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Dynamic Impacts of the Motives Behind M&As in the automotive industry

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Academic year: 2021/2022

Wordcount: 14 434

Statement of Originality

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Abstract

Nowadays we are living in the world where it is hard to lose out of sight the substantial and long-lasting changes that are gradually reshaping the automotive industry, one of the main locomotives of global technological and manufacturing development. The transformation goes far beyond the scope of direct automobile production and creates large indirect effects for various industries. One of the paths of perceived transformation transmission lies through Mergers and Acquisitions that have already become an essential and widely-used practice in the car world. Therefore, in order to understand the nature and significance of the changes taking place it becomes crucial to understand the real motives behind the reshape of automotive M&A operations and identify the key factors that influence and form these motives. In order to accomplish that, this research conducts mixed analysis combining both quantitative and qualitative methods. Regression and correlation analysis provide with general understanding regarding the existence of certain trends in the industry that are possible to evaluate in a numerical dimension and analysis of the information regarding the latest M&A operations that showed the largest impact and significance for the industry representation allows to form precise conclusions regarding how and why did the sector transform and what is even more important - where are these transformations leading in the future.

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Chapter 1: Introduction

We are living in a world of continuous and rapid technological development that does not leave a single sphere of life and business untouched and unaffected. Some of these developments happen constantly and result in substantial changes of business, behavioral and strategic paradigms of the economic and industrial worlds. The birth and development of the automotive industry was one of the first and the biggest results of an increased technological development over a century ago, reshaping the lives of entire generations, creating a new framework of economic and financial activity, which changed the world and made everyone adapt to its progress and development. Today we see a different picture where the automotive industry represents one of the large, old and hulking industrial giants that have to adapt and transform to survive the new global market conditions created by continuous waves of technological advancement and digitalization.

The last 20 years reshaped the automotive industry to a large extent. The previous competitions between the car producing brands were won by the ones obtaining the largest engine, or the most consumer-favoring design, compared to the current landscape, won by the one who obtains the most advanced and efficient technologies and matches the current market requirements (Conzade, J., Cornet, A., Hertzke, P. et al. 2021). New technological advancements in terms of digitalization of car operating systems and electrification of the drivetrain, have made the car production process substantially more complicated in terms of innovation and knowledge acquisition.

These changes, alongside with the reverse of trends in the M&A strategies which were always an important component of car business operations, created a situation of strategic uncertainty. This results in one of the key problems in management of the whole automotive industry, bringing to question if the major companies in the car business need to form new markets, integration and financial strategies and create a new business framework. If the answer on the previous question finds positive support – which business development and growth options should they follow, and will they be able to organize the strategic coherence in their actions, or will the industry become a chaotic field?

During much of the 20th century, the M&A integrations were mostly conducted on a horizontal basis in the automotive industry, which resulted in large multi-branded international entities that had their core goals of enriching their market shares and geographical expansion. We now see the switch towards more vertical M&A integration, when brands do not longer seek to cooperate with the competing brands, but rather to acquire the firms acting as their direct suppliers or customers. These actions follow various rationales, some companies seek value and supply chain improvements while others aim on acquiring a maximized amount of assets, technologies and knowledge in-house.

Existing literature and M&A cases of the last few years support the existence of such a trend underlying that more and more integrations are conducted vertically or in a conglomerate way. Despite the existence of the trend, the literature cannot give a precise and unified conclusion on the reason for such transformation of the industry and prove whether technological advancement and electrification influenced the trends in automotive M&A.

This paper seeks to understand the reasons and nature of the recent substantial trends in automotive M&A operations, identify the most effective ways of further development and answer the main research question – *What key drivers can be identified as having changed the motive behind M&A's in the automotive industry?* Did the electrification and technological complexity increase change the trend directions in automotive mergers and acquisitions or was it a result of market evolution? In order to find a comprehensive answer to this question the paper will investigate the key processes in automotive M&A operations, research the latest M&A integration cases and analyze the overall business trends and possibilities in the industry to define efficiency-maximizing strategy.

The findings of this paper will help managers and strategic analysts of the major car companies to analyze their previous strategic growth decisions, identify their most vulnerable weaknesses and form a more efficient strategy towards further development in the automotive market. Companies involved in automotive value chains will get a possibility of a more objective estimation of their strategic position which might influence their business developments and decision-making regarding integration operations. In addition, the findings will help to build a clearer picture of an automotive business framework which might contribute towards more precise market trends understanding of the potential investors and private individuals.

Chapter 2: Literature review

This part of the paper contributes to the discussion regarding the key concepts and theories of the observed topic in order to create the framework of the research.

2.1 What is M&A

The key concepts and processes described in this paper share at least one point of academic intersection – they all depend and are formed around *mergers* and *acquisitions*, also referred as M&A processes.

M&As can be described as a consolidation process between two or more independently existing firms that share their interests in various ways of integration or takeover each other (Martynova, N., 2014). Such transactions result in the form of an entity that combines participating companies to a certain degree. It is important to acknowledge the difference between a merger and an acquisition as both actions have their very own specific features, goals and ways of implementation.

Generally, the difference between a merger and an acquisition is financial as well as organizational. Merger action can be described as a process of co-integration between the firms in which both participating sides combine their independent entities in order to create a brand new entity, often issuing new shares of the combined company. Such a situation allows one to achieve not only the general goals of the newly created entity but also to satisfy the needs and requirements of both of the firms prior to the integration process. However, a merger process requires a certain level of size and value comparability between the participating companies in order to maintain the most efficient input and output allocations.

An acquisition is more likely to be primarily an equity ‘takeover’ of one firm by another, and often results in the elimination of the target firms as separate listed companies. The process does not require comparability as most frequently the actions are represented when a larger company buys a smaller firm in order to integrate it in an already existing structure or form a new subsidiary. In such a situation the legal status of the smaller firms gets reallocated into the property region of the acquiring firm and grants it access to the desired assets, technologies and human capital. Nevertheless, merger and acquisition processes do not always follow a unique

particular procedure as they can also be distinguished between the friendly and hostile ones. Hostile merger is generally defined when the initial offer is being rejected by the target firm (L. Pinna). Such a situation creates additional complexities and tensions in the integration process.

Mergers and acquisitions can be performed in a domestic as well as in cross-border setting depending on the targets and goals that the integration carries in its' core. It is generally believed that domestic M&A is more commonly met in the integration with relatively small companies and therefore carry lower value.

2.2 Typology

There are various reasons for companies to get involved in M&A processes – some companies make such commitments in order to create operating synergies and acquire strategic assets, others seek greater market position and product and geographical market expansions. Some companies aim to maximize economies efficiency and enhance internal knowledge and skills within the firm. All aforementioned goals have been proven to be achieved via M&A integration in the past decades, the main complexity of their achievement lies in choosing the right type and path of execution of M&A.

The most important distinction in the types of merger and acquisition processes can be described in three words – vertical, horizontal and conglomerate. The processes involving integration of upstream and downstream firms in an already existing value chain are the *vertical* acquisitions. In such processes the target firms are most commonly represented by the customers or the suppliers of the parent firm (Aktas, N., de Bodt, E., Derbaix, A., 2003). Such acquisitions are usually performed in order to secure frequent and critical transactions for the parent firm, eliminate or decrease strategic threats in the value chain and achieve deeper development in specific areas. Participating in downstream M&A could be conducted with a goal of profitability increase via internalizing the value chains and eliminating markups and occupying a larger market share in the customer sector. Upstream M&A therefore secure the relations with the strategic suppliers of the parent firm making them a part of a bigger entity and guaranteeing a competitive advantage. Vertical M&A are essential in situations of high asset specificity, durability and intensity. They are also very effective in reducing frequent and

often complex transaction costs that a firm would otherwise face on a more competitive open market. However, despite the large pool of benefits, vertical M&A also possess a number of specific risks being represented by various contractual voids, asymmetric information, opportunistic behavior or worsening of contractual conditions.

Integration processes between the firms that produce and operate in the same niche and market are *horizontal* M&A (Aktas, N., de Bodt, E., Derbaix, A., 2003). It is commonly met that two competing firms decide to get involved in such integration therefore creating a bigger entity and decreasing existing level of competition. Horizontal mergers can be performed in order to gain competitor's strategic assets such as brand name or intellectual property (Audi and Lamborghini), improve network externalities, obtain additional industrial or technological domains and simply to largely increase the market share, quickly, often because a potential competitor has been removed from the field. In mature sectors of the economy, horizontal mergers act as a clearing instrument helping via excess capacity reduction, such examples were widely presented in the automotive industry of 1970-1980s and banking industry of early 2000-s. Horizontal merger execution allows to neutralize threats created by the competitors by implementing them in their own structure additionally with seizing technologies or product lines that obtain high market potential. However, one of the biggest challenges connected with such a type of M&A lies in the fact that horizontal integrations attract more attention and are easier to block by the market.

Conglomerate M&A operations can be described as a new entity created from various kinds of unrelated businesses. General Motors and Mitsubishi Heavy Industries are one of the best conglomerate examples. The latter company owns a large pool of unrelated businesses that operate in automotive, mining, telecom, shipbuilding and other industries and represent a highly diversified portfolio. Conglomerate formation brings substantial advantages as it can increase the market power and survival capabilities of the firm, create a wholly new and highly independent internal capital market ecosystem and diversify risks. Despite all these benefits one might notice that the golden age of conglomerates has already past somewhere in the middle of the 20th century and their amount decreases from year to year. In most of the cases the cause for that is formed by high managerial complexity of the current operations, imperfect monitoring efficiency and agency problems. The biggest challenge faced by conglomerates lies in complexity to frame the overall strategic direction of the company that often leads to high inefficiencies and market leadership loss.

2.3 What is the automotive industry – what it consists of, key numbers and fields

Automotive industry is one of the largest parts of the world-wide manufacturing networks consisting of hundreds of brands producing the automobiles alone and millions of firms connected via supplier or consuming chains with the industry. The global automotive manufacturing market was sized at approximately 2.7 trillion U.S. dollars in 2021(Statista) which underlines the importance of the field for many sectors in the economy. The automotive industry has become a vital element in the economy of the industrialized countries—motor vehicle production and sales are one of the major indexes of the state of the economy in those countries (Rae, J. Bell, Binder, A. K., 2020). The industry is not only represented by the firms producing the cars as a final product but also by a large number of companies adding the value for the end value chain. Such companies can be seen both in production markets - producing tyres, headlights, glass, on-board controlling computer systems, microchips etc. and in the commodities markets – large companies depend on the automotive industry orders regarding the use of steel, rubber, gold, wood, magnesium and oil. The list of associated companies is not limited only to the production and goods sectors of the economy as there are various financial institutions such as banks, leasing corporations and gigantic distribution networks working solely on the automotive industry.

According to Hill et al. (2015), due to the fact that jobs in the automotive industry go far beyond designing and building vehicles and creates large leverage on the consumer demand in aluminum, copper, iron and other industries it results in a substantial multiplier effect on the job market. The study shows that in the US alone every OEM (Original Equipment Manufacturer) employee had an employment multiplier effect of 7.6 (or 6.6 additional jobs for every direct OEM job), together with an evaluation that an entire industry employment multiplier effect goes up to 4.7(Hill et al., 2015). These effects are supported by another study conducted by M. Mathur and R. Kidambi in 2013. Both the studies emphasize the importance of the automotive industry for both its multiplier effects and industrial development. The paper *The Contribution of the Automotive Industry to Technology and Value Creation* states that the automobile industry is a pillar of the global economy, a main driver of macroeconomic growth and stability and technological advancement alongside with the fact that the core automotive industry (vehicle and parts makers) supports a wide range of business segments, both upstream and downstream, along with adjacent industries. This leads to a multiplier effect for growth

and economic development. Furthermore, R&D and innovation within automotive can benefit other industries, such as the insurance industry's use of innovative ideas, for example, automotive telematics (R. Kidambi, M. Mathur, 2013).

During the course of the 20th century there was a visible and vital influence of the automotive industry not only on the trends in the economy but also on various aspects in the societal factors, politics and further path of world development. The industry opened new horizons regarding the boundaries of personal transportation and mobility, created new travel cultures and resulted in new segments of the service markets oriented solely on the users of the newly born industries like gas stations, motels and on road restaurants that created new amenities (Rae, J. Bell, Binder, A. K., 2020). In a certain way, the possession of an own automotive industry became a matter of a country's prestige in particular regions as such industrial sectors could state the effectiveness and developments in technological, manufacturing and engineering fields. Since the boom in development and international expansion of the automotive industry in the beginning of the 20th century only one other industry managed to outperform it. Such achievement was gained by tech and computer industry that nowadays is rapidly being integrated in many of the crucial sectors of the automotive industry.

2.4 Why M&A has been important for automotive industry

M&A processes were always a crucial part of the automotive industry due to high complexity of the car manufacturing process, its requirements of a long list of unconnected accessories that demand high technological and knowledge concentration, do not work on their own but in a combination create a well-constructed an advanced product in a form of a car or any other vehicle. The automotive supply industry contains a number of different product segments. Competitiveness within each segment strongly depends on the individual product with different market consequences, as some suppliers deliver very complex products, for example Xenon-headlights, tires, forgings might bear suffer from over-capacity which in turn increases the degree of rivalry experienced within these segments (Carr, 1993) and call for an M&A solution as a mean of effectiveness improvement (Laabs, JP., Schiereck, D., 2010).

That is why towards the turn of the last century, many industries including the automotive supply industry faced increasing merger activity. The pressure to produce better equipped and

less expensive automobiles created a growing trend towards specialization and internationalization of the industry (Laabs, JP., Schiereck, D., 2010). Another reason for a wide M&A implementation in the segment was performed as a measure of geographical expansion (Sadler, 1999). Integration between multiple brands played an important role in conquering new markets with high consumption and financial potentials. In certain occasions the brands sought integration as a mean for acquiring a new field for gathering and testing the technologies and new market formats. One of the biggest examples of such integrations could be traced to history of Land Rover brand acquisition by BMW group and Ford Motor Company. In 1994 BMW Group acquired Land Rover, a well-known producer of 4x4's and luxury SUVs with high market competence and deep specialized knowledge in order to attain, develop and test the new technologies for their own SUV program within the BMW brand. When all the required technologies were acquired and tested followed up by releasing a first BMW SUV model – BMW X5 in 1999, the brand Land Rover was sold to another market giant – Ford Motor Company in year 2000. Being an American market-orientation brand, Ford required a new product to attain large amounts of potential consumption of the SUV products in the European market where Land Rover was already among the market favorites regarding the brand reputation. Therefore, via Land Rover acquisition Ford Motor Company managed to largely expand their customer pool on the European markets and bring a new product line of luxury SUVs to the main and fastest growing SUV market – North America.

2.5 Electrification of the automotive industry and its impacts

The last 20 years played a crucial and unique role in the timeline of the automotive industry development and brought new trends, strategic directions and requirements that fully reshaped the market situation. At the turn of this century, the automotive industry could already show the signs of rapid transformation regarding the strategic development as the majority of the produced goods increased the amount of technological developments and high-tech systems implementation to a great degree. The cars being produced from 2000's barely had similar technologies and components with the cars that were still in production in the end of 1990's. Old, large, heavy and cheap components that were widely used and had hardly changed since the end of 1960's were replaced by newer, more complex and lighter engines, suspensions and brake systems, with components that relied mostly on the software controlling and tailoring their behavior. Such a technological turn in the industry was explained by various factors. First,

after the golden age of horizontal M&A processes that were happening in 1980-2000, the largest automotive brands gained a wide variety of technologies with high market potential that were collected via inter-brand integration and cooperation and were needed to implement in the new products before they lose their market values. Secondly, the automotive industry became in the scope of the political processes regarding corporate social responsibility, especially regarding the emissions problems. New regulations implemented regarding emissions controls forced the companies to take new engineering decisions which brought complexity of the produced components to even higher levels. These new engineering complexities resulted in a large list of new components required to be present in newly produced cars and therefore created a necessity for their most effective and efficient production. Many new companies got formed on such market changes and later on were in the center of M&A processes.

With the later development of the automotive industry one more major reason for large technological complexity density arose, represented by electrification. Industry players are accelerating the speed of automotive technology innovation as they develop new concepts of electric, connected, autonomous, and shared mobility. The industry has attracted more than \$400 billion in investments over the last decade—with about \$100 billion of that coming since the beginning of 2020. All this money targets companies and start-ups working on electrifying mobility, connecting vehicles, and autonomous driving technology (Conzade, J., Cornet, A., Hertzke, P. et al., 2021). Electrification will play an important role in the transformation of the mobility industry and presents major opportunities in all vehicle segments, although the pace and extent of change will differ. To ensure the fast, widespread adoption of electric mobility, launching new EVs in the market is an important first step. In addition, the entire mobility ecosystem must work to make the transformation successful, from EV manufacturers and suppliers to financiers, dealers, energy providers, and charging station operators (Conzade, J., Cornet, A., Hertzke, P. et al., 2021).

The result of such large technological complexities can be seen in the shift of the M&A integrations from horizontal towards the vertical ways of implementation. Such assumption is being represented by the latest cases of M&A integrations in the automotive business. Twenty years ago there was a clear market trend in this field – major players being represented by end product producing brands were integrating and creating large stakes of new values. Such mergers were large but rather rare and all the values of global M&A processes were created by

a few large transactions. Nowadays the market picture has suffered drastic changes. One might find it difficult to find a large deal between the major car producing brands in the last year but it is not due to the fact that M&A does not happen in the industry anymore, but rather because they got transferred into a new shape. The value of the M&A processes was never as high as in 2020 and 2021 but the value is now created not by the integration of competing companies but by the tech-driven transactions and shoring up the supply chains. Mergers and acquisitions that accelerate digital transformation are likely to continue to dominate the market and lead to premium valuations.

In M&A, technologies vary, but include electric and autonomous vehicles, batteries and charging technologies, additive manufacturing, next-generation materials, production with non-fossil energy sources, data-driven insights, and the tools to monitor and report environmental, social and governance (ESG) performance (Anzivino, N., Elie, P., Heinemann, S., 2022).

2.6 Micro-economic perspective

Academic literature regarding the general micro-economic theories and strategies regarding optimizing and dealing with characteristics of manufacturing firms also contain several explanations for the existing change in automotive M&A. Existing theories underline the importance of the size and scope and technological advancement levels in operating manufacturing companies that imply a substantial influence on the strategies used and further plans to be developed. The study conducted by B. Tomlinson and M. Krzus in 2019 states that many of the spheres of economic activity and especially heavy manufacturing share a certain combination of requirements. One of the most crucial of them lies in the current need for a long-term focus regarding all major investments conducted by manufacturing facilities. This can be explained by high fixed costs that are vital to plan in advance by such types of companies. Another explanation regards the rising board involvement and strategic investor initiative as boards had often been involved in the long-term arrangements and were adjusting to account for long-term and sustainability priorities (B. Tomlinson & M. Krzus, 2019). This implies that the current position of the high market capitalization and vulnerability regarding rapid market changes influence the position of increased share- and stakeholders for their critical bias against large operations and integrations. Current investors require long-term

guarantees in terms of firm operations and therefore reject the risk of large M&A. The rejection of execution of large integrations therefore forces the firms to move into vertical operations that can often possess lower risk and show immediate results.

Another microeconomic explanation is based on the work of S. Cameron in 2018 describing the key characteristics of manufacturing. It implies that the theory of the firm requires the companies to constantly seek for more efficient ways of production creating continuous industrial competition that previously led to primary Detroit assembly lines and now to implementation of artificial intelligence and robotics. Such development is impossible without inter-sectional expansion which also influences industries to cooperate in a vertical way via technology and knowledge acquisition.

2.7 Conceptual Framework

After taking into account the academic knowledge on the development of M&A practices and real time data from already executed integration operations a conceptual framework of the research can be formed. As common M&A implementation and execution ways are believed to be tailored according to situation specific goals of the operation and influenced by previous market experiences and examples, one might assume several direct explanations of the trend change in automotive M&A operations. Based on combination of theory and market data, the first assumption states that technological complexity increase and electrification of the automotive market played the most important role in the trend change via reshaping the integration goals from conquering new market shares and geographical markets towards seeking for more technological and innovation knowledge in-house for the purpose of obtaining a competitive advantage in the industry. However, all aforementioned targets came at the cost of increasing financial barriers of entry for technology-driven M&A operations leaving the ability of effective participation in these integrations only to the biggest players on the market that can afford capital-intensive integrations and market transformation. On this assumption the Hypothesis 1 can be formed.

Hypothesis 1 – Due to large capital growth and financial barriers of entry technology-driven m&a becomes beneficial only for the largest automotive firms

Relying on the available data of the main companies in the car manufacturing market it is possible to form another assumption. Existing data states a continuous and generally successful growth of the market capitalization of the biggest automotive companies. Taking into account that in the “golden age” of horizontal automotive M&A (1987-2000) the car companies were much higher in the ranking of the most globally valuable companies (much higher than tech companies as they were only starting their operations; opposite to current situation) the representatives of the industry had wider possibilities for acquisition of an almost any desired firm. In the course of the previous twenty years the major giants in the automotive business had gained and acquired most of the competitors in the field of their interest to such an extent that created a point where the biggest players in the market are too big to integrate with smaller entities and not lose market credibility/legitimacy. This can be explained by the fact of the high valuation of the current market leader which stimulates more companies to get involved in horizontal integrations in order to increase their overall financial indicators via adding deals with higher transaction value to the operations history of the firm. On the aforementioned assumption the Hypothesis 2 can be formed.

Hypothesis 2 – As a result of automotive M&A transformation firms tend to participate in horizontal M&A mainly in order to create additional financial value through growth and synergies

Based on the available data containing the information regarding the market and overall efficiency indicators another assumption can be made. This assumption is built on the previous results of M&A practices in a way of their implementation. The assumption has its base that the relative effectiveness of technology-driven M&A operations depends on the degree of implemented corporate control measured in the amount of acquired stake in the process of integration. The data showing financial and managerial inefficiency of horizontally implemented integration processes can act as a factor of influencing towards the trends switch from horizontal to vertical and conglomerate M&A operations in the automotive industry. On such assumption the Hypothesis 3 can be formed.

Hypothesis 3 – the amount of corporate control influences the effectiveness of technologically-driven M&A integrations.

The information gathered from testing of aforementioned hypotheses will allow us to identify some of the core factors influencing the trends in automotive M&A and will give a possibility to evaluate the performance of the current managerial strategies in terms of integrations and business development. This will give a possibility to understand whether the car companies will need to change their current strategies and the particular results of the hypothesis testing will give a general understanding on how the strategic changes should be implemented, what are the weakest points of current operations and which strategic direction should be followed.

Chapter 3: Methodology

3.1 Samples and Datasets

In order to obtain a higher level of objectivity in results and overview information of the tested theories and hypothesis this study uses a combination of various numerical and factual indicators. The first step of the research takes place in the quantitative field aiming to identify certain concrete factors and strategies that can be seen over the past years in the automotive industry. The second step will elaborate on the quantitative results in a more theoretical and behavioral approach that will bring more general understanding on the reasons for quantitative changes and potential for further development.

In the quantitative part of this study we use four different datasets containing information regarding M&A, technology, financial operations in the automotive industry. The decision to extend the research to four separate datasets was taken in order to maximize the possibilities of objectivity of the observed factors and widening the ranges of the overseen determinants. Several datasets additionally allow the implementation of multiple models on a wider variety of factors.

The first reviewed dataset is represented by a database of 58 625 Global M&A deals conducted between 1980 and 2019 in different industries. The database provides with information regarding various factors: 1) Date 2) Acquirer name 3) Acquirer nation 4) Target name 5) Target nation 6) Acquirer Primary SIC Code 7) Acquirer Primary SIC Code Description 8) Target Primary SIC Code 9) Target Primary SIC Code Description 10) Value of transaction (\$mil) 11) Synopsis

Provided data went beyond the limits of current research interests and therefore was filtered by usage of the code words in synopsis and descriptions to identify the deals connected with the automotive industry. After filtering the data, we are able to obtain a sample of 977 M&A deals conducted in the automotive industry in the period between 1981 and 2019.

The second dataset presents already filtered information regarding automotive M&A deals that were conducted between 1998 and 2013. It contains the information on 46 global and

independent cases describing their factors via: 1) Name Acquirer 2) Country Acquirer 3) Name Target 4) Country Target 5) Announcement Date 6) Acquired stake (%)

The third dataset provides information in a specific region of rapid automotive M&A growth – in Asia. The dataset shows information on 2876 cases of M&A deals across different sectors and describes them via following factors: 1) Target/Issuer 2) Exchange: Ticker 3) Transaction Type 4) Transaction Status 5) Total Transaction Value 6) Buyers/Investors 7) Sellers 8) CIQ Transaction ID 9) M&A Closed Date 10) Target Market Cap 11) Acquirer Market Cap 12) Announced Date 13) Company

Taking into consideration the extended amount of data provided within the dataset it was decided to filter it in order to obtain clean data that will be relevant for the automotive cases. After filtering the dataset presents 76 automotive M&A deals that were conducted between 2009 and 2018.

The fourth dataset provides information regarding the technological patents issued by automotive companies or other firms for automotive purposes. The dataset presents information on 36 789 issued automotive patents and provides insight via following factors: 1) Date 2) Vehicles Classification 3) Patent Title 4) Patent Description 5) Issuer Name

In order to provide a comprehensive integration between datasets and possibility of regression it was decided to filter this dataset to such an extent that would allow comparison of the issued patents of only the firms investigated in the previous databases. After filtering the dataset provides information on 34 066 automotive patents that were issued between 2010 and 2021.

3.2 Data collection

The data was collected via inter-firm surveys, public resources/databases and previously conducted research. If conducted in surveys, the responses for the survey measures for the study must be only solicited from managers belonging to client organizations. The managers in these organizations committing to M&A activity should be approached to confirm if they

could think of a recently completed project in automotive M&A and possibility to evaluate it. In the case of public data usage, it can be available through the web resources and M&A databases.

3.3 Data and Measures

3.3.1 Financial data

Financial data used for this research was gathered in the presented datasets and public information storages of the companies that are involved in the analysis. The core of financial data for analysis consists of three main factors that can be traced across different time periods and deals – 1) The Deal Value 2) The Acquirer Market Capitalization and 3) Target Market Capitalization. Taking into consideration the provided financial factors of investigated companies it becomes possible to analyze the potential influence of financial motivation towards or against participating in M&A in general and decision-making regarding the type of integration in particular.

3.3.2 Technological and R&D data

Technological and R&D data of this research is summarized from the open datasets of the acquired and received technological patents by the firms operating in the automotive industry. The description and number of the main patents allow us to see the general trend of patent proposing in recent years and trace their connection to particular deals in the industry. This allows us to analyze whether certain M&A activity in the sector stimulates or prevents more rapid technological development.

3.3.3 Geographical data

Geographical data presented in analyzed datasets provides information regarding spatial distribution and changes of the investigated M&A deals. This is done via distinguishing the analyzed deals between different categories. Firstly, identifying the main big regions of operations – Asia, Europe, North America, South America, Africa, Oceania and Antarctica. Secondly the differentiation between domestic or cross-border transactions can be conducted.

This allows us to test for the existence of particular regional trends and importance of cross-border operations.

3.3.4 M&A Deal Type

The data providing information regarding the typology of the conducted deal – Horizontal, Vertical or Conglomerate allows to analyze the dynamic changes in trends distribution in the automotive industry and form a framework of connected change factors. The typology was filtered via correlation of the provided information and description of deals and companies regarding the industries of operation and purposes of integrations.

3.3.5 Date and timeline

Particular date of the deal and dynamic timeline of the investigated companies allows to trace the general trends in automotive M&A operations on both macro-industrial and micro-company levels. This allows to identify the changes of the industry in motion and provides a possibility to check for dynamic correlation with fellow factors.

3.4 Models

3.4.1 Dataset 1

$$\text{ValueTransaction} = a + \beta_1 \text{Type} + \beta_2 \text{Year} + \beta_3 \text{Domestic} + \beta_4 \text{Type} * \text{Domestic} + e$$

3.4.2 Dataset 2

$$\text{Patents} = a + \beta_1 \text{Region} + \beta_2 \text{Domestic} + \beta_3 \text{Type} + \beta_4 \text{Stake} + e$$

3.4.3 Dataset 3

$$\text{Patents} = a + \beta_1 \text{Type} + \beta_2 \text{MCAPAcq} + \beta_3 \text{ValueTransaction} + \beta_4 \text{MCAPTarget} + e$$

3.5 Independent variables

This research uses a variety of different independent variables across tested models in order to formulate a regression able to precisely describe the correlations and connection of the observed factors and changes happening in the automotive industry.

3.5.1 Deal Type

The first and one of the core independent variables accounted for in current research relies on the information regarding the typology of the observed deal. This independent variable is represented by a dummy variable showing the information whether the investigated integration was perceived as a Horizontal or Vertical M&A activity(0 if Vertical, 1 if Horizontal).

3.5.2 Year (t)

Independent variable providing with a possibility to control over the dynamics of the changes in the industry is concentrated on the year variable. Being able to trace certain deal to a precise year we obtain the information on the concentration of certain M&A activities in a particular time period and analyze the trend.

3.5.3 Region of integration

Addition of a dummy variable accounting for regional affiliation through definition whether the observed deal was conducted in the same region provides multi-level data. Firstly, it allows us to capture the insight on the regional trends in different parts of the globe. Secondly, it provides data regarding the behavioral distribution of conducted deals – whether the representatives of the industry are more willing to cooperate with their regional partners or expand into new emerging markets(0 if Different Regions, 1 if Same Region).

3.5.4 Domestic character of integration

Dummy variable representation on whether the conducted deal was finished within the geographical borders or operated in a cross-border way serves a similar purpose as the regional variable but provides more precise micro information on the countries(0 if Cross-Border, 1 if Domestic).

3.5.5 Transaction Value

Another core independent variable of this research is represented by the transaction value of the observed M&A operation in millions of USD. The data presented in the variable represents the financial side factor behind the conducted operation and describes the evaluated market value of integration. Obtaining transaction value allows us to analyze the real numerical terms of investigated operations, firm's relative value and check for particular limitations and thresholds of conducting the integrations in the automotive industry.

3.5.6 Acquired Stake

Independent variable of the acquired stake reflects on the percentage of the target company that was acquired upon the completion of the M&A activity by the acquirer firm. This variable allows one to draw a trend in acquisition dimensions and analyze correlations between the degree of inter-firm integrations, their effectiveness and potential results.

3.5.7 Market Capitalization Acquirer Firm

The data gathered for implications of the independent variable of market capitalization of the acquirer firm depicts the financial factors and dimensions in terms of millions of USD of the company that in most cases initiated the integration activity. The market capitalization measured in millions of USD prior to the M&A activity allows us to understand the certain patterns on which amount of financial leverage is required in order to maximize the effectiveness of the integration process.

3.5.8 Market Capitalization Target Firm

This independent variable shares characteristics with the previously-mentioned one but describes the financial factors of the target firm side. The variable depicts information on market capitalization of the target firm in millions of USD prior to the integration and allows for further regression analysis with fellow factors.

3.5.9 Patents

In the role of independent variables, the factor of acquired technological patents by the observed automotive companies provides insight on the technological motivation behind integration activity. The variable depicts the amount of single developed or acquired technological patents by the car companies that were registered after the integration process.

3.5.10 Interaction Term Type X Domestic

Interaction term of Type X Domestic provides additional explanation to the model. Interaction term provides information regarding situations when the conducted deal was both horizontal and domestically executed.

3.6 Dependent variables

The choice of the dependent variables is explained by their effectivity in measurement of the proposed theories. For Model 1 and Dataset 1, depicting the data on financially-driven M&A operations it was decided that the Transaction Value of the investigated deals will serve the best measure of deal's effectiveness due to its clear numerical character allowing to extract and interpret the results in objective form. Transaction Value provides understanding on how much exactly the financial value was increased for the company as a result of integration. For Models 2-3 and Datasets 2-3 elaborating on the data provided from technologically-driven deals the choice stopped on the amount of developed/acquired automotive technological patents developed by the participating firms after the integration. The amount of developed technological patents allows us to evaluate the effectiveness of technological advancement of the company and judge on how successful was the technologically-focused integration.

3.6.1 Transaction value

Due to the fact that different datasets vary across the models and research transaction value is depicted as a dependent variable in certain models as well. This allows to increase the objectivity of the analysis and check the proposed theories under different angles as well as widening the possible causality explanations. As a dependent variable transaction value also depicts information regarding the overall transaction value in millions of USD.

3.6.2 Patents

Dependent variable of technological patents similarly to the independent variable depicts the number of acquired or received technological patents by the observed companies after the execution of integration activity but captures the investigated regression results from a causality viewpoint.

3.7 Test Methods

The study provides a mixed methodology for maximization of the results objectivity that can be reached by combination of quantitative and qualitative methods.

Quantitative methods will be used to check for the existence of any numerically visible trends in the automotive M&A transformation and possible identification of the particular factors which played the most important role in the existing cases of investigated integrations.

Qualitative methods will use the approach of case study regarding the last and most important M&A deals that can be interpreted. This will be done via the analysis of the company's reports, press releases, industry news and forecasts given by consulting companies.

In order to find out the unknown parameters of the observed and investigated factors in the quantitative models, the Generalized Least Square method will be executed. Chosen method provides a possibility to minimize the sum of squared residuals between the observed and predicted values. Apart from the regression analysis, general statistics will be derived in order to evaluate the foundation factors of the observed changes in the industry and check for the existence of certain numerical and qualitative thresholds.

Chapter 4: Empirical Analysis

4.1 DATASET 1

4.1.1 Descriptive and general statistics

Variable	Mean	Std.Dev.	Min	Max
ValueTransaction	234,47	46,75	5	40466,48
Type	0,38	0,02	0	1
Year	2004	0,28	1981	2019
Domestic	0,14	0,01	0	1
Type x Domestic	0,06	0,01	0	1

Overall analysis of the observed factors in the table presented above provides information regarding the descriptive statistics of the variables. The table states that the mean and standard deviation variation between the variables shows sufficient differences which needs to be taken into account as a factor of high individual peculiar properties of the observed variables. General statistics provide an insight that the investigated automotive M&A deals always increase the threshold of \$5 Million (USD) in their operations and do not go over the limit of \$40467 Million (USD) which allows one to understand the general importance of automotive M&A integrations. The average size of the observed deals settles at the point of \$234 Million (USD).

Another important finding of the general statistics of this sample regards to information about the distribution between domestic and cross-border deals. In the presented case, out of the 977 observed deals only 141 or 14% were executed domestically leaving the other 836 deals or 86% to be implemented in a cross-borders. This factor states an existence of a clear trend of international cross-

border orientation in modern M&A integration processes that will likely increase over the years even more.

4.1.2 Variables Correlation

Independent Variables Correlation

	(1)	(2)	(3)	(4)	(5)
(1)ValueTransaction	1				
(2)Type	0,072	1			
(3)Year	0,020	0,062	1		
(4)Domestic	-0,026	0,044	0,052	1	
(5)Type*Domestic	- 0,029	0,329	0,013	0,628	1

Dependent Variables Correlation

	(1)	(2)
(1) Patents	1	
(2)ValueTransaction	0,0102334	1

The table above provides information regarding the correlation between the observed variables in the sample. From the observed indicators we can state relatively low correlation between all investigated factors apart from the ones involved in interaction term formation between Type of M&A deal and its Domestic geographical affiliation. This fact creates understanding that all the observed variables are highly independent in their results. Other correlations give an insight that along the course of the timeline of the observed companies, on average the Value of Transactions and therefore deals was

steadily growing. Another important findings of the existing integrations conclude the existence of weak but still positive correlation between the timeline advancement and the amount of domestically-executed M&A deals. Along with the growth of the Value Transactions over the years we also see a steady growth of the amount of horizontally-executed M&A deals with every year.

4.1.3 Regression Results

Dataset 1

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-4579,9246	10557,1459	-0,4338222	0,6645138	-25297,348	16137,4985	-25297,348	16137,4985
HOR	279,134003	104,627562	2,66788214	0,00776011	73,8120826	484,455924	73,8120826	484,455924
YEAR	2,35799128	5,26862724	0,44755326	0,65457537	-7,9812028	12,6971853	-7,9812028	12,6971853
DOM	44,824411	175,437035	0,25550142	0,7983899	-299,45456	389,10338	-299,45456	389,10338
Hor*Dom	-399,12673	269,263839	-1,4822886	0,13858763	-927,53213	129,278672	-927,53213	129,278672

The regression analysis of the model 1 checks for the existence of connection between the M&A Deal Value, its execution type (Horizontal or Vertical), dynamic changes across the timeline, domestic character of geographic affiliation and interdependence with interaction term on typology and domestic character. In order to check for the regression results the distribution goes as follows: Y variable (the dependent) is represented by the Value of the investigated deal/M&A transaction accounted for in millions of USD(\$). The X variables show the factors of the conducted deal type (Horizontal or Vertical), time trend in years, geographic affiliation (Domestic or Cross-border) and the interaction term of the deal being both conducted domestically and in a horizontal way of implementation. These tests are conducted in order to make a decision to accept or reject the Hypothesis 2 of the research. Out of the conducted regressions, only the typology of the conducted deals shows a statistically-significant effect on the deals value ($\beta=279.13$; $p<0.01$). This brings to the conclusion that an M&A integration deal implemented in a horizontal way, therefore between direct competitors in the same market, shows larger financial value, *ceteris paribus*. Unfortunately, even though the indicator of domestic geographical affiliation shows positive correlation results with the deal value, they cannot be statistically interpreted as they do not show the signs of relative statistical significance.

Overall, the results of this regression analysis show the support for the Hypothesis 2, indicating direct influence of the type of conducted M&A deal on the monetary value of the deal. This effect can be explained by the connection between the relative sizes of the automotive companies involved in horizontal M&A operations. Deal conducted between two horizontal competitors more often represent an integration of firms that operate in the same or

similar size and scope, whereas the deal conducted vertically often depicts an acquisition of a particular supplier/customer/subsidiary or department of the other firm that creates lower financial value and serves different strategic purpose from addition of monetary value to the company, for example, to acquire certain element of technology or human capital.

4.2 Dataset 2

4.2.1 Descriptive and General statistics

Variable	Mean	Std.Dev.	Min	Max
Patents	647,5	314,69	0	14052
Region	0,61	0,07	0	1
Domestic	0,33	0,07	0	1
Type	0,5	0,07	0	1
Stake	61,28	5,25	6	100

Observation over the descriptive statistics presented in the table above provides general explanations regarding the sample and the variables. Taking into account the variation in mean and standard deviation of the variables, similarly to the situation with Sample 1, we can underline the independence of the observed factors and richness of the sample. General statistics state that the average number of acquired technological patents among the 46 observed automotive companies after implementation of M&A integration is set at the level of 647,5. This corresponds with the average amount of technological patents acquired by the company's operation in the sector. Other important findings of the general statistics depict the situation in which the sample is represented by horizontal type of M&A activity in 50% of the investigated integrations accounting for 23 automotive deals. The deals share a distribution of 28 (61%) being conducted in the same region and 18 (39%) to be cross-regional. With a more precise

investigation of the geographical affiliation between the cases, we also see that even though the majority of the deals were conducted in the same region, only 15 (33%) of them were implemented domestically leaving the rest 67% to be executed on a cross-border basis. This adds and supports the findings from the Dataset 1 underlining the existence of the cross-border and internalization trend in automotive M&A activity. It shows that even though companies are looking forward to internationalizing their merger integrations, they are much more willing to cooperate with their closest partners from neighboring regions rather than with companies situated further from them. The last important finding of the general statistics states the fact that the average acquired stake in the observed deals stays at the level of 60.64%. This finding proposes an assumption that the companies involved in M&A activity are more likely to commit a full takeover of the interested company rather than getting involved in integrations in equal merger form.

4.2.2 Variables Correlation

	(1)	(2)	(3)	(4)	(5)
(1)Patents	1				
(2)Region	0,021	1			
(3)Domestic	0,155	0,558	1		
(4)Type	-0,109	0	-0,046	1	
(5)Stake	-0,213	0,149	0,072	-0,057	1

The table above provides information regarding correlation between the observed variables in the dataset. From correlation analysis the data suggests an existing positive correlation between the amount of acquired technological patents and the fact of M&A activity being executed domestically. Another important finding of the correlation analysis presents information about positive correlation between the fact of integration being executed between the companies operating in the same region and the acquired stake being taken over in the deal. This suggests an assumption that in a situation of closer geographic proximity, managerial decision-makers of the operating firms are willing to take higher risks and implement higher investments in the merger processes. Lower yet still positive correlation also

corresponds with correlation between domestic character of deal implementation and acquired stake which also supports the assumption.

4.2.3 Regression Results

Dataset 2

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	1010,74024	672,838339	1,5022037	0,14070803	-348,08435	2369,56483	-348,08435	2369,56483
REGION	-461,64424	797,455087	-0,5788969	0,56582575	-2072,1375	1148,84898	-2072,1375	1148,84898
DOMESTIC	905,546484	826,376533	1,09580373	0,27955989	-763,35478	2574,44775	-763,35478	2574,44775
TYPE	-492,09963	650,856326	-0,7560803	0,45392352	-1806,5306	822,331384	-1806,5306	822,331384
STAKE	-1,6262216	2,31980881	-0,7010153	0,48725324	-6,3111705	3,05872734	-6,3111705	3,05872734

This regression model represents the dependent variable (Y variable) as the observed transaction/M&A deal value accounted for in millions of USD(\$) and the connection to independent variables (X variables) showing regional geographic affiliation (deal conducted in the same region or not), country-scope geographic affiliation (deal done Domestically or Cross-Border), type of the integration (Horizontal or Vertical) and the acquired stake during the transaction (%). Despite the theoretical reasoning providing a possible explanation of the effectiveness of the observed factors, none of the independent variables accounted for in this regression model show the signs of statistical significance. This leads to the conclusion that these factors do not play a role in technological advancement at least in the presented and analyzed sample and therefore we have to reject the Hypothesis 3.

However, the absence of statistical significance still creates a value to the research allowing to exclude the variables that could bias the research. Results of the regression analysis create a framework proving that the regional/spatial orientation of merger processes and the degree of stake acquisition do not influence the amount of acquired automotive technological patents after implemented integration and therefore cannot be used as a causal explanation for automotive M&A transformation.

4.3 DATASET 3

4.3.1 Descriptive and General statistics

Variable	Mean	Std. Dev.	Min	Max
Patents	308,17	1670,44	0	14052
Type	0,24	0,42	0	1
MCAP ACQ	2773,03	3396,97	0	18700,39
MCAP T	5,82	26,77	0	157,29
TransactionValue	137,31	320,66	0,04	1832,35
Year	2013	3,20	2009	2018

Information presented in the table above provides the numbers of descriptive and general statistics over the deals and variables observed in the sample. A particular variable for definition of regional/geographic affiliation is not used for this dataset and model as all the investigated deals were conducted in Asia. From the general analysis important findings underline the variation of deal's values - the smallest deal accounts only for \$0,04 Million (USD) whereas the largest one surpasses the threshold of \$1 Billion USD and accounts for \$1832,36 Million (USD). The average observed deal size varies around the point of \$137,31 Million (USD). Such large dispersion in transaction values states the diversity of the ongoing automotive M&A processes in the region and dictates a conclusion of the fact that the region can represent the majority of existing M&A deals - from small-scale micro-targeted takeovers to giant technology and market-expansion-driven competitor takeovers that often reshape the market.

Observation regarding the certain patterns in the financial factors of the investigated firms leads to analysis of the market capitalization of both acquiring and target firms. Acquirer and Target firms show an average of \$3 010,72 Million (USD) and \$110,68 Million (USD) of their publicly-available Market Capitalization respectively. These numbers show the pattern that the target firms in the majority of the cases are substantially smaller in relative sizes or lower-valued in financial terms than the acquiring firms which goes in line with Hypothesis 2. Such a pattern represents a sign of more often full takeovers,

rather than equal mergers being conducted in the industry. Alongside with market capitalization comparison, the type distribution of conducted integrations (Horizontal or Vertical) bring similar conclusions. Investigated sample represents only 24% of the observed deals to be executed as a Horizontal automotive M&A integration.

4.3.2 Variable Correlation

	(1)	(2)	(3)	(4)	(5)	(6)
(1)Patents	1					
(2)Type	-0,089	1				
(3)MCAPACQ	0,218	-0,05	1			
(4)MCAPT	-0,04	0,16	-0,15	1		
(5)Transaction Value	0,01	0,02	0,41	0,05	1	
(6)Year	0,235	-0,17	0,117	-0,059	-0,05	1

Correlation analysis presented in the table above allows us to understand the primary connections between the observed variables in the sample. One of the most important correlations that show positive results represent connection between Market Capitalization of the Acquiring firm and the amount of developed technological patents after the integration as well as positive correlation between variables depicting the amount of acquired technological patents and observation over the years. These two positive correlations give us knowledge that the amount of acquired technological patents by such companies was increasing over the years and once more proves that the investigated integrations can be judged as technology-orientated/driven. Moreover, correlations suggest that horizontal type of M&A activity grants lower results in terms of developed technological patents after the integration. Market Capitalization of the Acquiring firms was increasing over the years as well, whereas the Market Capitalization of the Target firms as well as the overall Transaction Values were decreasing with the time advancement. This creates a situation where over the years we see a trend of more financially-successful and generally larger companies starting to aim on lower-tier niche-operating companies to

merge with when looking for certain technological advancements or particular patents that in the majority of the cases represent vertical M&A activity rather than collaborating with equally sized competitors in horizontal way of implementation. This assumption is supported by the fact that among the observed integrations, the amount of horizontal deals decreased over the years as well. Another important finding elaborates on the substantial positive correlation between Market Capitalization of the Acquiring firm and Transaction Value. Less extensive yet still existing positive correlation between Market Capitalization of the target firm and the typology of the conducted deal also shows the results. All aforementioned positive correlations allow to form a certain theoretical trend and support the line of the Hypothesis 1 and 2 but are still not enough to state a clear decision and conclusion. In order to be able to do that, final and proper regression analysis needs to be conducted.

4.3.3 Regression Results

Dataset 3

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	-435,79661	1876,36114	-0,2322563	0,81701668	-4178,0809	3306,48769	-4178,0809	3306,48769
TYPE	-307,29289	458,693883	-0,6699302	0,5051063	-1222,129	607,54321	-1222,129	607,54321
MCAP ACQ	0,1252975	0,0634257	1,97550056	0,052155	-0,0012011	0,25179606	-0,0012011	0,25179606
MCAP T	0,87489802	7,44195846	0,11756287	0,9067507	-13,96762	15,7174162	-13,96762	15,7174162
TRANSACTION VALUE	-0,4866569	0,66514411	-0,7316563	0,46682078	-1,813245	0,83993121	-1,813245	0,83993121
Year	0,26246087	0,93670267	0,28019657	0,78015309	-1,6057337	2,13065545	-1,6057337	2,13065545

The last regression describes the connection of the dependent variable (Y variable) representing the *amount of technological automotive patents* acquired/developed by participating company after M&A operation with independent variables (X variables) describing the *Type* of conducted integration (Horizontal or Vertical), *Market Capitalization of the Acquiring firm* accounted in millions of USD(\$), *Market Capitalization of the Target firm* accounted in millions of USD(\$) and the overall *Transaction Value* of the investigated M&A integration accounted for in millions of USD(\$). The main finding of the run regressions of the following model contain information regarding the connection between the Market Capitalization of the Acquiring firm and the amount of the acquired patents after the completion of the M&A deal. According to the regression results, there is statistical significance of the correlation between Market Capitalization of the Acquiring firm and the total number of technological patents developed by the created entity after merger integration ($\beta=0.125$; $p<0.1$). This leads to a conclusion, that the bigger the market capitalization of the acquiring firm, the larger will be the amount of developed technological patents after the integration. This conclusion can be seen as a causal factor for bigger companies to be more actively and effectively involved in merger activities that aim on technological advancement as a primary target. Therefore, these results support Hypothesis 1.

4.4 Results Interpretation

This section contributes to a more clear understanding of the real findings and conclusions of the conducted research via more precise explanation of the results that were received from regression and correlation analysis.

The results of correlations and regressions conducted with the dataset 1 that represents M&A integrations that were aimed on satisfying particularly financial targets of the automotive companies suggest the following conclusion: Nowadays financially-driven M&A operations favor horizontal type of implementation in the automotive sector in the majority of the cases. Such results have its reasoning due to the fact that horizontal type of M&A activity brings more financial value rather than vertical via capital creation, financial growth and synergies. This finding supported Hypothesis 2.

Opposite to that, over the years the tendency developed that companies seeking technological development as a primary target of their integrations started favoring more the vertical type of integration implementation. Moreover, the representative group of the companies initiating these technology-driven and vertical integrations changed as well, as now they mostly benefit generally larger and financially more successful companies. Therefore, vertical integrations in our age also bring higher value for the established giants of the automotive industry that can afford to take over smaller players of the market obtaining the desired technological assets. This fact leaves less space and reasoning for involvement in vertical M&A for smaller companies despite the trend in decrease of the overall transaction values. These results were gained from testing the models on the data from Dataset 3 representing the technologically-oriented M&A integrations that in the end allowed them to accept the Hypothesis 1.

The core finding of the research is that given from information in the existing literature previous cases of M&A integrations did not have such drastic separation of purposing in regard with choice of integration implementation type. Now we see that if the operation has purely financial focus it will only/highly favor the horizontal M&A. That is why financially-focused integrations were implemented more horizontally from year to year.

On the other hand, the technologically-focused M&A operations became purely locked on a vertical way of execution. Moreover, the change of the market landscape with large increase in industry-leading company's market capitalizations as well as increase in R&D and technology development costs reshaped the group of companies that are more likely to participate in vertical type of M&A and gain more benefits from this type of integration. Vertical M&A, especially the technologically-focused ones, became effectively open for the large players only now.

According to the existing literature reviewing M&A activity in the past, both these factors did not take place or at least could not show such large extent in previous periods of automotive industry development, whereas nowadays they show significance and relevance in causal terms on why exactly companies decide to go vertical or horizontal in their M&A activity. Current choice for operating companies became more clear than ever before, if the company pursues purely financial goals in the integration process, then it should get involved in horizontal M&A. Contrary to that, if the company has already achieved its' financial goals, is large, strongly-set on the market and mainly seeking technological advancement, then the choice leads only towards vertical integrations. Once again, the previous situation in the automotive industry could not lock the companies to such realities in their choice of M&A implementation. Past deals both represented by vertical and horizontal character of implementation were able to satisfy technological and financial desires of the car development world.

4.5 Cases Analysis

While the quantitative part of the research may not show the full picture of the existing situation in the automotive industry due to certain limitations and factors that are highly-complicated or impossible to measure in relative and objective terms, the existing cases of performed automobile M&A operations depict certain trends in a more precise way.

In order to do that we should analyze the information describing the key M&A operations. Observed companies obtain extensive integration experience and usually depict the industry-wide trends first. The first case showing such drastic changes in M&A operations depicts the dynamic development of PSA group. PSA as a business entity was always active in terms of

integration operations, especially the horizontal ones. In 1976 PSA as we know it today was formed after Peugeot acquired its domestic competitor Citroen with clear intentions of technological assets usage, large product line and market expansions. The activity in horizontal integrations field was further followed by acquisition of Chrysler Europe in 1978 that was explained by further development of newly produced models and formation of the sub-brand Talbot (sportscar department) uniting the technological potential and production facilities of Chrysler and Simca. Over years PSA group was numerously involved in similar horizontal activities, for example acquisitions of Opel and Vauxhall Motors once again focusing on market and technological gains. However, the new age drastically changed the preferences of the company regarding their M&A operations purposing. This resulted in one of the largest automotive M&A deals in history, the merger of the giants - PSA and FCA (Fiat-Chrysler Automobiles). This merger, finished in 2021 showed an unprecedented value of \$50 billion USD and was aimed at the satisfaction of purely financial targets. In terms of product line enrichening or creation of new specialized sub-brand departments, the integration could not provide any significantly large value leaving all the focus on the increasing of the participating companies' market capitalization, providing additional access to financial assets, loans and investments for further development and eliminating once again arising threat of bankruptcy for automobile giants in the current market setting. It is important to take into account that it was not the first time when Chrysler escaped bankruptcy threats via involvement in horizontal integration. In 2009 a similar precedent was formed when Fiat and Chrysler formed a large integration deal worth \$10.4 billion USD with only one financial purpose - to save Chrysler from a failure in the face of bankruptcy. Moreover, this Fiat Chrysler merger was a result of the previous financially-driven integration that turned out to be a market failure - \$38 billion USD integration of Daimler-Benz and Chrysler in 1998.

Another large case showing drastic change of significant changes in M&A operations can be seen in observation over VW Group development. Similarly to PSA, VW Group being one of the European automotive giants was always active in terms of M&A integrations. VW Group in a way played the role of the closing curtain in the golden age of automotive horizontal M&A with their steady and continuous expansion in the industry via take over of the major competitors and creation of new and extremely valuable entities. The roll of large horizontal integrations started large from the beginning with acquisition of Spanish Seat in 1986, continued with Czech Skoda in 1994-2000 and created the company's crown jewels with

acquisition of British Bentley, Italian Lamborghini and French Bugatti in 1998. It did not stop the company's corporate ambitions on that point and continued with market diversification via acquisition of Swedish Scania in 2008, domestically-German MAN and Italian Ducati in 2012. In the case of acquisition of Seat and Skoda, the reasoning was driven by simple elimination of direct competitors in utility and low-price market segments and geographical market expansion on the relatively unrepresented European markets. Acquisition of Bentley on the other hand created a high-end luxury branch in the business entity allowing it to use new suppliers with higher quality products, attain complex technologies and add value to the brand reputation and image. Similar situation happened with Lamborghini and Bugatti integration into VW Group, but instead of luxury technologies the company attained even rarer and more expensive to create developments in the autosport industry. Scania, MAN and Ducati largely contributed towards the company's diversification, product line expansion and capturing additional market power. However, the latest and one of the largest horizontal integrations conducted by VW Group shows a different purposing aiming on fulfillment of purely financial targets. In this case, it was the acquisition of Porsche SE Holdings in 2012. At the first glance it might seem that the integration was conducted in order to acquire unique motorsport and luxury technologies of Porsche and yet again strengthen VW Group position in the luxury car segment but in reality such assumption is false. This comes from the fact that prior to the integration Porsche SE Holdings were already possessing partial ownership over some stake at VW Group and therefore acting as a united business entity at the moment in time. Therefore, acquisition of certain technologies or strategic assets from the target firm cannot be seen as an integration aim. In fact, this particular integration has a purely financial explanation as VW Group got involved in a complicated cross-ownership exchange combination resulting in purchasing a 100% stake of Porsche Holdings SE in order to cover the target firm's debt and ensure protection against corporate raider attacks.

The list of market leading companies that were noticed in conducting financially-focused horizontal integrations in recent years does not limit itself to the aforementioned companies. In fact, all the largest horizontal M&A integrations since 1998 can be judged as financially-focused. Apart from the previously mentioned Daimler-Benz/Chrysler, Fiat/Chrysler and PSA deals, the list represents such important members of the industry as Tata Motors Limited, Jaguar Land Rover, Ford Motor Company, Renault, Nissan and Mitsubishi Motors. Conducted in 2008, \$2.3 billion USD acquisition of Jaguar Land Rover subsidiary of Ford

Motor Company by Tata Motors Limited was similarly dictated by financial factors. Jaguar Land Rover, producer of premium niche British automobiles showed substantially unsatisfactory market indicators, did not provide any particular future value for the parent company in terms of technological development and faced a situation of unwillingness of Ford Motor Company to invest additional capital into it. However, the subsidiary was lucky enough to get a financial savior in the face of Indian Tata Motors Limited that was able to supply the company with monetary reassurance and hedge the risks in the times of 2008 recession uncertainties. One of the most recent large horizontal integrations, the 2016 Renault-Nissan and Mitsubishi Motors deal accounting for \$2.3 billion USD is not an exception from the financially-oriented operations either. In 2016 Renault-Nissan rescued Japanese competitor Mitsubishi Motors that was facing large financial troubles from substantial sales underperformance and upcoming liabilities from its fuel-economy scandal. On the other hand, Mitsubishi brought financial benefits to its new partners in cost reduction regarding the raw materials sourcing that was crucial for Renault-Nissan. The list of similar cases can be expanded to a much larger extent (Volvo/Geely; HUMMER/Sichuan Tengzhong Heavy Industrial Machinery Co;etc) and all of them will bring to a similar conclusion.

When looking at the changes that happened with the horizontal type of M&A activity, it is impossible to lose sight of change in the general purpose of conducted operations. Previously, most of the large horizontal integrations in the automotive industry were conducted in order to acquire or capture new/unique product lines of new models, take over certain valuable technological assets, initiate geographical or market expansion and sometimes even to create new subsidiaries in new niches, for example, to form or integrate new luxury brands within the business entity. The opposite situation is depicted nowadays when the companies no longer pursue aforementioned targets in their horizontal M&A activity and mostly concentrate on satisfying their financial desires through horizontal integrations. These financial targets are often represented by avoiding or helping other brands to avoid bankruptcy, increase the market value and capitalization, get the access to additional monetary resources and get away from problematic situations that capture the car producers with taxation and law suits liabilities.

The trend shows a situation when the market-leading companies that have already achieved the desired position on the market with regard to market share, secured possibilities against competition threat and attained certain level of technological advancement that does not require them to participate in financially-risky and large horizontal integrations that serve

other than primary business targets of value creation. As a result, the companies leave capital-intensive horizontal deals to be executed only in order to fulfill the financial aims that are easy to predict and faster to gain objective benefits from. This finding supports and allows to accept Hypothesis 2 stating that as a result of automotive M&A transformation firms tend to participate in horizontal M&A mainly in order to create additional financial value through growth and synergies.

However, the changes that keep reshaping automotive M&A are not only limited by horizontal integrations. One of such examples is represented by BMW Group that recently announced a strategic integration partnership with microchip developer Inova Semiconductors and semiconductor manufacturer GlobalFoundries. This decision will allow the automotive company to decrease its exposure towards the global semiconductor market and not simply “wait in line” with the other car manufacturers but follow independent policy in the sector. Another example elaborates on Tesla signing long-term supply agreement with Vali nickel producer. This strategic decision allows the company to hedge the risks of scarce resources that are highly valuable for one of their key technologies - batteries that activate their powertrain.

Volvo Trucks recently got involved in vertical integration of a new battery assembly plant in Belgium, Skoda committed to large vertical operations to found battery production in Mlada Boleslav for Skoda, VW, Audi and Seat brands. Stellantis Group similarly was noticed in vertical integration of battery production in a \$4.1 Billion USD joint venture with LG Chem. General Motors’s latest M&A activity also shows vertical character with technological focus after the 2022 announcement of acquisition of the autonomous vehicle unit Cruise. The deal will grant american automotive giant access to a self-driving car subsidiary which according to the company provides far larger potential than promised \$2.1 Billion USD investment.

Notable changes are also seen when looking at the case of Mercedes Benz Group, previously known as a horizontal M&A expert with rich experience of integrations with Chrysler, Smart, Maybach and KAMAZ. Nowadays we see a complete switch of the company's focus towards vertical integrations as all the latest deals conducted by the firm get distributed to this category. In 2015 the firm got involved in vertical integration via formation of the joint venture with VW Group and BMW Group to take over the mapping, location data and related automotive services company HERE. This was followed by a 2016 move into downstream

development via acquisition of Athlon car leasing and mobility solutions company. And 2019 could be judged as a triumph of the vertical M&A conducted by Mercedes Benz Group as the year ended with three significant vertical integrations. That year brought under the roof of Mercedes an autonomous driving company Torc Robotics, logistics application Habbt and multigaming/esports entity of SK Gaming.

After careful investigation in the aforementioned cases we can come up with several conclusions. One can see that even though horizontal integrations still play a highly important role in the car business, they are continuously being overshadowed by the impact of vertical M&A operations. Horizontal deals are generally larger in their transaction value and usually contain brand names that attract more attention but vertical deals in reality create the largest potential impact on the future of the industry development. After precise observation over the sector, one can notice that far more vertical integrations are being conducted rather than horizontal nowadays, that this gap was growing over the years and there are several reasons for that. The reasoning described in academic literature finds its implication in real world perspective with recurring cases setting the new trend that is highly likely to reach larger extents in the future. Firstly, as noted in aforementioned argumentation, on average automotive M&A deals became smaller because the companies no longer needed to acquire the whole manufacturers at their point of development to fulfill some particular targets. With the current unstable market situation and due to the fact of generally high companies valuation it becomes too risky to take over the whole set of operations of existing competitors or any other firm that falls into the scope of interest to extract particular parts without significantly strong reasoning. Nowadays it is enough to acquire a particular upstream or downstream department and simply integrate it to the existing framework with minimal adjustments.

Another important reasoning behind company's switch towards more active participation in vertical M&A lies in their desire to secure crucial resources. The corona crisis of 2020-2022 underlined the importance of direct and reliable access to certain components, for example, microchips and semiconductors. Due to their shortage large delays were faced by all the markets which resulted in substantial losses and image damage for numerous automotive companies. In order to avoid similar losses in the future many automotive companies decided to get more actively involved in internalization of their value chains through vertical

integrations or at least in securing their company position via settlement of long-term specialized partnerships.

Additional reasoning for the change regarding increase in the amount of vertical M&A lies in the fact that new technologies cannot be developed with already existing facilities obtained by traditional automotive firms due to the fact they are coming from other markets and points of competence. Producers of traditional combustion V8 or V12 engines need large resources and time periods to learn how to produce lithium-ion batteries, electric drivetrains and control systems for electric vehicles and hybrids that are gradually taking over the automotive market. Often the companies do not obtain such resources and time for adjustment to competition and novelty, complexity, scarcity and capital-intensiveness of current technologies and reshaping the market in terms of EV expansion requires them to vertically internalize these new technologies from the outside. We can see the implications of such a fact in the cases of Volvo Trucks, Skoda, Stellantis, VW Group, General Motors and Mercedes Benz Group.

Moreover, apart from proving the switch of the industry towards more active participation in vertical M&A operations, the case's evidence also shows the support of Hypothesis 1 that due to large capital growth and financial barriers of entry technology-driven M&A becomes beneficial only for the largest automotive firms. This evidence comes from the fact that all listed company cases represent market-leading companies that already obtain large financial and expansion capacities as the deals conducted by smaller companies provide smaller overall financial and potential value and are therefore difficult to identify in the media field. As a result these market leading firms take the advantage of the smaller firms in the other industries via implementation of the existing monetary leverage and promises of potential benefits of close cooperation. Despite the generally decreased value of vertical integrations, small automotive companies still perceive a much lower amount of benefits than their larger competitors because in the majority of the cases there are no companies left to invest after the largest players are done with their choice of integrations. Market giants have larger abilities in terms of market research for identification of the most beneficial deals and can afford to diversify their investments in various sectors at the same time which multiplies their probabilities for higher effectivity. In the end small players of the sector still obtain the ability to gain certain benefits from the integration process but cannot form market trends and are left with investment possibilities that did not favor the desires of their larger competitors.

Chapter 5: Discussion

The target of this research paper was to elaborate on how exactly the automotive M&A operations changed in recent years and find answers to the question regarding which key drivers can be identified as having changed the motive behind M&As in the automotive industry. In order to formulate an applicable conceptual framework, a wide literature review describing the particularities of operations in the automotive industry and features of M&A implementations was conducted. The created conceptual framework was tested in a two-step approach - in the first step quantitative methods were applied in order to check for the existence of certain trends in the industry and forming general understanding on which particular factors could be identified to play a key role in the transition process. In the second step qualitative methods with anecdotal evidence of the real-world perspective were implemented to prove the existence of claimed change in the industry and identification of particular purposes of explanation reasoning.

The first step of quantitative analysis provided two key findings. Firstly, automotive companies tend to favor horizontal type of conduction of M&A operations in a situation requiring the fulfillment of purely financial targets. Secondly, large automotive companies over the years developed higher incentives to be involved in vertical M&A integrations. The second step provided further proof. Firstly, the purposes behind horizontal automotive M&A changed due to large capital increase of the car companies and their achievements in terms of market share capturing. Secondly, in general, the automobile sector tends to favor more vertical integrations, largely due to technological complexity of the novel-required developments and their high specialization.

5.1 Theoretical Implication

This research paper contributes to theoretical implication in at least three different dimensions. The study contributes to previous research conducted about the automotive industry development, key determinants, micro-/ as well as macro-economic importance in global value chain and future potential. This is done via elaboration and continuation of through shared in the work of R. Kidambi and M. Mathur (2013) “The Contribution of the Automobile Industry to Technology and Value Creation”. The expansion of observed framework by the literature includes underlining and investigation of the importance of the automotive sector for development of the connected industries that create multiplier effects in terms of additional technological advancement, creation of demand lines for new products (for example, EV batteries, charging stations or computerized control systems) and labor expansion by the companies that directly or indirectly provide services for car companies. Moreover, the presented evaluation of the effectiveness of technological developments acquired in the automotive operations proves and expands the assumptions previously shared by Winkelhake, U. (2018) that R&D and innovation within automotive can benefit other industries. The expansion is done via showing that the automotive sector does not only benefit already existing elements of the other sectors but sometimes even solely creates new ones by setting new market and consumption realities that create demand for brand new industries. The study also elaborates on the importance of automotive influence on the upstream and downstream channels of the global value chain which continues the ideas shared by J.Rae, Bell and A.K. Binder (2020).

In the second dimension of theoretical implication, the paper contributes towards the studies regarding M&A and general purposing of typology choice between horizontal and vertical integration. The findings of the paper show extreme distinction between the choice of the integration execution type depending on the main targets of the company. The study proves that horizontal integrations are currently serving the purely financial aims of automotive companies(which suggests the switch in horizontal purposing), whereas vertical operations mainly provide solutions for technological requirements. This finding continues the reasoning introduced by N. Aktas, E. de Bodt and A. Derbaix (2003). Going further than that, the paper suggests that larger car companies receive far more benefits from technologically-focused vertical integrations than their competitors obtaining lower market capitalisation. As one of

the main findings, the paper shows the change of overall trend in integration choice in the car industry. This is done through providing evidence that nowadays automobile M&A generally favors vertical integration, contrary to previously existing horizontal domination in the sector. Such assumption was proven by cases of the industry-leading companies showing their higher investment in vertical operations.

Third dimension of theoretical relevance contributes to development of studies elaborating on the importance of technological complexity increase. It is done through showing how the technology complexity increase cannot only create new products or markets but also completely change operations of well-developed multi-trillion dollar industries, such as automobile industry. This novel result enriches the research conducted by J. Conzade, A. Cornet, Hertzke et al.(2021).

Finally, and most importantly, this paper closes the gap in the existing literature regarding automotive M&A transformation that took place. Unfortunately, there is a present shortage of conducted research that investigates the dynamic changes in automotive industry M&A and the factors that influence this transformation. Presented paper unites the aforementioned theoretical works and forms a new framework that allows to see significant results in the investigated field. As previously mentioned before, the paper provides quantitative evidence that automotive firms tend to favor horizontal deals in situations requiring purely financial reasoning, as well as proving that market leaders in the automotive business managed to maintain higher incentives and perceived benefits in participation in vertical M&A activity over the recent years. Qualitative results therefore prove the change of purposing to monetary reasoning behind horizontal M&A implementation due to large capital and market share increase of the companies. Following up, qualitative analysis helped understand that the automobile business is continuously switching towards more active participation in vertical M&A due to introduction of novel technologies, their broad specter of development and desire of the companies to secure both upstream and downstream strategic resources for the future.

5.2 Practical Implications

Conducted research provides broad theoretical implications for various groups in the business world. Representatives of the automotive industry or the one that is involved in close cooperation with the car business might find the study useful due to the fact that it provides insight on what exactly changed in the automotive M&A, how it changed and where it is potentially going in its future development. Based on this information it will be possible to choose future integration strategies with higher effectiveness that will grant a higher amount of perceived benefits and understanding of further market development.

For financial analysts the paper shows a more precise explanation on why certain automotive deals are being or have already been conducted. This can lead to better prediction of automotive market operations with regard to market changes and financial indicators such as stock market dynamics and ownership transition. Another implication can be achieved in more objective valuation of the future deals due to deeper understanding of underlying strategic reasoning and potential value creation in the future.

Technological companies can also gain certain benefits from the results of the paper. Relying on the information presented in the cases of this study, managers of these companies can acknowledge the increasing potential in collaboration with the automotive world on a multi-layer basis. On the other hand, by evaluating the tendency of increasing automotive presence in the high-tech field they can raise awareness regarding how exposed their company is towards hypothetical or potential take over in the future.

5.3 Limitations and Future Research

Despite the findings presented in the research, it obtains certain limitations that stop from providing deeper and more detailed results. Firstly, the study faces a problem that not all factors are possible to measure or evaluate in relative or objective terms that could be used for scientific research. Secondly, the complexity and large scope of the automotive business creates a situation with the existence of numerous amount of small and diversified details forming the big framework that are almost impossible to take all into account at once. Thirdly, the presented samples are not able to show the whole picture of the market therefore

some of the factors are being left out of the evaluation and create omitted variables in the tested models. Fourthly, the quantitative part of the research analysis shows relatively low explanatory power due to aforementioned complexity and multi-layered connections of factors in the automotive industry that are impossible to take into account at the same time and sometimes even quantify because of their qualitative character. As the obtained and used data was limited on parameters indicating Market Capitalization, the amount of developed Technological Patents, overall Transaction Value, Acquired Stake, Geographic affiliation and point in the timeline of the observed companies, future research could expand the variety of descriptive variables. Direct influence on the financial markets could be taken into account via integration of control over the stock prices movements or changes of the credit ratings of the automotive companies. More data could be used in order to identify if several firms use the services of a single patent, technology or subsidiary (for example, like almost all currently produced Trucks using ZF gearboxes instead of producing their own in-house). Future research can investigate if executed M&A practices had a meaningful impact on the general financial and pricing policies of the automotive companies.

Further research could be also expanded with more precise investigation of the automobile M&A operations in particular markets that tend to form the global trends in the industry, for example, the United States or European markets. This can be continued in investigation whether automotive strategy regarding M&A execution has moved from domestic to inter-region deals. This would require obtaining far larger and more detailed samples depicting numerous explanation variables but would provide with a potential of novel and possibly deeper elaborating findings. Finally, fellow researchers of the automotive sector and contained M&A operations could try to shed a light on another hidden part of the industry via investigation on how companies decide on whether to get involved in vertical or conglomerate M&A operations if the firm no longer pursues horizontally-achievable goals.

Acknowledgements

This section contributes to the purpose of my opportunity to show gratitude to the people who provided crucially important support during the whole period of this thesis creation. First of all, I would like to extend my gratitude to Assistant Professor of Utrecht School of Economics Mr. Luigi Pinna who's help and guidance in terms of constructive criticism and expansion of my research perspective was essential to the writing process. Secondly, I would like to thank Assistant Professor of Utrecht School of Economics Mr. Riccardo Valboni for the knowledge shared and study materials provided in the courses of Empirical Economics and Mergers and Acquisitions that acted as a formation basis for creation of this paper. Without the knowledge and perspective that I learned from Mr. Pinna and Mr. Valboni this study would lack an extensive amount of objectivity and relevance.

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Appendixes

Regression model 1

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0,09281552							
R Square	0,00861472							
Adjusted R S	0,00453495							
Standard Error	1458,01567							
Observations	977							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	4	17955166	4488791,49	2,11156789	0,07739876			
Residual	972	2066287019	2125809,69					
Total	976	2084242185						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-4579,9246	10557,1459	-0,4338222	0,6645138	-25297,348	16137,4985	-25297,348	16137,4985
HOR	279,134003	104,627562	2,66788214	0,00776011	73,8120826	484,455924	73,8120826	484,455924
YEAR	2,35799128	5,26862724	0,44755326	0,65457537	-7,9812028	12,6971853	-7,9812028	12,6971853
DOM	44,824411	175,437035	0,25550142	0,7983899	-299,45456	389,10338	-299,45456	389,10338
Hor*Dom	-399,12673	269,263839	-1,4822886	0,13858763	-927,53213	129,278672	-927,53213	129,278672

Regression model 2

SUMMARY OUTPUT								
<i>Regression Statistics</i>								
Multiple R	0,22784078							
R Square	0,05191142							
Adjusted R S	-0,040585							
Standard Error	2177,23465							
Observations	46							
<i>ANOVA</i>								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	4	10641634,7	2660408,67	0,56122613	0,69207185			
Residual	41	194354379	4740350,7					
Total	45	204996014						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	1010,74024	672,838339	1,5022037	0,14070803	-348,08435	2369,56483	-348,08435	2369,56483
REGION	-461,64424	797,455087	-0,5788969	0,56582575	-2072,1375	1148,84898	-2072,1375	1148,84898
DOMESTIC	905,546484	826,376533	1,09580373	0,27955989	-763,35478	2574,44775	-763,35478	2574,44775
TYPE	-492,09963	650,856326	-0,7560803	0,45392352	-1806,5306	822,331384	-1806,5306	822,331384
STAKE	-1,6262216	2,31980881	-0,7010153	0,48725324	-6,3111705	3,05872734	-6,3111705	3,05872734

Regression model 3

SUMMARY OUTPUT								
Regression Statistics								
Multiple R	0,24923415							
R Square	0,06211766							
Adjusted R S	-0,0048739							
Standard Err	1674,51353							
Observations	76							
ANOVA								
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>			
Regression	5	12999962,4	2599992,47	0,92724558	0,468717			
Residual	70	196279688	2803995,55					
Total	75	209279651						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>	<i>Lower 95,0%</i>	<i>Upper 95,0%</i>
Intercept	-435,79661	1876,36114	-0,2322563	0,81701668	-4178,0809	3306,48769	-4178,0809	3306,48769
TYPE	-307,29289	458,693883	-0,6699302	0,5051063	-1222,129	607,54321	-1222,129	607,54321
MCAP ACQ	0,1252975	0,0634257	1,97550056	0,052155	-0,0012011	0,25179606	-0,0012011	0,25179606
MCAP T	0,87489802	7,44195846	0,11756287	0,9067507	-13,96762	15,7174162	-13,96762	15,7174162
TRANSACTIC	-0,4866569	0,66514411	-0,7316563	0,46682078	-1,813245	0,83993121	-1,813245	0,83993121
Year	0,26246087	0,93670267	0,28019657	0,78015309	-1,6057337	2,13065545	-1,6057337	2,13065545