: Ferrari and Maserati have dominated international competitions while Lancia made history in rally racing with models like the Delta Integrale. At the same time, other prestigious Italian brands such as Alfa Romeo, Lancia and Ferrari gained prominence for their innovation and success in motorsport, helping establish Italy as a global benchmark for luxury and sports cars. During the 1970s and 1980s, the sector experienced significant transformations, introducing new technologies to improve safety and engine efficiency. However, the 1973 oil crisis and labour tensions put pressure on the industry, leading to a period of economic difficulty for many Italian automakers. Despite these challenges, FIAT remained the market leader and continued its expansion by acquiring brands such as Lancia, Autobianchi and Ferrari (which was later partially sold). In the 1990s and 2000s, the Italian automotive industry faced increasing international competition, particularly from Japanese and German manufacturers. After a period of crisis, FIAT managed to recover, thanks to successful new models like the Fiat Punto and the rebirth of the Fiat 500, which became a global icon. In the 2000s, growing global competition and financial difficulties forced many Italian automakers to seek international alliances. The most emblematic case was FIAT's acquisition of Chrysler in 2009 forming Fiat Chrysler Automobiles (FCA) in 2014. Later, in 2021, FCA merged with the French group PSA, creating Stellantis, one of the world's largest automotive manufacturers. At the same time, Ferrari was spun off, and Lamborghini came under the control of the Volkswagen Group, marking the increasing influence of foreign capital in the sector. Today, the Italian automotive industry is undergoing a major transformation, with an increasing focus on electric mobility,

sustainability and digitalization. Luxury and high-performance brands like Ferrari, Lamborghini and Maserati continue to represent Made in Italy excellence, while Stellantis is investing in new technologies to remain competitive in the global market. Italy retains its prominent role in the automotive sector, with a strong historical legacy and a forward-looking vision focused on innovation.

Regarding geographical distribution, the Italian automotive industry has been highly concentrated, with Turin becoming the capital of the automotive industry in the early 1900s: in fact, between 1900 and 1905, 60 companies were founded in Italy, 34 (57%) in Turin and 10 (17%) in Milan. The AUTOITA database considers a sample of 395 companies, of which 37.22% were established in Turin and 29.37% in Milan.

Provincia	*N°*	*%*
Torino	147	37,22%
Milano	116	29,37%
Modena	11	2,78%
Roma	11	2,78%
Genova	9	2,28%
Brescia	7	1,77%
Firenze	7	1,77%
Bologna	6	1,52%
Palermo	6	1,52%
Parma	5	1,27%
Altre	70	17,72%
Totale	395	100%

Figure 3.1: Database AUTOITA, Distribution of companies by province.

3.1.2 THE IMPACT OF COVID

In 2020 the pandemic had a significant impact on the global automotive sector. As a direct consequence of the coronavirus, car production dropped below the levels recorded during the 2009 financial crisis and hundreds of thousands of workers were temporarily or permanently laid off. Supply was drastically reduced due to the closure of numerous factories worldwide in the first half of the year. On the other hand, consumer demand also declined accordingly as people typically cut back on their budgets for durable goods of this kind during economic downturns. The combination of these two factors led to an initial collapse in vehicle registrations and production, followed by a gradual recovery in the second half of the year. Once again, these trends were not uniform across different countries. China was affected by the health crisis earlier than the U.S. and Europe, but later, sales and production rebounded significantly, surpassing the average levels reached in 2019.

On a global scale, from the third quarter of 2020 to the first quarter of 2021, automobile manufacturers worldwide experienced a swift increase in production levels. Unlike the projections for China, production in

Europe and the U.S. is anticipated to remain below full capacity in the foreseeable future. This can be attributed, among other factors, to the significant shifts in economic conditions and outlooks, which will require time before being effectively addressed and adapted to.

Like many industries across different regions, the health crisis has significantly accelerated trends in the mobility value chain that were already emerging before the coronavirus outbreak. During the pandemic, technology proved to be essential allowing customers to customize their future vehicles through virtual configurators and online platforms. An unexpected side effect of the pandemic was the global semiconductor crisis. With the surge in demand for electronic devices and disruptions in supply chains, many automakers found themselves short of microchips, slowing down production and causing delivery delays. This phenomenon highlighted the automotive industry's dependence on Asian suppliers and accelerated investment plans for local chip production in Europe and the United States. Indeed, e-commerce and the broader digitalization of the economy expanded rapidly during this period, giving rise to new consumer behaviour models. As a result, distribution channels have been restructured both in the automotive sector and among related service providers. Likewise, prospective buyers have been able to utilize websites and applications to explore and arrange services such as financing and insurance remotely, integrating these steps into the car-buying journey. Similar transformations have been occurring in vehicle production as well. Despite concerns related to COVID-19, geopolitical instability and semiconductor shortages, supply chains have remained resilient, in some cases even exceeding expectations. This shift towards digitalization serves a dual purpose: first, to align with evolving consumer demands; second, to enhance operational flexibility while cutting costs to maintain financial stability. At this stage, the automotive industry has once again demonstrated its ability to adapt and overcome new challenges, proving to be well-prepared for this digital transformation. As pandemic-related restrictions ease in many regions, both physical and digital sales channels continue to coexist, complementing and competing with one another. Despite the disruptions caused by the pandemic, the automotive sector is undergoing a profound transformation driven by the advancement of electric vehicles and increasingly stringent regulations on CO2 emissions and pollution. In this context, companies must take decisive action, prioritizing digital customer engagement, robotic process automation and artificial intelligence while transitioning away from conventional supply chain models. These elements are expected to be crucial in successfully navigating the ongoing transition. The future of the automotive industry is driven by three main pillars: electrification, autonomous driving and connectivity. By 2040, most cars sold are expected to be electric and increasingly equipped with advanced driver-assistance systems. At the same time, the sharing economy and robotaxis could radically change the very concept of car ownership. The industry is therefore facing one of the biggest transformations in its history and success will depend on its ability to innovate, adapt to new regulations and meet consumer needs. The trend toward automation is projected to accelerate further as the industry moves beyond the COVID-19 crisis.

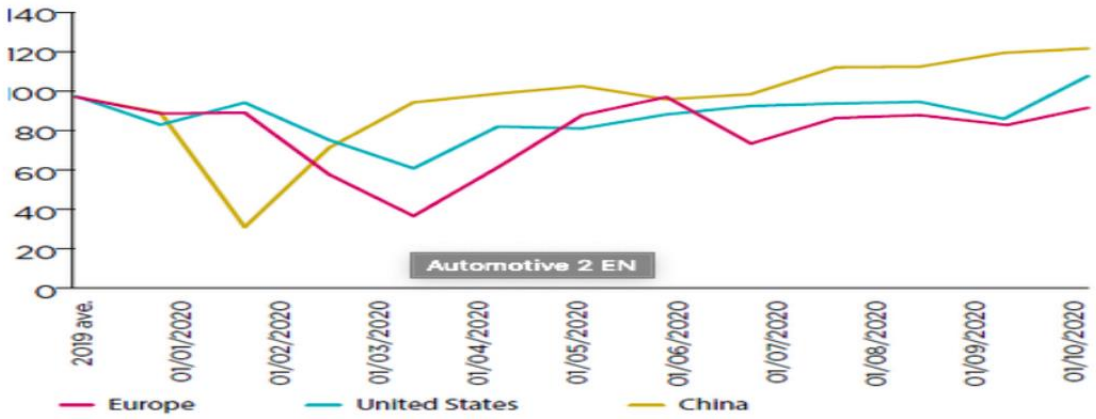

Figure 3.2: Vehicle sales evolution and COVID-19 impact. Source: Refinitiv DataStream, CAAM, ACEA, BEA

3.1.3 THE TRANSITION TO ELECTRIC

The automotive industry is undergoing a profound transformation as it shifts toward electric mobility. Driven by environmental concerns, regulatory pressures and advancements in battery technology, automakers are increasingly investing in the development and production of electric vehicles (EVs). Consequently, all leading automobile manufacturers are striving to secure a share of the market by strategically transitioning towards the production of hybrid and fully electric vehicles. A notable example of this trend is Volkswagen (VW): the German automaker is repurposing its engine manufacturing plant into a battery production facility for electric cars. This decision is driven by the projected sharp decline in internal combustion engine (ICE) vehicle sales, which are expected to drop by more than 50% by 2035.

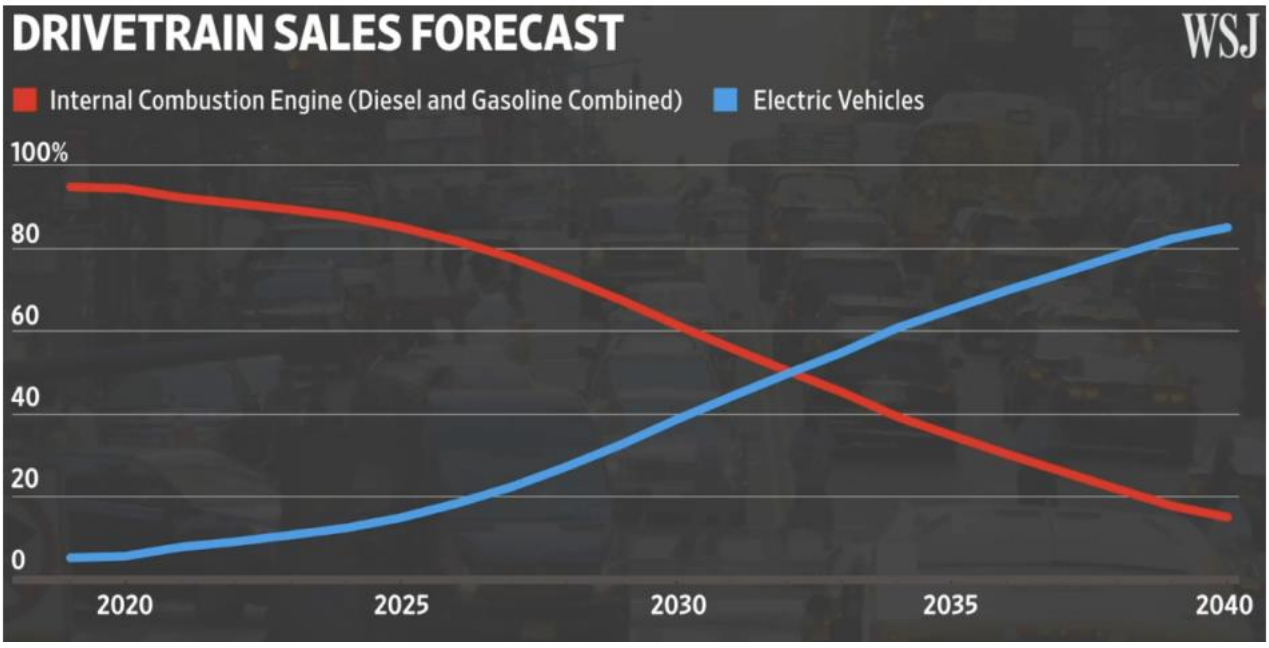

Figure 3.3: Representation of the progressive reversal of sales in the automotive sector. Source: WSJ, 2021

Despite the impact of COVID-19, the electric vehicle market continues to expand driven by a remarkable surge in sales of both battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs). BEVs

rely entirely on battery power, while PHEVs can operate with zero emissions but also have the flexibility to use gasoline or diesel for longer trips. This significant growth has been largely influenced by the increasingly stringent emission regulations enforced by European authorities, which have played a crucial role in accelerating the shift towards the production and commercialization of eco-friendly vehicles. Furthermore, China has contributed to market expansion due to the more advanced state of its automotive industry. Although the growth of the EV market is exponential, there are still significant obstacles to large-scale transition. The main challenge is the lack of a widespread network of charging stations, especially in rural areas and emerging countries. Additionally, battery costs, while decreasing, still account for a significant portion of the vehicle's final price. To overcome these limitations, massive investments in infrastructure and technological advancements are needed to increase range and reduce charging times.

Among the key markets leading this transition, China, Europe and the United States have emerged as the dominant players. China has consistently maintained its position as the world's largest EV market, supported by strong government policies, extensive charging infrastructure and incentives for manufacturers and consumers. European countries have also witnessed substantial growth, fueled by strict emissions regulations and investments in charging infrastructure. Many European countries have committed to phasing out ICE vehicles by 2035, further boosting EV adoption. The United States has experienced a gradual but consistent rise in electric vehicle (EV) adoption, with consumer interest steadily increasing as battery technology improves and charging infrastructure expands. While the U.S. market has grown at a slower pace compared to China and Europe, it is now gaining momentum due to significant investments in electrification by major automakers such as Tesla, General Motors and Ford. These companies, alongside government incentives and stricter emission regulations, are driving the transition towards wider EV adoption. As advancements in battery range, charging speed and overall vehicle performance continue, the U.S. is expected to play a larger role in the global shift towards electric mobility.

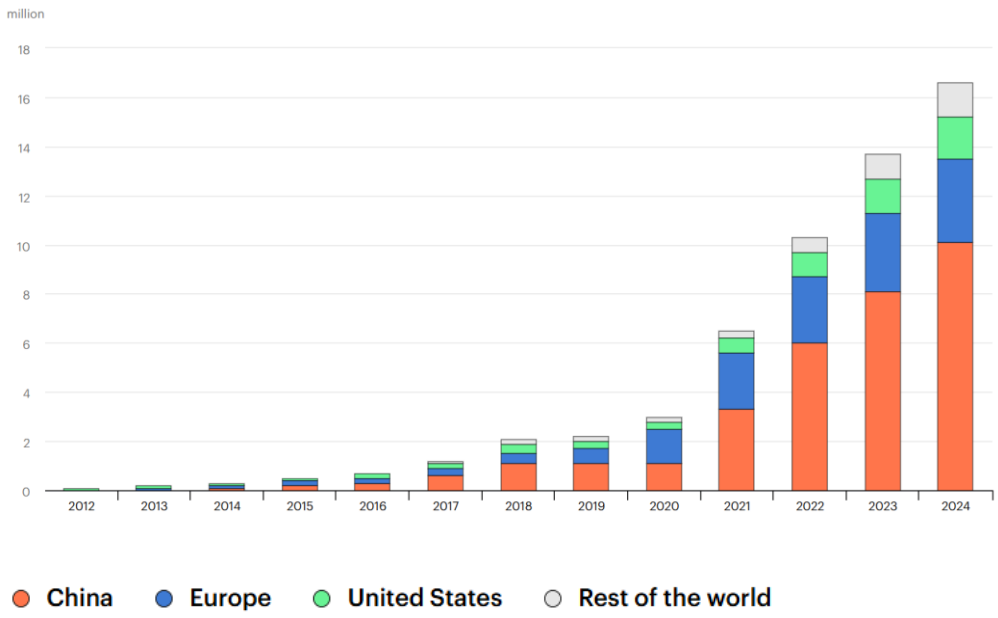

Figure 3.4: Electric car sales 2012-2024. Source: IEA

Deloitte has examined the latest data to provide an updated forecast for the electric vehicle (EV) market over the next decade. Currently, BEVs already outperform PHEVs globally, and by 2030, BEVs are expected to account for approximately 81% of all new EV sales, totalling 25.3 million units. In contrast, PHEV sales are projected to reach 5.8 million units by the same year. Deloitte also anticipates that by 2030, China will dominate the global EV market with a 49% share, while Europe will account for 27% and the United States for 14%[52].

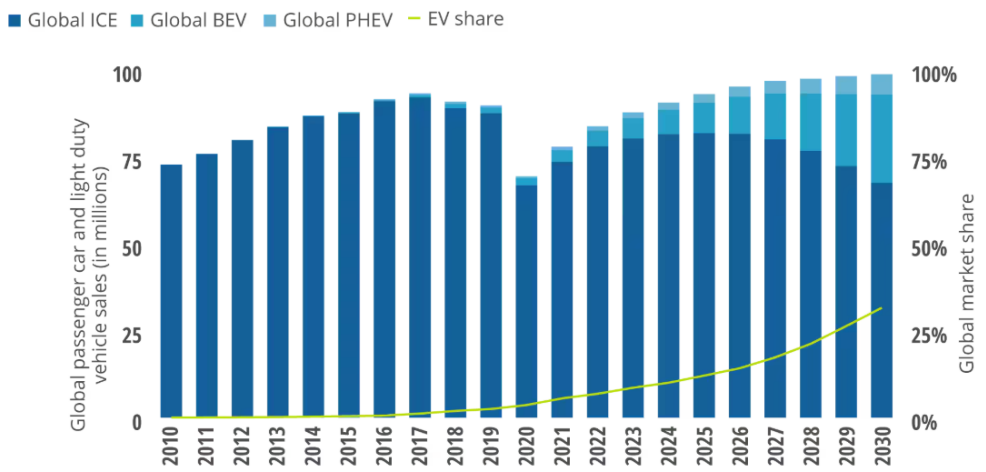

Figure 3.5: Outlook for annual global passenger-car and light-duty vehicle sales to 2030. Source: Deloitte Analysis, EV-Volumes.com

Deloitte foresees that after 2030, the growth rate of EV sales will begin to slow. Not all markets will be able to transition to electric vehicles as effectively as wealthier nations will over the next decade. Looking beyond 2030, a crucial factor in maintaining market expansion will be the development of adequate charging infrastructure. This will require substantial investments amounting to billions of dollars—feasible in certain regions through a mix of public and private funding, but unlikely to be implemented consistently across all markets. In countries where investment in charging infrastructure is limited, internal combustion engine (ICE) vehicles are expected to remain in use for a longer period.

The substantial shift in expected volume of BEVs and PHEVs by 2030 is driven by four factors: consumer sentiment, policy and regulation, OEM strategy and the role of corporate companies.

Consumer demand will be a key driver of EV growth but many individuals have not yet transitioned from ICE vehicles to electric alternatives for various reasons. However, as adoption barriers are rapidly dismantled, EVs are becoming an increasingly practical and attractive choice. In the coming years, several of these obstacles are expected to disappear entirely. The driving range of EVs is now comparable to that of ICE vehicles and when factoring in subsidies and total ownership costs in different markets, price parity has already been achieved. Additionally, the variety of available EV models continues to expand. As EV sales rise and these vehicles become a more common sight on the roads, consumer confidence is likely to increase. First-hand

[52] https://www2.deloitte.com/us/en/insights/focus/future-of-mobility/electric-vehicle-trends-2030.html

experiences—whether driving an EV, seeing more of them in daily life, or riding in one owned by friends or family—are expected to outweigh initial hesitations. Furthermore, the widespread adoption of commercial electric vehicles, such as vans, trucks and lorries, along with the expansion of electric public transport options like buses, should further reinforce consumer trust in EV technology.

Government action remains a crucial force in accelerating EV sales, as demonstrated by Norway's success, the fluctuating demand in the Netherlands and the evolving dynamics of China's EV market. Beyond the economic advantages for nations that promote the shift to electric mobility, the environmental benefits have made large-scale EV adoption an essential step toward meeting climate targets, including those outlined in the 2015 Paris Agreement. Various policies and regulatory measures are actively supporting and encouraging the expansion of EV adoption: fuel economy and emission targets; city access restrictions; financial incentives.

Over the past year, several leading OEMs have made strategic commitments to EVs and they have introduced new models, raised production targets and accelerated as well as expanded their sales goals. Several OEMs already offer models of affordable EVs on average on the market. However, consumers are still not inclined to pay a premium on the price to purchase an electric vehicle compared to an ICE. Nonetheless, the prediction for the immediate future is that the relative price is getting closer to 1, leading to a balance or savings by buying a green car versus a higher-emission one.

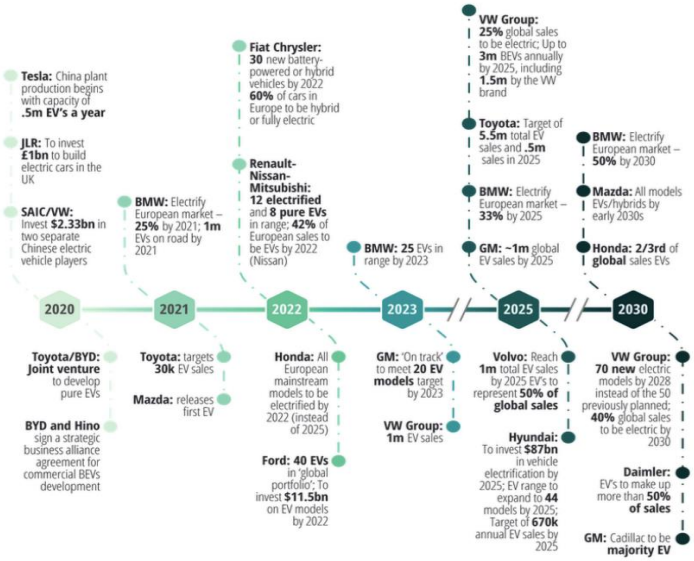

Figure 3.6: Timeline of strategic OEM targets for EVs. Source: Deloitte Analysis

Finally, companies play a significant role in the future of an electric shift. They can exploit the three factors described above in order to reduce emissions and costs. In addition, several tax measures tend to incentivize the use of electric vehicles also inside corporates. However, due to COVID-19, this trend has slowed, as companies have other priorities regarding distributing their investments.

Beyond the four key factors outlined by Deloitte, Statista highlights two additional elements shaping the future of electric vehicles: the so-called "Tesla effect" and the declining cost of batteries.

Regarding the first element, it is important to note that, for many years, automakers primarily focused on improving ICE vehicles, leaving little room for investment in electric mobility. It was once assumed that consumers cared only about the environmental benefits of EVs, with little concern for design or performance. However, Tesla changed this perception by introducing electric vehicles that combined sleek aesthetics, high performance and sustainability. Elon Musk played a crucial role in making EVs more appealing and engaging, shifting the industry's perception and accelerating mainstream interest in electric mobility. His vision of revolutionizing the transportation sector continues to push innovation and drive the future of green technology forward.

As for declining cost of batteries, it should be underlined that, since companies prioritize profitability, a complete shift to electric will only occur when production costs match or fall below those of ICE vehicles. In recent years, battery prices have significantly decreased, dropping from $1,100 per kWh in 2010 to $115 per kWh in 2024. This steep reduction is largely due to advancements in battery chemistry, improved manufacturing techniques, and increasing competition among industry leaders. As manufacturers strive to develop more cost-effective and competitive EV solutions, the ongoing price drop is expected to make electric vehicles increasingly accessible, accelerating their adoption on a global scale.

3.2 INDUSTRY'S CHARACTERISTICS

The automotive industry encompasses a wide array of organizations and businesses involved in the design, development, manufacturing and sale of motor vehicles, competing across various segments and target markets. Key products of this industry include passenger cars, light trucks and industrial machinery while its main segments include light vehicles, trucks and buses, construction and agricultural vehicles, electric and hybrid vehicles, and autonomous vehicles. Historically, the automotive industry has been a pivotal element of economic growth, deeply integrated into both the industrial and cultural realms globally. Over the past century, it has contributed approximately 3.5% to the worldwide GDP and currently employs more than 1.7 million people. To meet evolving consumer demands and industry trends, automakers invest heavily in research and development, allocating between $16 and $18 billion annually—99% of which is self-financed by industry participants, as noted by K. Hill[53]. The substantial investment required underscores the high costs associated with automotive manufacturing, limiting the number of manufacturers in the sector. This has led to a mixed oligopoly structure within the industry, where only a few companies produce a range of differentiated products. Notably, 86% of workers in the automotive sector work in facilities that employ 250 or more people.

The automotive industry is both capital and labour-intensive, necessitating extensive management of various costs and expenses related to facilities, materials, components, research and development and labour. For instance, when prices for crucial raw materials peak, companies must deploy effective hedging strategies to mitigate the risk of significant production cost increases. A similar approach is needed for other external factors like gasoline prices, which not only affect production costs but also influence customer preferences regarding fuel efficiency, durability, engine power and quality of vehicles. Changes in such factors can shift consumer demand, as seen during the 1973 oil crisis. Automotive manufacturers must adapt to these shifts among a broad, international customer base, as changing economic conditions and driving habits frequently reshape global car production. Consequently, companies continuously update their product lineups with new models, innovations and technologies.

3.2.1 MARKET COMPOSITION

The market composition in the automotive industry refers to the structure and distribution of market shares among the various players in the sector, analyzing aspects such as vehicle segmentation, available powertrains and the presence of global and emerging manufacturers. Understanding this composition is essential to assess market competitiveness and its strategic developments, considering three key elements: market size, market share and the level of concentration.

[53] Hill, K., Menk, D., Cregger, J., Schultz, M. (2015). Contribution of the Automotive Industry to the Economies of All Fifty States and the United States. Center for Automotive Research (CAR).

Market size, or the overall size of the market, represents the total value of the automotive sector, measured in terms of units sold or total revenue[54]. This indicator provides a clear view of the industry's scale and its growth over time. Understanding and accurately calculating this dimension is crucial for several reasons: it helps stakeholders estimate potential profits from a new business, product or service, thereby supporting investment decisions. Additionally, for those entering a sector, market sizing allows for the projection of necessary investments, both in financial resources and human capital, to undertake the project with greater awareness. In 2023, the global automotive market exceeded $2.86 trillion, with strong expansion in the electric and hybrid vehicle segments, which are gaining an increasingly significant share compared to traditional internal combustion vehicles[55].

Market share indicates the percentage of sales held by a company or a group of companies relative to the total market[56]. This indicator is essential for measuring a company's competitiveness within the industry and assessing its position compared to competitors. In 2023, Toyota confirmed its position as the global leader with a 13.5% share, followed by Volkswagen (11.6%) and General Motors (8.3%)[57]. However, the growth of new players, such as BYD, has progressively redistributed market shares, particularly in the electric vehicle segment, altering the competitive balance and creating new challenges for traditional manufacturers.

Finally, market concentration, or the level of market concentration, indicates the level of dominance exerted by the leading companies, often measured using indicators such as the Herfindahl-Hirschman Index (HHI)[58] or the market share held by the top four manufacturers (CR4)[59]. In recent years, the concentration of the automotive market has progressively declined, driven by the entry of new competitors, particularly from China, which has reduced the dominance of Western giants. This phenomenon has increased competition and diversified the market offering, pushing traditional automakers to innovate in order to maintain their position.

Understanding market composition is not just about defining its structure but also about analyzing its implications. Market composition plays a crucial role in shaping competition, identifying industry trends,

[54] Market size is determined by the total number of potential buyers of a product or service within a given market and the total revenues that such sales could generate.
[55] Statista Report 2024: https://www.statista.com/topics/1487/automotive-industry/#topicOverview
[56] Market share is calculated by dividing a company's sales in a given period by the total industry sales in the same period.
[57] https://www.bloomberg.com/news/articles/2024-01-30/toyota-holds-lead-as-world-s-no-1-carmaker-for-fourth-year
[58] The HHI is calculated by summing the squares of the market shares of all companies in the industry. The HHI ranges from 0 to 10,000 when market shares are expressed as percentages. An HHI below 1,500 indicates an unconcentrated market; between 1,500 and 2,500 signifies moderate concentration while a value above 2,500 indicates high concentration. For example, a market with companies each holding a 50% share will have an HHI of 2,500.
[59] CR4 measures the total market share held by the four largest companies in an industry and it is calculated by summing the market shares of the four top firms. The CR4 ratio ranges from 0 to 100. A high CR4 indicates a highly concentrated market while a low value suggests greater competition. For example, if the top four companies hold 30%, 25%, 20% and 15% of the market then the CR4 would be 90%.

influencing corporate strategies and aligning with regulatory frameworks. These factors make market analysis an indispensable tool for stakeholders in the automotive industry.

Analyzing market composition helps evaluate the level of competition in the automotive industry and the strategies adopted by manufacturers. A high market concentration may indicate the dominance of a few key players, leading to reduced competition and higher barriers to entry for new firms. In contrast, a more fragmented market suggests increased competition and greater opportunities for new entrants, fostering innovation and a more dynamic industry landscape. Market composition analysis is also critical in identifying emerging trends that shape the industry's future. The shift from internal combustion engine (ICE) vehicles to electric vehicles (EVs) is one of the most transformative changes in the sector. In Europe, battery electric vehicles (BEVs) accounted for 14.6% of total new car registrations in 2023, surpassing diesel vehicles for the first time, which held a 13.6% market share[60]. Companies rely on market composition analysis to guide their expansion strategies, enter new market segments, and allocate investments in research and development (R&D). For instance, Stellantis has committed €30 billion toward the transition to electrification, aiming to strengthen its position in the evolving automotive market and comply with stricter environmental regulations[61]. Government policies are playing an increasingly crucial role in shaping market composition. The European Union's 2035 ban on new internal combustion engine vehicle sales is a significant regulatory shift that forces automakers to accelerate their transition toward zero-emission vehicles. This regulatory push is expected to create a new competitive landscape where compliance with emissions regulations becomes a key factor in a company's market positioning. Manufacturers that fail to meet these new standards risk losing market share and facing financial penalties[62].

The market composition in the automotive industry can be also structured through a detailed segmentation process, which allows for a comprehensive understanding of consumer preferences and market dynamics. This segmentation is essential for analyzing demand patterns, evaluating competition and developing strategic positioning within the industry. The automotive market can be segmented based on three primary criteria: vehicle type, powertrain technology and target clientele.

For what concerns vehicle type, the automotive market is categorized based on the size, purpose and design of vehicles. In Europe, a widely accepted classification system assigns alphabetical segment labels to distinguish different vehicle categories. This segmentation provides clarity for both manufacturers and

[60] https://www.acea.auto/pc-registrations/new-car-registrations-13-9-in-2023-battery-electric-14-6-market-share
[61] https://www.reuters.com/business/autos-transportation/stellantis-says-h1-margin-expected-top-annual-target-55-75-2021-07-08
[62] https://www.europarl.europa.eu/topics/it/article/20221019STO44572/il-divieto-di-vendita-per-le-nuove-auto-a-benzina-e-diesel-nell-ue-dal-2035

consumers, facilitating comparisons across different models and aiding in market positioning. The primary vehicle segments include:

- Segment A (Mini Cars/City Cars): Small urban vehicles designed for efficiency and maneuverability in congested areas, such as the Fiat 500.
- Segment B (Subcompact Cars): Small hatchbacks or sedans, typically offering a balance between affordability and practicality, such as the Peugeot 208.
- Segment C (Compact Cars): A widely popular segment comprising hatchbacks and sedans that provide a blend of space and efficiency, exemplified by the Volkswagen Golf.
- Segment D (Mid-Size Sedans): Larger family-oriented vehicles with enhanced comfort and space, such as the Alfa Romeo Giulia.
- Segment E (Executive Sedans): Premium mid-to-large-sized sedans offering luxury features and advanced technology, such as the Audi A6.
- Segment F (Luxury Sedans): High-end, full-size luxury sedans known for superior comfort, performance and exclusivity, such as the Mercedes-Benz S-Class.
- Segment J (SUVs and Crossovers): The fastest-growing segment globally, encompassing compact, mid-size and full-size SUVs designed for versatility and off-road capability.
- Segment M (MPVs – Multi Purpose Vehicles): Minivans and vehicles designed for high passenger capacity and flexibility, commonly used for family transportation.
- Segment S (Sports Cars and Performance Vehicles): High-performance coupes and convertibles focused on speed, aerodynamics and driving experience[63].

As for powertrain technology, the automotive market has evolved to incorporate multiple propulsion systems, influenced by environmental concerns and stringent emissions regulations. The choice of powertrain significantly affects consumer purchasing decisions, government policies, and industry innovation. The primary propulsion technologies include:

- ICE (Internal Combustion Engine Vehicles): Traditional petrol and diesel-powered vehicles, which remain dominant in various global markets despite growing electrification trends.
- HEV (Hybrid Electric Vehicles): Combining an internal combustion engine with one or more electric motors, hybrids improve fuel efficiency and reduce emissions, making them a transitional technology toward full electrification.
- PHEV (Plug-in Hybrid Electric Vehicles): Featuring rechargeable batteries that allow for a limited all-electric driving range, these vehicles provide a balance between conventional and electric driving.

[63] https://en.wikipedia.org/wiki/Car_classification#:~:text=This%20article%20is%20about%20the%20categorisation%20of%20cars,%28e.g.%20sedan%2C%20coupe%2C%20hatchback%29%2C%20see%20Car%20body%20style

- BEV (Battery Electric Vehicles): Fully electric vehicles powered exclusively by batteries, offering zero tailpipe emissions and increasingly competitive ranges due to advancements in battery technology.
- FCEV (Fuel Cell Electric Vehicles): Using hydrogen fuel cells to generate electricity, these vehicles produce only water vapor as a byproduct, positioning them as a potential long-term solution for sustainable mobility[64].

Regarding target clientele, the automotive market is divided based on consumer demographics and purchasing behaviour, which significantly influence product offerings, pricing strategies, and distribution models. The three primary consumer segments include:

- Private Consumers (Retail Market): Individuals or households purchasing vehicles for personal use, driven by factors such as affordability, fuel efficiency, technological features and brand reputation.
- Corporate Fleets and Company Vehicles: Businesses acquiring vehicles for operational needs, often benefiting from fleet discounts, tax incentives and leasing options. This segment includes service fleets, company cars and logistics vehicles.
- Rental and Mobility Services: Companies specializing in short-term and long-term leasing, car-sharing and ride-hailing services. This segment has experienced significant growth due to the increasing preference for subscription-based and shared mobility models.

Understanding market segmentation is crucial for automotive manufacturers as it allows them to tailor their offerings to the specific needs of each customer group, thereby optimizing commercial and marketing strategies.

3.2.2 KEY MARKET PLAYERS

The global automotive market is characterized by the presence of established players, emerging companies and a complex network of suppliers that make up the supply chain. Among the market leaders are companies such as Toyota, Volkswagen, Stellantis, General Motors and Tesla. These automakers dominate the global landscape through diversified strategies and a strong international presence. Toyota, in the first half of 2024, reported a net profit of €14.59 billion, solidifying its position as the world's most profitable automaker, despite a 4.8% decrease in global sales. Volkswagen, leader in terms of revenue with €158.8 billion during the same period, faced a profit reduction to €6.378 billion, highlighting challenges in the European market[65]. At the beginning of 2025, Stellantis initiated an internal reorganization to enhance efficiency and strengthen its competitiveness in the global market. The company announced an investment plan exceeding $400 million to

[64] https://www.findmyelectric.com/blog/bev-phev-hev-fcev-ice-decoding-the-alphabet-soup-of-electric-vehicles
[65] https://cincodias.elpais.com/companias/2024-08-19/toyota-vapulea-al-resto-de-automovilisticas-con-mas-de-14500-millones-de-beneficios-en-la-primera-mitad-de-2024.html

upgrade three plants in Michigan, dedicated to producing electric and hybrid vehicles, including the Ram 1500 REV and the upcoming Jeep Wagoneer EV. Additionally, with Donald Trump's second presidential term, Stellantis revised its strategy for the U.S. market, planning investments of over $5 billion to offer a diversified range of vehicles. In December 2024, Carlos Tavares announced his resignation as CEO, effective January 2026, amid financial pressures and tensions with the Italian government over local production activities[66]. General Motors faced challenges in the Chinese market due to increasing competition from local electric vehicle manufacturers. In the fourth quarter of 2024, GM reported a net loss of $2.96 billion, primarily due to asset impairments and restructuring charges related to its joint ventures in China. However, GM has decided to focus on the premium market, emphasizing Cadillac, Buick and imported vehicles to maintain competitiveness in the country[67]. In 2024, Tesla reported a 53% drop in profits, totaling $7.09 billion, despite a 1% increase in revenue. The decline was driven by a 6% decrease in automotive revenue, mainly due to discounts and promotions. However, its market capitalization reached $1.2 trillion, with forecasts predicting growth up to $2 trillion by the end of 2025, fueled by investments in AI and autonomous vehicles. The company is expanding its robotaxi production and enhancing autonomous driving technologies, while the Trump administration is considering eliminating federal tax credits for EV purchases, posing a new challenge for Tesla in the coming years[68].

The global automotive market is witnessing the emergence of new players, particularly Chinese manufacturers and startups focused on electric vehicles (EVs), which are reshaping the competitive dynamics of the industry. China has become an epicenter for innovation in the EV sector through numerous companies gaining prominence both nationally and internationally. Among these: BYD is one of the world's leading electric vehicle manufacturers, offering a diverse range of electric cars, buses and trucks; NIO is renowned for its premium electric SUVs and its innovative battery-swapping technology, which enhances vehicle convenience and operational efficiency; Xpeng Motors focuses on the development of intelligent electric vehicles, integrating advanced artificial intelligence features and autonomous driving capabilities to enhance user experience and driving safety[69].

The Chinese government has played a crucial role in fostering the growth of the electric vehicle (EV) market through a combination of policies and incentives aimed at increasing adoption and encouraging production. Financial subsidies provided to both manufacturers and consumers have significantly reduced the cost of EVs, making them more competitive against traditional internal combustion engine (ICE) vehicles. Additionally, tax exemptions, including the removal of purchase taxes and reductions in registration fees, have further incentivized consumers to choose electric mobility. Beyond financial support, regulatory measures have also

[66] https://www.ft.com/content/54c1e058-35cf-484d-abc4-433c1997d8d3
[67] https://www.reuters.com/business/autos-transportation/gm-closing-plant-china-part-restructuring-2025-02-14
[68] https://cincodias.elpais.com/companias/2025-01-29/el-beneficio-de-tesla-cayo-a-la-mitad-en-2024-con-los-ingresos-casi-estancados.html
[69] https://www.electromaps.com/it/blog/mercato-veicoli-elettrici-dinamica-cina

been implemented to accelerate the transition toward electrification. The New Energy Vehicle (NEV) quota system mandates that a specific percentage of a manufacturer's sales must consist of electric or hybrid vehicles, compelling automakers to prioritize EV production. At the same time, increasingly stringent emission standards for ICE vehicles are making EVs a more attractive option for both consumers and manufacturers, reinforcing the shift towards sustainable transportation in China[70].

After considering the major automotive manufacturers and emerging players, it is also essential to consider the strategic role of suppliers, who represent a fundamental pillar of the automotive industry. The supply chain in the automotive sector is characterized by a complex network of component suppliers, technologies and logistics services. The transition toward electrification and digitalization has heightened the importance of efficient and resilient supply chain management. Companies such as Bosch and Continental dominate the automotive components market, providing advanced systems for safety, autonomous driving and infotainment. Bosch, a global leader in the sector, develops electric motor technologies, batteries and assisted driving software, collaborating with major automakers to optimize the efficiency of next-generation vehicles. Continental, in addition to being one of the largest tire manufacturers, specializes in advanced driver assistance systems (ADAS) and electronic components, which are essential for the evolution of autonomous vehicles. In the battery sector, the growing demand for electric vehicles has led CATL to emerge as the world's largest EV battery manufacturer, supplying major players such as Tesla, Volkswagen and BMW. In this context, the role of suppliers is no longer limited to component supply but has evolved into a strategic collaboration with automakers to drive innovation, ensure the competitiveness of the global automotive industry and address the challenges of future mobility.

3.2.3 GEOGRAPHICAL DISTRIBUTION OF THE MARKET

The global automotive market exhibits a diverse geographical distribution, with significant differences between the United States, Europe, China and India. Variations in demand trends and market composition have been influenced by local industrial policies, government incentives, and the evolving preferences of consumers.

In the United States, light vehicle sales reached 16.1 million units, with 61% of these vehicles produced domestically. This data underscores a slight decrease compared to the previous year, indicating a growing presence of imported vehicles. The market was characterized by strong demand for SUVs and pickup trucks, which accounted for over 75% of total sales, while electric vehicles (EVs) experienced slower growth compared to other markets, making up approximately 7.6% of total sales. To protect domestic production, the

[70] https://www.electromaps.com/it/blog/mercato-veicoli-elettrici-dinamica-cina

government reinforced protective measures, introducing tariffs on Chinese EV imports, while the Inflation Reduction Act[71] incentivized the purchase of U.S.-made EVs through tax credits of up to $7,500.

In 2024, the European automotive market experienced moderate growth. In July, vehicle registrations across the EU, EFTA and the UK increased by 0.4% compared to the same month of the previous year, totalling 1,025,290 units. However, in November, a 2% decline in new car registrations was observed. Germany ranked first in monthly registrations among the major markets, followed by the UK, France, Italy and Spain. Stellantis Group accounted for 14.9% of the expanded European market, including EFTA and the UK, making it the second-largest automaker after Volkswagen Group, which held a 26.6% market share. To counter the growing competition from Chinese electric vehicles, the European Union introduced preliminary tariffs on their imports, ranging from 9% to 36.3%, in addition to the standard 10% tariff[72]. These measures were implemented to protect European manufacturers from foreign competition.

China strengthened its position as the world's leading automobile producer in 2024, with 31.28 million vehicles manufactured, including over 27 million passenger cars. This represents a 3.7% increase compared to the previous year. Sales reached 31.44 million units, marking a 4.5% growth. This success is attributed to favourable government policies, including subsidies for both manufacturers and buyers of electric vehicles, which have made Chinese vehicle prices more competitive in global markets.

In India, the market continued to expand due to rising domestic demand and increased investment in electrification. Vehicle sales reached 4.5 million units, marking a 7.8% growth compared to the previous year. The government introduced a new incentive scheme to attract investments, allowing manufacturers to benefit from tax reductions, provided that 50% of the components are produced locally. This measure encouraged companies like Toyota and Hyundai to strengthen their presence in the country, while Tesla decided not to invest directly due to regulatory and infrastructure challenges.

To summarize, the global automotive market in 2024 followed divergent trends: while China and India experienced strong growth, Europe and the United States implemented protective measures to safeguard domestic production. The adoption of electric vehicles was faster in China and certain countries of Europe, whereas in India and the United States, demand remained more focused on internal combustion and hybrid models.

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[71] The Inflation Reduction Act (IRA), enacted in the United States in 2022, is a federal law aimed at reducing inflation through investments in clean energy, domestic manufacturing and fiscal deficit reduction. In the automotive sector, the IRA has had a significant impact, particularly on the transition to electric vehicles (EVs), by incentivizing the production and purchase of zero-emission cars. One of its key provisions is a tax credit of up to $7,500 for the purchase of electric vehicles assembled in the United States. This measure has benefited automakers such as Tesla, General Motors and Ford, which have invested in local production to meet the IRA's requirements. Additionally, price limits apply to eligible vehicles: $55,000 for cars and $80,000 for SUVs, pickups and vans.

[72] https://www.ilsole24ore.com/art/dazi-ue-e-usa-cinesi-esportano-piu-emergenti-4-rischi-AFOMmBaD

3.2.4 TYPICAL COST STRUCTURE

The analysis and identification of costs are essential activities for both the operational and strategic management of a company in the automotive sector. Specifically, a detailed cost analysis allows for the identification of key areas for intervention to optimize resources and improve production efficiency. In particular, distinguishing between fixed and variable costs is crucial for developing effective financial management strategies.

Fixed costs are expenses that remain constant regardless of the production volume. In the automotive industry, the main fixed costs include:

- Investments in Research and Development (R&D): The development of new technologies, such as electrification, autonomous driving and advanced safety systems, requires significant investments. These investments are essential to maintain competitiveness and comply with increasingly stringent environmental regulations.
- Infrastructure and Production Facilities: The construction, maintenance and upgrading of production plants represent a substantial component of fixed costs. The adoption of automated processes and the robotization of production lines require additional investments but can improve operational efficiency in the long term.
- Personnel Costs: Salaries and training for a skilled workforce constitute another significant fixed cost. The availability of specialized personnel is crucial to support innovation and ensure high production standards.

Variable costs fluctuate based on production volume. In the automotive industry, the main variable costs include:

- Raw Materials and Components: The purchase of materials such as steel, aluminum, plastic and semiconductors is directly proportional to the number of vehicles produced. Market price fluctuations of these raw materials can significantly impact total production costs.
- Logistics and Transportation: Expenses for the global distribution of vehicles and components represent a considerable portion of variable costs. Any disruptions in the supply chain or increases in transportation costs can have a direct impact on profitability.
- Energy and Utilities: The operation of production plants requires high energy consumption. Variations in energy prices can, therefore, affect overall operating costs.

Economies of scale play a crucial role in reducing unit costs in the automotive industry. By increasing production volume, companies can spread fixed costs over a larger number of units, thereby decreasing the cost per vehicle. This approach has historically been adopted to make vehicles more affordable and competitive in the market. For example, the implementation of efficient assembly lines has significantly

reduced per-unit production costs. Additionally, strategies such as component standardization, supply chain optimization, and production process automation further contribute to cost reduction. However, it is essential to balance production efficiency with the flexibility needed to adapt to changing market demands and technological innovations.

To address modern needs in cost accounting, more advanced and sophisticated models have been introduced, including Activity-Based Costing, Target Costing and Kaizen Costing. These models provide a more comprehensive and detailed approach to cost management.

3.2.4.1 THE ACTIVITY BASED COSTING (ABC)

The Activity-Based Costing (ABC) was first applied by General Electric, marking a complete break from the traditional methods used until then. ABC highlighted the obsolescence of traditional accounting systems based on direct labour; in contrast, activity-based cost determination does not allocate indirect costs arbitrarily but assigns them to products based on the underlying activities that generate these costs. Furthermore, ABC does not limit itself to production costs but, where possible, assigns period expenses to the activities that are their primary cause. By using resources as a new reference point and focus of evaluation, ABC assigns resource costs to activities through specific parameters (resource drivers) that measure resource consumption within them. Subsequently, the activity centers (processes and sub-processes) whose cost is to be calculated are identified. For each center, the key activities are determined, and in turn, resources are assigned to activities through direct calculation, estimation or allocation based on a resource driver (e.g., number of employees, occupied space, terminals used) considered most influential. Then, to measure the intensity and frequency of an activity, the factors influencing the demand for activity (activity drivers) in relation to a cost element are determined. Another indicator that can be calculated using the ABC model is unused capacity, represented by the formula:

Activity Available = Activity Used + Unused Capacity

This measure has great decision-making value, as it provides a very accurate representation of production potential. Firstly, it can be used in an internal and external evaluation process (such as in mergers and acquisitions – M&A), and secondly, it highlights the processes and activities that should be optimized to make the organization more efficient and profitable.

Furthermore, this new approach has led to a shift in the role and perception of accountants, transforming management control into Activity-Based Management (ABM), where managerial action focuses on the effectiveness and efficiency of the production combination.

A study conducted at Mesfin Industrial Engineering, an Ethiopian company specializing in automotive manufacturing, analyzed the application of Activity-Based Costing (ABC) in the trailer assembly department.

The main objective was to compare ABC with traditional cost accounting systems to assess which methodology provided a more accurate representation of production costs. The researchers collected data over an entire fiscal year, focusing on the various activities involved in the assembly process. Through the implementation of ABC, it was possible to allocate indirect costs to the specific activities that generated them, rather than distributing them evenly across all products. This approach enabled the identification of high resource-consuming areas and allowed for targeted interventions to optimize operational efficiency. The study results showed that adopting ABC led to a cost reduction of approximately 3% compared to traditional accounting methods. This decrease was attributed to better cost allocation and the identification of inefficiencies that had previously gone unnoticed[73].

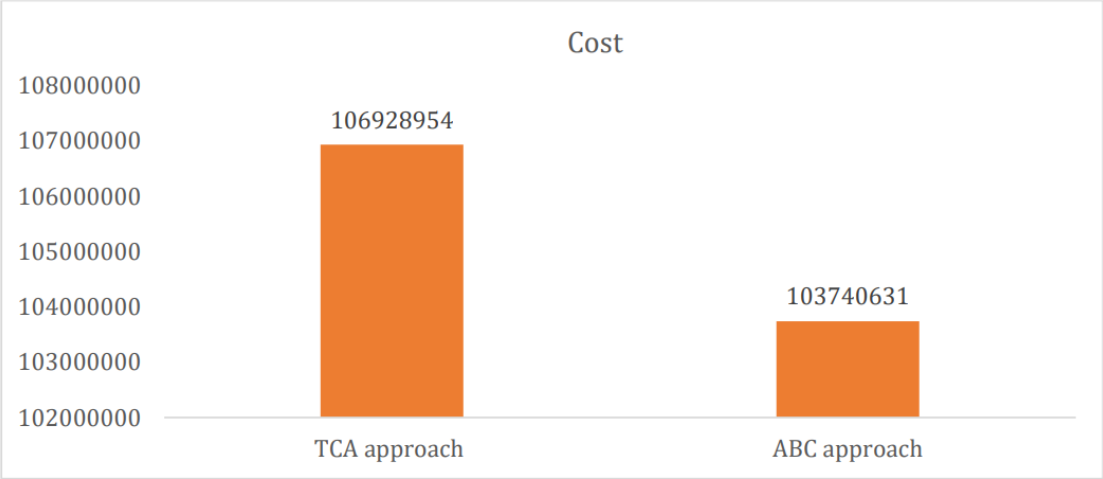

Figure 3.7: Comparison between ABC approach and TCA approach. Source: Teklay, G., Kitaw, D., Jilcha, K. (2021). ACTIVITY-BASED COSTING APPLIED TO AUTOMOTIVE MANUFACTURING A CASE OF MESFIN INDUSTRIAL ENGINEERING

3.2.4.2 THE TARGET COSTING

Japanese car manufacturers implemented a cost management system that relies on two key methods: Target Costing and Kaizen Costing. Target Costing is applied during the development and design stages of a new vehicle model to drive cost reduction, whereas Kaizen Costing focuses on continuous cost improvements for existing products. These two approaches are complementary, working together to form the Total Cost Management system adopted by major Japanese car manufacturers[74].

The Target Costing involves two key processes:

- Product design which focuses on creating a model that meets customer needs while defining essential parameters such as target cost, target profit and target price.

[73] Teklay, G., Kitaw, D., Jilcha, K. (2021). ACTIVITY-BASED COSTING APPLIED TO AUTOMOTIVE MANUFACTURING A CASE OF MESFIN INDUSTRIAL ENGINEERING
[74] Monden, Y., Hamada, K. (2000). Target Costing and Kaizen Costing in Japanese Automobile Companies

- Implementation phase aimed at achieving the target cost through value engineering and comparing projected costs with actual costs to ensure alignment with financial objectives.

The Target Costing process consists of five key steps:

1) Corporate Planning: In this initial phase, the company establishes its profit plans across all departments, setting overall target profits for specific periods and products. Beginning with marginal income[75], the contribution margin[76] and operating profit[77], various cost elements such as depreciation, development and production expenses are deducted. Once the target profit is determined using the Return on Sales (ROS)[78] metric by the strategic department, the plan is submitted to the engineering department for an assessment of its economic feasibility.

2) Development of a new product project: At this stage, the engineering department evaluates the estimated costs and technical feasibility of the project. Factors such as capital turnover[79] and a model's expected lifecycle—generally not exceeding two generations (approximately eight years)—are considered.

3) Determination of the ground plan for the new project: The third step involves determining the achievable cost, which is derived from the difference between the target selling price (based on market analysis) and the target profit (previously defined by the strategic division). The target cost is then set within the range established by the estimated costs and the achievable cost. Ultimately, the target cost serves as a guiding benchmark for the entire production process. After several review cycles, this cost is further detailed and allocated across all production expenses.

4) Product Design: In this phase, a preliminary design draft is created in accordance with the target cost for each individual component, ensuring collaboration across all departments involved in the process.

5) Transfer to production plan: The final stage involves the full-scale implementation of the project within the production cycles, while consistently adhering to the target cost established in the design phase (Step 4). Over the course of one year, all performance data is collected. If any discrepancies between the target cost and the actual production cost emerge, adjustments are made at the sub-process level to realign costs with the original objectives.

[75] Marginal Income = Selling Price – Variable Costs
[76] Contribution Margin = Marginal Income – Traceable Fixed Costs
[77] Operating Profit = Contribution Margin – Fixed Costs Allocated
[78] Return on Sales (ROS) = Operating Income / Sales Revenues
[79] Capital Turnover = Sales / Invested Capital

3.2.4.3 THE KAIZEN COSTING

In Kaizen Costing, the term "kaizen", derived from Japanese, signifies a series of small and continuous improvements aimed at enhancing performance. Rather than being merely an accounting method**,** Kaizen Costing serves as a strategy for increasing efficiency through incremental and ongoing process optimization. The activities within this method are categorized into two main areas: the first applies when there is a significant gap between the target cost and the actual cost within the first three months after production begins while the second consists of ongoing periodic efforts aimed at reaching the achievable cost. The first type of activity involves forming a temporary task force, where value engineers identify the root cause of cost discrepancies and develop solutions. The second type is managed through a detailed analysis of fixed and variable costs. Following a management by objectives approach, specific targets are set at different organizational levels, considering various efficiency, quality and flexibility routines to ensure continuous improvement.

In the Kaizen Costing model, the profit is calculated by subtracting the estimated profit from the target profit. The total amount of Kaizen Costs for all plants is calculated as follows:

Actual Cost per unit in the period = Actual Cost in the last period / Actual Production in the last period

Estimated Actual Cost for all plants in this period = Actual Cost per unit in the last period * Estimated Production in this period

Kaizen Cost Target in this period for all plants = Estimated Actual Cost for all plants in this period * Percentage of Cost Reduction Target from the Estimated Cost

The percentage of the cost reduction target is identified taking into account the achievement of the target profit for the year (usually 10%). The total amount of kaizen cost assigned to each establishment is calculated as:

Percentage of Attribution = Cost directly controlled by each plant / Total Costs directly controlled by all plants

Total Kaizen Cost for each plant = Kaizen Cost Target in this period for all plants * Percentage of Attribution

The Kaizen cost objective is achieved through continuous daily improvement efforts, serving as a key driver for cost reduction. The alternative approach, on the other hand, focuses on boosting sales, which in turn leads to higher profits. This cause and effect relationship is based on the principle that increasing sales enhances the turnover of invested capital, ultimately improving financial performance.

3.3 ANALYSIS MODELS FOR THE AUTOMOTIVE INDUSTRY

The automotive sector is characterized by intense competition, technological innovation and continuous transformations driven by economic, regulatory and environmental factors. Companies operating in this market must face complex challenges, including the evolution of consumer preferences, the transition toward sustainable mobility and the adoption of new digital technologies. To address these dynamics and make effective strategic decisions, businesses rely on various analytical tools that help assess market opportunities and threats, as well as identify their strengths and weaknesses. The most commonly used tools are: Porter's five forces model, PEST analysis, SWOT analysis and BCG matrix.

3.3.1 PORTER'S FIVE FORCES MODEL

To analyze the automotive sector, the Five Forces Model by Porter is adopted, a strategic tool useful for understanding the competitive dynamics of the market. The analysis aims to identify the structural characteristics of the sector and their impact on competition and profitability, predict possible future developments in terms of competitiveness and profits, as well as study the competitive landscape and consumer needs to identify opportunities for competitive advantage. According to this model, the level of competition in a sector depends on the simultaneous interaction of five main factors: the threat of new entrants, the threat of substitute products, the power of suppliers, the power of customers and the degree of competition.

The Threat of New Entrants

The entry of new players into the automotive sector is heavily influenced by the presence of entry barriers, which can make the market access process complex and costly. The higher the barriers, the more difficult it will be for new competitors to challenge established manufacturers. Historically, barriers in the automotive sector have been significant, primarily due to the high investments required in research and development (R&D), production infrastructure, distribution and marketing.

One of the main obstacles for new entrants is the high capital required to start vehicle production and develop advanced technologies. Established automakers benefit from economies of scale, which allow them to spread fixed costs over large production volumes, reducing unit costs and offering competitive prices. For new entrants, achieving these economies is challenging without a significant initial production volume. However, companies like Tesla have demonstrated that, with a strategy based on targeted investments and production verticalization, it is possible to overcome this obstacle. Tesla, in fact, has reduced its reliance on external suppliers by producing key components in-house, such as batteries and software.

Another significant barrier is the need for an extensive distribution and service network. Traditional manufacturers operate through dealerships and global distributors, which allows them to easily reach end customers. New entrants often face difficulties in accessing these channels but can adopt alternative strategies.

For example, Tesla bypassed the traditional model and adopted a direct online sales system, avoiding dealerships and opening company-owned showrooms. This model allowed for cost reduction and improved control over the customer experience.

Finally, the automotive industry is highly regulated, with particularly strict safety, emissions and environmental compliance standards, especially in Europe and the United States. For a new entrant, complying with these regulations involves costly certification processes and technological adjustments.

Despite these barriers, several new players have successfully entered the industry by leveraging innovative strategies. Companies like Tesla, Rivian, Lucid and NIO have revolutionized the industry by adopting innovative business models based on production verticalization, digitalization of sales and technological innovation. Brands such as BYD, XPeng, Li Auto and Geely are rapidly gaining market share due to lower production costs, government incentives and international expansion. Another strategy used by new entrants is collaboration with established companies to access technology and distribution channels.

The Threat of Substitute Products

The threat posed by substitute products arises when alternative solutions emerge that can meet consumer needs in different ways, thereby reducing demand for traditional products. In the automotive sector, this threat is particularly relevant due to changing consumer behaviours, technological innovations and environmental policies. The greater the availability and attractiveness of such alternatives, the higher the pressure on the competitiveness of the automotive market.

One of the primary alternatives to private car ownership is the efficiency of public transportation, including high-speed trains and metro systems, particularly in densely populated urban areas. In recent years, shared mobility services have expanded exponentially, offering more flexible and cost-effective solutions compared to purchasing a vehicle. For example, car-sharing services (such as Share Now, Zipcar, and Enjoy) allow users to access vehicles without owning them, thereby reducing ownership and maintenance costs. Furthermore, the concept of vehicle ownership is evolving, with a growing preference for more flexible solutions such as long-term rental. Increasingly, both businesses and private individuals are opting for leasing rather than purchasing, benefiting from comprehensive packages that include maintenance, insurance and assistance services.

To counteract the increasing threat of substitute products, automakers must implement targeted strategies to differentiate themselves and provide added value to consumers. This includes:

- Investing in research and development to create vehicles that are technologically advanced, energy-efficient, and environmentally sustainable.
- Enhancing the overall consumer experience, both online and offline, to strengthen brand loyalty and compete effectively against alternative mobility solutions.

By adopting such strategic measures, automotive companies can maintain their relevance and competitiveness in an evolving market landscape.

The Power of Suppliers

Bargaining power is an economic concept that describes the ability of one party in a negotiation to influence the terms of a contract. In the automotive sector, the bargaining power of suppliers is a key factor affecting production costs, market dynamics and the competitiveness of automakers.

Due to the complexity of the supply chain and the reliance on highly specialized components, some suppliers hold a dominant position, particularly in strategic areas such as semiconductors, electric vehicle batteries and advanced software. The automotive industry is highly dependent on specialized suppliers that hold near-monopolies on essential components, such as semiconductors (TSMC), electric vehicle batteries (CATL) and software and sensors for autonomous driving (Bosch).

Replacing a supplier in the automotive sector can result in high costs, not only in terms of pricing but also in terms of: time and resources required to validate new components; compatibility with existing systems; quality and reliability risks.

In addition, Suppliers offering unique or highly differentiated products strengthen their bargaining power, as automakers cannot easily replace them or replicate their technology.

To reduce dependence on dominant suppliers, automakers are adopting various strategies, including investing in in-house production of key components to lessen reliance on external suppliers. For example, Volkswagen has initiated the construction of gigafactories for battery production in Europe[80], reducing its dependence on CATL and LG Chem. Some automakers are entering into strategic agreements with key suppliers to ensure stable supplies and competitive prices. For instance, General Motors and LG Chem have established a joint venture (Ultium Cells)[81] for battery production in the United States. Additionally, to avoid excessive dependencies, many companies are working to diversify their supplier base and gain direct access to raw materials.

The Power of Customers

The bargaining power of customers is a key element in Porter's Five Forces analysis, as it directly influences automakers' strategies regarding pricing, quality and innovation. In the automotive sector, customers have

[80] https://www.reuters.com/business/autos-transportation/vw-bosch-plan-joint-venture-equip-gigafactories-report-2022-01-18/#:~:text=Volkswagen%20and%20autos%20supplier%20Bosch%20are%20planning%20to,Manager%20magazine%20reported%20on%20Monday%2C%20citing%20anonymous%20sources

[81] https://investor.gm.com/news-releases/news-release-details/lg-chem-and-general-motors-reach-agreement-long-term-supply/

gained an increasingly central role due to several factors, including greater access to information, a wide range of vehicle options and the growth of alternatives to car ownership. With the evolution of the automotive market, consumers are no longer limited to a restricted set of choices and can easily compare brands and models, pushing automakers to adapt in order to remain competitive.

Firstly, the European automotive market offers a vast selection of vehicles, ranging from affordable city cars to luxury SUVs, with numerous brands and models available. High competition exists, with traditional manufacturers (Volkswagen, Toyota, BMW, Stellantis, Renault, Ford) competing against new entrants (Tesla, BYD, NIO, Rivian), increasing the options available to consumers. Additionally, automaker websites and comparison platforms (e.g., AutoScout24) enable customers to quickly and transparently compare prices, technical specifications and reviews.

Furthermore, consumers are becoming increasingly price-sensitive, particularly during periods of economic instability. The rising prices of new cars have led many consumers to turn to the used car market, while others opt for leasing or long-term rental to reduce the initial cost.

To mitigate the growing pressure from consumers, many automakers are expanding into shared mobility and car subscription services. For example, BMW and Daimler launched Free Now and Share Now to provide innovative mobility solutions. To meet customer expectations, automakers are focusing on customizable configurations, digital purchasing experiences, autonomous driving and AI, ensuring a more tailored and engaging customer journey.

The Degree of Competition

Rivalry among existing competitors in the European automotive sector is extremely intense due to the presence of numerous established players and new entrants competing for market share in a highly dynamic environment. The industry is characterized by rapid technological innovations, regulatory changes and evolving consumer preferences, which drive companies to invest heavily in research and development (R&D), aggressive marketing strategies and new forms of mobility. The intensity of competition is determined by several key factors, including market saturation, pressure for innovation, the transition to electric mobility and brand differentiation strategies.

The European automotive market is mature and saturated, with a high penetration of vehicles in many countries. As a result, companies can no longer rely on natural market growth and must attract customers by offering discounts, incentives and favourable financing options. In such a competitive and saturated market**,** branding and marketing play a crucial role in differentiating companies. Automakers are increasingly focusing on online advertising, influencer marketing and social media channels to reach new generations of customers.

Electric mobility is reshaping competition in the automotive sector, creating a new challenge between traditional manufacturers and new entrants. Established automakers such as Volkswagen, BMW, Mercedes, Stellantis and Ford are accelerating electric vehicle production to avoid losing market share and are making significant investments in advanced technologies to differentiate themselves and maintain a competitive advantage.

3.3.2 PESTEL ANALYSIS

The PESTEL analysis is a strategic model used to examine the macroeconomic factors that influence an industry. Applied to the automotive sector, it helps to understand how political, economic, social, technological, environmental and legal variables impact the competitiveness and strategies of automakers. The model allows for the identification of key trends and challenges within the industry, supporting strategic decision-making for manufacturers, suppliers and policymakers.

P – Political

The automotive sector is heavily influenced by political decisions and government regulations. Governments worldwide are implementing measures to accelerate the ecological transition, shaping the strategies of automakers. Many countries offer incentives to promote the adoption of electric vehicles (EVs): in the European Union, funding is available for charging infrastructure and purchase bonuses for EVs; in the United States, the Inflation Reduction Act includes tax incentives for the production and purchase of electric cars; in China, the government provides subsidies and tax benefits for EVs.

Emission restrictions are imposing significant challenges on internal combustion engine (ICE) vehicle manufacturers. EU Regulations[82] mandate that from 2035 the sale of new combustion engine cars will be banned while in the United States, Corporate Average Fuel Economy (CAFE) standards[83] require a reduction in fleet emissions.

E – Economic

The automotive industry is heavily influenced by economic fluctuations, raw material costs and supply chain dynamics. The production and commercialization of vehicles are closely tied to macroeconomic stability, the

[82] In March 2023, the European Union adopted a regulation that, starting from 2035, will ban the registration and sale of gasoline and diesel-powered vehicles. This measure is an integral part of the "Fit for 55" package which aims to reduce net greenhouse gas emissions by 55% by 2030 compared to 1990 levels and achieve climate neutrality by 2050.

[83] In the United States, CAFE standards are federal regulations established in 1975 with the goal of improving the average fuel efficiency of vehicles produced for the American market. These standards set the average fuel consumption that a manufacturer's vehicle fleet must achieve annually, expressed in miles per gallon (mpg). In June 2024, the National Highway Traffic Safety Administration (NHTSA) announced that, for model year 2031, CAFE standards will require an average fuel consumption of approximately 50.4 mpg for passenger cars and light-duty vehicles.

availability of critical resources and international trade relations. The shift toward electric mobility has increased the demand for critical materials essential for battery production, including lithium, cobalt and nickel. Access to these resources is subject to significant price fluctuations, driven by growing demand, geopolitical tensions and the trade strategies of major producing countries. The scarcity of these materials can lead to higher production costs, directly impacting the retail prices of electric vehicles. Semiconductors are also essential components in modern vehicle manufacturing, particularly for electronic systems, driver assistance, infotainment and battery management in electric vehicles. However, tensions between raw material-producing countries and trade restrictions have caused production delays, increased procurement costs and a reduced manufacturing capacity for automakers. Global economic conditions, including inflation and interest rates, directly affect consumer purchasing power and, consequently, the demand for automobiles. Specifically: rising inflation leads to an increase in vehicle prices, reducing affordability for many buyers and higher interest rates negatively impact auto financing and leasing, making credit more expensive for consumers.

S – Social

Consumer preferences in the automotive sector are undergoing profound transformations, influenced by a growing focus on environmental sustainability, the expansion of shared mobility and advancements in digital technologies. In recent years, interest in electric vehicles (EVs) has significantly increased, driven by greater environmental awareness, government incentives and technological innovations. The main factors fueling this transition include greater ecological sensitivity, incentive policies and the expansion of charging infrastructure. The adoption of shared mobility models is reducing the need for private vehicle ownership, particularly in densely populated urban areas. The key drivers of this trend include lower ownership costs, increased integration between public transport and shared mobility and the development of sustainable urban infrastructure. Finally, digitalization has made consumers more informed and aware in their purchasing decisions. Through instant access to online information, it is now possible to compare prices, technical specifications and reviews before purchasing a vehicle.

T – Technological

Technological innovation represents the primary driver of change in the automotive industry, shaping the evolution of vehicles, energy efficiency and the driving experience. Automakers and technology companies are making significant investments in advanced solutions to enhance vehicle safety, sustainability and connectivity.

Among the key innovations, Advanced Driver Assistance Systems (ADAS) play a crucial role, as many modern vehicles are equipped with automatic braking and parking assistance. Automakers such as Tesla, Waymo and Mercedes are actively developing fully autonomous driving systems. Finally, Artificial

Intelligence (AI) is improving energy consumption management and user interfaces, enhancing overall vehicle efficiency and driving comfort.

E – Environmental

Sustainability is becoming increasingly central to the strategies of governments, consumers and businesses, pushing the automotive industry to reduce its environmental impact and adopt more eco-friendly solutions. One of the most significant aspects concerns CO_2 emissions and the entire vehicle life cycle, with automakers striving to decrease emissions across the entire production chain, from raw material extraction to disposal. At the same time, the recycling of electric vehicle (EV) batteries is becoming a key priority to ensure the industry's sustainability. Recovering critical materials such as lithium and nickel not only reduces dependence on new mining activities but also helps minimize the environmental impact of production and disposal processes.

L – Legal

The automotive sector is regulated by strict laws concerning vehicle safety, emissions and manufacturer liability, with the goal of ensuring high standards for consumer protection and environmental sustainability. Vehicle safety is a fundamental aspect, and automakers must comply with increasingly stringent regulations governing crash tests, structural resistance and the effectiveness of driver and passenger protection systems. Regulatory authorities impose rigorous standards, such as those established by Euro NCAP[84] in Europe and NHTSA[85] in the United States, to ensure that every new model meets strict safety criteria before entering the market. At the same time, the growing adoption of autonomous driving technologies has led to the introduction of specific regulations that vary significantly from one country to another. Some governments have adopted more permissive approaches to encourage innovation, while others maintain stricter regulations, requiring extensive testing and imposing limitations on the use of autonomous vehicles on public roads. The lack of a unified regulatory framework presents a challenge for companies developing autonomous driving systems, forcing them to adapt their technologies to different national legislations to operate on a global scale.

The PESTEL analysis, while commonly used to assess the broader automotive sector, can also be applied to individual automakers to evaluate how external factors influence their specific strategies and market positioning. Each company operates within the same macroeconomic environment but responds differently based on its resources, competitive advantages and strategic vision. Applying PESTEL to Stellantis allows for a deeper understanding of how the company navigates regulatory challenges, economic fluctuations,

[84] Euro NCAP (European New Car Assessment Programme) evaluates vehicle safety through crash tests and other assessments, providing consumers with independent information on the safety performance of different car models.

[85] The NHTSA (National Highway Traffic Safety Administration) is an agency of the U.S. Department of Transportation responsible for road safety. In addition to setting CAFE standards, the agency conducts vehicle safety tests, issues recalls and promotes public awareness campaigns for road safety.

technological advancements and shifting consumer preferences, leveraging its strengths and addressing potential risks.

- **Political**: As stringent environmental regulations in the EU and U.S. increase compliance costs for automakers, Stellantis is proactively investing in electrification, gigafactories and the development of low-emission vehicles to ensure regulatory alignment and market competitiveness.	- **Economic**: High interest rates and economic recessions reduce consumer purchasing power so Stellantis is expanding its financing options and subscription-based mobility services to offer more affordable alternatives and maintain demand.
- **Social**: As consumers increasingly prioritize sustainability and digital experiences, Stellantis is accelerating the expansion of its EV lineup while integrating advanced infotainment systems and AI-driven interfaces to meet evolving customer expectations.	- **Technological**: Given the rapid advancements in battery technology and autonomous driving, Stellantis is strengthening its partnerships with technology firms and increasing R&D investments to stay at the forefront of innovation and enhance vehicle performance.
- **Environmental**: The carbon footprint of vehicle production, particularly in battery manufacturing, is under scrutiny leading Stellantis to invest in battery recycling technologies and sustainable raw material sourcing to minimize environmental impact.	- **Legal**: Facing diverging regulations across Europe, the U.S. and China, Stellantis is implementing modular vehicle platforms and adaptable production strategies to efficiently meet different compliance standards in global markets.

3.3.3 SWOT ANALYSIS

The automotive industry is characterized by intense global competition, with rapid technological and regulatory changes. The SWOT analysis allows for an evaluation of strengths, weaknesses, opportunities and threats that impact the entire sector, providing a strategic overview of market dynamics.

Strengths

The automotive industry has developed significant competitive advantages, enabling it to innovate and meet consumer needs on a global scale. Among the key strengths are:

- Innovation and R&D capabilities allowing continuous technological advancements.
- Brand reputation as many historic manufacturers (Mercedes-Benz, BMW, Ferrari) enjoy high brand recognition and a strong customer connection.
- Global distribution network and large-scale production, with major automotive groups operating global production facilities and supply chains, enabling economies of scale and cost reduction.

Weaknesses

Despite its strengths, the automotive sector faces structural challenges that limit its flexibility and profitability, including:

- Dependence on critical raw material such as lithium, cobalt and nickel for EV batteries, exposing the industry to geopolitical tensions and price volatility.
- High costs of transitioning to electric mobility, requiring significant investments in infrastructure, technology and supply chains.
- Regulatory complexity as differences in regulations between the U.S., Europe and China create challenges for companies that must adapt their models to varying safety and emissions standards.

Opportunities

The automotive industry is facing new growth opportunities, driven by digitalization and the increasing demand for sustainable mobility. Examples include:

- Expansion of the EV market as electric vehicle adoption continues to rise.
- Development of new business models such as subscriptions, long-term rentals and car sharing.
- Advancements in software and autonomous driving technologies, enabling more connected and intelligent vehicles.

Threats

The automotive industry faces significant threats that could slow growth and reduce profitability, including:

- Increasing competition driven by the entry of new market players.
- Stricter regulations as both the EU and the U.S. are implementing more stringent emissions standards, increasing costs for manufacturers.
- Economic recessions and high interest rates which reduce consumer purchasing power and negatively impact demand for new vehicles.

Each automaker faces these challenges with different resources, strategies and competitive advantages. For this reason, it is essential to complement the industry-wide SWOT analysis with a specific analysis of an

individual manufacturer, in this case Stellantis. Applying the SWOT analysis to Stellantis allows for an assessment of how the company positions itself within this context, its strengths and weaknesses compared to competitors and how it can leverage emerging opportunities while mitigating potential threats.

- **Strengths**: • Diversified brand portfolio (Fiat, Jeep, Peugeot, Opel, Citroën, Maserati, Alfa Romeo, Chrysler, Dodge). • Strong presence in key markets (Europe, North America, Latin America). • Significant investments in electrification and gigafactories.	- **Weaknesses**: • High dependence on internal combustion vehicles compared to EV-focused competitors. • Limited presence in China, the world's largest EV market. • Complex production structure and need for internal supply chain optimization.
- **Opportunities**: • Expansion in the EV market and development of new battery technologies. • Growth in the SUV and pickup segment, especially in North America. • Development of new business models (subscriptions, shared mobility services).	- **Threat**: • Increasing competition from Tesla, BYD, and emerging EV startups. • Regulatory pressure on emissions and high compliance costs. • Dependence on the global supply chain and raw material price volatility.

3.4 MERGERS AND ACQUISITIONS IN THE AUTOMOTIVE INDUSTRY

Mergers and acquisitions represent a strategically significant phenomenon in the automotive sector, characterized by constantly evolving market dynamics and an increasingly global competitive environment. Corporate consolidation through M&A has emerged as a key tool for companies in the sector, enabling them to adapt to industrial, technological and regulatory transformations. Over the past decades, the automotive sector has undergone profound transformations, influenced by factors such as technological innovation, supply chain integration and economic and geopolitical pressures. In this scenario, mergers and acquisitions have become an essential lever for companies aiming to strengthen their market position, expand their geographical presence or optimize their production structure. However, in recent years, factors such as declining sales volumes and shifts in traditionally growing markets, such as China, have further complicated the competitive landscape for Western manufacturers. The rise in battery production for electric vehicles (EVs) has been marked by high volatility while hybrid electric vehicles continue to be a viable option, alongside further developments in internal combustion engines. Overall, there remains significant uncertainty regarding the strategies of original equipment manufacturers (OEMs) in relation to software development, electrical/electronic architecture and vertical integration in the high-voltage battery value chain.

Amid these challenges and transformations, companies largely refrained from engaging in M&A activities in 2024, with the total deal value dropping by approximately 80% and the transaction volume declining by around 60% in the first three quarters of the year. However, M&A activity is likely to resume as companies increasingly recognize that they cannot face these challenges alone for much longer. Since traditional M&A transactions become more complex during periods of high uncertainty, a growing number of companies are exploring alternatives such as joint ventures (JVs) and alliance agreements, which provide greater flexibility to remain competitive in different future scenarios. These agreements also require lower investments compared to traditional acquisitions. Recent examples include the $625 million joint venture between GM and Lithium Americas to secure access to critical minerals and the strategic partnership between CATL and Hyundai for the supply of batteries for Hyundai's future EV models[86].

The most forward-thinking companies are shaping various future scenarios and actively integrating them into their current decisions while taking strategic actions to strengthen their business in the present. Partnerships allow companies to explore different technological pathways more quickly and once the technological trajectory becomes clearer, the most promising alliances can be transformed into full acquisitions while the less advantageous ones can be scaled down or discontinued. In both cases, the most successful companies will be those capable of proactively shaping their future, anticipating changes and flexibly adapting to industry evolutions.

[86] Bain & Company. (2025). Global M&A Report 2025.

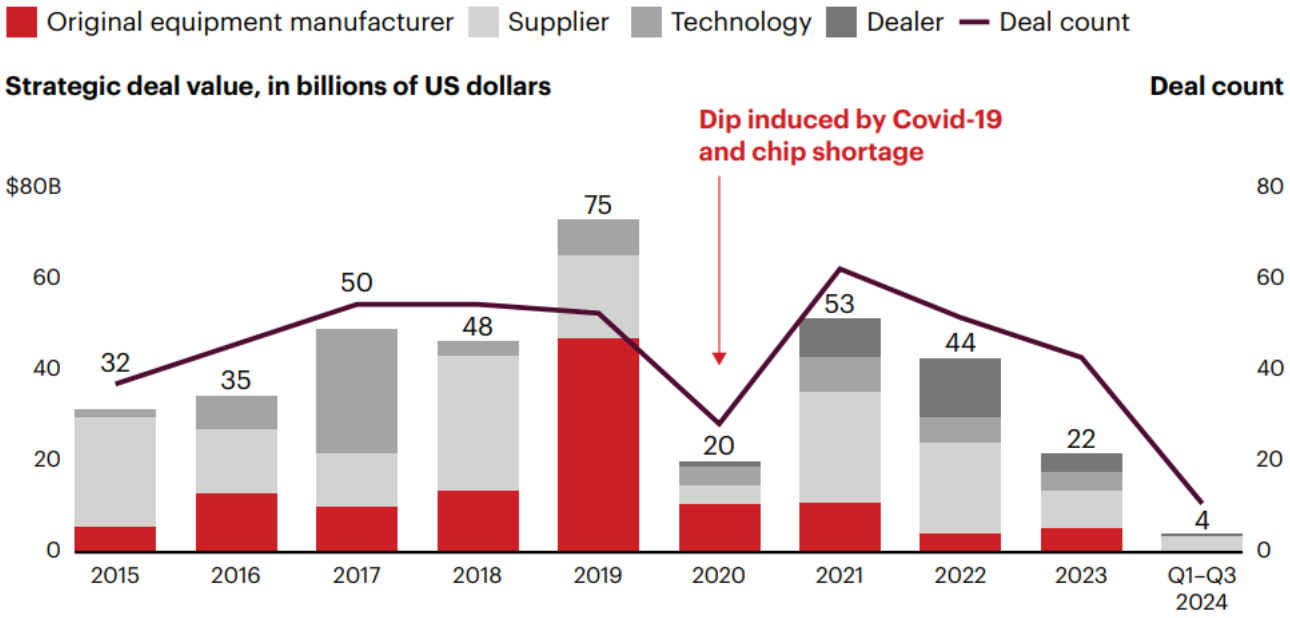

Figure 3.8: Amid challenges, automotive and mobility companies mostly avoided M&A in 2024. Source: Dealogic; Bain analysis.

3.4.1 KEY MOTIVES

M&A operations in the automotive sector are driven by various strategic motivations, including access to new markets and technologies, the realization of operational synergies, product portfolio diversification and the need to remain competitive in an ever-evolving industry. Companies that understand how to strategically leverage mergers, acquisitions and partnerships can strengthen their market position, reduce risks and improve profitability.

Access to new markets

M&A operations enable automotive companies to expand their geographical presence without having to build infrastructure from scratch. This is particularly relevant in emerging markets where entry barriers can be high due to local regulations, consumer preferences and established competition. By acquiring a company already operating in a target market, the buyer can leverage existing distribution networks, local market knowledge and customer relationships, thereby accelerating entry and reducing the risks associated with independent market penetration. Moreover, in markets characterized by high development and infrastructure costs, a joint venture or strategic alliance can represent a more flexible and lower-risk alternative to a full acquisition, allowing companies to expand with a more limited investment. A notable example is the case of Geely and Volvo. In 2010, the Chinese group Geely acquired Volvo Cars from Ford for $1.8 billion[87]. This operation enabled Geely to enter the European and North American markets by leveraging Volvo's established

[87] https://it.wikipedia.org/wiki/Geely_Holding_Group

distribution network and strong reputation in these regions. At the same time, Volvo benefited from access to the rapidly growing Chinese market, thanks to Geely's resources and local presence.

Access to new technologies and expertise

Technological innovation is crucial in the automotive sector, especially with the rise of electrification, autonomous driving and advanced connectivity. M&A operations allow companies to quickly acquire specialized expertise, emerging technologies and intellectual property without having to invest time and resources in internal development. Beyond traditional acquisitions, many companies choose to enter joint ventures or strategic alliances to explore new technological developments with a lower initial investment. This approach enables them to test various solutions without fully committing to a single technological direction, thereby reducing risk and maximizing the chances of success. A prominent example is General Motors, which formed a joint venture with Lithium Americas, as previously mentioned. This partnership allowed GM to acquire strategic capabilities without bearing the full costs of research and development[88].

Operational synergies and economies of scale

Mergers and acquisitions can generate significant operational synergies, enabling companies to reduce costs through resource sharing, the elimination of redundancies and supply chain optimization. By combining operations, companies can increase production volumes, negotiate better terms with suppliers and leverage economies of scale that lower the unit cost of products. The size growth achieved through M&A not only brings economic benefits but is often necessary to attain a sustainable leadership position in the market. In a sector characterized by high fixed costs and significant technological investments, achieving greater scale is essential for improving long-term profitability. In 2021, Fiat Chrysler Automobiles (FCA) and Groupe PSA merged to create Stellantis, the world's fourth-largest automotive manufacturer. This merger allowed for substantial operational synergies, including the sharing of technological platforms, supply chain optimization and cost reductions through economies of scale[89]. The integration of the two companies led to greater production efficiency and a stronger presence in global markets, which will be further detailed in the following chapters.

Product portfolio diversification

Acquiring a company with a different market segment or a focus on specific types of vehicles allows automotive companies to diversify their product portfolio. This strategy reduces dependence on a single product or market, mitigating risks associated with demand fluctuations or changes in consumer preferences.

[88] Lithium Americas Corp. (2024). Lithium Americas Announces Closing of Thacker Pass Joint Venture with General Motors.
[89] https://www.stellantis.com/en/news/press-releases/2019/december/groupe-psa-and-fca-agree-to-merge

In 2017, Geely acquired a majority stake in Lotus Cars, the legendary British sports car manufacturer[90]. This acquisition enabled Geely to diversify its product portfolio by adding high-performance vehicles to its lineup. At the same time, the investment provided Lotus with the necessary resources to develop new models and technologies, benefiting from Geely's manufacturing expertise and economies of scale. Many manufacturers also use strategic partnerships to test diversification before proceeding with a full acquisition. For example, Hyundai signed an agreement with CATL for the supply of batteries for electric vehicles, a move that allows it to expand its offering without a direct investment in a battery production facility. If the market evolves in the desired direction, Hyundai could decide to further consolidate the partnership through an acquisition.

Necessity of survival in a competitive market

The automotive sector is characterized by intense competition with new players such as Chinese manufacturers and tech startups challenging traditional companies. To maintain their market position and respond to competitive pressures, established companies may turn to mergers and acquisitions. Another increasingly common strategy is the formation of joint ventures and partnerships to achieve adequate scale without bearing the full costs of development and production. This allows companies to remain competitive while assessing the future direction of the market. In some cases, joint ventures can be converted into full acquisitions once the technological path is clear and risks have been mitigated. The need to rapidly acquire new production, technological and scaling capabilities is essential for achieving leadership positions with sustainable profitability. In a market where adaptability is crucial, companies that leverage mergers, acquisitions and strategic alliances will gain a significant competitive advantage. In 1999, Renault acquired a significant stake in Nissan, creating a strategic alliance to address the challenges of an increasingly competitive automotive market. Mitsubishi later joined the alliance in 2016. This collaboration allowed the three companies to share resources, technologies, and platforms, reducing costs and increasing global competitiveness. The alliance facilitated access to new markets and enhanced innovation capabilities, enabling its members to maintain their corporate identities while benefiting from common synergies[91].

3.4.2 RELEVANT CASE STUDIES

To better understand the dynamics of mergers and acquisitions in the automotive sector, two emblematic cases are analyzed: the merger between Daimler-Benz and Chrysler Corporation and the Renault-Nissan-Mitsubishi Alliance. These examples provide a clear picture of the opportunities and challenges associated with such operations, highlighting the success factors and the causes of potential failures.

[90] https://zgh.com/media-center/news/20170929_1
[91] https://alliancernm.com/home-alliance/about-the-alliance

The Daimler-Chrysler Case

In May 1998, Daimler-Benz, a German manufacturer of luxury and commercial vehicles, and Chrysler Corporation, one of Detroit's Big Three automakers, announced their merger. The deal, valued at $36 billion, was described by executives as a merger of equals, aiming to create a global leader capable of competing with Toyota, Ford and General Motors. The newly formed entity, DaimlerChrysler AG, was headquartered in Germany but maintained significant operations in the United States[92].

Several key factors drove the merger[93]:

- Market Expansion: Daimler-Benz sought a stronger presence in the U.S. market, while Chrysler aimed to reinforce its global position.
- Production Synergies: The merger aimed to combine Daimler's advanced technologies with Chrysler's efficient production and innovative design.
- Financial Stability: Chrysler hoped to achieve greater financial security by merging with Daimler, a financially solid company.
- Cost Reduction and Competitiveness: The merger was expected to lower operational costs by integrating supply chains and production platforms.

Despite its promising premise, the Daimler-Benz and Chrysler merger encountered numerous obstacles that ultimately led to its failure. The key issues were:

- Cultural Differences: Daimler-Benz had a rigid, hierarchical corporate culture focused on quality and technological innovation. In contrast, Chrysler operated with a more flexible, aggressive market approach, emphasizing cost efficiency and high sales volumes. These differences led to significant friction in corporate management[94].
- Lack of Operational Integration: Contrary to initial claims, the merger was not truly an equal partnership. Daimler's German management imposed its decision-making model, progressively reducing Chrysler's autonomy. This led to dissatisfaction among American executives and triggered a talent exodus.
- Disappointing Financial Performance: While Chrysler was financially stable at the time of the merger, it began experiencing economic difficulties in the early 2000s due to declining demand for SUVs and pickups and increasing competition from Japanese automakers. These financial issues worsened with the broader crisis in the U.S. automotive industry.

[92] Vlasic, B., & Stertz, B. (2001). Taken for a Ride: How Daimler-Benz Drove Off with Chrysler. HarperBusiness.
[93] DaimlerChrysler Annual Report 1998.
[94] Badrtalei, J., & Bates, D. L. (2007). Effect of Organizational Cultures on Mergers and Acquisitions: The Case of DaimlerChrysler. International Journal of Management.

- Shareholder Dissatisfaction: Daimler-Benz shareholders felt disadvantaged by the merger as Chrysler absorbed significant resources without delivering expected profits. Likewise, American investors were dissatisfied as Chrysler failed to gain the anticipated technological benefits from Daimler.

Faced with worsening financial and managerial conditions, Daimler decided in 2007 to sell 80.1% of Chrysler to Cerberus Capital Management for $7.4 billion, retaining only a small stake[95]. This marked the end of the merger and the return of Chrysler to American control. However, even under Cerberus, Chrysler continued to struggle financially and, in 2009, filed for bankruptcy before being rescued by Fiat.

The Daimler-Chrysler case is a prime example of a failed merger in the automotive sector. Initially seen as a mutually beneficial deal, it turned into a strategic mistake due to cultural differences, integration issues and disappointing financial results. This case highlights that the success of a merger does not solely depend on economic and technological factors but also on the ability to harmonize cultural and managerial differences between the merging companies.

Renault-Nissan-Mitsubishi Alliance

The Renault-Nissan alliance was officially established in 1999 when Renault acquired a 36.8% stake in Nissan for $5.4 billion. The goal was to restructure the finances of the Japanese automaker, which was facing severe economic difficulties at the time. The agreement was designed to maintain the operational independence of both companies while fostering strong industrial and financial collaboration[96]. In 2016, Nissan acquired a 34% stake in Mitsubishi Motors for approximately $2.3 billion, bringing the Japanese automaker into the alliance[97]. Mitsubishi, struggling due to an emissions scandal, saw Nissan as a strategic partner to strengthen its position in the electric vehicle and SUV segments.

The key reasons behind the creation and expansion of the alliance were:

- Nissan's Restructuring: By the late 1990s, Nissan had over $20 billion in debt and was suffering significant losses. Renault's intervention, led by Carlos Ghosn's restructuring plan, allowed Nissan to quickly return to profitability.
- Renault's Global Expansion: The deal enabled Renault to strengthen its presence in Asian and Japanese markets, where Nissan had a well-established commercial network.

[95] https://money.cnn.com/2007/05/14/news/companies/chrysler_sale/
[96] Nissan Motor Co., Ltd. Annual Report 2019.
[97] https://en.wikipedia.org/wiki/Renault%E2%80%93Nissan%E2%80%93Mitsubishi_Alliance

- Mitsubishi's Entry for Technological Synergies[98]: Mitsubishi, known for its expertise in SUVs and as a pioneer in electric vehicles with the i-MiEV[99], provided an opportunity for the alliance to develop common platforms and enhance leadership in electric mobility.

The alliance has yielded significant benefits for its members:

- Nissan's Financial Improvement: Under Carlos Ghosn's leadership, Nissan quickly regained profitability, surpassing Renault in sales and profit margins.
- Shared Production Platforms: The adoption of a shared platform and component strategy led to significant cost reductions and increased economies of scale[100].
- Joint Technological Development: The three alliance members collaborated on innovative technologies, including autonomous driving and electric motors, with the Nissan Leaf and Renault Zoe being among the key electric vehicles produced.

Despite its initial success, the alliance has faced internal tensions in recent years, particularly following the scandal involving Carlos Ghosn who was arrested in 2018 in Japan on charges of financial fraud and this was an event that destabilized the alliance and strained relations between Renault and Nissan[101]. In 2020, the three partners announced a new strategy, with Nissan leading electrification efforts in Asia, Renault in Europe and Mitsubishi in emerging markets.

The Renault-Nissan-Mitsubishi alliance represents a flexible cooperation model that has enabled the three companies to achieve production and technological synergies while maintaining their independence. However, internal tensions in recent years highlight the challenges of a complex international partnership. The future of the alliance will depend on the ability of its members to balance their interests and address the challenges of the energy and technological transition.

[98] https://www.motortrader.com/motor-trader-news/automotive-news/mitsubishi-joins-renault-nissan-alliance-21-10-2016

[99] The Mitsubishi i-MiEV (Mitsubishi Innovative Electric Vehicle) is an electric city car produced by Mitsubishi Motors. Launched in 2009, it was one of the first mass-produced electric vehicles available on the market.

[100] Renault-Nissan-Mitsubishi Annual Report 2018

[101] https://www.bloomberg.com/news/articles/2018-11-19/ghosn-to-be-arrested-on-suspected-financial-law-breach-asahi-joo251ln

CHAPTER 4: FCA-PSA MERGER

4.1 THE PLAYERS INVOLVED IN THE MERGER

M&A have proven to be a highly effective tool for generating value within a relatively short timeframe. When analyzing the automotive sector, it becomes evident that this is a capital-intensive and highly consolidated industry, where both scale and technological advancements play a crucial role in shaping cost structures and revenue streams. Given these characteristics, M&A strategies tend to offer a more strategic advantage compared to greenfield investments. The following chapter will focus on the merger between Fiat Chrysler Automobiles (FCA) and Peugeot S.A. (PSA), a deal announced in 2019 and completed on 4th January 2021, which led to the creation of Stellantis. The primary objective of the merger was to establish the world's fourth-largest automotive manufacturer by volume and the third-largest by revenue[102].

The purpose of this study is to provide a comprehensive overview of this M&A case, with particular emphasis on several key aspects. The analysis will explore microeconomic factors, such as the strategic rationale behind the merger and long-term corporate strategies; macroeconomic influences, including the impact of global events like the COVID-19 pandemic; and industry-specific trends, such as the transition to electric vehicles. These elements will be examined to assess their role in shaping the final outcome of the deal.

4.1.1 FIAT CHRYSLER AUTOMOBILES N.V. (FCA)

Fiat Chrysler Automobiles (FCA) was an Italian-American multinational corporation engaged in the design, production and sale of vehicles, components and production systems worldwide. Despite being headquartered in Amsterdam, FCA was tax domiciled in London and, by the end of 2019, employed 191,752 people globally[103]. Before merging with PSA, FCA's common shares were traded on the New York Stock Exchange (NYSE) under the symbol "FCAU" and on the Borsa Italiana (MTA) under the symbol "FCA". Although FCA was officially established in 2014 through the acquisition of Chrysler, which began in 2009, its history traces back over a century, particularly to the founding of Fiat in 1899 in Turin. A detailed account of Fiat's history has already been provided in the previous section (3.1.1 Italian Automotive Industry).

By the late 2000s, Chrysler was in severe financial distress since the company experienced a decade of failures from its unsuccessful merger with Daimler in 1998 to a sales decline of over 45% between 2000 and 2008. The global financial crisis of 2008 further worsened its condition, and in 2009, Chrysler filed for bankruptcy, unable to meet its debt obligations to the U.S. government[104]. At the same time, Fiat was seeking to expand into the North American market while diversifying its vehicle portfolio. Chrysler, on the other hand, needed a partner to help execute its turnaround plan, particularly in developing small and midsize cars—a segment in

[102] Keohane, D. (2019). Fiat Chrysler and Peugeot agree to pursue giant auto merger. Financial Times.
[103] FCA Annual Report 2019
[104] https://home.treasury.gov/data/troubled-assets-relief-program/automotive-programs

which Fiat had significant expertise. Fiat initially acquired a 20% stake in Chrysler in June 2009, increasing it to 58.5% by 2012 and finally purchasing the remaining 41.5% for $10.3 billion in 2014, making Chrysler a wholly owned subsidiary[105]. Shortly after, Fiat and Chrysler formally merged into Fiat Chrysler Automobiles and began trading on the NYSE. This deal enabled FCA to implement new strategies, enter new markets and expand its product range, setting the foundation for its global expansion in the following years.

In 2015, Sergio Marchionne[106], seeking to expand FCA as he considered it too small, unsuccessfully proposed a merger between FCA and General Motors but the offer was rejected. He initially considered a hostile takeover bid, which was later abandoned. In 2017, FCA was investigated in the U.S. for violating emission regulations and paid an $800 million fine in 2019. That same year, FCA attempted a merger with Renault but the deal fell through due to conditions imposed by the French government. During this period, FCA faced legal issues for inflating sales figures and diesel emissions, resulting in further sanctions in the United States.

By 2019, FCA had firmly established itself as a leading global automaker, with total revenues exceeding $108 billion and a well-diversified geographic revenue structure: 54.35% from North America; 28.26% from EMEA; 13% from LATAM[107] and 4.35% from APAC[108].

In terms of market presence, FCA was:

- The fourth-largest vehicle producer in U.S. with a 12.6% market share. The growth in this market was driven by the brand recognition of Jeep, Dodge, Ram and Chrysler which capitalized on rising demand for SUVs and trucks.
- The third-largest automaker in LATAC with a 13.9% market share and the first one in Brazil holding 18.7% market share, despite economic and political volatility in Latin America.
- A minor player in APAC, only 0.5% market share. Despite its limited presence, FCA acknowledged the APAC region as a market with substantial growth potential. Consequently, it began investing in initial partnerships and agreements with key joint venture collaborators, such as Guangzhou Automobiles, in China and India.
- The eighth player in EMEA, with a 6.0% market share, where Fiat dominated the small car segment[109].

[105] https://it.wikipedia.org/wiki/Fiat_Chrysler_Automobiles
[106] Sergio Marchionne was the architect of Fiat's revival and the global expansion of the group. Appointed CEO of Fiat in 2004, he found a company in crisis, with losses exceeding €6 billion and an uncompetitive product lineup. He implemented a strategy of restructuring and internationalization, focusing on operational efficiency, cost reduction and the revival of historic brands. His greatest achievement was the merger with Chrysler; moreover, under his leadership, Jeep became a global brand and FCA established itself among the world's leading automobile manufacturers.
[107] LATAM stands for Latin America.
[108] APAC stands for Asia Pacific region.
[109] FCA Annual Report 2019.

At the time of the merger with PSA, FCA's brand portfolio included Abarth, Alfa Romeo, Chrysler, Dodge, Fiat, Jeep, Lancia, Maserati, Mopar, RAM and SRT, as well as components and production systems divisions Comau and Teksid. The group also controlled FCA Bank, a joint venture with Crédit Agricole, providing automotive financial services.

Finally, FCA's ownership structure before the merger was: 28.66% owned by Exor N.V., the Agnelli family's holding company registered under the Dutch Law; 4.01% owned by BlackRock, a major U.S. investment firm; 67.33% free float.

4.1.2 PEUGEOT S.A. (PSA)

PSA Groupe, previously known as PSA Peugeot Citroën, was a major French multinational automotive manufacturer and holding company. It produced cars and motorcycles under the Peugeot, Citroën, DS, Opel and Vauxhall brands. Headquartered in Paris**,** by 2020 PSA had become the second-largest automaker in Europe in terms of vehicle sales volume, operating 18 production facilities worldwide[110]. As of December 2020, the company employed approximately 204,000 people; its shares were publicly traded on Euronext Paris under the ticker symbol "UG", being part of the CAC40 index[111]. The group's business structure was divided into three main divisions: automotive manufacturing, automotive equipment and financial services. The PSA Group was formed through the merger of Peugeot S.A. and Citroën S.A. The process began in 1974 when Peugeot S.A. acquired a 38.2% stake in Citroën, later increasing its ownership to 89.95% in 1976 by taking over the shares held by the Michelin family, as Citroën was facing severe financial difficulties. This acquisition led to the creation of PSA (Peugeot Société Anonyme), a name later changed to PSA Peugeot Citroën and eventually to Groupe PSA. In the following years, PSA expanded its production capacity by acquiring the Chrysler Europe factories but this move also resulted in significant financial losses, particularly between 1980 and 1985. As part of this acquisition, PSA also obtained the SIMCA brand. When Chrysler Europe was rebranded as Talbot in 1979, several models were sold under three different brand names for seven years. However, in 1986, the Talbot brand was discontinued and PSA focused its production exclusively on Peugeot and Citroën. Over the years, PSA established several strategic partnerships. One of the most notable agreements was with Toyota, leading to the production of city cars at a newly built plant in the Czech Republic. The joint venture, named TPCA (Toyota Peugeot Citroën Automobile), was responsible for manufacturing the Citroën C1, Peugeot 108 (formerly Peugeot 107) and Toyota Aygo. Additionally, PSA entered into a joint venture with BMW, mainly in the mechanical and engine development sector. In 2012, PSA signed a significant alliance with General Motors (GM) to collaborate on the development and sharing of platforms, components and automotive technologies. As part of the deal, GM acquired a 7% stake in the French group.

[110] Stellantis Annual Report 2020.

[111] The CAC40 (Cotation Assistée en Continu) is the benchmark stock market index of Euronext Paris, representing the 40 largest publicly traded companies in France based on market capitalization and liquidity. Major companies listed on the CAC 40 are LVMH, TotalEnergies, Airbus, BNP Paribas and Renault.

Following the global economic crisis of 2008, PSA faced financial difficulties and, in 2014, had to open its shareholding structure to new investors, allowing both the French government and the Chinese group Dongfeng Motor to acquire stakes in the company. That same year, Carlos Tavares[112] was appointed as Chairman of the Group. In 2016, PSA Peugeot Citroën officially changed its name to Groupe PSA. The following year, on March 2017, PSA acquired Opel and Vauxhall Motors from General Motors for €1.3 billion, with a total transaction cost of €2.2 billion. This acquisition further strengthened PSA's position, making it the second-largest automaker in Europe, right behind Volkswagen[113].

At the end of 2019, Groupe PSA recorded total revenues of €74.7 billion, slightly higher than the €74.03 billion achieved in 2018, demonstrating consistent financial performance before the disruptions caused by the COVID-19 pandemic in 2020. In 2019, PSA sold approximately 3.5 million vehicles worldwide, distributed across various geographic regions as follows:

- Europe: 2,083,408 vehicles sold representing 59.88% of total sales. PSA held a market share of 15.6%, positioning itself as the second-largest automaker in Europe, behind Volkswagen, which dominated the market with a 24.5% market share.
- Middle East and Africa: 129,074 units (3.71%); through its 50:50 joint venture with Dongfeng Motor Corporation, the Group gained the opportunity to develop and introduce a range of new energy vehicles, improve profitability, boost annual sales and further refine its product portfolio.
- China: 108,649 units (3.12%) showing a sharp decline from 251,701 in 2018, illustrating ongoing struggles in the Chinese market.
- Latin America: 134,645 units (3.87%) slightly down from 174,147 in 2018 due to the challenging economic conditions in certain Latin American countries and the negative effects of exchange rate fluctuations, the Group faced difficulties in the region. However, it maintained a strong presence with two production facilities and two R&D centers in Brazil and Argentina, primarily focused on biofuel-related technologies.
- India and Asia Pacific: 34,826 units (1.00%); although the number of units sold was relatively low, the India-Pacific region proved to be one of the most dynamic markets for the Group, driven by significant growth in Japan and South Korea, offering promising opportunities. Following the joint production agreement with Malaysia's Naza Corporation in 2018, PSA benefited from successful product

[112] Carlos Tavares, born in 1958, is a Portuguese automotive executive who played a key role in revitalizing PSA Groupe and later orchestrating the merger with FCA to form Stellantis. Appointed CEO of PSA in 2014, he inherited a company in financial distress, heavily impacted by the 2008 economic crisis. Through an aggressive cost-cutting strategy, operational efficiency improvements and a product portfolio revamp, he successfully returned PSA to profitability within just a few years. One of his most significant achievements was the acquisition of Opel and Vauxhall from General Motors in 2017, turning them from loss-making brands into profitable assets. Renowned for his decisive and pragmatic leadership, Tavares played a crucial role in negotiating the 2021 merger with FCA, creating Stellantis.

[113] https://it.wikipedia.org/wiki/Groupe_PSA

launches, the ability to meet specific customer demands and a strong collaboration with importer partners.

- Eurasia[114]: 15,063 units (0.43%); in this area PSA developed part of its vehicle lineup, established the foundation of its joint venture with the Mitsubishi Group and maintained a vehicle assembly partnership in Kazakhstan.

Before the merger, PSA's ownership structure was: Lions Participation (BPI France) 12.23%; Dongfeng Motor Group 12.23%; Peugeot family 12.23%; free float 63.31%[115].

4.2 RATIONALE BEHIND FCA-PSA MERGER

Mergers in the automotive sector are often driven by three main factors: economies of scale, geographic presence and access to new technologies. As a capital-intensive industry, automobile manufacturing requires substantial investments in research and development, along with efficient management of production costs. The merger between Fiat Chrysler Automobiles (FCA) and Groupe PSA, which led to the creation of Stellantis in January 2021, resulted from a combination of strategic, economic and political factors that had previously hindered collaboration attempts between the two groups[116].

Need of a strategic and complementary partnership

FCA had long recognized the need for a strategic partnership to strengthen its global presence and tackle the challenges of the automotive industry. Former FCA CEO Sergio Marchionne had always acknowledged that the company could not face alone the technological and cultural transformations reshaping the sector, such as the transition to electrification and digitalization of vehicles[117]. Despite this necessity, in 2019, FCA rejected a merger proposal from Groupe Renault due to excessive demands from the French government, which owned 15% of Renault's shares[118]. The French authorities insisted on securing a seat on the board of directors of the newly merged entity and demanded that the headquarters remain in France. These conditions led FCA to withdraw from negotiations and explore alternative strategic options, ultimately leading to the merger with PSA. On the other hand, PSA was looking for a strategic partner to expand into the North American market, a region where it had historically struggled to establish a strong presence. By merging with FCA, PSA could rely on FCA's well-established position in North America, avoiding the huge costs associated with building a new dealership network and marketing infrastructure in the U.S.

[114] Eurasia refers to Russia, Ukraine, Kazakhstan and other Commonwealth of Independent States (CIS) countries
[115] PSA Annual Report 2019.
[116] https://www.stellantis.com/en/news/press-releases/2019/december/groupe-psa-and-fca-agree-to-merge
[117] https://www.frost.com/growth-opportunity-news/psa-fca-merger-a-mega-industry-player-in-the-making/
[118] https://www.reuters.com/article/world/fiat-chrysler-withdraws-merger-offer-for-renault-blames-french-politics-idUSKCN1T62WI/

Expected merger synergies

As a result of the merger, significant synergies are expected to be achieved through the integration of the legacy FCA and PSA businesses, particularly in four key areas:

- Technology, platforms and products: The alignment and convergence of PSA's and FCA's platforms, modules, and systems, combined with the optimization of R&D investments, manufacturing processes and tooling are anticipated to generate substantial efficiencies. These efficiencies will be particularly impactful as investment costs will be distributed across the combined Group's production.
- Purchasing: Cost savings in procurement are projected by leveraging the Group's larger scale, leading to reduced product costs, especially for electric and high-tech components, improved price alignment, and broader access to a wider range of suppliers.
- Selling, general and administrative expenses (SG&A): Savings are expected through the consolidation of functions such as sales and marketing, along with the optimization of costs in regions where both FCA and PSA have a well-established presence, including Europe and Latin America.
- All other functions: Additional synergies are foreseen through the optimization of various functions, including logistics. Cost reductions are expected in logistics for new vehicles, as well as from increased procurement volumes, impacting overall expenditures across FCA and PSA. Further efficiencies are anticipated in supply chain management, quality control and after-market operations.

Annual industrial synergies are projected to exceed €5 billion, with approximately 80% of these synergies expected to be realized by the end of 2024. Around 75% of the savings are expected to result from technology integration, platform convergence, and procurement efficiencies, while the remaining 25% will stem from SG&A reductions and other functional optimizations. These synergies are anticipated to surpass implementation costs within the first year, with total one-time expenses associated with achieving them estimated at approximately €4 billion[119].

Despite the significant synergies expected from the integration of FCA and PSA, the merger also presented several challenges. Combining two large automotive groups with distinct corporate cultures, operational structures and market strategies required careful management to avoid inefficiencies and conflicts.

Political and governmental issues

Although both companies recognized the benefits of the merger, several political issues needed to be addressed:

[119] Stellantis Annual Report 2020.

- Government ownership and influence: The French government owned a 12.23% stake in PSA through the Agence des participations de l'État (APE)[120], while the Italian government no longer held any stake in FCA. This imbalance granted the French government greater influence in the negotiations compared to the Italian government.
- Employment concerns: The merger raised fears of downsizing and job cuts, which could have significant social and economic consequences in both countries. In Italy, there were concerns that French influence might lead to the closure of some of FCA's historic plants.
- Impact in the United States: In the U.S., Chrysler played a crucial role in the local economy, especially in states like Michigan and Indiana. Although the U.S. government had committed not to interfere in management decisions following Chrysler's bailout in 2009, the social and industrial interests were evident.

Risks related to the merger

The merger between FCA and PSA presented several strategic and operational risks, which are common in the automotive industry:

- Brand overlap: Both groups owned numerous brands, some of which were in direct competition with each other. This raised concerns about the need for significant investments to renew models from brands like Lancia and Chrysler or the possibility that certain brands could be discontinued to reduce internal competition[121].
- Unfavourable economic cycles: The automotive industry is highly cyclical. During economic recessions, consumers tend to cut spending on durable goods, such as cars, posing a risk to the profitability of the newly formed group.
- Geopolitical tensions: Factors such as the trade war between China and the United States and the rise of economic nationalism, highlighted by events like Brexit, could create obstacles to production and exports for Stellantis. This could lead to higher production costs and negatively affect the group's competitiveness in international markets.

[120] The Agence des participations de l'État (APE) is a French government agency responsible for managing state holdings in strategic companies. Founded in 2004 and operating under the Ministry of Economy and Finance, the APE oversees the state's stakes in key sectors such as energy, transportation, telecommunications and the automotive industry. In the context of the FCA-PSA merger, the APE held a 12.23% stake in PSA, granting France a position of influence in the negotiations. This raised concerns in Italy and among other shareholders, as the French government has historically used the APE to play an active role in the strategic decisions of state-owned enterprises.

[121] https://lavoce.info/archives/61954/fca-e-psa-le-incognite-di-una-fusione/

4.3 PHASES OF THE DEAL

The merger that led to the creation of Stellantis lasted about a year and a half, from the first official announcement in October 2019 to its completion on January 16, 2021. The merger between FCA and PSA can be divided into six main phases.

1) Preliminary Phase

In September 2019, the top executives of FCA and Groupe PSA initiated a series of exploratory discussions to assess the feasibility of a merger. Both companies operated in a rapidly evolving automotive sector, characterized by advancements in new technologies, electrification, autonomous driving and digital connectivity. In this context of profound transformation, joining forces appeared to be a winning strategy to tackle future challenges with greater competitiveness and financial strength. FCA, with a strong presence in the North and South American markets, lagged behind some competitors in electrification, whereas PSA, well-established in Europe and more advanced in sustainable mobility technologies, had a limited presence outside the European market. The idea of a merger would enable the creation of a global group with complementary industrial, financial and technological capabilities, strengthening its positioning across all key segments, from luxury vehicles to light commercial vehicles. During the initial negotiations, the CEOs—Mike Manley for FCA and Carlos Tavares for PSA—along with their respective boards of directors, conducted thorough evaluations of the synergies that could arise from the union of the two companies. The goal was to build a new automotive giant capable of competing with the world's leading groups at a time when economies of scale and technological innovation were becoming increasingly crucial for market success. Extensive discussions were held regarding the governance of the new entity and how to integrate the existing structures without negatively impacting productivity and employment. The merger would result in the creation of the world's fourth-largest automobile manufacturer, with an annual sales volume of 8.7 million vehicles and some of the highest margins in key markets. Additionally, the union of the two groups would strengthen the positioning of their respective brands in the premium, SUV, passenger vehicle and light commercial vehicle segments, maximizing the use of production capabilities and technological innovations already in development. After a phase of analysis and negotiations, on October 31, 2019, the merger project between FCA and PSA was officially announced through a joint press release. The agreement outlined the creation of a company equally owned by FCA and PSA shareholders (50% each), with balanced governance and strong leadership: John Elkann would be appointed Chairman while Carlos Tavares would take on the role of CEO. The statement also highlighted that the operation would generate estimated annual synergies of €3.7 billion without plant closures. The merger would allow the new company to invest more effectively in advanced technologies, accelerating the development of electrified propulsion, autonomous driving and digital connectivity—all essential elements

for navigating the new era of sustainable mobility[122]. With this announcement, the preliminary phase of the merger concluded, paving the way for the formalization of agreements and the regulatory approval process.

2) Announce to merge and Combination Agreement

On December 17, 2019, FCA and PSA signed a combination agreement outlining the merger of their businesses, defining the terms of integration, governance structure and strategic objectives of the fusion. The new parent company, headquartered in the Netherlands, would be listed on three major global stock exchanges: Euronext (Paris), Borsa Italiana (Milan) and the New York Stock Exchange (NYSE), benefiting from the strong historical presence of both companies in France, Italy and the United States. The governance structure of the new entity was designed to ensure efficiency and decision-making stability, with a Board of Directors consisting of 11 members, the majority of whom would be independent. Five members were to be appointed by FCA and its key shareholders, including John Elkann as Chairman, while another five would be designated by Groupe PSA and its key shareholders, including the Senior Non-Executive Director and the Vice Chairman. Additionally, the board would include two representatives from FCA and PSA's workforce to ensure a better balance in managing corporate interests. Carlos Tavares was appointed as CEO with an initial five-year mandate, bringing his expertise in corporate management and integration[123]. According to the proposed bylaws for the new company, no shareholder would be allowed to hold voting rights exceeding 30% of the votes cast at the general meeting, ensuring a balanced governance structure and preventing excessive concentration of decision-making power. Furthermore, special double voting rights—an instrument aimed at encouraging shareholder stability—would not be automatically transferred from existing shareholders but would instead mature only after a three-year holding period following the completion of the merger[124]. At the same time, regulatory and antitrust authorities began their analyses to assess the impact of the merger on the global market. The European Commission closely examined the light commercial vehicle sector where the merger could have excessively strengthened the new group's market position. Key stakeholders, including investors, financial analysts and labor representatives, also began evaluating the impact of the operation on the group's future and employment dynamics across the various countries where the two companies operated. Following the official announcement, FCA and PSA took a decisive step toward completing the merger, initiating the regulatory approval process and engagement with shareholders.

3) Due Diligence and Amendment to Combination Agreement

[122] Stellantis. (2019). Groupe PSA and FCA plan to join forces to build a world leader for a new era in sustainable mobility. Stellantis Press Release October 31, 2019 :https://www.stellantis.com/en/news/press-releases/2019/october/groupe-psa-and-fca-plan-to-join-forces-to-build-a-world-leader-for-a-new-era-in-sustainable-mobility

[123] PSA Annual Report 2019.

[124] Stellantis. (2019). Groupe PSA and FCA agree to merge. Stellantis Press Release December 18, 2019: https://www.stellantis.com/en/news/press-releases/2019/december/groupe-psa-and-fca-agree-to-merge

One of the most significant aspects of the due diligence process involved analyzing the economic and financial projections of the new group with particular focus on the impact of the merger on business performance and the feasibility of achieving the expected synergies. The financial and operational review process helped identify areas for optimization and allowed for a more precise estimation of the added value generated by the integration of the two companies. Specifically, the analysis focused on the rationalization of production platforms, technology sharing and opportunities to reduce operating costs. Additionally, the transaction underwent a thorough verification process to ensure maximum transparency for shareholders and regulatory authorities, demonstrating the strength of the integration and the sustainability of the financial projections. At the same time, the crisis triggered by the COVID-19 pandemic had a significant impact on the negotiations. The sudden global recession led both companies to revise certain financial aspects of the agreement to preserve the stability of the new group. In September 2020, FCA and PSA agreed on a series of strategic amendments to the Combination Agreement, which were unanimously approved by their respective Boards of Directors with strong support from key shareholders, including Exor, the Peugeot family (EPF/FFP), Bpifrance and Dongfeng Motor Group (DFG). The objective of these revisions was to strengthen Stellantis' initial capital structure, ensuring additional liquidity to navigate the challenging economic landscape caused by the pandemic. One of the most significant changes concerned FCA's special dividend, which had initially been set at €5.5 billion before the merger but was reduced to €2.9 billion, allowing for greater cash availability within the new group[125]. At the same time, it was decided to modify the treatment of PSA's stake in Faurecia, a company specialized in the production of vehicle components: instead of being integrated into Stellantis, its 46% stake would be distributed to all Stellantis shareholders immediately after the closing, subject to the approval of the Board of Directors and shareholders. This solution allowed for the preservation of value for the shareholders of both companies while maintaining the principle of a 50/50 equity balance between FCA and PSA within the new group. As a result of these changes, FCA and PSA shareholders would each receive an equal 23% stake in Faurecia, preserving the economic value of the transaction and ensuring a stronger balance sheet for Stellantis, which would thus begin its operations with an additional €2.6 billion in liquidity[126]. Another key outcome of the negotiation phase was the increase in the projected synergies resulting from the merger. Thanks to significant progress in joint efforts between the two groups, the integration was expected to be more beneficial than initially anticipated: estimated annual synergies at full capacity were increased from €3.7 billion to over €5 billion, confirming the high efficiency potential of the union between the two companies. However, achieving these synergies would require higher investments than originally forecasted, with one-time integration costs rising from an estimated €2.8 billion to a maximum of €4 billion. After these

[125] Stellantis. (2020). FCA and Groupe PSA amend their Combination Agreement to further strengthen Stellantis' opening capital structure. Stellantis Press Release September 14, 2020: https://www.stellantis.com/en/news/press-releases/2020/september/fca-and-groupe-psa-amend-their-combination-agreement-to-further-strengthen-stellantis-opening-capital-structure

[126] Stellantis. (2020). FCA and Groupe PSA Boards note continued progress towards merger completion and agree additional steps including in respect of Faurecia stake distribution to Stellantis shareholders. Stellantis Press Release October 28, 2020: https://www.stellantis.com/en/news/press-releases/2020/october/fca-and-groupe-psa-boards-note-continued-progress-towards-merger

strategic revisions, FCA and PSA were on track to complete the merger, which was expected to be finalized within the first quarter of 2021.

4) Approval of the Prospectus

Another crucial step in completing the merger between FCA and Groupe PSA was the approval of the prospectus for the listing of Stellantis shares. This document, essential for ensuring transparency towards investors and market authorities, was reviewed by the relevant institutions and received approval in the final stages of the transaction. The listing prospectus was approved by the Autoriteit Financiële Markten (AFM), the Dutch financial markets authority, given the decision to register the new company in the Netherlands. The approval of this document confirmed that Stellantis shares were ready to be listed on the major international stock markets[127]. The new shares would replace the existing FCA and PSA shares and would be officially traded on three key stock exchanges:

- Borsa Italiana (MTA – Mercato Telematico Azionario) maintaining FCA's historic presence in the Italian market.
- Euronext Paris reflecting Groupe PSA's strong legacy in France.
- New York Stock Exchange (NYSE) ensuring a significant presence in the U.S. market.

The approval of the prospectus also served as a clear signal to investors, who now had a comprehensive understanding of the new group's governance, shareholding structure and growth prospects. With the green light from market authorities, FCA and PSA were moving toward the final phase of the merger, which would be completed with the official closing and the start of Stellantis share trading in the following weeks.

5) Closing Phase

On January 4, 2021, Fiat Chrysler Automobiles N.V. (FCA) and Peugeot S.A. (Groupe PSA) announced the final approval of the merger by their respective shareholder assemblies, marking one of the last formal steps before the creation of Stellantis. Support for the merger was nearly unanimous, with over 99% of votes in favor, demonstrating strong investor confidence in the new entity and its growth prospects[128]. The merger officially took effect on January 16, 2021, completing a process that had begun more than a year earlier and had gone through complex negotiations, regulatory reviews and financial adjustments. Through the formalization of the merger, Stellantis officially assumed its new corporate identity and prepared for its stock

[127] Stellantis. (2020). Approval of the prospectus relating to the listing of Stellantis shares. Stellantis Press Release November 20, 2020: https://www.stellantis.com/en/news/press-releases/2020/november/approval-of-the-prospectus-relating-to-the-listing-of-stellantis-shares

[128] Stellantis. (2021). Merger of FCA and Groupe PSA approved by shareholders: FCA and Groupe PSA expect to complete the combination on January 16, 2021. Stellantis Press Release January 4, 2021: https://www.stellantis.com/en/news/press-releases/2021/january/merger-of-fca-and-groupe-psa-approved-by-shareholders

market debut. Stellantis' common shares began trading on Euronext Paris and the Milan Stock Exchange on Monday, January 18, 2021, and on the New York Stock Exchange on Tuesday, January 19, 2021, under the ticker symbol "STLA" in all three markets[129]. The stock market debut was met with great interest from investors, who saw the creation of Stellantis as an opportunity for growth and consolidation in the global automotive sector.

The Stellantis Board of Directors was structured to ensure a balance between the two originating entities. Leading the Board is John Elkann, who assumed the role of Chairman, reinforcing the Agnelli family's influence through Exor as Stellantis' key shareholder. The Vice Chairman is Robert Peugeot, representing the Peugeot family, while the position of Chief Executive Officer, as previously announced, was entrusted to Carlos Tavares. The Board of Directors includes several members with diverse expertise and strong backgrounds in the industrial, financial, and technological sectors. Among them is Andrea Agnelli, a member of the Agnelli family, as well as prominent figures such as Henri de Castries, former CEO of AXA, and Fiona Clare Cicconi. The board is further strengthened by the presence of Nicolas Dufourcq, Ann Frances Godbehere, Wan Ling Martello, Jacques de Saint-Exupéry and Kevin Scott[130].

As of March 3, 2021, Stellantis' shareholding structure was as follows: The largest shareholder was Exor, the holding company of the Agnelli family, which owned 449,410,092 shares, representing 14.40% of the capital. It was followed by EPF (Établissements Peugeot Frères), holding a 7.19% stake, representing the historic Peugeot family, and BPI (Bpifrance), the French public investment bank, which owned 6.18% of the shares. Another key shareholder was Dongfeng, the Chinese automotive group, with a 5.62% stake, stemming from previous agreements with PSA. The remaining 66.61% represented the free float.

The closing of the merger and the beginning of operations under the new Stellantis brand marked the completion of a transformation process that brought together two of the world's leading automotive manufacturers, creating a group with a balanced geographical presence and a diversified portfolio of iconic brands.

After the completion of the merger between Groupe PSA and Fiat Chrysler Automobiles, Stellantis N.V. began to receive early recognition for its financial strength. Among these, DBRS Morningstar announced an upgrade in the group's credit rating, raising the long-term issuer rating and the senior unsecured debt rating from "BBB (low)" to "BBB". The trend associated with both ratings was confirmed as stable, reflecting a balanced outlook on Stellantis' financial profile in the medium term[131]. The upgrade by DBRS reflected the agency's

[129] Stellantis. (2021). The merger of FCA and Groupe PSA has been completed. Stellantis Press Release January 16, 2021: https://www.stellantis.com/en/news/press-releases/2021/january/the-merger-of-fca-and-groupe-psa-has-been-completed

[130] Stellantis Annual Report 2020.

[131] https://www.stellantis.com/en/news/press-releases/2021/january/dbrs-raises-the-ratings-on-stellantis-nv

appreciation for the initial stages of the post-merger integration process, which was viewed positively in terms of both operational synergies and financial discipline.

To compare Stellantis with major automotive competitors, the table below summarizes the credit ratings assigned by top international rating agencies.

Automotive Company	**Rating Agency**	**Credit Rating**	**Outlook**
Stellantis N.V.	DBRS	BBB	Stable
Volkswagen AG	S&P	BBB+	Negative
Toyota Motor Corp.	Fitch Ratings	A+	Stable
Ford Motor Company	S&P	BB+	Stable
General Motors	S&P	BBB	Negative

Source: Personal elaboration based on publicly available information and credit ratings as of 2021.

6) Post-merger integration

The post-merger integration phase, which is still ongoing, revolves around three key strategic pillars: the integration and positioning of the brands within the Stellantis portfolio, the development of electric mobility (e-mobility) and the consolidation of technological innovation with a particular focus on electrification.

In terms of managing and enhancing its brand portfolio, Stellantis can rely on a solid lineup of historic and iconic brands, many of which have played a key role in the evolution of the global automotive industry. The portfolio spans the entire spectrum of the automotive market: from luxury and premium vehicles to traditional passenger cars, SUVs, pickups and light commercial vehicles. It also includes brands focused on sustainable mobility, financial services, spare parts and after-sales support[132]. Specifically, Stellantis organizes its brands according to their market positioning:

- Global SUV: Jeep
- American brands: Chrysler, Dodge, RAM
- Core: Citroën, Fiat
- Upper Mainstream: Opel, Vauxhall, Peugeot
- Premium: Alfa Romeo, DS Automobiles, Lancia
- Luxury: Maserati

[132] https://www.stellantis.com/en/news/press-releases/2021/january/stellantis-building-a-world-leader-in-sustainable-mobility

The strategic challenge lies in maximizing the value of this broad and diverse portfolio while preserving the identity and distinctiveness of each brand, avoiding overlap between market segments and strengthening their presence in regions where each brand has traditionally been most competitive. This approach allows Stellantis to operate in a differentiated and targeted way across various geographic markets, leveraging synergies between brands and technological platforms, without compromising on the customization of its offerings.

As part of its strategy for transitioning toward sustainable mobility, Stellantis took a significant step forward through the establishment of the joint venture Free2Move eSolutions in partnership with Engie EPS, formally announced on January 26, 2021. With the official naming of the company and the appointment of its Board of Directors, a new industrial entity focused on electrification was launched. Free2Move eSolutions was created with the goal of supporting and facilitating the transition to electric mobility by offering innovative, tailored, and accessible technological solutions for both private and business markets. The company aims to play an active role in promoting clean mobility by providing a comprehensive ecosystem of services that spans the entire e-mobility value chain[133]. The operational scope of Free2Move eSolutions includes: infrastructure for electric vehicle charging, from installation to support and operational management; public and home charging solutions through monthly subscription plans; services for the management of the entire battery life cycle; advanced energy technologies, such as Vehicle-to-Grid (V2G) integration systems and energy management solutions aimed at reducing the total cost of ownership of electric vehicles.

This initiative enhances the offering of Free2Move, a tech company founded in 2016 and already an integral part of the Stellantis Group, whose mission is to simplify mobility for private and business customers through a single, flexible, and scalable digital platform (from one hour to long-term use). In addition to mobility services, Free2Move is also involved in the energy transition and corporate fleet management, providing advanced, sustainability-driven solutions. The new joint venture is built on an international foundation, with a highly specialized team capable of designing, developing, producing, and marketing integrated electric mobility solutions. Although initially focused on the European market, Free2Move eSolutions is structured to expand its operations globally over the medium to long term, further strengthening Stellantis' commitment to shaping the future of mobility.

Finally, in terms of innovation and technological transition, some of the key initiatives include: the Dare Forward 2030 strategic plan, the agreement with Orano for battery recycling and the investment in Leapmotor.

Strategic Plan "Dare Forward 2030"

On March 1, 2022, Stellantis officially presented its ten-year strategic plan, titled "Dare Forward 2030," outlining an ambitious vision for the future of mobility. The plan is built on the goal of positioning Stellantis

[133] https://www.stellantis.com/en/news/press-releases/2021/march/free2move-esolutions-the-name-of-the-jv-between-stellant-is-and-engie-eps-to-create-a-new-world-leading-provider-of-e-mobility-products-and-services

as a global leader in creating sustainable value for all stakeholders, through a strategy driven by innovation, electrification and environmental commitment. Among the key objectives of the plan is achieving carbon neutrality by 2038, with a 50% reduction in emissions already targeted by 2030. Stellantis aims to offer over 75 battery electric vehicles (BEVs) and reach 5 million global annual BEV sales by the end of the decade[134]. The plan also includes a major transformation of the customer experience and a strengthened position in commercial vehicles and the digital services segment. From an economic standpoint, Stellantis intends to double its net revenues by 2030 while maintaining double-digit operating margins throughout the duration of the plan, all while preserving an agile and efficient industrial structure.

Agreement with Orano for Battery Recycling

In October 2023, Stellantis and Orano signed a memorandum of understanding to establish a joint venture dedicated to recycling end-of-life electric vehicle batteries, as well as scrap materials from gigafactories. This initiative aligns fully with the circular economy strategy outlined in the Dare Forward 2030 plan and represents a concrete step toward achieving carbon neutrality by 2038. The partnership will leverage Orano's innovative hydrometallurgical technology, which is capable of recovering over 90% of strategic metals such as cobalt, nickel, lithium and reintegrating them into the production cycle in the form of new cathode materials. The project includes the construction of a refining plant in Dunkirk, France, which is expected to be operational starting in 2026. In addition to strengthening Europe's strategic autonomy in critical resource management, the joint venture will also offer solutions to other OEMs, providing a comprehensive service for end-of-life battery management in compliance with the European regulations set to take effect by 2031[135].

Strategic Investment in Leapmotor

On October 26, 2023, Stellantis announced a strategic investment of approximately €1.5 billion to acquire a 20% stake in Leapmotor, a Chinese manufacturer specializing in new energy vehicles (NEVs). The agreement includes the creation of a joint venture, Leapmotor International, 51% owned by Stellantis, which will hold exclusive rights to export, sell, and manufacture Leapmotor vehicles outside of China. This partnership represents the first global collaboration between a major Western automaker and a Chinese OEM in the EV segment. It aims to expand Leapmotor's commercial presence in Europe and other international markets by leveraging Stellantis' distribution and manufacturing capabilities[136]. The initiative is part of the electrification strategy outlined in the Dare Forward 2030 plan and strengthens the Group's global competitiveness in the

[134] https://www.stellantis.com/en/news/press-releases/2022/march/dare-forward-2030-stellantis-blueprint-for-cutting-edge-freedom-of-mobility
[135] https://www.stellantis.com/en/news/press-releases/2023/october/stellantis-and-orano-enter-electric-vehicle-battery-recycling-agreement
[136] https://www.stellantis.com/en/news/press-releases/2023/october/stellantis-to-become-a-strategic-shareholder-of-leapmotor-with-1-5-billion-investment-and-bolster-leapmotor-s-global-electric-vehicle-business

EV segment through access to advanced technologies, integrated vehicle models and highly scalable architectures developed by Leapmotor. Deliveries from the joint venture are expected to begin in the second half of 2024.

4.4 FINANCIAL PERFORMANCE

This section will provide a detailed analysis of the financial performance of the two companies prior to the merger and subsequently of the Stellantis group, in order to assess the extent to which the transaction has actually created value. The analysis will cover a time frame that includes the last three years of independent operations of FCA and PSA (2018–2020) as well as the first years following the merger (2021–2023), for which the consolidated financial statements of Stellantis are available. The objective is to compare the two pre-merger entities in terms of profitability, financial solidity, operational efficiency and cash generation and then evaluate how these indicators have evolved in the unified group. The work is based on an examination of the three main components of the financial statements: income statement, balance sheet and cash flow statement. Particular attention will be paid to specific performance indicators such as: revenues, net income, debt and cash flow generation capacity.

4.4.1 PRIOR TO MERGE

Based on the year-end financial reports for 2020, the consolidated Income Statement, Balance Sheet, and Cash Flow Statement of each company will be analyzed individually. These financial parameters provide an accurate and reliable picture of the companies' financial health and performance during the 2018–2020 period.

Fiat Chrysler Automobiles N.V.

FIAT CHRYSLER AUTOMOBILES N.V. AND SUBSIDIARIES
CONSOLIDATED INCOME STATEMENT
(in € million, except per share amounts)

		Years ended December 31,		
	Note	2020	2019	2018
Net revenues	4	€ 86,676	€ 108,187	€ 110,412
Cost of revenues		75,962	93,164	95,011
Selling, general and other costs		5,501	6,455	7,318
Research and development costs	5	2,979	3,612	3,051
Result from investments:		179	209	235
Share of the profit of equity method investees	12	184	208	240
Other income from investments		(5)	1	(5)
Gains on disposal of investments		4	15	—
Restructuring costs		73	154	103
Net financial expenses	6	988	1,005	1,056
Profit before taxes		**1,356**	**4,021**	**4,108**
Tax expense	7	1,332	1,321	778
Net profit from continuing operations		**24**	**2,700**	**3,330**
Profit from discontinued operations, net of tax	3	—	3,930	302
Net profit		**€ 24**	**€ 6,630**	**€ 3,632**

Figure 4.1: FCA Consolidated Income Statement at the end of 2018-2019-2020. Source: Stellantis Annual Report 2020.

In 2020, revenues dropped sharply to €86.67 billion, compared to €108.19 billion in 2019 and €110.41 million in 2018, due to the impact of the Covid-19 pandemic. The global automotive sector was hit hard, leading to plant shutdowns, a decline in demand and supply chain disruptions.

A particularly interesting data point concerns the trend in Research and Development expenses, which increased in 2019 (€3.61 billion) compared to 2018 (€3.05 billion) and then decreased only slightly in 2020 (€2.98 billion), despite the extremely adverse context. This behavior suggests a clear strategy on the part of management to maintain strategic investments in innovation even during a period of uncertainty.

EBIT stood at €2.34 billion in 2020, down from previous years (€5.03 billion 2018 and €5.16 billion in 2019). This decrease is consistent with the sharp drop in volumes and revenues; however, the fact that EBIT remained positive demonstrates the resilience of the industrial model during a highly critical year.

Net profit shows a trend heavily influenced by extraordinary events. In 2019, FCA reported a total profit of €6.63 billion, but this figure was inflated by the sale of Magneti Marelli, which was finalized in May 2019 for over €5.7 billion (of this amount, €3.93 billion was classified under "Profit from discontinued operations", as required by accounting standards). In 2020, as a result of the pandemic crisis, net dropped sharply to €24 million, reflecting an almost complete erosion of net profitability.

Overall, the data show a group capable of generating value under normal economic conditions with positive operating margins but also highly exposed to exogenous shocks, as evidenced by the impact of Covid-19. Despite the collapse in net profit in 2020, FCA maintained positive operating profitability, a sign of industrial resilience that likely reinforced the industrial and strategic rationale behind the merger with PSA.

FIAT CHRYSLER AUTOMOBILES N.V. AND SUBSIDIARIES
CONSOLIDATED STATEMENT OF FINANCIAL POSITION
(in € million)

		At December 31,	
	Note	2020	2019
Assets			
Goodwill and intangible assets with indefinite useful lives	9	€ 13,055	€ 14,257
Other intangible assets	10	12,519	12,447
Property, plant and equipment	11	27,582	28,608
Investments accounted for using the equity method	12	2,086	2,009
Other financial assets	13	331	340
Deferred tax assets	7	1,096	1,689
Other receivables	15	1,721	2,376
Tax receivables	15	95	94
Prepaid expenses and other assets		394	535
Other non-current assets		798	757
Total Non-current assets		**59,677**	**63,112**
Inventories	14	8,094	9,722
Assets sold with a buy-back commitment		852	1,626
Trade and other receivables	15	5,545	6,628
Tax receivables	15	89	372
Prepaid expenses and other assets		457	524
Other financial assets	13	851	670
Cash and cash equivalents	17	23,846	15,014
Assets held for sale	3	319	376
Total Current assets		**40,053**	**34,932**
Total Assets		**€ 99,730**	**€ 98,044**
Equity and liabilities			
Equity	26		
Equity attributable to owners of the parent		€ 25,737	€ 28,537
Non-controlling interests		124	138
Total Equity		**25,861**	**28,675**
Liabilities			
Long-term debt	21	17,036	8,025
Employee benefits liabilities	19	8,328	8,507
Provisions	20	4,966	5,027
Other financial liabilities	16	280	124
Deferred tax liabilities	7	1,845	1,628
Tax liabilities	22	248	278
Other liabilities	22	2,129	2,426
Total Non-current liabilities		**34,832**	**26,015**
Trade payables		20,576	21,616
Short-term debt and current portion of long-term debt	21	4,081	4,876
Employee benefit liabilities	19	592	544
Provisions	20	7,255	8,978
Other financial liabilities	16	353	194
Tax liabilities	22	228	122
Other liabilities	22	5,749	6,788
Liabilities held for sale	3	203	236
Total Current liabilities		**39,037**	**43,354**
Total Equity and liabilities		**€ 99,730**	**€ 98,044**

Figure 4.2: FCA Consolidated Statement of Financial Position at the end of 2019-2020. Source: Stellantis Annual Report 2020.

The analysis of the balance sheet highlights three key indicators — Net Working Capital (NWC), Net Financial Position (NFP) and Equity — which allow for a more in-depth assessment of the group's financial strength and capital structure on the eve of the creation of Stellantis.

Net Working Capital represents the difference between key short-term operating assets and liabilities and is a key indicator of operating liquidity. It can be calculated as NWC = Inventories + Trade Receivables – Trade Payables.

Items	**2020**	**2019**
Inventories	8.09	9.72
Trade Receivables	5.54	6.63
Trade Payables	20.58	21.62
Net Working Capital	**-6.95**	**-5.27**

Net Working Capital is negative in both financial years, but worsened further in 2020, declining from –€5.27 billion to –€6.94 billion due to a reduction in inventories and trade receivables, while trade payables remained largely stable. A negative NWC implies that the company is financing its operating activities through current liabilities, particularly trade payables. Overall, a negative NWC is consistent with the industrial model of a globally integrated automotive manufacturer, but its further decline in 2020 reflects both the impact of the health crisis and a tactical decision aimed at preserving cash.

Net Financial Position (NFP) measures the group's level of net debt and is calculated as follows: NFP = Financial debt - Cash and cash equivalents and current financial assets.

Items	**2020**	**2019**
Long-term debt	17.04	8.02
Short-term debt and current portion of long-term debt	4.08	4.88
Other financial liabilities (non-current)	0.28	0.14
Other financial liabilities (current)	0.35	0.19
Financial debt	**21.75**	**13.23**
Cash and cash equivalents	23.85	15.01
Other financial assets	0.85	0.67
Net Financial Position	**-2.95**	**-2.45**

In 2020, FCA was in a net cash position of approximately €2.95 billion, an improvement compared to 2019. Despite the global health crisis, the group strengthened its financial position through conservative cash management and the issuance of new long-term debt. This indicates that FCA entered the merger with PSA in

a position of financial strength, with sufficient cash reserves to support future investments or absorb potential additional shocks.

Finally, equity decreased by approximately €2.8 billion but still represents a significant portion of the group's funding sources, with an Equity-to-Total Assets ratio of 26%. This value indicates solid capitalization, consistent with the requirements of a large industrial company.

FIAT CHRYSLER AUTOMOBILES N.V. AND SUBSIDIARIES
CONSOLIDATED STATEMENT OF CASH FLOWS
(in € million)

	Note	Years ended December 31, 2020	2019	2018
Cash flows from operating activities:				
Net profit from continuing operations		€ 24	€ 2,700	€ 3,330
Amortization and depreciation		5,143	5,445	5,507
Net losses on disposal of tangible and intangible assets		3	19	1
Net gains on disposal of investments		(22)	(15)	—
Other non-cash items	29	1,192	1,541	129
Dividends received		73	156	75
Change in provisions		(434)	(1,744)	842
Change in deferred taxes		894	864	457
Change due to assets sold with buy-back commitments and GDP vehicles		(249)	(65)	158
Change in inventories		983	1,017	1,399
Change in trade receivables		366	100	19
Change in trade payables		565	2,020	(1,240)
Change in other liabilities, payables and receivables		645	(1,268)	(1,213)
Cash flows (used in)/from operating activities - discontinued operations		—	(308)	484
Total		**9,183**	**10,462**	**9,948**
Cash flows used in investing activities:				
Investments in property, plant and equipment and intangible assets		(8,600)	(8,385)	(5,392)
Investments in joint ventures, associates and unconsolidated subsidiaries		(63)	(2)	(3)
Proceeds from the sale of tangible and intangible assets		77	53	47
Proceeds from disposal of other investments		71	—	—
Net change in receivables from financing activities		396	336	(676)
Change in securities		207	(235)	(75)
Other changes		(3)	55	(7)
Net cash proceeds from disposal of discontinued operations		—	5,348	—
Cash flows used in investing activities - discontinued operations		—	(155)	(632)
Total		**(7,915)**	**(2,985)**	**(6,738)**
Cash flows from/(used) in financing activities:	29			
Issuance of notes		3,500	—	—
Repayment of notes		(1,376)	(1,480)	(1,850)
Proceeds of other long-term debt		15,215	329	935
Repayment of other long-term debt		(8,295)	(1,163)	(2,852)
Net change in short-term debt and other financial assets/liabilities		43	(782)	1,062
Distributions paid		—	(3,056)	(1)
Other changes		—	—	11
Cash flows from/(used in) financing activities - discontinued operations		—	325	(90)
Total		**9,087**	**(5,827)**	**(2,785)**
Translation exchange differences		(1,513)	212	106
Total change in Cash and cash equivalents		**8,842**	**1,862**	**531**

Figure 4.3: FCA Consolidated Statement of Cash Flows at the end of 2018-2019-2020. Source: Stellantis Annual Report 2020.

Cash flow from operating activities amounted to €9.18 billion in 2020 showing a slight decline compared to previous years, yet remaining at a very solid level. This result is particularly significant considering that net profit from continuing operations was nearly zero (€24 million). The positive cash flow is largely attributable to: amortization and depreciation; non-cash items; reduction in inventories and trade receivables and increase in trade payables. The trend in operating cash flow is consistent with the negative change in Net Working Capital as FCA extracted liquidity from its operating activities by reducing inventories and receivables while increasing trade payables. The negative NWC is therefore reflected in an improvement in cash flow, but also in a greater reliance on short-term external capital.

Cash flow from investing activities is negative at €7.91 billion, with the main outflows related to investments in property, plant and equipment and intangible assets totalling €8.6 billion. These are consistent with the

group's commitment to Research and Development and industrial transformation. No extraordinary proceeds from asset disposals were recorded, unlike in 2019, when FCA received over €5 billion from the sale of Magneti Marelli.

Cash flow from financing activities was strongly positive, amounting to €9.09 billion, driven by: issuance of notes (€3.5 billion) and long-term debts (€15.2 billion) only partially offset by debt repayments. The substantial liquidity raised brought FCA to a net cash position of €2.95 billion, as seen in the Net Financial Position. Despite the increase in financial debt, the accumulation of liquidity was more than proportional, resulting in an improvement in the net financial position compared to 2019.

Groupe PSA

(in million euros)	Notes	2020	2019 [1]	2018
Continuing operations				
Revenue	*6.1*	**60,734**	**74,731**	**74,027**
Cost of goods and services sold		(49,584)	(59,083)	(59,233)
Selling, general and administrative expenses		(5,019)	(6,472)	(6,623)
Research and development expenses	*6.3*	(2,446)	(2,852)	(2,482)
Restructuring costs	*6.4*	(696)	(1,531)	(1,051)
Impairment of CGUs	*6.5*	(367)	(283)	(299)
Other operating income (expense)	*6.6*	432	158	61
Operating income (loss)		**3,054**	**4,668**	**4,400**
Financial income		180	192	188
Financial expenses		(497)	(536)	(634)
Net financial income (expense)	*13.2*	**(317)**	**(344)**	**(446)**
Income (loss) before tax of fully consolidated companies		**2,737**	**4,324**	**3,954**
Current taxes		(644)	(816)	(1,008)
Deferred taxes		16	100	393
Income taxes	*15.1*	**(628)**	**(716)**	**(615)**
Share in net earnings of equity method investments	*12.3*	(87)	(24)	(44)
Consolidated profit (loss) from continuing operations		**2,022**	**3,584**	**3,295**
Attributable to Owners of the parent		*2,173*	*3,201*	*2,827*
Attributable to Non controlling interests		*(151)*	*383*	*468*
CONSOLIDATED PROFIT (LOSS) FOR THE PERIOD		**2,022**	**3,584**	**3,295**

Figure 4.4: PSA Consolidated Income Statement at the end of 2018-2019-2020. Source: Consolidated Financial Statements and Management's Discussion and Analysis of Groupe PSA for the year ended December 31, 2020.

In 2020, PSA reported net revenues of €60.7 billion in 2020, down by 18% compared to €74.0 billion in 2018 and by 19% compared to €74.7 billion in 2019, in line with the pandemic-driven decline also observed in the case of FCA.

Despite the decline in revenues, PSA managed to maintain a positive and solid operating margin, amounting to €3.05 billion in 2020. Although lower than in previous years, operating profitability decreased proportionally less than the decline in revenues, highlighting strong flexibility in fixed costs and an excellent ability to adapt. The operating margin (EBIT/Revenues) in 2020 remained around 5%, a competitive result considering the crisis context.

Consolidated net profit declined in 2020 to €2.02 billion, down from €3.58 billion in 2019 and €3.29 billion in 2018. The decrease was moderate, especially when compared to the drop in revenue, confirming the group's ability to protect net profitability even in adverse conditions. This positive result, achieved despite a revenue decline of nearly €14 billion, sends a strong signal to stakeholders ahead of the merger with FCA.

Assets *(in million euros)*	Notes	December 31, 2020	31 December 2019 [1]	December 31, 2018
Goodwill	*9.1*	4,364	4,312	3,608
Intangible assets	*9.1*	10,658	10,288	9,201
Property, plant and equipment	*9.2*	16,776	16,922	14,136
Equity method Investments - manufacturing and sales companies	*12.2*	520	719	1,072
Equity method investments - finance companies	*12.2*	2,632	2,604	2,372
Other non-current financial assets - manufacturing and sales companies	*13.4.A*	721	652	684
Other non-current financial assets - finance companies		-	11	28
Other non-current assets	*10.1*	1,485	1,733	1,669
Deferred tax assets	*15.3.A*	1,096	1,198	1,036
Total non-current assets		**38,252**	**38,439**	**33,806**
Loans and receivables - finance companies	*14.2.A*	31	85	179
Short-term investments - finance companies		67	78	79
Inventories	*7.1*	5,366	6,269	6,710
Trade receivables	*7.2*	3,147	2,503	1,904
Current taxes	*15.3.A*	216	221	376
Other receivables	*7.3.A*	2,789	2,922	2,470
Derivative financial instruments on operating - assets		115	95	110
Operating assets		**11,731**	**12,173**	**11,828**
Current financial assets and Financial investments	*13.4.A*	**627**	**1,321**	**892**
Cash and cash equivalents - manufacturing and sales companies	*13.4.B*	**22,303**	**17,379**	**14,961**
Cash and cash equivalents - finance companies	*14.2.C*	**590**	**454**	**465**
Total current assets		**35,251**	**31,327**	**28,146**
Assets held for sale		7	-	-
TOTAL ASSETS		**73,510**	**69,766**	**61,952**

Equity and liabilities *(in million euros)*	Notes	December 31, 2020	31 December 2019 [1]	December 31, 2018
Equity	*16*			
Share capital	*16.1.B*	895	905	905
Treasury shares	*16.1.C*	(183)	(240)	(270)
Retained earnings and other accumulated equity, excluding non controlling interests	*16.1.D*	20,582	18,409	16,450
Non controlling interests		2,580	2,727	2,509
Total equity		**23,874**	**21,801**	**19,594**
Non-current financial liabilities	*13.5*	11,083	8,917	5,257
Other non-current liabilities	*10.2*	5,361	5,173	4,926
Non-current provisions	*11*	1,578	1,345	1,392
Deferred tax liabilities	*15.3.A*	801	830	781
Total non-current liabilities		**18,823**	**16,265**	**12,356**
Financing liabilities - finance companies	*14.3*	236	272	327
Current provisions	*11*	3,808	4,941	5,065
Trade payables		15,166	14,505	13,551
Current taxes	*15.3.A*	440	469	525
Other payables	*7.3.B*	8,712	8,869	8,293
Derivative financial instruments on operating - liabilities		42	124	59
Operating liabilities		**28,404**	**29,180**	**27,820**
Current financial liabilities	*13.5*	2,409	2,520	2,182
Total current liabilities		**30,813**	**31,700**	**30,002**
Liabilities held for sale		-	-	-
TOTAL EQUITY AND LIABILITIES		**73,510**	**69,766**	**61,952**

Figure 4.5: PSA Consolidated Statement of Financial Position at the end of 2018-2019-2020. Source: Consolidated Financial Statements and Management's Discussion and Analysis of Groupe PSA for the year ended December 31, 2020.

As for FCA analysis, the three main indicators used to describe PSA's financial position are Net Working Capital, Net Financial Position and Equity.

Items	**2020**	**2019**
Inventories	5.37	6.27
Trade Receivables	3.15	2.50
Trade Payables	15.17	14.50
Net Working Capital	**-6.65**	**-5.73**

Net Working Capital remains negative in both years, indicating that PSA, like FCA, finances a significant portion of its current operations through trade payables, thereby reducing the use of its own capital in the operating cycle. The data reflects stable and consistent management of working capital, even in a challenging year like 2020.

Items	2020	2019
Non-current financial liabilities	11.08	8.92
Current financial liabilities	2.41	2.52
Financial debt	**13.49**	**11.44**
Cash and cash equivalents	22.30	17.38
Current financial assets and financial investments	0.63	1.32
Net Financial Position	**-9.44**	**-7.26**

PSA ended 2020 with a very strong net cash position of approximately €9.4 billion, further improving on 2019. This is an extremely positive figure, highlighting a strong self-financing capacity.

In calculating the Net Financial Position, components related to finance companies are excluded because these operate as separate entities from the core industrial business. The debt incurred by these entities is aimed at supporting customer and dealer financing activities (such as leasing and consumer credit) and does not reflect direct indebtedness related to production, research and development or logistics. For this reason, the NFP is calculated by considering only the financial liabilities and assets of the industrial segment in order to provide a more accurate indicator of the group's actual operational financial exposure.

Finally, PSA's equity increased by over €3.3 billion in 2020, despite the unfavourable context. This growth is mainly the result of solid net income (€2 billion) and the retention of undistributed earnings. The figure reflects a very strong capital structure, with an Equity-to-Total Assets ratio of 32.5%.

(in million euros)	Notes	2020	2019 [1]	2018
Consolidated profit (loss) from continuing operations		**2,022**	**3,584**	**3,295**
Adjustments for non-cash items:				
> depreciation, amortisation and impairment	*17.2*	4,058	3,717	2,995
> provisions		(777)	(97)	304
> changes in deferred and current taxes		6	(139)	(142)
> (gains) losses on disposals and other		(727)	(190)	(651)
Net financial expenses (income)	*13.2*	317	344	446
Dividends received from, net of share in net result of, equity method investments		393	274	189
Fair value remeasurement of cash flow hedges		113	30	72
Change in carrying amount of leased vehicles		(111)	50	226
Funds from operations		**5,294**	**7,573**	**6,734**
Changes in working capital	*7.4.A*	908	1,132	1,661
Net cash from (used in) operating activities of continuing operations [2]		**6,202**	**8,705**	**8,395**
Proceeds from disposals of shares in consolidated companies and of investments in non-consolidated companies		359	51	38
Acquisitions of consolidated subsidiaries and equity method investments		(528)	(1,293)	(713)
Proceeds from disposals of property, plant and equipment and of intangible assets		232	298	509
Investments in property, plant and equipment	*9.2.B*	(1,850)	(2,765)	(2,510)
Investments in intangible assets	*9.1.B*	(1,986)	(2,146)	(2,061)
Change in amounts payable on fixed assets		(265)	(160)	(198)
Other		106	43	196
Net cash from (used in) investing activities of continuing operations		**(3,932)**	**(5,972)**	**(4,739)**
Dividends paid:				
> to Peugeot S.A. shareholders		-	(697)	(474)
> to minority shareholders of subsidiaries		(37)	(133)	(143)
Proceeds from issuance of shares		5	4	27
(Purchases) sales of treasury shares		(162)	(29)	(48)
Changes in other financial assets and liabilities	*17.4*	3,464	923	631
Disposal of consolidated subsidiaries without loss of control [3]	*17.4*	308	-	-
Payment of lease liabilities		(381)	(377)	-
Net cash from (used in) financing activities of continuing operations		**3,197**	**(309)**	**(7)**
Net cash from the transferred assets and liabilities of operations held for sale		-	-	-
Impact of hyperinflation		146	(28)	22
Effect of changes in exchange rates		(543)	7	(66)
Increase (decrease) in cash from continuing operations and held for sale		**5,070**	**2,403**	**3,605**

Figure 4.6: PSA Consolidated Statement of Cash Flows at the end of 2018-2019-2020. Source: Consolidated Financial Statements and Management's Discussion and Analysis of Groupe PSA for the year ended December 31, 2020.

In 2020, PSA generated €6.2 billion in net cash flow from operating activities—a solid result, although lower than in previous years. Operating cash flow was primarily driven by a combination of positive net income, a high level of depreciation and non-cash adjustments, and a positive change in working capital (+€908 million). This last figure aligns with the trend observed in Net Working Capital, which remains negative but stable, indicating that the group maintained lean management of its operating cycle, with highly efficient working capital and no short-term liquidity pressures.

Cash flow from investing activities was negative at €3.93 billion, as PSA maintained a strong level of investment in property, plant and equipment and intangible assets (over €3.8 billion in total), despite the uncertain context. This reflects a consistent strategy aimed at supporting competitiveness over the medium to long term.

Cash flow from financing activities turned positive at €3.2 billion. This result is attributable to new financial instruments and changes in financial assets/liabilities, which had a net positive effect of over €3.4 billion. Unlike in previous years, the group did not distribute dividends, thereby strengthening its cash position, as noted in the analysis of the Net Financial Position.

Comparison

Based on the previously gathered and analyzed data for FCA and PSA, and using 2020 as the main reference year, the following is a comparison between the two companies across four key areas: capital solidity, profitability, working capital management and cash management.

1) Capital Solidity

In terms of capital structure, PSA shows a stronger financial position compared to FCA. As of December 31, 2020, PSA's equity amounts to €23.9 billion, with an Equity-to-Total Assets ratio of 32.5%, indicating a well-balanced capitalization. In contrast, FCA reports equity of €25.9 billion on a larger asset base (€99.7 billion) resulting in a lower Equity-to-Assets ratio of 26%. PSA is therefore less dependent on external capital, with a financial profile that provides greater resilience in the face of external shocks.

2) Profitability

Both groups ended 2020 with a net profit, but showed different performances in terms of operating and net profitability. PSA generated consolidated net income of €2.02 billion, with an operating profit of €3.05 billion, representing around 5% of revenues. In contrast, FCA recorded net income from continuing operations of just €24 million, with EBIT of €1.36 billion, an operating margin of approximately 1.5%. Therefore, PSA demonstrated a stronger ability to generate both operating and net income, even in a crisis year, thanks to a more efficient cost structure and strong control over operating leverage.

3) Working Capital Management

FCA and PSA both show a negative Net Working Capital, a value that is consistent with the business model of large automotive manufacturers, which tend to minimize the use of operating capital by leveraging extended payment terms with suppliers and efficiently managing inventory and trade receivables. In this context, a negative NWC does not indicate weakness but rather serves as a lever of financial efficiency, allowing production volumes to be sustained with limited use of internal resources. The management of working capital is very similar between the two groups, both in terms of strategic approach and in the scale of values, as both demonstrate strong control over their operating cycle. This contributes to the maintenance of positive cash flows even under economically challenging conditions.

4) Cash Management

The analysis of liquidity management in 2020 shows that both groups strengthened their financial position. In absolute terms, FCA recorded a larger increase in cash, with a positive change in cash and cash equivalents of approximately €8.8 billion, compared to €5.1 billion for PSA. This result was achieved thanks to strong operating cash flow (€9.2 billion) and the use of new long-term financing instruments, which allowed the group to significantly boost its short-term cash reserves. However, when considering the Net Financial Position, which takes into account not only available liquidity but also overall financial debt, the comparison favours PSA. FCA posted a net cash position of €2.95 billion (financial debt of around €22 billion) while PSA closed the year with a net cash position of €9.4 billion (with financial debt of around €13 billion). This highlights that FCA is more exposed to financial leverage, whereas PSA stands out for having a stronger and more independent net financial position.

4.4.2 POST MERGER

The analysis of the economic and financial performance following the merger between FCA and PSA will be conducted by examining Stellantis' consolidated financial statements for the 2021–2023 period, which represents the first three full fiscal years of activity for the new group.

		Years ended December 31,		
	Note	2023	2022[1]	2021[1]
Net revenues	4	€ 189,544	€ 179,592	€ 149,419
Cost of revenues		151,400	144,327	119,943
Selling, general and other costs		9,541	8,981	9,130
Research and development costs	5	5,619	5,200	4,487
Gains/(losses) on disposal of investments		20	72	(35)
Restructuring costs		1,119	1,144	698
Share of the profit/(loss) of equity method investees	12	491	264	737
Operating income/(loss)		**22,376**	**20,276**	**15,863**
Net financial expenses/(income)	6	(42)	768	734
Profit/(loss) before taxes		**22,418**	**19,508**	**15,129**
Tax expense/(benefit)	7	3,793	2,729	1,911
Net profit/(loss) from continuing operations		**18,625**	**16,779**	**13,218**
Profit/(loss) from discontinued operations, net of tax	3	—	—	990
Net profit/(loss)		**€ 18,625**	**€ 16,779**	**€ 14,208**

Figure 4.7: Stellantis Consolidated Income Statement at the end of 2021-2022-2023. Source: Stellantis Annual Report 2023.

In 2021, Stellantis reported net revenues of €149.4 billion, a significant result considering it was the first full year following the merger between FCA and PSA. This revenue figure exceeds the combined revenues of the two groups in 2020 (FCA: €86.7 billion; PSA: €60.7 billion), confirming the benefits of scale and operational integration. he growth continued in the following years, with a 20% increase in 2022 compared to 2021 and a further 5.5% rise in 2023. This trend highlights a strong expansionary dynamic, particularly between 2021 and 2022, driven by post-merger optimization and recovery from the pandemic crisis.

In the first year after the merger, Stellantis recorded an EBIT of €15.9 billion, with an operating margin of approximately 10.6%, immediately demonstrating a strong ability to generate operating income exceeding the performance of each pre-merger group. The operating margin continued to improve in the following years, reaching 11.8% in 2023. The integration led to tangible operational synergies, with profitability showing strong growth, already evident from the very first year.

As for net profit, Stellantis reported a total net income of €14.2 billion, marking a strong recovery compared to 2020 and representing a structural shift, driven by economies of scale, cost rationalization, and greater operational efficiency. It is a clear positive signal for stakeholders, confirming the value and effectiveness of the merger in the short term.

	Note	At December 31, 2022	2021[1]
Assets			
Goodwill and intangible assets with indefinite useful lives	9	€ 31,738	€ 29,921
Other intangible assets	10	19,006	16,635
Property, plant and equipment	11	36,205	35,488
Equity method investments	12	4,834	6,022
Non-current financial assets	13	710	607
Other non-current assets and prepaid expenses	16	6,723	6,266
Deferred tax assets	7	2,052	1,927
Tax receivables	16	112	105
Total Non-current assets		**101,380**	**96,971**
Inventories	14	17,360	11,361
Assets sold with a buy-back commitment		1,594	2,134
Trade receivables	16	4,928	2,998
Tax receivables	16	543	285
Other current assets and prepaid expenses	16	7,549	6,362
Current financial assets	13	4,323	1,903
Cash and cash equivalents	18	46,433	49,629
Assets held for sale	3	2,046	123
Total Current assets		**84,776**	**74,795**
Total Assets		**€ 186,156**	**€ 171,766**
Equity and liabilities			
Equity	27		
Equity attributable to owners of the parent		71,999	55,907
Non-controlling interests		383	400
Total Equity		**72,382**	**56,307**
Liabilities			
Long-term debt	22	19,469	22,624
Other non-current financial liabilities	17	—	6
Other non-current liabilities	23	8,129	7,696
Non-current provisions	21	8,460	7,270
Employee benefits liabilities	20	5,891	8,065
Tax liabilities	23	668	567
Deferred tax liabilities	7	4,332	4,374
Total Non-current liabilities		**46,949**	**50,602**
Short-term debt and current portion of long-term debt	22	7,684	10,958
Current provisions	21	11,311	9,909
Employee benefit liabilities	20	545	684
Trade payables		31,726	28,181
Tax liabilities	23	900	546
Other liabilities	23	14,528	14,439
Other current financial liabilities	17	18	89
Liabilities held for sale	3	113	51
Total Current liabilities		**66,825**	**64,857**
Total Equity and liabilities		**€ 186,156**	**€ 171,766**

Figure 4.8: Consolidated Statement of Financial Position at the end of 2021-2022. Source: Stellantis Annual Report 2022

As for FCA and PSA, the Net Working Capital is computed as NWC = Inventories + Trade Receivables – Trade Payables.

Items	**2022**	**2021**
Inventories	17.36	11.36
Trade Receivables	4.93	3.00
Trade Payables	31.73	28.18
NWC	**-9.44**	**-13.82**

Net Working Capital thus remains negative but a significant improvement can be observed between 2021 and 2022, with a reduction in the negative value of over €4.4 billion. This change is mainly attributable to an increase in inventories and trade receivables in a context of recovering demand and rising volumes.

Items	**2022**	**2021**
Long-term debt	19.47	22.63
Short-term debt	7.68	10.96
Other non-current financial liabilities	0	0.01
Other current financial liabilities	0.02	0.09
Financial debt	**27.17**	**33.69**
Cash and cash equivalents	46.43	49.63
Current financial assets	4.32	1.90
Non-current financial assets	0.71	0.61
Net Financial Position	**-24.29**	**-18.45**

In the first year after the merger, Stellantis was already in a very strong net cash position, supported by a solid liquidity base and a manageable level of debt. The 2021 Net Financial Position reflects an integrated and prudent financial management approach, in line with best practices inherited from PSA. From 2020 to 2022, the group moved from a combined NFP of approximately –€12 billion (FCA + PSA) to a consolidated net cash position of over –€24 billion, showing continuous improvement. This is a clear indication of the group's strengthened financial position and its ability to generate value in a sustainable way.

In conclusion, equity also shows significant growth, with an increase of €16.07 billion between 2021 and 2022. This rise in equity is also reflected in an improvement in the Equity-to-Total Assets ratio, which increased from approximately 33% in 2021 to over 38% in 2022, a sign of greater financial autonomy and reduced dependence on external funding sources.

4.4.3 COMPARISON PRE AND POST MERGER

In order to conduct a preliminary assessment of the economic and financial impact of the merger between FCA and PSA, it is useful to compare a series of key indicators before and after the creation of Stellantis. The goal is to understand whether, and to what extent, the merger has actually led to improvements in the structure and performance of the new group. In particular, the analysis will focus on three fundamental dimensions:

- The evolution of leverage, i.e., the group's financial leverage
- The efficiency in the use of invested capital, understood as the ability to generate profitability from employed resources
- The improvement in liquidity, assessed through the net financial position and total cash availability

These elements provide a solid foundation for evaluating the strength, sustainability and quality of the industrial and financial integration achieved through the merger.

1) Leverage

Leverage has decreased, indicating a stronger capital structure in the post-merger period. Pre-merger (2020), FCA had equity of approximately €25.9 billion with financial debt exceeding €21 billion (D/E = 0.84); PSA showed a more balanced situation, although on a smaller scale. In 2021, Stellantis' consolidated equity rose to €56.3 billion, with a more favourable Debt-to-Equity ratio of 0.60. The merger had a dilutive effect on financial leverage, strengthening the group's overall capital solidity.

2) Invested Capital Efficiency

Invested capital has been used more efficiently. by analyzing operating profitability (EBIT) in relation to invested capital and net cash generation, it becomes clear that Stellantis has achieved higher returns compared to those generated separately by FCA and PSA. In the post-merger period, the group has been able to generate greater value for every euro invested, benefiting from industrial synergies, economies of scale and increased operational efficiency.

3) Liquidity

Liquidity has improved; specifically, Stellantis was established with a positive net financial position, and in the two years following the merger, net cash increased significantly. At the same time, total cash and cash equivalents also rose, exceeding €50 billion in 2022. The merger clearly strengthened the group's liquidity and self-financing capacity.

4.5 RATIOS ANALYSIS

Ratio analysis is a fundamental methodology in the field of financial statement analysis, used to assess a company's economic and financial performance through the calculation of specific ratios between balance sheet items. This technique provides a concise and comparable view of the company's situation, facilitating both time-based comparisons (historical analysis) and comparisons between different companies (comparative analysis). Ratio analysis is divided into several main categories:

- Profitability ratios: measure the company's ability to generate profits in relation to the resources employed, such as Return on Equity (ROE) and Return on Assets (ROA).
- Liquidity ratios: assess the company's ability to meet short-term financial obligations, including the Current Ratio and Quick Ratio.
- Solvency or leverage ratios: analyze the capital structure and the sustainability of the company's debt, such as the Debt-to-Equity ratio.
- Operational efficiency ratios: evaluate how effectively the company manages its resources, for example, inventory and receivables turnover.

In this section, ratio analysis will be used to compare the performance of FCA and PSA in the pre-merger period (2020) with that of Stellantis in the post-merger period (2021). To assess the competitive positioning of the newly formed group, the analysis will focus on a comparison with Volkswagen Group as it represents the most directly comparable peer in terms of market presence, product diversification, geographic reach and strategic priorities.

Profitability Ratios

Profitability ratios measure a company's ability to generate earnings in relation to the capital employed, revenues and total assets.

Ratios	FCA (2020)	PSA (2020)	Stellantis (2021)	Volkswagen (2021)
ROE	0,093%	8,47%	25,23%	10,56%
ROA	0,024%	2,75%	8,27%	2,92%
ROI	3,86%	7,15%	14,84%	10,40%
EBIT Margin	2,70%	5,03%	10,62%	7,70%
Net Profit Margin	0,028%	3,33%	9,51%	6,17%

The merger led to a significant increase in the economic efficiency of the new group, with both operating and net profitability proving stronger than that of the two original companies since ROE, ROA and ROI all increased considerably. As for margins, Stellantis reports an EBIT Margin of 10.62% and a Net Profit Margin of 9.51%, both higher than pre-merger figures. In a direct comparison with Volkswagen, Stellantis outperforms in all major profitability margins, demonstrating remarkable economic efficiency already in its first year of

operation. This suggests that the merger produced swift and tangible synergies, significantly improving performance compared to the two original groups and positioning Stellantis among the top performers in the sector in terms of profitability.

Liquidity Ratios

Liquidity ratios measure a company's ability to meet its short-term financial obligations using its current assets. Indicators such as the Current Ratio, Quick Ratio and Cash Ratio are essential for assessing short-term financial soundness, especially in sectors characterized by strong operating cycles, such as the automotive industry.

Ratios	FCA (2020)	PSA (2020)	Stellantis (2021)	Volkswagen (2021)
Current Ratio	1,03	1,14	1,15	1,22
Quick Ratio	0,82	0,97	0,98	0,95
Cash Ratio	0,61	0,72	0,77	0,41

Analysis of these ratios reveals that, after the merger, the group has maintained a short-term financial balance consistent with that of the two original companies, confirming continuity in the prudent management of working capital. Stellantis demonstrates very solid liquidity levels, comparable to those of Volkswagen, with a significant advantage in immediately available liquidity, as evidenced by a greater Cash Ratio (0.77 compared to 0.41).

Leverage Ratios

Leverage ratios measure a company's level of debt in relation to its equity or total assets. Among these, the Debt-to-Equity (D/E) ratio is one of the most commonly used indicators to assess a company's financial structure and its ability to sustain debt. A lower value generally indicates greater financial solidity and lower financial risk.

Ratios	FCA (2020)	PSA (2020)	Stellantis (2021)	Volkswagen (2021)
Financial Debt	21.750,00	13.492,00	27.171,00	227.670,00
Equity	25.861,00	23.874,00	56.307,00	146.154,00
D/E	**0,84**	**0,57**	**0,48**	**1,56**

The analysis of the Debt/Equity ratio shows a significant improvement in Stellantis' financial structure compared to the pre-merger situation. In 2020, FCA and PSA reported values of 0.84 and 0.57 respectively, reflecting two different approaches to the use of financial leverage. After the merger, Stellantis further reduced its debt exposure, reaching a value of 0.48 in 2021, confirming a prudent and sustainable capital management policy. The comparison with Volkswagen reinforces this interpretation: the German group shows a D/E ratio of 1.56, indicating a financial structure that is much more reliant on debt. In this context, Stellantis stands out for its solid and conservative financial profile.

Efficiency Ratios

Operational efficiency ratios are measures that indicate how effectively a company utilizes its resources within its operating cycle. Specifically, they reflect the ability to manage inventories, trade receivables and trade payables. Higher inventory turnover and trade receivables turnover ratios indicate more efficient management. Conversely, a lower trade payables turnover ratio can signify effective liquidity management by leveraging favorable credit terms from suppliers.

Ratios	FCA (2020)	PSA (2020)	Stellantis (2021)	Volkswagen (2021)
Inventory turnover	9,38	9,24	10,56	4,64
Trade Receivables Turnover	15,63	19,30	49,84	16,12
Trade Payables Turnover	3,69	3,27	4,26	8,59

Analyzing operational efficiency before and after the merger reveals a general improvement in operational management post-merger. Particularly notable is the improvement in trade receivables turnover, which nearly tripled, increasing from approximately 17.46 (average of FCA and PSA) to 49.84 for Stellantis. This significant increase suggests a substantial improvement in the collection of trade receivables, thereby indicating more effective liquidity management. When comparing Stellantis with Volkswagen (2021), Stellantis clearly demonstrates more efficient operational management. In fact, Stellantis reports an inventory turnover more than twice that of Volkswagen (10.56 vs 4.64), indicating a leaner and faster inventory management. The most significant difference emerges in the trade receivables turnover, where Stellantis far exceeds Volkswagen with 49.84 compared to 16.12.

CHAPTER 5: EMPIRICAL ANALYSIS

5.1 RESEARCH QUESTION 1

5.1.1 DEFINITION OF THE ANALYSIS

This section introduces the methodological framework adopted to investigate the relationship between mergers and acquisitions and corporate performance in the automotive sector. The aim of this analysis is to assess whether, and to what extent, M&A transactions carried out in the automotive sector have created value for the acquiring companies. Analytically, the research question can be formulated as follows:

"Did M&A transactions in the automotive industries, carried out between 2005 and 2022, create value for the companies involved?"

The concept of "value creation" can be approached from two main perspectives:

- Market-based which focuses on the shareholders' perspective and measures the impact of M&A transactions on a company's market valuation, for example by observing abnormal returns in the days immediately before and after the deal announcement.
- Accounting-based which assesses whether the transaction led to an improvement in the company's operational performance and accounting fundamentals (such as ROA, Net Profit Margin, EBITDA Margin, etc.) over the medium term.

In this study, an accounting-based approach has been adopted for both practical and theoretical reasons. Firstly, the automotive sector includes a significant number of non-listed companies or firms that are part of large multinational groups, for which comprehensive market data is often unavailable. This limitation makes the market-based approach not only less applicable but potentially misleading, as it could exclude or misrepresent a substantial portion of the sample.

Secondly, the primary goal of this research is to assess the medium-term structural impact of M&A transactions on corporate performance, rather than merely capturing the short-term market reaction surrounding the announcement date. While market-based methodologies—such as event studies—are effective in identifying immediate investor sentiment, they do not account for the longer-term integration processes and strategic outcomes that may unfold over time. In contrast, an accounting-based framework allows for a more comprehensive evaluation of operational and financial performance indicators (such as ROA, Net Profit Margin and EBITDA Margin), thereby providing insights into whether the M&A transaction has led to sustainable improvements in business fundamentals.

Therefore, the decision to employ an accounting-based methodology stems from the dual necessity of maximizing sample coverage and capturing the true economic effect of mergers and acquisitions over a longer time horizon.

The timeframe selected for this analysis spans from 2005 to 2023, a choice driven by key methodological considerations. To reliably assess the impact of an M&A transaction on corporate performance, it is essential to have access to financial data from both before and after the transaction, ideally covering at least two full fiscal years on each side. This temporal structure enables the construction of a consistent pre- and post-deal comparison, helping to mitigate the influence of isolated macroeconomic fluctuations and enhancing the credibility of the results.

Furthermore, the selected period encompasses a wide array of distinct economic phases and external shocks, offering a rich empirical context in which to evaluate M&A outcomes. These phases include the 2008–2009 global financial crisis, the ensuing period of industrial recovery, the digital and sustainable transformation of the automotive sector, the COVID-19 pandemic and the recent global supply chain and geopolitical disruptions. The inclusion of such diverse economic environments ensures that the study does not assess M&A performance in a vacuum, but rather tests the resilience and adaptability of acquired firms under varying market conditions.

This extended timeframe also allows for the detection of structural changes in company performance, beyond short-term anomalies or temporary effects. By observing multiple years of financial performance surrounding each M&A event, the analysis can distinguish between transitory fluctuations and long-lasting operational transformations, providing a more nuanced understanding of the actual value generated by such transactions.

Ultimately, the 2005–2023 window enhances both the robustness and the generalizability of the findings, ensuring that the results reflect the complex realities of the automotive industry and are relevant across different economic and strategic contexts.

The objective of this study is not to determine whether a specific M&A transaction was successful, nor to explain the reasons behind a company's decision to engage in a merger or acquisition. Rather, the aim is to assess whether, on average, the operational performance of companies improves or deteriorates in the period following an M&A transaction compared to the period before it. To achieve this, a panel data econometric model will be implemented, allowing for the analysis of performance changes over time while controlling for certain structural characteristics of the firms involved.

5.1.2 DATA SAMPLE

Construction of the data sample

To analyze the impact of mergers and acquisitions in the automotive sector, a representative sample of transactions was constructed using the Orbis M&A database (Bureau van Dijk)[137].

The extraction procedure was structured in multiple stages, following a selective approach aimed at identifying relevant and completed transactions within the target industrial sector. Specifically, the following selection criteria were applied:

- Deal type: Only deals classified as Mergers & Acquisitions were included, excluding other forms of corporate restructuring (e.g., spin-offs, joint ventures).
- Deal status: Only transactions with the status "Completed" were selected, ensuring that the deal had been effectively finalized.
- Time period: Transactions completed between January 1, 2005, and December 31, 2023 were considered.
- Target industry: Only transactions where the target company operated within industry codes related to the automotive sector (e.g., motor vehicle manufacturing, auto parts, electric vehicles, etc.) were included.
- Geographic scope: The selection was conducted on a global scale, with no geographic restrictions, in order to increase the sample size and provide a broader representation of the phenomenon.

After applying the filters described above, the database returned 6,512 transactions. To make the analysis more manageable and focused on the most significant deals, an additional economic relevance criterion was introduced: the top 50 transactions by deal value (expressed in thousands of U.S. dollars) were selected.

This additional criterion reflects the intention to focus the analysis on the most impactful transactions, which are typically carried out by large industrial groups and are therefore more representative of the strategic dynamics within the automotive sector. Larger-scale deals tend to have a more pronounced effect on a company's financial structure and operational performance, making them especially suitable for an empirical analysis based on accounting indicators. By concentrating on high-value transactions, the study aims to capture cases where the consequences of M&A activity are more likely to be significant, observable and measurable, thereby enhancing the reliability and relevance of the findings.

[137] Orbis M&A (ex Zephyr) is one of the most comprehensive international sources for tracking corporate restructuring activities. Link: https://orbismanda-r1.bvdinfo.com/version-20250320-1-0/OrbisMA/1/Deals/Search

The final sample, as defined, includes the following key information for each transaction: Acquiror company name, Target company name, Acquiror country code, Target country code, Percentage of equity acquired, Deal value, Date of deal completion.

This information serves as the descriptive foundation for the subsequent construction of the panel dataset used in the econometric analysis.

Description of the data sample

The sample analyzed presents a heterogeneous composition both geographically and structurally. The majority of the deals (60%) are domestic, carried out between companies based in the same country, while the remaining 40% are cross-border transactions, highlighting the significant presence of international dynamics within the sector.

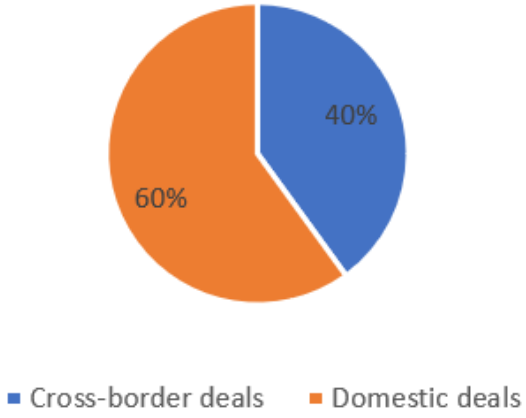

Chart 1: Cross-border vs domestic deals. Source: personal elaboration based on Orbis data.

From the perspective of acquirer nationality, Germany emerges as the most represented country, accounting for 30% of the transactions, followed by the United States with 28%. The remaining transactions are distributed among other industrially relevant countries in the automotive sector, including France, Italy, the Netherlands, the United Kingdom and China.

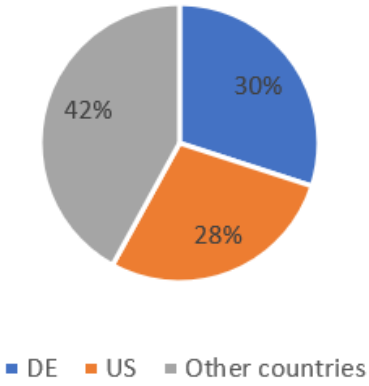

Chart 2: Acquiror company country. Source: personal elaboration based on Orbis data.

As for the target companies, the United States represents 30% of the total, followed by Germany with 20% while the remaining 50% involves firms based in other countries.

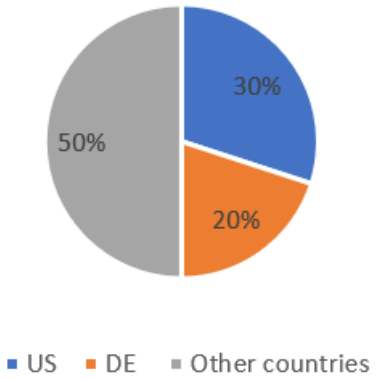

Chart 3: Target company country. Source: personal elaboration based on Orbis data.

In terms of acquisition structure, a significant portion of the analyzed transactions (38 deals) involves full acquisitions (100% acquisition) while only 12 deals are partial acquisitions. This indicates a predominance of deals aimed at achieving full control of the target company, consistent with the strategic goal of fully integrating the acquired operations.

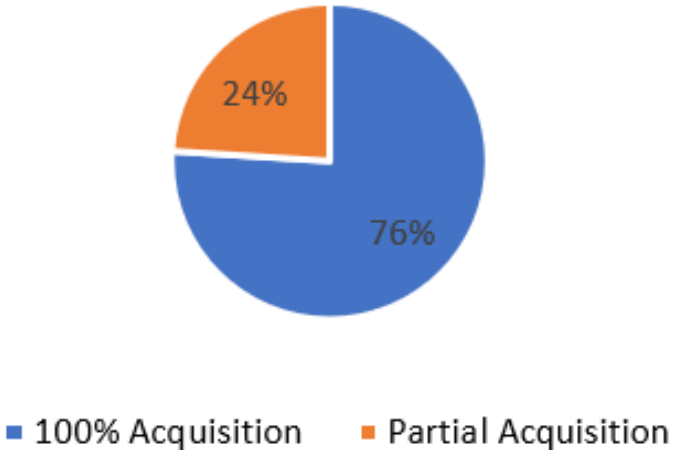

Chart 4: Type of operation. Source: personal elaboration based on Orbis data.

Regarding the temporal distribution of the transactions, peak occurred in 2021, with 7 transactions, followed by high activity in 2009, 2015 and 2022, each with 5 deals. This trend reflects alternating phases of expansion and restructuring in the automotive sector, influenced by exogenous factors such as the 2008–2009 financial crisis, the COVID-19 pandemic and the subsequent industrial recovery. The variability in the annual number of transactions helps to outline a dynamic and complex landscape, useful for assessing the impact of M&A in different economic contexts.

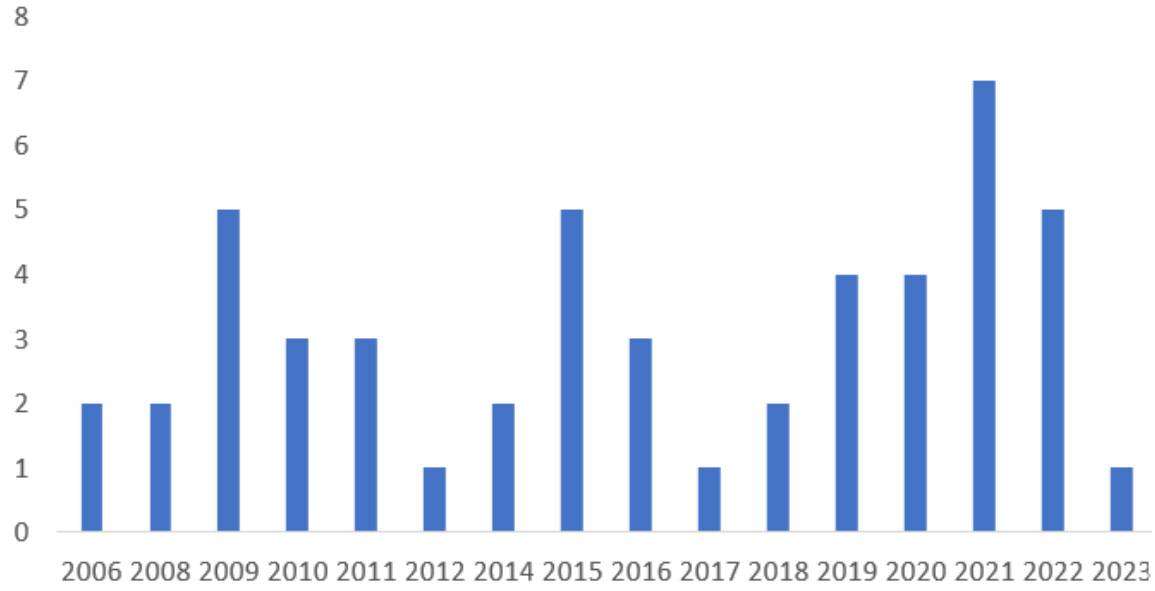

Chart 5: Deals per year. Source: personal elaboration based on Orbis data.

5.1.3 METHODOLOGY

To assess the effect of M&A transactions on corporate performance, an econometric model based on panel data was developed. This section outlines the process of variable selection and construction, the formulation of the model and the structure of the dataset used for estimation.

Dependent Variables

The analysis focuses on three accounting-based indicators of operational performance, selected for their ability to represent different dimensions of corporate profitability:

- Return on Assets (ROA): reflects the efficiency with which a company uses its assets to generate profit. It is a widely used indicator for measuring a firm's overall profitability.
- Net Profit Margin: represents the ratio of net income to total revenue and is useful for evaluating a company's ability to convert sales into net profit, taking into account financial and tax management.
- EBITDA Margin: measures earnings before interest, taxes, depreciation and amortization as a percentage of revenue. It is particularly relevant for cross-sector comparisons as it is not affected by differences in depreciation policies, financing structures or tax regimes.

The combination of these three metrics enables a more comprehensive evaluation of the impact of M&A transactions, capturing operational efficiency (EBITDA), managerial effectiveness (Net Profit Margin) and overall resource utilization (ROA).

Independent Variables

To explain the performance trends of firms in the period following a merger or acquisition, a set of independent variables was defined, selected based on economic and financial literature and their relevance in influencing corporate profitability. The primary focus is the "Post_MA" variable, a dummy variable specifically constructed for this analysis.

Post_MA is a binary variable that takes the value:

- 0 for all years prior to the transaction year;
- 1 for the transaction year and all subsequent years.

This variable allows for the isolation of the temporal effect associated with the M&A event, enabling the model to estimate whether, ceteris paribus, the acquiring firms experienced a systematic change in performance after the merger or acquisition. The dummy was constructed manually, year by year, based on the exact deal completion date as reported in the data extracted from "Orbis: company information across the globe"[138].

In addition to Post_MA, the model includes the following control independent variables:

- logAssets: natural logarithm of total assets. This was used to control for firm size effects on performance. The logarithmic transformation reduces distortion caused by large scale differences among firms, making the data more manageable and interpretable within a linear model.
- Leverage (D/E ratio): represents the firm's level of indebtedness. Higher leverage can imply greater financial risk but also a higher potential return on equity. This variable accounts for differences in capital structure choices across firms.
- RD_Sales: the ratio of R&D expenditure to revenues. This serves as a proxy for a firm's innovation intensity, which is particularly relevant in a technologically dynamic sector like automotive.
- Liquidity (Cash/Total Assets): measures the firm's relative liquidity. A solid cash position relative to assets may indicate prudent financial management and provide a buffer to support post-M&A integration or absorb operational shocks.
- Revenues Growth: year-on-year percentage change in revenues. This variable captures the firm's growth trend over time, distinguishing expanding firms from those in stagnation or decline.

Each of these variables was selected for its potential contribution to explaining corporate profitability. Including them in the model allowed for the isolation of the net effect associated with the M&A transaction while holding other relevant determinants of operational performance constant.

[138] https://orbis-r1.bvdinfo.com/version-20250325-3-0/Orbis/1/Companies/ListEdition

Econometric Model Specification

To estimate the effect of M&A transactions on corporate performance, an econometric approach based on panel data was adopted. This methodology is particularly suitable in contexts where repeated observations over time are available for multiple statistical units as in the present case where the dataset includes annual time series for a set of acquiring firms.

The panel data model allows for the simultaneous exploitation of both the cross-sectional and time-series dimensions of the data, offering several advantages over purely cross-sectional or time-series analyses:

- It enables control for unobserved heterogeneity across firms, reducing the risk of omitted variable bias from time-invariant factors;
- It increases the statistical efficiency of the estimates by expanding the total number of observations;
- It allows the observation of temporal dynamics and structural changes associated with specific events, such as M&A transactions.

In this analysis, a linear fixed effects model was implemented and estimated using Ordinary Least Squares (Panel OLS). This model captures the average impact of a merger or acquisition on corporate performance, while controlling for firm-specific characteristics.

The model is based on the following general specification:

$$Y_{it} = \beta_0 + \beta_1 \cdot \text{Post\_MA}_{it} + \beta_2 \cdot \log(\text{Assets}_{it}) + \beta_3 \cdot \text{Leverage}_{it} + \beta_4 \cdot \text{RD\_Sales}_{it} + \beta_5 \cdot \text{Liquidity}_{it} + \beta_6 \cdot \text{RevenueGrowth}_{it} + \varepsilon_{it}$$

Where:

- Y_{it} is the performance indicator (ROA, Net Profit Margin, or EBITDA Margin) for firm *i* at time *t*;
- Post_MA_{it} is the dummy variable indicating post-M&A years;
- $\log(\text{Assets}_{it})$ controls for firm size;
- Leverage_{it} captures the capital structure;
- RD_Sales_{it} measures innovation intensity;
- Liquidity_{it} reflects financial flexibility;
- $\text{RevenueGrowth}_{it}$ accounts for the firm's growth trend;
- ε_{it} is the error term.

This structure allows for the estimation of the coefficient β_1 which represents the average effect of the M&A transaction on the dependent variable, controlling for other observable factors. Based on the general model specification, three separate regressions were estimated, each with a different dependent variable, according to the following specifications:

1) Model with ROA as the dependent variable:

$$ROA_{it} = \beta_0 + \beta_1 \cdot Post\_MA_{it} + \beta_2 \cdot logAssets_{it} + \beta_3 \cdot Leverage_{it} + \beta_4 \cdot RD\_Sales_{it} + \beta_5 \cdot Liquidity_{it} + \beta_6 \cdot RevenueGrowth_{it} + \varepsilon_{it}$$

2) Model with Net Profit Margin as the dependent variable:

$$NetProfitMargin_{it} = \beta_0 + \beta_1 \cdot Post\_MA_{it} + \beta_2 \cdot logAssets_{it} + \beta_3 \cdot Leverage_{it} + \beta_4 \cdot RD\_Sales_{it} + \beta_5 \cdot Liquidity_{it} + \beta_6 \cdot RevenueGrowth_{it} + \varepsilon_{it}$$

3) Model with EBITDA Margin as the dependent variable:

$$EBITDAMargin_{it} = \beta_0 + \beta_1 \cdot Post\_MA_{it} + \beta_2 \cdot logAssets_{it} + \beta_3 \cdot Leverage_{it} + \beta_4 \cdot RD\_Sales_{it} + \beta_5 \cdot Liquidity_{it} + \beta_6 \cdot RevenueGrowth_{it} + \varepsilon_{it}$$

All the data (dependent and independent variables) required for the construction of the final dataset, structured in long panel format, were collected through the Orbis database. For each identified acquiring firm, annual accounting values were extracted for the period 2015–2023, in order to ensure a broad time window that includes at least three years before and after the transaction.

In light of the empirical objective of the paper, the following statistical hypotheses are formulated for each of the three dependent variables considered (ROA, Net Profit Margin and EBITDA Margin):

Null Hypothesis (H_0):
The M&A operation has no statistically significant effect on firm performance:
H_0: $\beta_1 = 0$

Alternative Hypothesis (H_1):
The M&A operation has a statistically significant effect on firm performance:
H_1: $\beta_1 \neq 0$

The verification of these hypotheses is carried out by estimating the coefficient associated with the *Post_MA* variable within a panel data linear regression model. The test is based on the p-value: if the p-value is lower than the predetermined significance level (5%), the null hypothesis is rejected in favor of the alternative.

5.1.4 RESULTS OF THE ANALYSIS

This section presents and analyzes the results obtained from the estimation of the three econometric models previously described, in order to assess whether M&A transactions had a statistically significant impact on the operating performance of the acquiring firms. The interpretation of the results considers both statistical significance, as indicated by the p-values and the economic consistency of the estimated coefficients with respect to the existing literature.

Results Regression 1

The first regression analyzes the impact of M&A transactions on the operating performance of acquiring firms, using ROA as the dependent variable. This indicator measures how efficiently a company uses its assets to generate profits, making it particularly suitable for assessing changes in economic performance following extraordinary operations such as mergers and acquisitions.

Parameter Estimates

	Parameter	Std. Err.	T-stat	P-value	Lower CI	Upper CI
Intercept	0.0053	0.0493	0.1071	0.9148	-0.0922	0.1028
Post_MA	0.0248	0.0098	2.5225	0.0128	0.0054	0.0442
logAssets	0.0027	0.0027	1.0175	0.3107	-0.0026	0.0080
Leverage	-0.0081	0.0032	-2.5404	0.0122	-0.0144	-0.0018
RD_Sales	0.0933	0.1014	0.9200	0.3591	-0.1072	0.2938
Liquidity	0.0158	0.0689	0.2288	0.8193	-0.1204	0.1519
Revenues_Growth	0.0261	0.0148	1.7655	0.0797	-0.0031	0.0554

The coefficient associated with the key variable Post_MA is 0.0248 and statistically significant at the 5% level (p-value= 0.0128) meaning that, on average, the ROA of acquiring firms increases by approximately 2.48 percentage points in the three years following the M&A transaction. The null hypothesis (H_0) is rejected in favour of the alternative, confirming that M&A transactions in the automotive sector are associated with a significant improvement in asset profitability.

Turning to the analysis of the control independent variables, the coefficient of logAssets, which represents firm size, is positive (0.0027), consistent with the literature suggesting that larger firms benefit from economies of scale and more efficient operational structures. However, this coefficient also does not reach statistical significance (p-value = 0.3107). In contrast, the coefficient for Leverage is negative and statistically significant ($\beta = –0.0081$, p-value = 0.0122). This suggests that a higher level of debt has a negative impact on ROA, as excessive reliance on external financing can lead to higher financial burdens and greater exposure to risk, thereby undermining managerial efficiency. The variable RD_Sales, representing R&D investment intensity, shows a positive coefficient of 0.0933, but it is not statistically significant (p-value = 0.3591). This result indicates that while innovation may potentially have a beneficial effect on profitability, such an effect is not statistically confirmed in the observed sample. Similarly, Liquidity and Revenues_Growth both display positive coefficients (0.0158 and 0.0261, respectively), but are not statistically significant. However, for the

latter variable, the p-value of 0.0797 is close to the 10% threshold, suggesting a possible, albeit weak, positive relationship between revenues growth and ROA.

Results Regression 2

The second regression aims to examine the effect of M&A transactions on the net profitability of acquiring firms, using Net Profit Margin as the dependent variable. This indicator measures the percentage of net income generated per unit of revenue and serves as a summary measure of a company's ability to convert revenue into net profit.

Parameter Estimates

	Parameter	Std. Err.	T-stat	P-value	Lower CI	Upper CI
Intercept	-0.1274	0.1102	-1.1556	0.2500	-0.3454	0.0907
Post_MA	0.0427	0.0201	2.1246	0.0355	0.0029	0.0824
logAssets	0.0104	0.0059	1.7771	0.0779	-0.0012	0.0221
Leverage	-0.0086	0.0069	-1.2440	0.2158	-0.0222	0.0051
RD_Sales	0.1446	0.2613	0.5535	0.5809	-0.3723	0.6615
Liquidity	0.2700	0.1527	1.7677	0.0795	-0.0322	0.5722
Revenues_Growth	-0.0529	0.0427	-1.2401	0.2172	-0.1373	0.0315

The estimated coefficient of the Post_MA dummy variable is 0.0427, suggesting a positive impact of M&A on the net margin of acquiring firms. Furthermore, this coefficient is statistically significant at the 5% level (p-value = 0.0201); in light of the results obtained, the null hypothesis (H_0) that M&A transactions do not significantly affect net margin can be rejected. Consequently, there is empirical evidence supporting the alternative hypothesis (H_1) that mergers and acquisitions have improved Net Profit Margin performance for acquiring firms in the automotive sector.

Regarding the independent control variables, they show limited significance. In fact, logAssets and Liquidity are weakly significant at the 10% level, suggesting that firm size and liquidity availability may exert a positive influence on net profitability, although the evidence is not robust. The other variables—Leverage, RD_Sales and Revenues_Growth—are not significant, indicating that, within the analyzed sample, there are no statistically reliable relationships between leverage, innovation intensity or revenue growth and net profit margin.

Results Regression 3

The third regression assesses the effect of M&A transactions on the operating profitability of acquiring firms, using EBITDA Margin as the dependent variable.

Parameter Estimates

	Parameter	Std. Err.	T-stat	P-value	Lower CI	Upper CI
Intercept	-0.1938	0.1485	-1.3050	0.1941	-0.4876	0.0999
Post_MA	0.0582	0.0287	2.0280	0.0445	0.0014	0.1149
logAssets	0.0167	0.0080	2.0905	0.0384	0.0009	0.0325
Leverage	0.0068	0.0096	0.7067	0.4809	-0.0122	0.0258
RD_Sales	0.3943	0.3588	1.0990	0.2737	-0.3153	1.1038
Liquidity	-0.1188	0.2049	-0.5798	0.5630	-0.5240	0.2864
Revenues_Growth	-0.0318	0.0460	-0.6923	0.4899	-0.1228	0.0591

The estimated coefficient of the Post_MA dummy variable is 0.0522, with a p-value of 0.0483, making it statistically significant at the 5% level. This finding suggests that, on average, M&A transactions have had a positive and significant impact on the operating margin of acquiring firms in the post-transaction period. The positive sign aligns with the theoretical hypothesis that a well-planned merger or acquisition can improve operational efficiency—for example, through productive synergies, cost rationalization or economies of scale. Therefore, in the case of EBITDA margin, there is sufficient evidence to reject the null hypothesis (H_0), confirming the alternative hypothesis (H_1): M&A transactions have had a positive and measurable effect on the operating profitability of firms in the automotive sector.

Conclusions

Based on the results obtained from the three econometric regressions conducted, it is possible to answer the initial research question: *Did M&A transactions in the automotive industries, carried out between 2005 and 2022, create value for the companies involved?*

In all model specifications, the Post_MA dummy variable, constructed to capture the effect of M&A in the years following the transaction, consistently shows a positive and statistically significant coefficient, indicating that firms involved in acquisitions experienced improvements in profitability and margins in the post-transaction period. Although the control variables contributed differently in terms of significance and effect direction, the core focus of this analysis lies in the assessment of the Post_MA variable. The results, consistent across all three specifications, provide strong support for the alternative hypothesis (H_1), suggesting that M&A transactions create value for acquiring firms in the automotive sector, at least in the short to medium term considered.

In conclusion, the empirical analysis conducted suggests that, within the observed context, mergers and acquisitions represent an effective tool for growth and restructuring, capable of producing measurable positive effects on the economic and financial performance of the firms involved.

5.2 RESEARCH QUESTION 2

5.2.1 DESCRIPTION OF THE ANALYSIS AND LITERATURE REVIEW

This section introduces a further empirical analysis aimed at assessing the financial market's reaction to the merger between FCA and PSA, which led to the creation of the Stellantis group. The research is based on the use of market data related to stock prices and aims to determine whether the announcement and completion of the operation triggered a significant response from investors, in terms of abnormal changes in stock returns compared to expected returns. Understanding the market's reaction to a merger event is a fundamental step in grasping how the operation was perceived from a financial standpoint. Stock prices, in fact, reflect investors' expectations about the company's future value, promptly incorporating all available information. Therefore, any abnormal variation in stock returns around the event provides valuable insights into the market's judgment regarding the merger, its industrial rationale and the prospects for value creation.

The objective of this research is to verify whether the merger was perceived positively or negatively by the market, by evaluating whether the observed reactions deviate in a statistically significant way from expected returns. To this end, the event study methodology is employed, which allows for isolating the effect of the event of interest from the normal market price dynamics. The approach adopted not only quantifies any short-term abnormal returns but also tests their statistical significance, with the aim of providing a clear and well-founded answer to the following research question:

"Did the market react positively to the merger that led to the creation of Stellantis?"

The choice to analyze the market's reaction to the formation of Stellantis is not accidental: the operation, due to its scale and sectoral impact, represents a particularly relevant case in the European landscape in recent years. Moreover, the merger involves two groups with different histories and reference markets, making the analysis even more interesting from an informational perspective. Evaluating investor response thus allows for a better understanding not only of the expectations surrounding the new group but also of the logic with which the market interprets and evaluates major industrial consolidation processes in the current context.

In order to rigorously and contextually explain the approach adopted in this analysis, it is appropriate to introduce a review of the academic literature that has investigated how financial markets react to M&A transactions. The literature review thus provides the necessary theoretical and empirical framework for the analysis conducted, offering references to previous studies that have addressed similar topics. The methodology commonly used in this field is the event study, which has a long history, with the first publication dating back to Dolley (1933)[139]. Among the most relevant contributions in the international literature are the

[139] Dolley, J. C. (1933). Characteristics and review of common stock split-ups. Harvard Business Review.

studies by Jensen and Ruback (1983)[140], which provide one of the earliest systematic overviews of the effects of M&As. They highlight how, in most cases, shareholders of the target company benefit from positive returns, while those of the acquiring company experience more heterogeneous effects. In the European context, the evidence tends to be more varied: studies such as that by Goergen and Renneboog (2004)[141] show that market reactions are significantly influenced by the institutional context, corporate governance structure and the degree of informational transparency. Furthermore, the existence of regulatory barriers, differences in corporate law systems and the level of stock market concentration make the impact of M&A operations in Europe less uniform compared to the U.S. context.

According to McWilliams and Siegel, the event study method relies on three fundamental hypotheses[142]:

H1: The efficient market hypothesis: the company share price reflects all the information available to market participants.

According to this principle, it becomes feasible to examine price movements that occur after the release of significant market information, within a specific time frame during which this information is expected to influence the firm's valuation.

H2- The event has not been anticipated: the market should not have had any information about the transaction in advance.

For the analysis to be valid, the market should not have prior knowledge of the event. In practice, especially for merger and acquisition announcements, some information might be leaked beforehand, due to strategic planning or informal communications. As a result, the market could already reflect part of the news. The risk of information leakage or insider trading supports the use of a symmetrical observation period, known as the event window, that spans both before and after the announcement date.

H3- Confounding effects: there are not confounding effects of other events.

As McWilliams and Siegel point out, other unrelated events can occur during the event window that may affect the stock price. These may include dividend declarations, announcements of mergers, government contracts, new product launches, lawsuits, unexpected earnings reports or executive changes. Any of these could distort

[140] Jensen, M. C., Ruback, R. S. (1983). The market for corporate control: The scientific evidence. Journal of Financial Economics.
[141] Goergen, M., Renneboog, L. (2004). Shareholder wealth effects of European domestic and cross-border takeover bids. European Financial Management.
[142] McWilliams, A., Siegel, D. (1997). Event study in Management Research: Theoretical and Empirical Issues. The Academy of Management Journal.

the true effect of the event being studied. For this reason, defining the right duration for the event window is essential in order to minimize the impact of such confounding factors.

5.2.2 DATA SAMPLE

The empirical analysis conducted in this research is based on the use of daily market data related to Stellantis stock and a representative index of the European stock market. The data were obtained from the Yahoo Finance platform, specifically by downloading the dates and adjusted closing prices, as these reflect the actual market value of a stock, taking into account dividends, stock splits or other technical adjustments. To represent the market, the EURO STOXX 50 index (ticker: ^STOXX50E) was selected as the benchmark. This index includes the fifty largest companies in the Eurozone in terms of market capitalization and liquidity. It was deemed the most suitable because it accurately reflects the European financial context in which Stellantis operates and is more appropriate than other local indices (such as the French CAC 40 or the Italian FTSE MIB), which might capture dynamics that are too sector-specific or geographically limited.

The data collection period spans from September 1, 2020, to February 28, 2021. This time frame was chosen to ensure:

- a sufficiently long estimation period before the event (September–December 2020);
- a comprehensive coverage of the event window (January 2021);
- an adequate post-event horizon to observe any delayed market reactions or corrections.

Based on the adjusted closing prices, daily returns were calculated using the following formula:

$$R_t = \frac{P_t - P_{t-1}}{P_{t-1}}$$

Where:

R_t represents the daily return at date t

P_t is the adjusted closing price of the stock or index at date t

P_{t-1} is the adjusted closing price on the previous date.

This calculation was performed for both instruments (the stock and the index), resulting in two parallel time series of daily returns, which are essential for the subsequent analysis.

5.2.3 METHODOLOGY

The empirical analysis conducted in this research, as previously mentioned, is based on the event study approach in order to assess whether, at the time of the merger completion, significant abnormal returns occurred compared to the stock's ordinary trend and whether such returns indicate a positive or negative reaction from the market. The key steps of the methodology include: estimating the expected return through linear regression, calculating abnormal returns and aggregating them in cumulative form to obtain the Cumulative Abnormal Returns (CAR).

It should be noted that in the following study, the event day is defined as January 18, 2021, which is the first trading day following the official date of the merger, which took place on Saturday, January 16, 2021.

The Market Model

The market model is a linear specification that describes the expected return of a stock as a function of the return of a market index. It is estimated using ordinary least squares (OLS) regression over a period preceding the event, under the assumption that during this interval the stock is not yet influenced by news related to the event itself. The model is formulated as follows:

$$R_{i,t} = \alpha + \beta R_{m,t} + \varepsilon_t$$

Where:

$R_{i,t}$ is the daily return of the stock (Stellantis) at time t;

$R_{m,t}$ is the return of the market index (EuroStoxx50);

α is the intercept term;

β is the market coefficient term;

ε_t is the error term

The estimation window used to estimate α and β is the interval [–121; –21], that is, from September 1, 2020 to December 16, 2020, relative to the event date (January 18, 2021). This window, spanning 101 calendar days (with 76 actual trading observations), was chosen in line with established literature to ensure a robust estimation of the parameters while avoiding informational contamination related to the event.

The output of the OLS regression conducted on the data from the estimation period is presented in the table below. Both estimated parameters are statistically significant:

	coef	std err	t	P>|t|	[0.025	0.975]
const	0.0051	0.002	2.809	0.006	0.001	0.009
Market_Return	0.9442	0.131	7.207	0.000	0.683	1.205

The coefficient α (intercept) is equal to 0.0051, with a p-value of 0.006, indicating a positive expected return independent of the market. The coefficient β, equal to 0.9442, is highly significant (p-value < 0.001), suggesting a strong positive correlation between the return of Stellantis stock and the return of the EuroStoxx 50 index. The model shows an R^2 of 0.412, indicating that approximately 41% of the variance in the stock's returns is explained by the market return— a value considered satisfactory for a market model based on daily data.

Abnormal Returns

Once the market model has been estimated, it is possible to calculate the abnormal returns (AR), which represent the difference between the actual return observed for the stock and the return that would have been expected based on its normal relationship with the market:

$$AR_{i,t} = R_{i,t} - (\hat{\alpha} + \hat{\beta} R_{m,t})$$

where $\hat{\alpha}$ and $\hat{\beta}$ are the parameters estimated during the estimation period. The ARs were calculated over two distinct event windows in order to assess the consistency and intensity of the market's reaction:

- A short window [-1; +1], which includes the day before, the event day (January 18, 2021), and the day after;
- A wider window [-5; +5], covering an eleven-day period, to capture any early or delayed investor reactions.

In both windows, Abnormal Returns were calculated on a day-by-day basis to observe the direction and volatility of the market reaction relative to the stock's normal behaviour.

Cumulative Abnormal Returns

To obtain an overall measure of the event's effect over time, abnormal returns were aggregated through cumulative summation, resulting in the Cumulative Abnormal Returns (CAR), defined as follows:

$$CAR[t_1, t_2] = \sum_{t=t_1}^{t_2} AR_{i,t}$$

where the interval [τ_1; τ_2] represents the event window under consideration, i.e., [–1; +1] or [–5; +5].

The CAR provides a summary of the overall impact of the event on the stock, allowing for an assessment of whether, over the course of several days, the effect was overall positive or negative and to what extent. This measure will also be subjected to statistical testing to verify its significance against the null hypothesis of no effect.

5.2.4 RESULTS OF THE ANALYSIS

This section aims to present, analyze and discuss the results obtained from the application of the methodology previously described. The objective is to assess the existence and direction of any abnormal changes in stock returns in connection with the merger between FCA and PSA, using January 18, 2021 as the reference date.

The presentation of the results is organized into two distinct subsections: the first presents the abnormal returns observed within the narrow three-day event window, while the second analyzes a broader time window. For both, the values of the daily abnormal returns (AR), the cumulative abnormal returns (CAR) and the main statistics relevant for the economic and statistical interpretation of the results will be reported.

Event Window Analysis [-1; +1]

In the event window [–1; +1], which includes the day before the event (January 15, 2021), the event day (January 18) and the following day (January 19), daily Abnormal Returns (AR) were calculated, yielding the following results:

Date	Abnormal_Return
2021-01-15	-0.015237
2021-01-18	0.016087
2021-01-19	0.121642

A particularly interesting pattern emerges from the data: on the eve of the event (January 15), a negative abnormal return (–1.52%) is recorded, which may reflect market uncertainty or volatility in anticipation of the official confirmation of the merger. However, in the days that follow, the reaction appears clear and decisive: on the announcement day (January 18), a first positive AR of +1.61% is observed, which significantly increases on January 19, reaching an abnormal return of +12.16%. This latter figure, in particular, suggests a strong market revaluation, potentially driven by a combination of factors: a favourable reception of the news, a better understanding of the expected synergies or an upward revision of expectations for the new Stellantis group.

The AR trend thus indicates a reaction that is not immediate but progressively intensifies, consistent with a process of investor expectation adjustment as the details of the operation are absorbed by the market.

By summing the daily abnormal returns over the [–1; +1] window, the Cumulative Abnormal Return (CAR) is obtained, which amounts to +12.25% for the period considered, an overwhelmingly positive value that signals a significant appreciation of the stock in response to the merger announcement. To assess whether this result is statistically significant and not due to chance, a t-test was performed using the following formula:

$$t = \frac{CAR}{\sigma_{AR} \cdot \sqrt{n}}$$

Where:

σ_{AR} is the standard deviation of the daily abnormal returns estimated during the estimation period,

n is the number of observations in the event window (in this case 3).

From the regression, a t-statistic of 4.5177 was obtained, corresponding to a two-tailed p-value of 0.0457. Since the p-value is below the 5% significance threshold, it can be concluded that the CAR observed in the [–1; +1] window is statistically significant.

CUMULATIVE ABNORMAL RETURN ANALYSIS - EVENT WINDOW [-1, +1]

Metric	Value
Cumulative Abnormal Return (CAR)	0.1225
T-Statistic	4.5177
Two-Tailed P-Value	0.0457

In financial terms, the positive and significant CAR can be interpreted as a manifestation of market confidence in the industrial and strategic validity of the merger, as well as in its potential to generate synergies or future growth opportunities. This confirms that the market reacted positively to the transaction. From a methodological standpoint, the concentration of abnormal returns around the event date strengthens the validity of the event study approach as a tool for isolating and quantifying the informational effects of extraordinary corporate actions.

Event Window Analysis [-5; +5]

To extend the analysis beyond the market's immediate reaction, the event window [–5; +5] was considered, which includes five days before and five days after the official event date. The daily abnormal returns (AR) calculated over this interval are reported below:

Date	Abnormal_Return
2021-01-11	0.013788
2021-01-12	0.039382
2021-01-13	0.012256
2021-01-14	0.046757
2021-01-15	-0.015237
2021-01-18	0.016087
2021-01-19	0.121642
2021-01-20	0.014749
2021-01-21	-0.002934
2021-01-22	-0.008347

The analysis reveals a complex but generally positive pattern. In the days leading up to the announcement, positive and increasing ARs are observed, particularly on January 12 and 14, suggesting possible information leakage or anticipatory trading by the market. The highest peak occurs on the day following the event (+12.16% on January 19), confirming a strong favourable response from investors. The days that follow show a slight correction, but not enough to offset the cumulative positive impact generated earlier. Overall, the distribution of ARs across the window suggests a broad and persistent informational effect, extending beyond the single event day and consolidating over the short term.

The sum of the daily abnormal returns in the [–5; +5] window yields a Cumulative Abnormal Return (CAR) of +23.81%. A t-statistic was also calculated in this case to test the significance of the result, producing a value of 4.8107, with a two-tailed p-value of 0.0010, well below the 5% significance threshold. The result is therefore highly statistically significant.

CUMULATIVE ABNORMAL RETURN ANALYSIS - EVENT WINDOW [-5, +5]

Metric	Value
Cumulative Abnormal Return (CAR)	0.2381
T-Statistic	4.8107
Two-Tailed P-Value	0.0010

This evidence suggests that the observed effect is not only statistically relevant, but also more pronounced and persistent than what was observed in the shorter event window. The presence of positive abnormal returns even in the days prior to January 18 may indicate a gradual incorporation of information into the stock price, consistent with a market reaction in advance, possibly due to rumors or expectations regarding the outcome of the transaction. The high level of the CAR (+23.81%) over such a short time frame reinforces the interpretation that the merger between FCA and PSA was perceived by investors as a strategically advantageous and potentially value-generating operation in the medium term. In this case, both the statistical significance and the magnitude of the result support the hypothesis of a favourable market reaction confirmed not only on the day of the announcement, but also by a broader positive trend.

Conclusions

The empirical analysis conducted in this study has made it possible to evaluate the market's reaction to the merger between FCA and PSA. Based on the calculated abnormal returns and the statistical significance of the results, several key conclusions can be drawn.

In both event windows analyzed, cumulative abnormal returns (CAR) were found to be positive and statistically significant. Specifically, the CAR in the short window reached +12.25%, with a p-value of 0.0457, while in the wider window the CAR amounted to +23.81%, with a p-value of 0.0010. These results indicate that, in the period immediately following the announcement, the market reacted favourably, significantly revaluing Stellantis stock. The reaction was not only positive but also economically meaningful, suggesting that the merger was interpreted by investors as a strategic decision capable of generating value in the short to medium term.

Beyond the numerical summary, it is important to reflect on the theoretical and methodological implications of the findings, particularly in relation to the three key assumptions underlying the event study approach, as formulated by McWilliams and Siegel:

- H1 – Efficient Market Hypothesis: this hypothesis posits that prices reflect all information available to the market. The results obtained appear consistent with this assumption: Stellantis stock recorded significant changes precisely in the period immediately following the dissemination of the merger news. The fact that the highest AR occurred on the day after the announcement (January 19) indicates that the market processed and incorporated the new information rapidly into prices, as predicted by the semi-strong form of market efficiency. The presence of a significant and immediate response therefore supports the validity of Hypothesis H1.
- H2 – No Anticipation of the Event: this second hypothesis requires that the event was not anticipated by the market. However, the analysis of abnormal returns in the [–5; +5] window reveals that positive and significant values were already present in the days preceding the official announcement (particularly between January 11 and 14). This may suggest a certain degree of anticipation by investors, potentially linked to market rumors, informal communications or pre-announcement signals. While this does not invalidate the entire analysis, it represents a potential limitation to Hypothesis H2, while also reinforcing the methodological decision to adopt a symmetric window that includes the days before the event, as recommended by theory. This allows for the capture of any pre-announcement effects, preventing the overall impact of the event from being underestimated.
- H3 – Absence of Confounding Events: the third and final hypothesis states that no other significant events occurred during the event window that could have influenced stock prices. During the construction of the window and the selection of the observation period, no other relevant corporate announcements (e.g., earnings reports, changes in governance or impactful macroeconomic

communications) were identified that could have interfered with the effect of the merger. Although the influence of minor external factors cannot be entirely ruled out, there is no evidence to suggest the presence of significant confounding events. Therefore, Hypothesis H3 can be reasonably considered satisfied, strengthening the reliability of the analysis.

In conclusion, the results obtained have important implications from a managerial perspective and for the stakeholders involved. For investors, the market's positive reaction serves as a signal of confidence in the prospects of the new group and its ability to generate operational and financial synergies. For management, the empirical evidence supports the strategic choice of pursuing a merger as an effective response to the competitive challenges of the global automotive industry. Finally, for analysts and regulatory authorities, the study provides confirmation of the functioning of pricing mechanisms in European markets in the context of complex extraordinary corporate transactions.

CONCLUSIONS

This paper aims to provide an in-depth analysis of the role of M&A as a strategic lever for growth and consolidation in the automotive sector. By integrating theoretical analysis, industry context and empirical evaluation, the objective is to understand whether and to what extent such operations generate value for the companies involved and their stakeholders. Particular attention is given to the merger between FCA and PSA, a major international operation that led to the creation of Stellantis, now one of the leading global players in the automotive industry.

The analysis clearly highlights the rationale that drives companies to undertake extraordinary operations like M&A: the pursuit of operational and financial synergies, the improvement of competitive positioning, access to new technologies and markets, as well as responses to external pressures such as technological innovation and regulatory changes. At the same time, it emerges that these operations also entail significant challenges, including the complexity of post-deal integration, risks of overvaluation, cultural difficulties and the need for clear and realistic strategic planning.

In the specific context of the automotive industry, severely affected in recent years by extraordinary events such as the Covid-19 pandemic and the transition toward electric mobility, M&A operations are increasingly seen as essential tools to face radical transformations and ensure long-term economic sustainability. The Stellantis case stands as an emblematic example of how two historic groups, through a well-structured operation driven by shared strategic goals, were able to build a more solid and globally competitive entity.

On the one hand, the theoretical analysis highlighted the multiple strategic drivers behind M&A operations, as well as the critical issues that can undermine their success, while on the other hand, the empirical analysis provided concrete evidence of the effectiveness of such operations. Specifically, the first analysis, conducted using a multiple regression model, demonstrated that M&A operations in the automotive sector generate positive and significant effects on corporate performance. The variable *Post_MA*, introduced to measure the impact of the operation, proved to be positive and statistically significant across all three tested specifications (ROA, EBITDA Margin, Net Profit Margin), confirming the validity of the thesis that such operations can enhance the profitability and operational efficiency of the companies involved. The second research question investigated the market reaction to the merger between FCA and PSA. Through the analysis of the Cumulative Abnormal Return (CAR), a positive and statistically significant result emerged, indicating a favourable perception by investors of the operation. This finding suggests that the market recognized the strategic potential of the creation of Stellantis, in terms of synergies, competitive consolidation and the ability to face the challenges of the transition toward sustainable mobility.

Although the results obtained are overall encouraging and consistent with the initial hypotheses, it is important to highlight some limitations that characterize the analysis conducted. First and foremost, the quality and availability of financial data represent a significant constraint. The econometric analyses rely on accounting

and financial indicators whose reliability depends on the transparency and consistency of the information published by the companies. In some cases, differences in accounting standards, data presentation methods or the lack of complete and up-to-date information may introduce distortions in the results and undermine comparability across firms.

Moreover, key variables such as ROA or EBITDA Margin can be affected by extraordinary events that are not always easily identifiable within the datasets used, leading to a potential overestimation or underestimation of the impact of M&A operations. A second limitation concerns the size and structure of the sample. Although the analysis is intentionally focused on the automotive sector, in line with the research question, the sample includes a limited number of observations, selecting only the top 50 transactions by deal value within a defined time frame. While this criterion allows the study to concentrate on major deals, it may exclude smaller mergers and acquisitions that, despite having strategic or regional significance, fall outside the scope of the analysis. On one hand, the chosen time frame makes it possible to observe medium to long-term effects; on the other hand, it limits the ability to fully assess the impact of long-term structural dynamics, such as regulatory changes, shifts in business models or strategic developments of smaller firms, which are often excluded from the selection. Finally, the analysis is based on a purely quantitative approach. Fundamental aspects such as cultural integration, the quality of post-deal management, communication strategies and the impact on governance are difficult to measure yet often crucial to the success of a transaction. Their exclusion, inevitable within the adopted econometric framework, represents a further area to consider when interpreting the results comprehensively.

Based on the results obtained, several avenues for further research emerge that could enrich the understanding of the impact of M&A operations in the automotive sector. One potential development would be to expand the sample analyzed, including not only the largest transactions but also smaller deals, which are often overlooked yet potentially significant from a strategic or regional perspective. This would allow for a more comprehensive and nuanced view of the phenomenon, going beyond the most high-profile deals in the media or financial markets. Additionally, it would be valuable to explore the qualitative implications by complementing the quantitative analysis with methods such as case studies, document analysis or interviews with managers, advisors and stakeholders involved in the merger processes. This approach would help investigate aspects often neglected in econometric models, such as post-merger organizational dynamics, governance decisions, cultural integration and the effectiveness of communication strategies. Finally, given the ongoing transformation of the automotive industry, future studies could focus on tracking more recent M&A transactions to analyze their evolution over time and assess their impact in relation to the major current drivers of change: the electric transition, digitalization, adoption of ESG standards and national and supranational regulatory pressures. Observing how M&A operations adapt to these new scenarios will be crucial to understanding the strategic role they will continue to play in shaping the future of the sector.

In conclusion, this thesis has demonstrated that M&A operations, when properly planned and managed, can represent a significant engine for value creation, both financially and strategically. The Stellantis case stands as a concrete and timely example, confirming the relevance of extraordinary operations as a strategic response to the challenges and opportunities shaping the evolution of the automotive industry.

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