A Case Study: The Merger between Fiat Chrysler Automobiles and Groupe Renault

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To my parents and grandparents, who have always showed me the value of learning

something new everyday

Acknowledgments

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Abstract

On the 27th of May of 2019, Fiat Chrysler Automobiles suggested a Merger Deal to Groupe Renault. After the Deal was acknowledged by Renault, the necessary conditions for it to be successful were stipulated, the announcement of this new Merger was made public, the markets in which the shares from the combined firm would be traded were defined as well as the share issue price. However, even with a favourable financial situation from both companies and a well-elaborated plan, the Merger between FCA and Renault failed. The present study analyses the conditions of this Merger Deal, with the goal of exploring it and understanding why this Merger failed. Therefore, after a Literature Review and having chosen a Qualitative Methodology, a PESTLE and Porter analysis were carried out; a group of Financial Key Performance Indicators was defined and calculated; the history of both companies was covered; and the chronology of the Merger Deal was clarified. Afterwards, a Conclusion was achieved: this is the case of a failed Merger probably due to political conditions, which emphasized that having an amazing Deal from the Financial Perspective may not be enough for it to be successful. The present case study also highlights the importance of studying Key Performance Indicators to analyse the financial situation of a company, and may be used to show to students the importance of analysing the conditions surrounding a Merger Deal - not only the financial ones, but also the macro economical ones.

Sumário

No dia 27 de maio de 2019, a Fiat Chrysler Automobiles propôs um plano de Fusão ao Groupe Renault. Após a Renault ter considerado o negócio, as condições com vista à obtenção duma Fusão bem-sucedida foram estipuladas, a Fusão foi anunciada ao público, definiram-se quais seriam os mercados nos quais as ações da empresa resultante da Fusão iriam ser transacionadas e qual o preço de emissão das ações. No entanto, ainda que a situação de ambas as empresas fosse favorável e se tenha elaborado um plano bem delineado para a execução da Proposta de Fusão, a Fusão destas empresas não se concretizou. O presente Estudo de Caso analisa as condições da Proposta de Fusão, com o intuito de explorar e compreender o porquê deste negócio não ter sido bem-sucedido. Desta forma, após uma Revisão de Literatura e se ter escolhido utilizar uma Metodologia Qualitativa, foram elaboradas as análises PESTLE e de Porter; definiu-se e calculou-se um grupo de *Key Performance Indicators*; foi explorada a história de ambas as empresas; e foi indicada a cronologia dos acontecimentos da Fusão em estudo. Após o desenvolvimento do caso, foi retirada uma Conclusão: este é o caso de uma Fusão que, provavelmente, falhou devido às condições políticas dos países nos quais estas empresas têm sede (França e Itália), tendo-se salientado que ter um negócio favorável do ponto de vista financeiro nem sempre implica que este possa vir a ser bem-sucedido. Este projeto ressalva ainda a importância de se estudarem *Key Performance Indicators* para analisar a situação financeira de uma empresa, e poderá ser utilizado para mostrar aos alunos a importância de estudar as condições que poderão influenciar uma Fusão - não só as financeiras, mas também as macroeconómicas.

JEL *Classification*: G30 & G34

Palavras Chave: Aquisições, Reações dos Órgãos de Gestão, Finanças Empresariais, Fusões

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Glossary of Acronyms & Abbreviations

APV	Alternatively-powered vehicles
BEV	Baterry electric vehicles
CCR	Cash Conversion Rate (minimum)
D	Debt
E	Equity
E85	Ethanol vehicles
EBIT	Earnings Before Interest & Taxes
EBITDA	Earnings Before Interest, Taxes, Depreciation & Amortization
EC	European Commission
ECV	Electric charged vehicles
EREV	Extended-range electric vehicles
EU	European Union
FCA	Fiat Chrysler Automobiles
FCEV	Fuel cell electric vehicles
FCFF	Free Cash Flows to the Firm
Fiat	Fiat Chrysler Automobiles
HEV	Hybrid electric vehicles
LPG	Liquified petroleum gas vehicles
KPIs	Key Performance Indicators
M&A	Merger and Acquisition
NGV	LPG and natural gas vehicles
PESTLE	Political, Economic, Social, Technological, Legal, Environmental
PHEV	Plug-in hybrid electric vehicles
RD	Return on Debt
RE	Return on Equity
Renault	Groupe Renault
ROCE	Return of Capital Employed
SMART criteria	Specific, measurable, achievable, time criteria
UNECE	United Nations Economic Commission for Europe
YTM	Yield to Maturity

1. Introduction

Multinational companies are a complex set of interconnected teams working towards the same goal, characterized by being a business involving different facilities based in several countries and for being a large entity composed by different cultures with well stipulated core values. Given the difficulty of managing an entire corporation of this type, there is usually a team assigned for negotiating Mergers and Acquisitions.

A Merger occurs when two separated firms combine their assets as a single legal entity (Ratajczak-Mrozek, 2015), and it can be one of the strategies adopted by a multinational company to develop its activities and to increase its market power, while growing and implementing a sustainable plan. However, in order to assess this type of deals, one should take into consideration the companies' past experiences (Galpin & Herndon, 2007) and study other Merger Deals, to be prepared for future adversities and to achieve the best possible result from the combined firm.

Realistically, it is more common for a Merger Deal to fail than to succeed, given that it is more complex to execute a plan than to elaborate one; which was why a Merger failure was chosen as the topic of this study: the Merger between Fiat Chrysler Automobiles & Groupe Renault. Considering that everything pointed out to an extremely successful deal between these two companies (in financial terms), the main goal of this project is to understand why it failed.

On the next pages, the reason for engaging in a Merger Deal and its obstacles will be explored. Furthermore, a method to forecast the financial success of a Merger will also be developed, by analyzing different categories of Financial Key Performance Indicators. After bearing in mind the Literature Review and defining a Qualitative Methodology to study the Data, a Market Analysis and an Automobile Industry Analysis will be carried out, and the history of Fiat Chrysler Automobiles and Groupe Renault will be studied.

Afterwards, the Merger between these two companies will be analyzed chronologically, the hypothesis of testing if the failure of this Deal was due to the possibility of one of the companies was trying to acquire the other one's business will be tested, and a Conclusion will be made. Moreover, all the bibliographical references are at the end of this project, and there are also several Appendices available complementing the gathered data.

2. Literature Review

Mergers can be divided into three categories, as noted by Gaughan (2015), depending on the relationship between the merging companies. A Horizontal Merger results in the combination of businesses between two competitors, a Vertical Merger consists in the combination of enterprises that have a "buyer-seller relationship", and a Conglomerate Merger occurs if the companies merging do not have a buyer-seller relationship and are not competitors.

In the case of a Horizontal Merger, if Government suspects that it could lead to a Monopoly in the field of competition of the enterprises merging, the State can decide to stop it. Yet, according to several studies compelled by Gaughan (2015), there is little support to the use of Mergers with this intention.

No matter which type of Merger the companies decide to negotiate, this deal implies the equal treatment of both parties. However, there is usually one firm that wants to take control over the other (Ratajczak-Mrozek, 2015), and when that happens an Acquisition or a Hostile Takeover might be on the horizon. A commitment of both companies is necessary, to protect the deal being negotiated and to avoid a withdrawal of the Merger Proposal.

Additionally, Gaughan (2015) emphasized that a friendly negotiation can end up as a hostile takeover, if one of the companies does not agree with the bid that was offered or if the bid is terminated. The pride of managers plays a decisive role in opting for a takeover, which is why a Board Committee should be appointed to avoid that some of the Board Members might be driven by their own agendas.

Galpin and Herndon (2017) identified six stages in the making of a Merger, which were named as The Deal Flow Model. The Merger starts with the Formulation, which is followed by the Location and the Investigation, before arriving to the Negotiation, which allows the Integration, with the last step of the process being the Motivation. Each one of these phases has key activities, issues and risks, which can be consulted in Appendix B.

Considering the complexity of negotiating a Merger and the need for involving experts in the different stages of the deal, there are several players in a M&A. These

players can be Investment Bankers, Accountants, and Legal Advisors helping in the formulation of the deal and in its execution (Gaughan, 2015).

The process of Merging starts with one firm contacting the targeted company, which is done by the Investment Bankers of each of the enterprise - and is essential for a friendly negotiation between the Managers of both firms. Then, the Managers should keep the Board of Directors up to date, given that the Board needs to approve the Merger before it takes place (Gaughan, 2015).

After the process of Due Diligence, the Merger agreement is elaborated by the representatives of the Law Firms representing each of the companies involved in the negotiation. During this stage of the deal, the Board should contact a firm that specializes in valuation, to obtain a fairness opinion regarding the terms of the deal, such as an Investment Bank (Gaughan, 2015).

When the Board approves the Merger, it is necessary to ask for the approval of the shareholders for the deal to take place. The shareholders give their approval through a vote, and if the Merger is approved the firms can complete the deal with the signature of the necessary documents as proposed by the State Authorities. The deal is then closed (Gaughan, 2015).

Nonetheless, the deal can fail even after being announced to the Public, due to several factors (Fuad & Gaur, 2019). It is highly important to consider if there is cultural incompatibility, if the styles of management are different, which are the difficulties in merging two different cultures (or more), the post deal integration and if the people involved in the process are the right ones (Galpin & Herndon,2007).

Regarding the Negotiation stage of the Deal (Galpin & Herndon, 2017), Agarwal and Kwan (2017) highlighted the difficulty of pricing a Merger and the behavioral factors involved in it. The higher the risk appetite of the buyer, the higher the price he will be willing to pay; and the more hostile the takeover, the greater the price premium. To arrive to the real price of the Merger, Brealey and Myers (1981) reinforced the importance of measuring costs (which are measured differently depending if the Merger is financed by cash or by stock), and benefits. Also, Harford (2016) pointed out that the company's value is not static during every stage of the deal and pricing a Merger can be difficult, considering the market environment at the time.

The determination of a Merger's success can only be done by analyzing the pre-Merger and post-Merger stages (Hassan, Ghauri & Mayrhofer, 2018), which may be difficult to examine given that the motives that led to the Merger are not always clear. However, for a Merger to succeed it is necessary to elaborate an effective plan in which the combined shareholder value needs to grow faster than what would happen if the firms were independent of one another (Galpin & Herndon, 2007).

The post-Merger performance can be increased, if the strategy developed has a cultural component, due to the fact that cultural issues have had an increasing importance in the breaking of the initial deal settlement between the firms (Achim, 2015).

Regarding the protection of the information shared during the stages of the deal flow, a Confidentiality Agreement between the parties involved in the Merger might be required and it may even be necessary to reduce the number of employees inside the firm that know about the deal, given their possible impact in the results of the process (Achim, 2015).

On the other hand, Gaughan (2015) also noted that Mergers can happen in waves resulting from a combination of shocks, namely: technological, economic and regulatory-which shape the macroeconomic conditions (Ratajczak-Mrozek, 2015). Additionally, macroeconomic shocks can only originate a Merger Wave, if the capital liquidity is enough to support the asset allocation (Harford, 2005).

Fuad and Gaur (2019) advised that the Merger deal should be conducted in a non-wave environment, given that within a wave companies experience heightened uncertainty. Nevertheless, if the company opts to enter in a Merger wave, it should announce the deal during the peak phase of the wave - which is when the friction between partners is lower (as presented in Appendix A) -, and late deals exhibit better performance than early deals within a wave (Xu, 2017).

On a different note, companies that decide to Merge have several incentives to do so - intangible and tangible - (Hassan, Ghauri & Mayrhofer, 2018), regardless of the geographical space in which the deal occurs (Achim, 2015). Two of the most common benefits are growth and synergies, which are divided into operating synergies or financial synergies. Operating synergies can be revenue enhancements and cost reductions, and

financial synergies refer to the combination of two or more companies with the intention to reduce the cost of capital (Gaughan, 2015).

A Merger can be useful for a company that wants to diversify its business. It can be used to lower costs, it should be customer focused, there should be an alignment regarding the intentions of the deal by everyone involved in it - which will allow a smoother transaction and a faster integration - (Galpin & Herndon, 2007), and it offers the possibility to exchange resources (Ratajczak-Mrozek, 2015). According to Brealey and Myers (1981), merging can also lead to economies of scale, the elimination of inefficiencies, and can be done with the intent of taking advantage of unused tax shields and surplus funds.

3. Methodology and Data

The present study aims to explore the reasons why a company should engage in a Merger Deal, which can be the obstacles to finishing a Merger's deal, and how can we have an idea if the Merger will be successful. Therefore, a recent Merger was chosen to achieve an answer to these questions: The Merger Deal proposed by Fiat Chrysler Automobiles (FCA) to Groupe Renault (Renault), in 2019.

After the Board Committee of both companies concluded that the value of the forecasted synergies was high, the FCFF of the combined firm were positive and the deal would lead to the achieving of sustainable growth for both companies, the Merger Deal was approved. The date of the Merger was settled, the share issue price was established and announced to the public, however the Deal never saw the light of day. So, how can a Merger that had everything to succeed in theoretical terms never occur? Was there any way to predict what would happen? Could the managers have used a different approach to forecast the success/failure of the Merger in question?

In order to find out an answer to the problems announced above, a Qualitative Research was applied. Tuckman (2012), Bogdan and Biklen (1992) identified five major characteristics that describe the research Methodology chosen: the investigator is the element able to collect the information needed to analyze a specific situation, this type of study focuses on describing the case and posteriorly examining the data, the researchers

are a part of the investigation process, the comprehension of the data uses induction as a resource, and the examiner focuses on seizing why the event took place and in what happened. Additionally, Creswell (2010) emphasized that the Methodology in question is an emerging project - one in which the questions can change and the way of processing the information can be modified -, it is necessary to explore the theory around the concept of study, and it implies interpreting the information acquired.

After defining the type of Methodology to be used, a Map of Literature as proposed by Creswell (2010) was elaborated. This Map is a tool to define the main Key Words when searching for the information needed to develop the Case Study and the Preliminary Index for the Project. Afterwards, it was possible to conduct a research of the articles to elaborate our Thesis and to consequently arrive to conclusions that could provide an answer to our questions.

Hence, a search for "Mergers and Acquisitions" was done in B-On - which is one of the most complete databases used in the Portuguese academic field -, having found 824.671 papers. Considering the importance of using current information on the topic, a filter that delimited research from 2000 until 2019 was applied, as well as a filter by 'Published in Academic Journals' and by 'Peer Reviewed'. The result was the gathering of 108.293 articles. Applying the same filters, when searching for "Merger advantages", we obtained 109.370 papers. On the other hand, researching for "Merger difficulties" resulted in 72.329 findings.

Bearing in mind the amount of bibliography available and the structure of Master's Thesis regarding Mergers and Acquisitions available in ISCTE's Library, it was also considered if the findings were directly related with the automobile industry, the precision of the information, if the articles were repeatedly appearing, and if the addressed topics were relevant for the analysis of the proposed Case Study - which allowed us to filter even more the data collected, as compiled in the Bibliography of the present project. Besides this, a search for the most well-known and relevant books in the field was carried out and the books that we decided to select as the ones which were going to be the auxiliaries for this study were the ones referenced in the majority of the web-sites that can be consulted by searching for "Best Mergers and Acquisitions Books".

Furthermore, the gathering of important news regarding the Merger between FCA and Renault was also carried out. When analyzing the data, the following principles of

Qualitative Research were taken into consideration: it is important to take note of the situation and the parties involved, the relationships and behaviors in each article should be identified, the motivations of the subjects need to be addressed, and the consequences that followed the decisions made by the players have to be considered (Tuckman, 2012).

On the other hand, when the success of a Merger deal is being discussed, one must analyse the future Free Cash Flows to the Firm (FCFF) that would be generated by the combined firm and compare them to the costs of the Merger. Nevertheless, considering that this value had already been estimated by FCA when the company proposed the Merger Deal to Renault, and the fact that other Thesis regarding M&A usually show how to calculate FCFF and deduct the costs of the combined firm to verify if the deal would be successful, we decided to develop a group of Financial Key Performance Indicators (KPIs) as an auxiliary method in the interpretation of the estimation of the FCFF of the company resulting from the Merger.

The dynamic nature of the market and businesses (Chan & Chan, 2004) implies that companies should be able to adapt to rapid changes and develop business strategies to allow the growth and sustainability of the business, if they want to achieve competitive advantage (Mahbod & Shahin, 2006). In order to do so, it is essential to choose benchmarks to compare the results achieved with other companies from the same sector with similar characteristics (which is the case of Fiat and Renault). One way to achieve these important benchmarks is to use KPIs, planned by the Business Process Management of the company (Ghannouchi & Wannes, 2019).

KPIs have been used to study specific activities in a company (Haber & Schryver, 2019), after the managers' establishment of goals for the organization (Lazarova, n.d.). KPIs are metrics and operational control figures that should reflect important data to determine whether the company has been successful in a certain activity or not. Their understanding is only possible after taking into consideration the relations between each of these indicators, given that some of them may be correlated (Horst et al., 2016).

In a study from 2018, Crane et al proved managers choose performance indicators that are able to provide important insights regarding the achievement of the company's goals while considering their precision - they should not be precise enough given that some of the incentives attributed to these managers depend on the metrics' performance; in other words, KPIs should not affect the noise in the managers' personal earnings.

According to Howard et al. (n.a.), the desired characteristics of SMART criteria are that KPIs must be specific, measurable, achievable, relevant and must consider the time phase for which they are being designed. With the intent of studying the financial performance of FCA and Renault, the need to better understand the dependencies between KPIs emerged[1] . Therefore, we decided to categorize our Financial KPIs in four areas, taking into account that the importance of each KPI depends on the user perspective (Haber & Schryver, 2019), while using the SMART criteria to develop the following metrics. The four categories that have been chosen for our study were: Capital Structure, Growth, Liquidity, and Profitability; and will be analysed in Chapter 8.

By understanding the macroeconomic conditions of the European market at the time of the deal, retrieving data from several articles and newspapers, reading books, and studying a new method that might have been useful to predict the end of the Merger Deal between FCA and Renault - Financial KPIs analysis -, we were able to reach an answer to the questions raised in the Introduction and to collect information that could enlighten future studies regarding Merger and Acquisitions. The choosing of the Methodology was the starting point to define our method of study, which therefore enabled a Conclusion.

4. Market Analysis

In order to study a market, one should take into consideration the variables able to influence the dynamics of the market in analysis. Following the logic of the PESTLE analysis, there are six fronts that should be considered when examining a market: political, economic, social, technological, legal and environmental.

The following chapter portrays the automobile market worldwide, with a special emphasis in Europe - which is the region where FCA and Renault were established at the time of the Merger Proposal. Besides this, the analysis carried out had a focus in 2018, given that the Merger in study was supposed to happen in June of 2019. Additionally, for a matter of simplification, the data portrayed below emphasizes the macroeconomic outlook for passenger cars in the European Union in 2018, although there is also available data for commercial vehicles and for other countries in the world.

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[1] Which was one of the problems that appeared after the study of Horst et al., 2016

4.1. Political

Considering that at the time of Fiat's Proposal for Merger Deal to Renault both companies had their headquarters in countries that were a part of the European Union (EU), and bearing in mind the difficulty of analysing the political factor at a worldwide level, we decided to focus on the political characteristics to be a part of the EU.

In order for a country to apply to be a part of the EU, there are certain membership criteria that need to be fulfilled. Among them, the country needs to work as a democracy, it has to have stability, Human Rights should be applied as a part of the country's law, the Law defines the rules of the country, and minorities need to be protected. Besides this, the economy has to be functional, to be able to face competition and to deal with macroeconomic forces from the EU. Also, the obligations aiming "political, economic and monetary union" (according to UE's website) must be applied.

The political relations established in the European continent are based on trust, given the highly incentive that is given for the correct functioning of the free market and the willingness to achieve the highest possible, degree of internationalization through the mobilization of resources and skills. There have been political advances to stipulate labour laws, to support the search for high level workers with the intention of achieving a faster technological development, while considering the Environment (Chanaron & MacNeill, 2005).

4.2. Economic

Brexit played an important role in the Economy of the European Union, during the year of 2019. Bearing in mind that this deal took some time to be formalized, in 2018 the European Commission expected global trade tensions caused by it for 2019, which could lead to a great impact in the manufacturing sector in 2019.

GDP growth was expected to decrease from 2,0% in 2018 to 1,4% in 2019, followed by an increase to 1,6% in 2020 (a forecast of the European Union GDP growth for the Summer of 2019 can be consulted in Appendix F). Inflation was expected to decrease from 1,9% in 2018 to 1,5% in 2019, due to the reduction in energy's prices.

Additionally, considering that it was expected that more jobs would be created and wages would rise, unemployment would decrease from 6,8% in 2018 to 6,5% in 2019.

Table 1: European Economic Forecast – Summer 2019

EU FORECAST	2018	2019	2020
GDP GROWTH (%, YOY)	2.0	1.4	1.6
INFLATION (%, YOY)	1.9	1.5	1.6
UNEMPLOYMENT (%)	6.8	6.5	6.2

SOURCE: EUROPEAN COMMISSION, DG ECFIN

Figure 1 European Economic Forecast - Summer 2019

The demand for car registrations worldwide decreased, due to the contraction of the Turkish market and diminishing demand in Western Europe. Furthermore, the ongoing Argentina's recession was responsible for a decrease of almost 52% in car sales in South America, with Brazil being an exception because of its ability to offset these losses. The decreasing consumer confidence in the Chinese market allied to trade tensions with the United States of America and an economic slowdown of the country also affected car sales in China negatively; however, the global passenger car market share of the US increased from 2018 to 2019. The number of cars sold in Japan remained almost the same, nevertheless the sluggish economic conditions provoked a fall in the automobile demand in South Korea. On the other hand, the liquidity crisis in India and the increase of its ownership cost also caused a decrease in the country's car sales. Overall, there were 8,0% less cars being sold worldwide during the first semester of 2019 than in the same period for 2018 (see Appendix G).

In Europe, the Top 5 Automobile Markets[2]- United Kingdom, France, Italy and Spain- have all experienced a decrease in the volume of car sales, with Spain registering the most dramatic fall.

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[2] Excluding Germany

4.3. Social
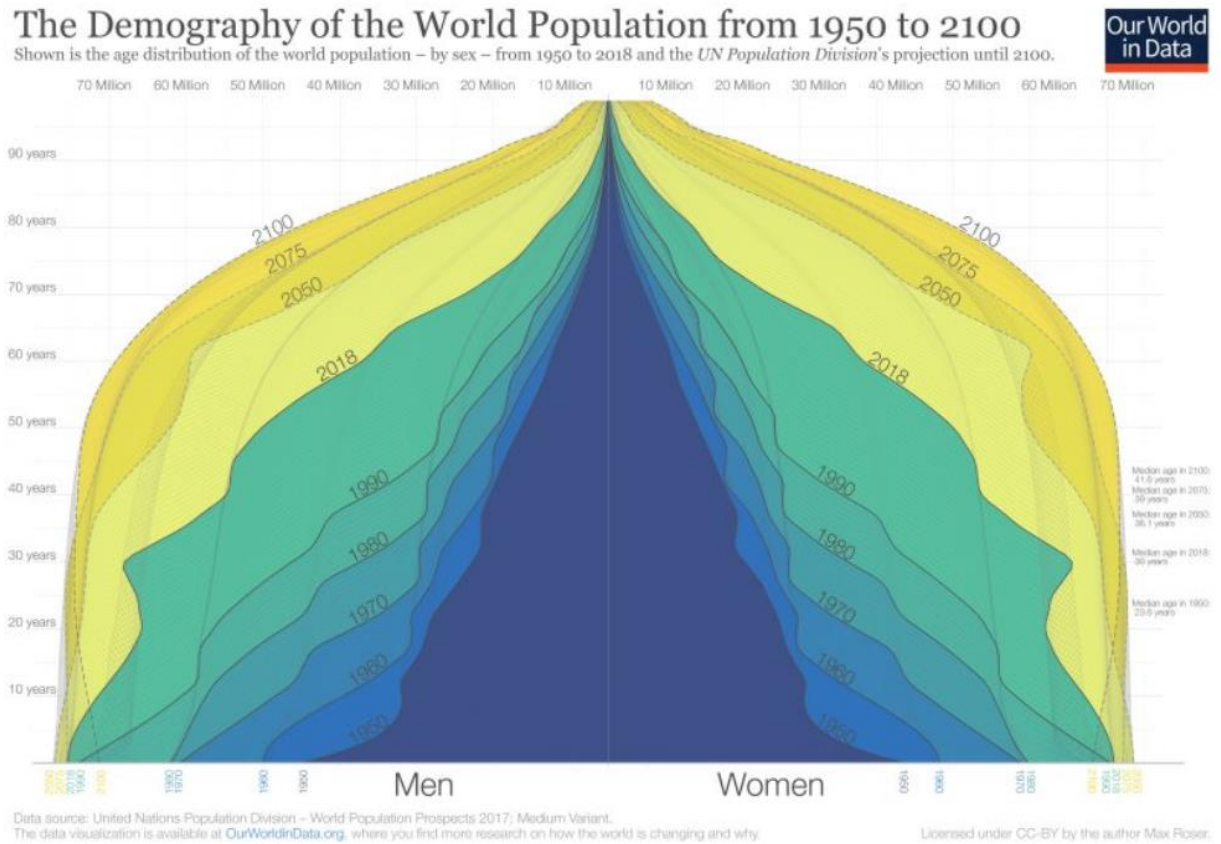
Figure 2 The Demography of the World Population from 1950 to 2100. Retrieved from
https://ourworldindata.org/world-population-growth, 12th of April of 2020, 23:41h

The image above shows the demography of the world population between 1950 and to 2100. The vertical axis represents the age of the individuals and the horizontal axis below the image is divided in two: the temporal gap for men on the left and the temporal gap of analysis for women on the right. Each color portrays a different time in history. The colored areas identify the world pyramid for a specific year. For example, the area in dark blue is the world pyramid for 1950, and the entire area below the line of 1960 (which includes the area in marine blue and in dark blue - which is the area for 1950) represents the world pyramid in the same year.

Comparing the pyramid for 2018 with the one for 1950, the first one has a much larger form at the bottom than the last. This can be explained by the fact that in 1950 life expectancy was lower than the one for 2018, due to the development of the healthcare system and technology. On the other hand, while in 1950 the pyramid had a form of a

triangle, in 2018 the base of the pyramid and the middle of it have a similar appearance. The shape of the pyramid in 1950 also shows that the number of newborns in comparison to the remaining ages of the population was higher than for 2018. Child mortality in 1950 was 1 out of 5 children and in 2018 was less than 1 out of 20 children.

Accordingly to information collected from the ourworldindata.org website, there is a tendency for a continuously decreasing number of newborns and a filling of the remaining ages of the pyramid, given that the number of births per family is decreasing, life expectancy is higher today than it was in 1950, the percentage of older people will increase and the number of people with a working age will become bigger. In general, the world population is becoming healthier and the mortality rate is decreasing.

Considering that the average working age for all countries is comprehended between 15 and 64 years old, it is estimated that in 2018 for 2,5 working people there is 1 child (with an age younger than 15 years old); while in 1950 there were only 1.8 people with an age comprehend between 15-64 to 1 child, and the tendency shows that by the end of the century we should have 3,4 people in working-age for 1 child. However, this does not mean that the number of people in the labor market is increasing within the overall population. Given the increasing portion of the older population over the years, there is also a higher percentage of retired people.

All things considered, the population growth rate is increasing and the world pyramid is starting to acquire the form of a square, which means that the number of people in working age will have to support more retired people and more children than what happened in previous years.

4.4. Technological

In the last years, there has been a major development in Technology. Manufacturers from the automobile industry have been introducing new strategies to build their vehicles, in a faster and more secure way. According to Chanaron and MacNeill (2005), the assembly line is becoming more dependent on computerized and electrical technologies, and we know that there were four main drivers responsible for the technological progress in this area: the demand for new and better vehicles associated with intense competition to fulfill the customers' needs, the desire to increase the margins

on vehicles' sales, the intention to develop better solutions to protect the environment and encourage sustainability, and the commitment to improve the safety of the vehicle's occupants and pedestrians.

The progress of Technology, as well as the change of social standards related with protecting the Environment, allied with the issuing of new Laws to preserve the Environment and to improve safety are reflected in the type of fuel being used in new cars. During the first half of 2019, 59,4% of the new passenger cars in the European Union were petrol vehicles, 31,7% were diesel vehicles, and 8,9% were alternatively-powered vehicles (APV). The biggest difference has been the increase in the number of APV vehicles, from which 2,4% were electric charged vehicles (ECV), 4,9% were hybrid electric vehicles (HEV) and the remaining 1,6% were other vehicles than electric (such as LPG and natural gas cars).

Figure 3: New passenger car in the EU by fuel type, % share | H1 2019
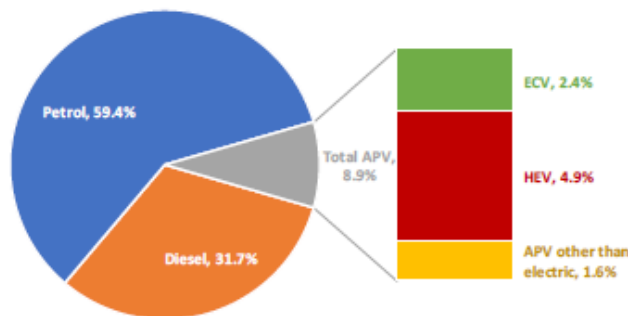
SOURCE: ACEA

Figure 3 New passenger car in the EU by fuel type, % share | H1 2019

4.5. Legal

The Legal framework has been showing a tendency to the creation of a regulatory framework that protects the Environment, while ensuring safety and portraying a progress in mobility - that can be achieved with the development of new technologies. Considering the main importance being given to these concerns, Chanaron and MacNeill (2005) emphasized that "The European Commission has taken a strong lead in a number of areas

ranging from 'end of pipe' emissions to the opening up of retailing through the New Block Exemption Regulation." (Chanaron & MacNeill, 2005, page 2). According to the same paper, the laws that had a larger impact in the automobile market during the past years were: new emissions legislation, legislation on allowance substances, EURO-NCAP standards for occupant and pedestrian safety, and the end of life vehicle and recycling requirements.

Additionally, the European Commission (EC) website provides a detailed explanation of the United Nations Economic Commission for Europe (UNECE) regulations and the European Union (EU) directives and regulations regarding the automobile industry. Also, the EU legislation is divided in four different categories, namely: motor vehicles, their trailers, systems and components; two-wheel and three-wheel vehicles, and quadricycles (4x4); tractors; and non-road mobile machinery emissions. On the other end, UNECE regulations focus on establishing "a global market for vehicles while ensuring a high level of environment protection and safety".

Given that the present Case Study portrays the analysis of the Merger between FCA and Renault, we should also bear in mind the existence of Legislation regarding Mergers, which can be accessed via the European Commission (EC) webpage. The EC Merger Regulation and the Implementing Regulation are the main legislative texts regarding Mergers, the notices and guidelines published by the EC are used to interpret the Merger Regulation, the Best Practice Guidelines are used to provide a better guidance of the relationship established between all the parties involved in the deal, and the EU Competition Law illustrates the rules applicable to merger control. Furthermore, the Notices and Guidelines regarding the Abandonment of Concentrations can be found in Appendix C, given their importance to understand the process behind the declaration of abandonment of the Merger Deal by FCA and Renault.

4.6. Environmental

The increasing concern with Climate Change and the idea of sustainability, as well as the definition of new Legal Policies and the development of Technology, have been starting a trend of shifting the powertrain of cars from petrol and diesel to alternatively-powered vehicles, to diminish pollution and the level of gases considered harmful for the

Environment. As stated above, APV vehicles can be electrically-chargeable vehicles (ECV), hybrid electric vehicles (HEV), LPG and natural gas vehicles (NGV), and ethanol vehicles (E85). ECV can be divided into battery electric vehicles (BEV), extended- range electric vehicles (EREV), fuel cell electric vehicles (FCEV) and plug-in hybrid electric vehicles (PHEV); and HEV can be full and mild hybrids.

During the first semester of 2019, the sales of APV showed a growth of 27,5% in EU, when in comparison to the same period of 2018, being the ECV the ones with the highest increase in sales (37,8% increase in 2019 in comparison to 2018). HEV were the most representative share of the APV in EU, having registered an increase of 36,5% in 2019 versus 2018. Additionally, the demand for NGV dropped 35,3% during the first semester of 2019 and consequently the registration of APV other than electric fell by 3,4% (see Appendix I).

From the five key markets in the European Union, Italy is the one with the highest value of alternatively-powered car registrations, having the double of the registrations from Spain (more than 150.000 versus more than 70.000, respectively).

5. The Automobile Industry

In 1979, Michael Porter emphasized the idea that a company should be aware of five different forces within an industry when developing its business strategy (Prasad & Warrier, 2016): the bargaining power of suppliers, the bargaining power of customers, the rivalry between existing players, the threat of new substitutes and the threat of new entrants. As stated by Mouillot and Park (2019): "(…) forces (…) mean, a strength or an energy as an attribute of physical action or movement.".

Bearing in mind the 5 Forces Theory and taking into consideration the sector from FCA and Renault, the following chapter provides an analysis of Porter's five forces of the automobile industry.

5.1. Bargaining power of suppliers

The higher the number of available suppliers a company has, the lower is the bargaining power of suppliers. Considering the size of FCA and Renault, as well as their market power, the terms contractually agreed with their suppliers should be well stipulated and clear. If the companies start to discover that there are other options in the market with better quality or the same quality for a lower price, the management will advise to change the suppliers in order to decrease the costs associated with the supply of the necessary materials. However, it is also important to consider that some of the components purchased by these companies can be extremely difficult to replicate, and if the supplier produces one of these unique pieces it may be able to have a higher bargaining power than the others when defining the terms of the supply contract. Overall, the bargaining power of suppliers is low.

5.2. Bargaining power of customers

The number of cars sold to customers depends on the unemployment rate of the countries and on the growth of the countries' economies. Additionally, the value of new sales is influenced by the changing of customers' taste, market exchange rates, the fact that the economy may be facing a decline, and on the laws applied to the automobile commerce (Chanaron & MacNeill, 2005). Assuming that all these characteristics were aligned to attract customers and the levels of sales were high, the customers would not have a lot of power when it comes to negotiating the prices stipulated by a certain brand.

Nowadays, the type of products being offered by the automobile manufacturers are usually the same and the prices of the same service/product are similar among different companies available in the market. This implies that the customers can decide which is their favourite brand, however, if they want to purchase a certain product, it is difficult to discover an arbitrage opportunity; given the fact that the market corrects them quickly - the other companies selling the same product/service would be aware if one of the others was selling a similar product/service by less, and the prices would all start to converge with the intent to capture the majority of market share. Besides this, the companies want to be able to achieve a certain level of revenues, which would not be possible if they were constantly changing the prices of their products/services.

5.3. Rivalry between existing players

The latest tendencies in the automobile industry have showed that the players in this field are seeking for a worldwide presence through internationalization and aim to obtain economies of scale (Chanaron & MacNeill, 2005), in order to increase their market power. Furthermore, the intense competition felt in the automobile industry implies a high investment in research and development to meet customers' needs and requirements, which can lead to a technological progress within the industry. Therefore, if a company wants to survive and achieve growth inside the automobile market it not only needs to adapt to the circumstances faster, but it also needs to be the one to do it better.

5.4. Threat of Substitutes

The substitutes of an automobile are all the vehicles able to perform the same function that an automobile can perform, such as mobility and transportation. Therefore, the substitutes of the products commercialized and produced by FCA & Renault are public means of transportation (buses, metro, and boats, among others), bicycles and scooters, motorcycles, airplanes, for example.

Considering the diversity of the automobiles commercialized by Fiat and Renault, the fact that using other means of transportation could have a higher cost (as what happens with an airplane), some of the substitutes are not very friendly to ride within higher distances (as a subway in a specific city), and others are not useful to transport heavier merchandise (like a bicycle or scooter), it is highly improbable that automobiles will not be used in the future. Therefore, the threat of substitutes is low.

5.5. Threat of New Entrants

The entrance in the automobile industry requires a high investment in resources and R&D to compete with the actual players and these resources can be difficult to gather if a legislative shock occurs. Unless a company is planning on introducing something new in the market, such as a new technology, it may be extremely hard to break through this

barrier (Chanaron & MacNeill, 2005). However, it is important to consider the chance that new global players can emerge from developing economies, as what has been happening with AutoVaz in Russia and manufacturers FAW and SAIC in China.

Additionally, the biggest players in the industry have been around since several years ago. Some of the newest expansions can be avoided by acquiring and merging the existing companies with new organizations (which was what happened in Korea, after the country started dealing with economic difficulties), and this is an industry with intense competition. Thus, although the appearance of new entrants is possible, it is also low.

6. Fiat Chrysler Automobiles and Renault- a Brief History of the Companies in Analysis

In May of 2019, Fiat Chrysler Automobiles proposed a Merger Deal to Groupe Renault, which could lead to one of the strongest alliance of forces in the automobile industry. This is an economic sector that has been in constant development, with FCA and Renault being two of the most well-know and valuable brands from their field at an international level. However, these companies were not always as we might know them, and both had humble beginnings. Understanding the history of the enterprises in study can contribute to a better understanding of the proposed Merger Deal.

In the next pages, the reader will be able to have a perception of where the history of these two giants from the automobile industry started, which are their values and portfolios, some of the companies' most remarkable years, interesting facts, as well as their size and the location of their headquarters, among others.

6.1. Fiat Chrysler Automobiles N.V. Overview

Fiat Chrysler Automobiles N.V. is a company from the automobile sector with Italian and American roots that engineers, designs, distributes, manufactures and sells vehicles, components and production systems at an international level. The company has its headquarters in London, counts with 198.545 employees, and has a unique portfolio divided into automotive brands - Abarth, Alfa Romeo, Chrysler, Dodge, Fiat, Fiat

Professional, Lancia, Jeep, Maserati, Mopar, RAM, SRT -, and components and productive systems - Comau and Teksid.

However, this multinational company was not always known by "Fiat Chrysler Automobiles N.V.". It all started 120 years ago, on the 11th of July of 1899, the day in which the Società Anonima Fabbrica Italiana di Automobili Torino- F.I.A.T. was created. Fiat was listed on the stock exchange by 1903, having Giovanni Agnelli as its Managing Director; and began to produce its first vehicles for the transportation of goods by the same year.

With the following years passing by, Europe was the stage of an economic and scientific progress, from which Fiat took advantage. Nevertheless, the Great War was responsible for a change of course in the industrial activity of the company, which started to be used as an important pawn of support for the military industry. After the First World War ended, Fiat needed to pay careful attention to its cost management policy, in a time filled of intense political and social conflict, given that it was facing a difficult period.

In 1923, the company introduced the concept of industrialized production, developed an assembly line and transformed its working methods; and in 1930, Fiat started its expansion abroad.

On the 10th of June of 2009, the Fiat Group took an initial 20% ownership interest in Chrysler Group LLC, marking the start of a global strategic alliance that is still active nowadays. At the time, VEBA Trust, the US Treasury and the Canadian Government were the ones holding the remaining interest of Chrysler Group LLC, besides Fiat; and Sergio Marchionne, who was the CEO from the Fiat Group, was also appointed as the CEO from Chrysler Group LLC.

The deal mentioned above only happened in practice and was not officialized on paper, however it generated synergies that were beneficial for both groups. Fiat Group saw its manufacturing footprints being optimized, gained access to new markets, the sharing of technologies accelerated innovation and sustainability, and it also got access to a global supplier base. Chrysler Group, which was under a turnaround process, was able to fully repay the loans asked to the U.S. and Canadian Governments, six years ahead of schedule.

By 2012 the ownership interest of Fiat Group over Chrysler Group reached 58.5%, and the companies were able to achieve a full integration. In January of 2014, the ownership of Fiat over Chrysler reached 100%, and in October the companies merged to create the Fiat Chrysler Automobiles (FCA) - with shares being traded on the New York Stock Exchange and the Milan Stock Exchange.

The Group's strategic plan started to be marked by ambitious strategic goals, while still delivering the financial results established in its corporate plan, being the latest announcement of 2019 its intent to merge with Groupe PSA (a French manufacturer, which is also the second largest car manufacturer in Europe). On the 21st of July of 2018, Michael Manley was appointed the CEO of the FCA Group.

Each of FCA's brands has characteristic core values and a particular history. Considering that this is a Group in which several Mergers and Acquisitions happened, FCA has brands with both Italian and American roots. From its Italian brunch, Abarth was founded in 1949 and is responsible for the performance modification for on-road sport cars; Alfa Romeo was established in 1910 and offers stylish and exclusive cars, with the use of the best resources, technology and know-how; Fiat was founded in 1899 and is a mass market brand focused on small and compact cars with distinctive Italian style. Additionally, Fiat Professional started its operations 100 years ago, within the light commercial vehicle market; Jeep was founded in 1941, and is a global icon associated with an adventurous lifestyle - offering SUVs and an unmatched off-road capability; Lancia was established in 1906 and portrays the Italian style through the sophistication and elegance of its vehicles; and Maserati was founded in 1914, being responsible for the delivery of luxurious and unique sport cars.

On the other hand, FCA's brands from its American brunch are: Chrysler, which was founded in 1925, standing for innovation, efficiency and functionality, and was the brand that invented the minivan; Dodge, founded in America in 1914, offers a full lineup of performance vehicles and SUVs that deliver best-in-class horsepower, class exclusive technology and unmatched capability; RAM, launched in 2009, has a strong core market in North America and is a dedicated truck and light commercial vans' brand that stands for dependability, capability and efficiency; and SRT, which is part of the Dodge product line, responsible for a new era of high-performance and innovative vehicles, with the most powerful and fastest mass-produced sedan in the world, the world's most powerful

production Grand Touring vehicle, as well as the fastest, most powerful and most capable three-row SUV and the fastest quarter mi-le production car.

Still into the automotive brands, FCA works with Mopar, which was established in 1937, providing expert service, genuine parts and customer care for all FCA vehicles around the world. The name of this brand comes from the contraction of the words "Motor" and "parts".

On the other hand, the brands from FCA's productive and component systems portfolio are: Comau - the global leader in delivering advanced industrial automation products, systems and services -; and Teksid - global leader in the production of iron and aluminum components for the automotive sector.

6.2. Renault Overview

Renault SA is a French automobile company, responsible for the manufacture, design and distribution of commercial vehicles, passenger cars and electric vehicles. It has operations in Europe, Asia, America, and Africa, and has a commercial alliance with Nissan and Mitsubishi. Besides this, it also operates under the brands Renault, Dacia, Alpine, Lada and Renault Samsung Motors - which is essential to the maintenance of its growth strategy and allows a constant adaptation to technological changes, while addressing its customers' needs.

Established in 1898 by three brothers (Louis, Marcel and Fernand Renault), this company that has as its mission making customers' life easier, started its operations on the day that Louis Renault drove the first vehicle produced by the enterprise up the *Lepic* street, in Paris.

The vehicles of this company were even mobilized to the First World War, in 1914, which was a factor for the company to become more well-known. As what happened with FCA, Groupe Renault became an essential part in the production of components for the military industry, having to pay careful attention to its costs' management in the following years.

Even with the difficult years after the end of the First World War, Renault has always been an innovative company, and, by the year of 1924, the logo of the company

had already adopted the diamond shape that is so well recognizable nowadays. Aligned with its creativity, Renault is also an affordable company, which makes the fact that it is constantly responsible for anticipating trends and adapting to the environment's changes a strong point in favor of its business when customers decide to purchase the products and services commercialized by this firm.

On the other hand, another similarity that Renault has with FCA is its "birth" year. 2020 also marks the 120th anniversary of this company that intends to be the future of mobility with its electric, connected and autonomous vehicles. Its range of cars has vehicles that cover every person needs - regardless of their wealth and the place in which they live-, while being sustainable. The offer provided by Renault makes it a lovable brand by a huge quote of the automobile market, with loyal customers.

Additionally, Renault is headquartered in *Boulogne-Billancourt*, *Île-de-France*, France, has 181.344 employees worldwide, and is a company that has always had a passion for sport and excellence - which can also be seen in its structure and hierarchy. The chairman of the company is Jean-Dominique Senard, and there are four different and specialized committees composing the business: audit, risks and ethics committee (CARE); compensation committee; appointments and governance committee; international, industrial and digital strategy committee.

Although this company has faced some difficult and uncertain times - as FCA -, Renault decided to create Renault Foundation as its commitment to solidarity and society, and proudly announces it on its website.

Just like FCA, this Group has a diverse portfolio of brands. These brands join forces with each other daily to achieve the greatest potential possible for the future of the company, being each of them associated with a different adjective (as stated in the company's Annual Report from 2017 - 2018).

Renault is a brand characterized by passion that is sold in 134 countries, being the biggest French brand worldwide, and has a leading position in the European car market with its electric-vehicle market and motorsport commitment. Additionally, Alpine was established in 1955 by Jean Rédélé and pursues the idea of having a competitive DNA, represented by the driving pleasure offered by its vehicles.

Furthermore, Renault Samsung Motors was created in 2000, being one of the top five car makers in South Korea, offering a range of seven sedans and SUVs, all with the highest quality - which is emphasized by the fact that it was voted as the number one brand in customer satisfaction for the fifteen-consecutive year in 2017.

On the other hand, Dacia portrays pleasure and simplicity with its affordable, simple and reliable vehicles, being responsible for the retention of more than 5 million customers since 2004 along the 44 countries in which it operates.

Nevertheless, even considering the diversity offered by Renault's portfolio, the company decided to expand its business with a new branch. The most recent Renault's brand is Lada, which makes it the one associated with a New Era. It was established in January of 2017 and is the leader in the Russian automobile market, being characterized by a rapid transformation in its energetic designs and presenting a renewed range.

Even though this is a successful company, the status of Renault has already changed several times during the years. The nationalization of the company occurred in 1945, and in 1990 Renault changed its status once again to become a public company with State capital. Yet, by 1996, the privatization of Renault had already become effective.

The Annual Report of the company for 2018 - 2019 announced the company's moto as "Living the future of mobility today", stating the importance that the business gives to a constant technological development in hand with the achievement of a more sustainable industry.

Fiat Chrysler Automobiles and Groupe Renault are two companies with a strong history in the automobile market, both portraying success throughout the adversities faced during the past 120 years and being a great example of the importance of a constant adaption to the macroeconomic conditions - not only locally, but worldwide. If these two companies were combined, the resulting firm would lead to the achievement of a highest market quote than the one from the stand-alone businesses, which would create one of the biggest automobile groups in the World.

But, does it mean that having a strong culture is enough to succeed in a Merger Deal? Besides studying the history of the companies, the different forces of the

macroeconomy influencing the daily lives of FCA & Renault, and checking which were the obstacles to negotiate in the automobile industry, we also decided to assemble a group of Financial Key Performance Indicators (considering the Earnings Reports of both companies from 2017 - 2018) to study the hypothesis of being possible to discover if this was a Deal condemned to failure through a financial analysis.

7. The Merger between Fiat Chrysler Automobiles and Groupe Renault

On the 27th of May of 2019, Fiat Chrysler Automobiles (FCA) released its proposal for a Transformative Merger with Groupe Renault (Renault). This Merger was going to create the third largest automobile group in the world, following Toyota and Volkswagen (Observador, 06/06/19).

The conditions of the proposed deal involved a combination of businesses as a 50/50 Merger, the expected sales would round the 8,7M vehicles, the new company would have a strong market share with a portfolio that would offer luxury and mainstream vehicles, no plants would be shut down, the existing synergies from Renault-Nissan-Mitsubishi Alliance would have an estimated annual run rate synergies of €5 billion and the other Alliance partners would also have an additional run rate synergies estimated of approximately €1 billion. Additionally, the Merger between FCA and Renault would allow the distribution of dividends and a flexible capital allocation, given that it would create a stronger balance sheet than the one that the companies had on a standalone basis.

The Board of the new entity would be composed by 11 members, with 4 members representing Renault, 4 members representing FCA, 1 representing Nissan and the remaining being independent. Besides this, the parent company was going to be listed in three different markets: Borsa Italiana (in Milan), Euronext (in Paris), and the New York Stock Exchange (in New York).

Considering the different equity values from both companies, a dividend of €2,5 billion would be distributed to FCA's shareholders, and Comau's shares were going to be distributed to FCA's shareholders or an attribution of an incremental dividend with the value of €250 million would happen if the spin-off of Comau did not occur.

On the other hand, the combination of both companies would originate an operating profit of approximately €10 billion, a net profit greater than €8 billion and annual revenues of €170 billion, considering FCA's statistics regarding the available data for both companies during the year of 2018.

Having John Elkann (the chairman of FCA) and Jean-Dominique Senard (the chairman of Renault) on the same page, and an amazing deal for both companies (The Economist, 06/06/2019), was not enough for the Merger to occur. After a six-hour meeting and ten days of negotiations (Observador, 06/06/2019), Renault's Board of Directors announced that they were not able to make a final decision regarding FCA's proposal to merge, on the 5th of June of 2019.

The lack of an answer from the Board of Renault happened as a consequence of a request from the French State to postpone the vote, which is the owner of a 15 percent stake of Renault (Japan Times, 03/08/2019) and the major shareholder of Renault (The Guardian, 06/06/2019). Additionally, the fragile relationship between Nissan and Renault, which was overwhelmingly prejudiced by the arrest of Carlos Ghosn - former chairman of both parties - (Financial Times, 04/08/2019), was also a factor to consider during the negotiations.

As an implication of the notice issued by Renault, FCA issued a document on the 6th of June of 2019 withdrawing the Merger proposal to Groupe Renault, with the justification of having reached the conclusion that the political conditions in France were not suitable for the deal to be sealed.

However, as from the 3rd of August of 2019, Nissan Motor Co. and Renault SA started to consider the introduction of changes to their partnership, with the intention of restarting the negotiations between FCA and Renault once again (Japan Times, 03/08/2019), and with the biggest decision being the reduction of the 43 percent stake that Renault has on Nissan.

Regardless of Nissan and Renault intentions, the French Government seemed to oppose to an ideal deal between FCA and Renault for the second time, having the French President Emmanuel Macron declared that he was not going to consider any changes in the structure of the companies in question (Japan Times, 03/08/19).

Even though the conditions seemed unfavorable to a deal, Mr. Manley (Fiat's CEO) declared that if the circumstances surrounding the failure of the attempted Merger were worked out, FCA would be interested in rekindling the proposal previously made (Financial Times, 04/08/2019). For now, the World needs to wait and see how things will turn out and, as put into words by Galphin and Herndon (2007), this is a clear case in which making a deal and implementing one are not the same thing and the second was harder than the first one.

8. Key Performance Indicators

With the intent of studying the financial performance of Fiat Chrysler Automobiles and Groupe Renault, the need to better comprehend the dependencies between KPIs emerged[3] .

The calculation of Key Performance Indicators was only possible with data retrieved from the Earnings Reports from both FCA and Renault. Considering that the Merger between these two companies was predicted to happen in June 2019, the Consolidated Reports used to forecast if the Merger would be successful or not were the ones from 2018- which was the most recent complete fiscal year prior to the Merger Deal.

Taking into consideration the Methodology adopted, this chapter is divided into four parts, with each one exploring a different category of KPIs: Capital Structure, Growth, Liquidity and Profitability. For each of these categories, there will be a brief explanation of the meaning of the KPI category, as well as the chosen KPIs to carry out the analysis and what we may deduct by them.

Additionally, in order to simplify the following of our reasoning, the obtained values should be analysed with the table from Appendix K - which has all the calculations and data needed from the Earnings Reports to achieve the amount of each KPI. The assumptions made to work with the data gathered are also listed below.

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[3] Which was one of the problems that appeared after the study of Horst et al., 2016

8.1. Appendix K Assumptions

According to Fiat's Merger Deal Proposal to Renault made on the 27th of May of 2019, we were able to find out some of the expected synergies values. The Present Value of the expected synergies of the combined firm would be an estimation of 10.000.000.000,00EUR based on the operating profit, while the Present Value of the expected Equity's synergies would be of 8.000.000.000,00EUR- estimated through net profit-, and annual sales were forecasted to increase by 15.000.000,00EUR.

Additionally, we should bear in mind that the Cash Flows to Equity are discounted at a levered rate defined by the shareholders, and the Cash Flows to the Firm are discounted ignoring Debt at a rate usually identified as RU (Unlevered Shareholders' Required Rate of Return), or when considering Debt at the WACC (Weighted Average Cost of Capital). Consequently, we had to calculate both rates to determine the value of synergies and the value of the combined firm (in other words, the firm that would result from the Merger Deal).

After exploring the database compiled by Damodaran, we found out the US 10Y(Years) YTM (Yield to Maturity) - which is a country with AAA Rating -, the French Risk-Free Rate - which is a country with Aa2 Rating -, the Equity Risk Premium for France, the Levered Beta, the Unlevered Beta and the Unlevered Beta Corrected for Cash of the European Auto Trucks Sector. Furthermore, if the French interest rate is lower than the one from the United States, the rate that must be used needs to be the risk-free rate of the currency used in the calculations (the EUR) including the respective (French) country risk premium; and if Beta for Cash is zero, the Unlevered Beta Corrected for Cash will have the value of 0,8. With these considerations, the values in the light blue lines from Figure 3 First Assumptions were obtained, as explained in the "Calculations" column.

Calculations	Variables	Values
(a)	US 10Y YTM	0,59%
(b)	Risk Free Rate France	0,73%
(a)+(b)	Adjusted Risk Free Rate France	1,32%
(c)	Equity Risk Premium France	5,96%
(d)	Levered Beta Sector	1,55
(e)	Unlevered Beta	0,68
(f)	Unlevered Beta Corrected for Cash	0,8
[(a)+(b)]+(d)*(c)	RE Levered	10,56%
[(a)+(b)]+(f)*(c)	RE Unlevered Corrected for Cash	6,09%

Figure 4 First Assumptions regarding the KPIs Analysis

Considering that the headquarters of FCA are in Italy and the ones from Renault are in France, we assumed both countries had the same rating and decided to choose the French Risk Premium. Therefore, the rates to be used to carry out the KPIs calculation would be the same. However, it is also important to consider that while Damodaran had the information compiled for USD, we would need to find out a way to adjust it to EUR- which is the currency used in the Earnings Reports of both companies in study. Besides this, the inflation rate in Europe is not the same as in the USA - it is actually lower than the inflation in the US by 1,44% (Adjustment in Figure 5). Applying the Adjustment to the RE and RD rates, we were able to determine the EURO Adjusted Versions (also on Figure 4).

In the figure below, the column for "USD Data" was the one used by Damodaran, we assumed that the values highlighted in yellow would be the same for EUR and USD, the RE from "French Data" column is the RE Levered from Figure 3, the RU is the RE Unlevered Corrected for Cash from Figure 3, and E% and D% are the values for the average Equity and average Debt proportion in the automobile sector (respectively).

Variables	USD Data	French Data	EURO Adjusted Version
RE	11,23%	10,56%	11,23%
RD	3,96%	3,96%	3,96%
t	16,71%	16,71%	16,71%
RD*(1-t)	3,30%	3,30%	3,30%
E%	37,71%	37,71%	37,71%
D%	62,29%	62,29%	62,29%
WACC	6,29%	6,04%	6,29%
WACC EUROS	4,78%	4,78%	4,78%
RU	6,09%	6,09%	6,09%
Adjustment	1,44%		

Figure 5 WACC Data for USD, EUR and adjusted

The WACC and the Adjustment were calculated by applying the following formulas:

$$WACC = RE * E\% + RD(1 - t) * D\% \tag{1}$$

$$Adjustment = \frac{1 + WACC}{1 + WACC\ EUROS} - 1 \tag{2}$$

The RE and RD from the EURO Adjusted Version column were calculated in the following way:

$$RE = \frac{1 + RE\ USD\ Data\ Column}{1 + Adjustment} - 1 \tag{3}$$

$$RD = \frac{1 + RD\ USD\ Data\ Column}{1 + Adjustment} - 1 \tag{4}$$

After having obtained the necessary values to forecast the value of a hypothetic loan with constant annuity payments and a fixed interest rate, with the amount of the

Present Value of the Expected Synergies for both the Equity and the Combined Firm of the company resulting from the Merger Deal, we applied the PMT Function on Excel to find out which would be the Annual Value of Synergies (for both the Equity and the Firm approaches). By assuming the perpetuity of the Merged Firm and a minimum rate for both the Equity and the Firm Synergies calculations, we arrived at the values in yellow in Figure 5. After this, the Average Minimum - which is the FCFF from the combined firm - was calculated by dividing 487.040.000,00EUR+478.000.000,00EUR by 2., i.e. considering a simple average of the two figures.

Equity 8.000.000.000,00 € Synergies

Variables	Variables' Values	5 Years	10 Years	Perpetuity
RU	6,09%	1.903.719.993,39 €	1.091.479.890,27 €	487.040.000,00 €
RE (Euro Adjusted Version Column)	9,65%	2.091.570.830,80 €	1.282.479.890,18 €	772.040.580,21 €
RE Levered	10,56%	2.140.547.482,90 €	1.333.334.372,82 €	844.640.000,00 €
RE (USD Data Column)	11,23%	2.177.100.189,19 €	1.371.539.069,05 €	898.400.000,00 €

Firm 10.000.000.000,00 € Synergies

Variables	Variables' Values	5 Years	10 Years	Perpetuity
WACC (USD Data Column)	6,29%	2.392.680.019,10 €	1.377.365.267,43 €	628.933.410,36 €
WACC EUROS	4,78%	2.295.719.226,07 €	1.281.246.049,08 €	478.000.000,00 €
WACC (French Data Column)	6,04%	2.376.284.429,14 €	1.360.992.908,91 €	603.592.290,36 €
WACC (EURO Adjusted Version)	4,93%	2.305.140.396,95 €	1.290.509.272,58 €	492.780.546,08 €
RU	6,09%	2.379.649.991,74 €	1.364.349.862,84 €	608.800.000,00 €

Average Minimum 482.520.000,00 €

Figure 6 Annual Synergies 5 years, 10 years and Perpetuity

Given all the assumptions above, we were able to map the necessary data to calculate the KPIs explained in the next pages. Instead of only having the KPIs values for FCA and Renault, we have also estimated the values that would result from the combined firm, which can be consulted in Appendix K. Therefore, if the combined values were optimistic, the idea of Merging the two companies would generate synergies and it would be predictable that the Merger Deal should be successful - even though we already know it was not, it would allow the justification of the managers intent to proceed with the Merger Deal and emphasize that (maybe) the plan had failed due to other reason besides a mistake in the forecasted values.

8.2. Capital Structure

By reflecting the proportion of Equity and Debt, Capital Structure KPIs allow the study of the company's level of Debt. Each company should aim to have an optimal level of Debt, given that too much Debt can lead to difficulty in getting access to different financing products and can change the company's credit rating, and having too little Debt can imply a negative effect on the cost of capital because Debt can be cheaper than Equity up to a certain level.

Therefore, an interesting KPI to be analysed is the Net Debt to EBITDA. When this ratio is positive, it indicates that the company has the potential to achieve the targets defined. However, if the KPI value is positive and low it could also mean that the company has limited control options with regard to its Capital Structure.

The table below indicates the values for Net Debt to EBITDA, obtained with the data from Appendix K, for 2018. The Net Debt to EBITDA from Renault was higher than the one from FCA, having the first a value of 9,07 and the second a value of 5,58. With the Merger, synergies would be generated and the estimation of the Net Debt to EBITDA from the combined firm would be of 6,75, which will lead to FCA benefiting more from the deal than Renault. This KPI is also affected by the fact that Renault is investing more in its business than FCA, and, therefore, it has a higher debt level:

Table 1 Net Debt to EBITDA

Net Debt to EBITDA FCA 2018	Net Debt to EBITDA Renault 2018	Sum of Net Debt to EBITDA of both companies	Net Debt to EBITDA from Synergies
5,58	9,07	6,97	6,75

On the other hand, it is also important to consider the level of Debt to Equity of each company, given that the options to finance the business depend on the rating calculated taking into consideration this ratio:

Table 2 Debt- to- Equity

Debt-to-Equity FCA 2018	Debt-to-Equity Renault 2018	Sum of Debt-to-Equity of both companies	Debt-to -Equity from Synergies
2,89	2,19	2,47	2,47

The value of the Debt-to-Equity ratio for FCA was 2,89, being higher than the value obtained for Renault (which was 2,19). With the data from the table, we can verify that the proportion of Debt when in comparison with the proportion of Equity for Renault was closer to one another than the one from FCA. Having a lower ratio could help when asking for funding options, because it is safer to have more Equity than Debt. Furthermore, the value from the generated synergies would be responsible for a ratio of 2,47 for the combined firm.

8.3. Growth

Evaluating the quantitative increase of a certain value implies an analysis of the effect of Growth in a company. Designing KPIs to analyze the Growth of a company is essential to discover the value of current revenues when in comparison to other firms of the same sector in the market, and it also allows the forecasting of future revenue performance. The idea of Growth is connected to the idea of achieving an ideal profit established by the Management of the business.

In Financial Analysis, Revenue Growth is a KPI to understand if the profit target was reached. This KPI is very important to understand if the company would be able to support additional costs of the business.

Table 3 Revenue Growth

Revenue Growth FCA 2018	Revenue Growth Renault 2018	Sum of Revenue Growth of both companies	Revenue Growth from Synergies
4%	-2%	2%	11%

According to the values obtained in our calculations from Appendix K, the Revenue Growth for FCA was higher than the one for Renault, being the former 4% and the latter -2%. The option of proceeding with a Merger of both companies would generate a Revenue Growth of 11%, and, therefore, both companies would benefit from the Merger Deal.

8.4. Liquidity

A company should aim for Capital Efficiency and sustainable Growth, in order to continue operating in the market. However, this is only possible by having the right proportion of cash and cash equivalents. By analyzing Liquidity, we can find whether the company has the adequate proportion of cash and cash equivalents in its assets or not.

The generation of cash can be studied with the calculation of Free Cash Flows to the Firm (FCFF), and the Cash Conversion Rate (CCR minimum). These two variables were calculated according to Appendix K, and their results are the ones from table 4 and 5, respectively.

Table 4 FCFF

FCFF FCA 2018	FCFF Renault 2018	Sum of FCFF of both companies	FCFF from Synergies
M 8.468,10EUR	M -1.398,49EUR	M 7.069,61EUR	M 7.552,13EUR

The FCFF from FCA had a value of M 8.468,10EUR, which was higher than the ones achieved by Renault (M -1.398,49EUR). The Merger would generate Synergies of M 7.552.13EUR, which would make Renault benefit more from the Deal than FCA. FCA decreased its Working Capital and Assets from 2017 to 2018, but Renault increased the value of these variables. Therefore, Renault is investing more in its business than FCA and the value of its investment is higher than the achieved Profit. Even if Renault would

benefit more in numerical terms from the Deal than FCA, FCA would start having the knowledge gathered by Renault through their investments in Research and Development.

Additionally, we have also found the values for the CCR (minimum):

Table 5 CCR (minimum)

CCR (minimum) FCA 2018	CCR (minimum) Renault 2018	SUM of CCR (minimum) of both companies	CCR (minimum) from Synergies
0,40	0,45	0,42	0,43

For 2018, the CCR minimum for FCA was 0,40 and the one from Renault was 0,45- having the second company achieved a higher value. The CCR minimum resulting from Synergies would have a value of 0,43, which would lead to FCA getting more of the Deal than Renault. For Renault, the CCR minimum would decrease 0,02.

8.5. Profitability

Profitability analysis allows the measuring of the rates of return of a certain business and should be studied in comparison to other key figures to understand how it is reflected in the company. The target of achieving a certain value of profit is usually defined to evaluate capital efficiency and is useful for investors to decide whether they should invest in a specific company or not.

One way of exploring the relation between profitability and revenue is by studying Profit Margins. Profit Margins portray the percentage of revenue that remains after profit. If the Profit Margin is positive, the costs of the product/service are lower than the revenue earned with it; and if the Profit Margin is negative, the production can be too expensive and/or the market price of the product/service is low. With the intent of studying the Profit Margins of the companies in analysis, the Gross Margin and EBITDA (Earnings before Interest, Taxes, Depreciation and Amortization) were calculated.

Table 6 Gross Margin

Gross Margin FCA 2018	Gross Margin Renault 2018	Sum of Gross Margin of both companies	Gross Margin from Synergies
M 15.401,00EUR	M 12.002,00EUR	M 27.403,00EUR	M 182.831,00EUR

The Gross Margin from FCA was higher than the one from Renault, however both companies would benefit with the synergies arriving from the Merger Deal and would have a combined Gross Margin of M 182.831,00EUR. Additionally, the value of FCA's EBITDA was also higher than the one from Renault, but both companies would also benefit from Merging - achieving M 18.316,33EUR of EBITDA with synergies incorporated.

Table 7 EBITDA

EBITDA FCA 2018	EBITDA Renault 2018	Sum of EBITDA of both companies	EBITDA from Synergies
M 10.671,00EUR	M 7.066,00EUR	M 17.737,00EUR	M 18.316,33EUR

On the other hand, it is also important to realize which was the efficiency of profit generation. The Return of Capital Employed (ROCE) is the key performance indicator chosen to compare the relation between Net Income before Interest and Average Capital Employed, and indicates whether profit was generated by using a low or high level of capital. This variable can be calculated by dividing EBIT*(1-t) by the value of Capital Employed, or by dividing EBITDA by the Capital Employed. The first option will lead to a lower percentage, given that the value of EBIT is always lower than EBITDA.

Calculating ROCE with EBIT* (1-t), the value achieved for FCA was higher than the value from Renault and Renault would benefit from the combination of the firms, achieving a value of Synergies of 4,31%. Furthermore, FCA would not benefit from the forecasted Synergies- decreasing the ROCE value from 5,09% to 4,31%:

Table 8 ROCE calculated with (EBIT(1-t))*

ROCE with (EBIT*(1-t)) FCA 2018	ROCE with (EBIT*(1-t)) Renault 2018	Sum of with ROCE (EBIT*(1-t)) of both companies	ROCE with (EBIT*(1-t)) from Synergies
5,09%	3,18%	4,05%	4,31%

Using the second method, calculating ROCE with EBITDA, the value from FCA would decrease from 12,64% to 9,92% and the value of from Renault's ROCE would increase from 7,05% to 9,92%. Renault would, once again, benefit more from the deal and FCA would not take advantage of the Synergies with this KPI:

Table 9 ROCE calculated with EBITDA

ROCE with (EBITDA) FCA 2018	ROCE with (EBITDA) Renault 2018	Sum of ROCE with (EBITDA) of both companies	ROCE with (EBITDA) from Synergies
12,64%	7,05%	9,61%	9,92%

Overall, FCA's business is more profitable than Renault's.

9. The failure of FCA's and Renault's Merger Deal

The Merger in study is a classic case of a horizontal Merger, given that FCA and Renault are both competitors in the same industry. If this deal would lead to anticompetitive effects, there could be an opposition by antitrust goods (Gaughan, 2015).

Furthermore, a Cross Border Merger such as the one in study can be used to empower the firm position in an international market. The difference of cultures can make this type of deal riskier and consequently more uncertain (Ratajczak-Mrozek, 2015). Despite this fact, these types of Mergers, which have been significantly increasing since the mid- 1990s, became one of the most important parts of foreign investment, and policymakers should develop manners to induce this type of investment (Xu, 2017).

Even though the Deal was forecasted to be a success, the Merger did not happen. The studied financial KPIs indicate that both firms would achieve benefits from the generated Synergies, there was a clear interest of both parties to proceed with the Merger, but it all ended when the major shareholder of Renault (the French State) declared they were not able to reach a conclusion regarding the Merger Deal. Afterwards, FCA withdraw the Merger Deal, allegedly due to the unstable political conditions being felt in France at the time.

As stated in the Literature Review, a Merger Deal can be broken at any time and having the necessary financial conditions for a Merger to be successful does not mean it will be. The Management styles from Renault and FCA could be very different from one another, perhaps the cultures of both companies were incompatible, or the people involved in the Deal could not have been the right ones.

By definition, a Merger Deal should have originated a single legal entity resulting from the combination of businesses, with FCA and Renault being equal partners. However, usually one of the companies has more power than the other and this could lead to an acquisition or even to a hostile takeover. In this case, we can calculate the Market Cap to discover if this could have happened with the particular Merger Deal in study[4]:

$$Share\ Price\ FCA\ at\ 31.12.2018 = \tag{5}$$
$$= Share\ Price\ FCA\ at\ 31.12.2018\ in\ USD *$$
$$* Exchange\ Rate\ USD\ to\ EUR\ at\ 31.12.2018$$
$$= 11{,}51 * 0{,}87097 = 10{,}016155 EUR/share$$

$$Market\ Cap\ FCA\ 2018 = \tag{6}$$
$$= Number\ of\ shares\ FCA *$$
$$* Share\ Price\ FCA\ at\ 31.12.2018 =$$
$$= M\ 1.550.618{,}00 * 10{,}016155 EUR/share$$
$$= M\ 15.531.230{,}23 EUR$$

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[4] The share price was retrieved from finance.yahoo.com and the remaining variables were gathered from the Earnings' Report of CFA & Renault

$$Market\ Cap\ Renault\ 2018 = \hspace{3cm} (7)$$
$$= Number\ of\ shares\ Renault *$$
$$* Share\ Price\ Renault\ at\ 31.12.2018 =$$
$$= M\ 269.850,00 * 48,24 EUR/share =$$
$$= M\ 13.017.564,00 EUR$$

$$FCA\ \%\ of\ the\ combined\ firm = \hspace{3cm} (8)$$
$$= \frac{Market\ Cap\ FCA\ 2018}{Market\ Cap\ FCA\ 2018 + Market\ Cap\ Renault\ 2018} *$$
$$* 100 =$$
$$= \frac{M\ 15.531.230,23 EUR}{M\ 15.531.230,23 EUR + M\ 13.017.564,00 EUR} * 100 =$$
$$= 54,4042\%$$

$$Renault\ \%\ of\ the\ combined\ firm = \hspace{3cm} (9)$$
$$= 100 - FCA\ \%\ of\ the\ combined\ firm =$$
$$= 100 - 54,4042 = 45,5958\%$$

Considering that the Market Capitalization from Renault was lower than the one from FCA, but as the proposed deal was a 50/50 Merger (i.e. a Merger of Equals), FCA's shareholders were expected to be compensated with the payment of extraordinary dividends, as previously presented. Therefore, even though the contributions for the combined firm were different, both companies would get the same stake of the merged company, i.e. 50% each.

10. Conclusion

Mergers and Acquisitions can be used as a part of a company's sustainable growth strategy. Elaborating one of these Deals requires an extensive knowledge about the topic and the collaboration of different intermediaries. Furthermore, in a Merger, the combined firm results from the combination of a 50/50 division of power of the single entities engaged in the Deal, while in a Acquisition there is clearly one partner with a higher stake of the combined firm than the other- which can lead to an hostile takeover and to a withdrawal of the Deal.

After realizing that the execution of a Merger Deal was more difficult than its elaboration, the study of the Merger Deal between FCA and Renault was chosen with the main goal of understanding why a Merger Deal between two of the most successful companies from the automobile industry could have failed. Therefore, considering the Literature Review and a Qualitative Methodology, a PESTLE and 5 Forces Analysis were carried out. The study of the companies' history, the analysis of the Deal, the values of the Market Capitalization for FCA & Renault, and the calculation of a group of Financial KPIs were fundamental to reach the Conclusion that this is a case of a Merger Deal withdrawal due to political conditions in France and, probably, also due to the fact that the French Government was not willing to give up its control of Groupe Renault.

However, this Conclusion also has its limitations: it would be interesting to develop a group of Financial KPIs to be applied to the market, which can help to prevent a withdrawal given political conditions; and the forecasted values were estimated with values from different sources, which decreases their accuracy. Although, the present study can be used in classes, to help students understanding that a Deal could come to an end at any stage, even if all the financial indicators seem to point to a successful Deal, and to realize that elaborating and executing a Deal are two different things.

There is still a lot to be explored about Mergers and their Deal Flow, which is not static and influences the pricing of the proposal and the measurement of its success. The compilation of previous studies from different authors and ours has been important to develop new theories and reach different conclusions regarding this matter.

Knowledge is power, and the more complete the knowledge of the companies engaging in a Merger Deal is, the higher is the chance of success.

11. Bibliographical References

A Merger of Fiat Chrysler Automobiles and Renault is no more. (2019, June 6). *The Economist.* Retrieved from https://www.economist.com/business/2019/06/06/a-Merger-of-fiat-chrysler-automobiles-and-renault-is-no-more

ACEA. (2019). *Economic and Market Report, EU Automotive Industry, First half of 2019.* European Automobile Manufacturers Association. Retrieved from https://www.acea.be/statistics/article/economic-and-market-report-state-of-the-eu-auto-industry-first-half-of-2019

ACEA. (2019). *Economic and Market Report, EU Automotive Industry, Full-year 2018.* European Automobile Manufacturers Association. Retrieved from https://www.acea.be/statistics/article/economic-and-market-report-state-of-the-eu-auto-industry-full-year-2018

Achin, S. A. (2015). Recent trends in the study of mergers and acquisitions. *E a M: Ekonomie a Management, 18*(1), 23-133. Retrieved from https://pdfs.semanticscholar.org/9b36/8e4926aecde5f4a5e34ae5a54f195409e4f2.pdf

Agarwal, N., & Kwan, P. (2017). Pricing Mergers & Acquisitions Using Agent- Based Modeling. *Economics, Management and Financial Markets, 12*(1), 55-67. Retrieved from https://www.questia.com/library/journal/1P3-4321629015/pricing-Mergers-acquisitions-using-agent-based-modeling

Ashktorab, N., Fakhrabadi, M., Feylizadeh, M. R., Gheisari, M., Hendalianpour, A., & Zhang, X. (2019). Hybrud Model of IVFRN-BMW and Robust Goal Programming in Agile and Flexible Supply Chain, a Case Study: Automobile Industry. *IEEE AccessHendalianpour, 7*(June 12), 71481-71492.

Benedek, B., & László, E. (2019). Identifying Key Fraud Indicators in the Automobile Insurance Industry using SQL server Analysis Services. *Studia Universitatis Babes-Bolyai Oeconomica, 64*(2), 53-71.

Bhagwat, V., Dam, R., & Harford, J. (2016). The Real Effects of Uncertainty on Merger Activity. *Oxford University Press, 29*(11), 3000-3034. Retrieved from https://doi.org/10.1093/rfs/hhw061

Brealey, R., & Myers, S. (1981). *Principles of Corporate Finance* (1st ed.). McGraw-Hill Book Company.

Cabanillas, C., del-Río-Ortega, A., Resinas, M., & Ruiz-Cortés, A. (2013). On the definition and design-time analysis of process performance indicators. *Elsevier Ltd., 38*, 470-490. Retrieved from https://www.researchgate.net/publication/235338328_On_the_definition_and_design-time_analysis_of_process_performance_indicators

Campbell, P., Inagaki, K., & Keohane, D. (2019, August 4). Fiat Chrysler says door still open to Renault Merger. *The Financial Times.* Retrieved from https://www.ft.com/content/253e66ee-b524-11e9-8cb2-799a3a8cf37b

Chan, A., & Chan, A. (2004). Key performance indicators for measuring construction success. *Emerald Group Publishing Limited, 1*(2), 203-221. Retrieved from https://www.emerald.com/insight/content/doi/10.1108/14635770410532624/full/html?skipTracking=true

Chan, M., Cheung, Y., & Martin, I. (2004). Sustaining Competitive Advantages in Mergers and Acquisitions. *IEEE International Engineering Management Conference* (pp. 183-187). IEEE.

Chanaron, J.-J., & MacNeill, S. (2005). Trends and Drivers of change in the European automotive industry: (II) scenarios and implications. *Int. J. Automotive Technology and Management, 5*(1), 107-134.

Chen, Y., Li, L., Wang, K., Wang, X., & Zhang, W. (2018). The impact of firms' mergers and acquisitions on their performance in emerging economies. *Technological Forecasting & Social Change, 135*(2), 208-216.

Chiarini, A., & Vagnoni, E. (2015). World - class manufacturing by Fiat, Comparison with Toyota Production System from a Strategic Management, Mangement Accounting, Operations Management and Performance Measurement dimension. *International Journal of Production Research, 53*(2), 590-606.

Cornaggia, J., & Li, J. Y. (2019). The value of access to finance: Evidence from M&As. *Journal of Financial Economics, 131*(1), 232-250.

Crane, A., Koch, A., & Wei, C. (2018). Choosing the Precision of Performance Metrics. *Journal of Finacial and Quantitative Analysis, 53*(4), 1911-1935.

Creswell, J. W. (2010). *Projeto de pesquisa, Métodos Qualitativo, Quantitativo e Misto (Trans)* (3rd ed.). Artmed.

Damodaran, A. (2005). *The Value of Synergy.* Stern School of Business.

Deloitte LLP. (2015). Bid data and analytics in the automotive industry, Automotive analytics thought piece. 1-16.

Devi, S., Ethiraj, N., Manivannan, S., & Srinivasan, R. (2019). Warranty Cost Estimation using K- Means Cluster Analysis for Automobile Industry: Technical Note. *International Journal of Vehicle Structures & Systems, 11*(1), 36-38.

Duchin, R., & Schmidt, B. (2013). Riding the merger wave: Uncertainty, reduced monitoring, and bad acquisitions. *Journal of Financial Economics, 107*(1), 69-88.

Ferguson, J., Milliman, J., & Slyvester, K. (2008). Implementation of Michael Porter's Strategic Corporate Social Responsability Model. *The Jounral of Global Business Issues*, 29-33.

Fiat Chrysler Automobiles. (2018). *2018 Annual Report.* Fiat Chrysler Automobiles.

Fiat Chrysler Automobiles. (2019). *FCA Submits proposal for a Transformative Merger with Groupe Renault to create preeminent global automotive group.* Fiat Chrysler Automobiles.

Fiat Chrysler Automobiles. (2019). *FCA withdraws merger proposal to Groupe Renault.* Fiat Chrysler Automobiles.

Froese, F. J. (2010). Success and Failure in Managing Foreign Acquisitions in South Korea and Japan: Lessons From Renault, General Motors, and DaimlerChrysler. *Wiley Periodicals, Inc.*(November/December), 50-59.

Fuad, M., & Gaur, A. S. (2019). Merger waves, entry-timing, and cross-border acquisition completion: A frictional lens perspective. *Journal of World Business, 54*(2), 107-118. Retrieved from https://www.sciencedirect.com/science/article/pii/S1090951618301251

Fuat Chrysler retira oferta de fusão com a Renault. (2019, June 6). *Observador*. Retrieved from https://observador.pt/2019/06/06/fiat-chrysler-retira-oferta-de-fusao-com-a-renault/

Galpin, T., & Herndon, M. (2007). *The Complete Guide to Mergers and Acquisitions, Process Tools to support M&A Integration At Every Level* (2nd ed.). John Wiley & Sons, Inc.

Galpin, T., & Herndon, M. (2007). *The Complete Guide to Mergers and Acquisitions: Process tools to support M&A Integration at every level* (2nd Edition ed.). John Wiley & Sons, Inc.

Gaughan, P. (2015). *Mergers, Acquisitions and Corporate Restructurings* (6th ed.). Wiley Corporate F&A.

Gaughan, P. A. (2015). *Mergers, Acquisitions, And Corporate Restructurings* (6th Edition ed.). Wiley Corporate F&A.

Ghannouchi, S. A., & Wannes, A. (2019). KPI- Based Approach for Business Process Improvement. *Procedia Computer Science, 164*, 265-270.

Ghauri, P., Hassan, I., & Mayrhofer, U. (2018). Merger and acquisition motives and outcome assessment. *Thunderbird Iternational Business Review, 60*(4), 709-718. Retrieved from https://doi.org/10.1002/tie.21967

Group Renault. (2018-2019). *Living the future of mobility today.* Groupe Renault.

Groupe Renault. (2017-2018). *Annual Report: Life on the move.* Groupe Renault.

Groupe Renault. (2018). *Earnings Report.* Groupe Renault.

Groupe Renault. (2019). *Press Release: Communication of Renault's Board of Directors.* Groupe Renault.

Groupe Renault. (2019). *Presse Release: 2019 Financial Results.* Groupe Renault.

Gugler, K., Mueller, D., & Weicjselbaumer, M. (2012). The determinants of merger waves: An international perspective. *International Journal of Industrial Organization, 30*(1), 1-15. Retrieved from https://www.sciencedirect.com/science/article/pii/S0167718711000464

Haber, J., & Schryver, C. (0219, April). How to Create Key Performance Indicators. *The CPA Journal*, pp. 24-30.

Hanssens, M. D., Pauwels, K., Silva-Risso, J., & Srinivasan, S. (2004, November). New Products, Sales Promotions, and Firm Value: The Case of the Automobile Industry. *Journal of Marketing, 68*(4), 142-156.

Harford, J. (2005). What drives merger waves? *Journal of Financial Economics, 77*(3), 529-560. Retrieved from https://www.sciencedirect.com/science/article/abs/pii/S0304405X04002041

Haucap, J., Rasch, A., & Stiebale, J. (2019). How mergers affect innovation: Theory and Evidence. *International Journal of Industrial Organization, 63*, 283-325.

Hongjiu, L., Qingyang, L., & Yanrong, H. (2019). Evaluating Risks of Mergers & Acquisitions by Grey Relational Analysis Base on Iterval- Valued Intuitionistic Fuzzy Information. *Mathematical Problems in Engineering*.

Horst, J., Li, J., Kang, N., & Zhao, C. (2016). A Hierarchical structure of key performance indicators for operation management and continuous improvement in production systems. *Informa UK Limited, 54*(21), 6333-6350.

Horward, N., Kuhafl, R., Sehkle, C., & Sones, J. (n.d.). Key Performance Indicators: What Can They Do for You? *The Journal of the American Society of Military Comptrollers*, pp. 37-41.

Jacobson, J. (n.d.). The Chrysler Bankrupcy and reorganization with Fiat: a Unite States, rules-based regulation should control future labor disputes between the U.S. and italian divisions. *Wisconsin International Law Journal*.

Kocourek, A., & Vosta, M. (2017). Competitiveness of the European Automobile Industry in the Gblobal Context. *Politics in Central Europe, 13*(1), 69-86.

Kollewe, J. (2019, June 6). Renault. Fiat Chrysler Merger Colpases. *The Guardian*. Retrieved from https://www.theguardian.com/business/2019/jun/06/renault-fiat-chrysler-Merger-collapses

Lazarova, S., & Stefanova, K. (n.d.). An Integrated Model for Designing and Developing a Key Performance Indicators System. *Information and Communication Technologies*, 5-23.

Lopes, R. L. (2006). The Automobile Industry in Paraná: The Case of Renault. *The Haworth Press, Inc.*, 77-95.

Ludvik, M. B. (2019, March- April). What makes a Performance Indicator an Equity- Driven, High- Performance Indicator? *Wiley Periodicals, Inc., 31*(2), pp. 1-16.

Mahbod, M., & Shahin, A. (2006). Prioritization of key performance indicators, An integration of analytical hierarchy process and goal setting. *International Journal of Productivity and Performance Management*, 226-240.

MarketLine. (2011). MarketLine. *Company Profile Renault SA*(September), 1-15.

MarketLine. (2017). Company Profile Fiat Chrysler Automobiles NV. *Marketline*, 1-28.

Mouillot, P., & Park, R. (2019). Rivalry and its misteries: When Physics leverages Strategy. *Recherche en Science de Gestion- Management Sciences- Ciencias de Gestión, 133*(4), 29.

Nissan and Renault considering restructuring for Fiat Merger. (2019, August 3). *The Japan Times*. Retrieved from https://www.japantimes.co.jp/news/2019/08/03/business/corporate-business/nissan-renault-eye-restructuring-fiat-Merger-report/#.XYaRrihKhPY

O'Shaughnessy, N. (1997). The idea of competitive advantage and the ideas of Michael Porter. *Strategic Change, 6*(2), 73-83.

Prasad, A., & Warrier, L. (2016). Mr. Porter and the New World of Increasing Returns to Scale. *Journal of Management Research, 16*(1), 3-15.

Ratajcazk-Mrozek, M. (2015). The SME perspective on motives and success factors in cross-border mergers. *IMP Journal, 9*(2), 136-162. Retrieved from https://doi.org/10.1108/IMP-04-2015-0015

Rebner, S., & Yeganeh, B. (2019). Mindful Mergers & Acquisitions. *OD Practicioner, 51*(1), 11-16. Retrieved from https://nmcdn.io/e186d21f8c7946a19faed23c3da2f0da/d6ee10fc56ee4d50ad570d3d6045a8eb/files/educate/recent-articles/OD_Review-vol51_no1_-_Rebner__Yeganeh.pdf

Tuckman, B. W. (2012). *Manual de Investigação em Educação, Metodologia para Conceber e Realizar o Processo de Investigação Cinetífica (Trans)* (4th ed.). Lisbon: Fundação Caloustre Gulbenkian.

Veterinary Ireland Journal. (2020). New offerings from Renault. *9*(10), p. 571.

Xu, E. Q. (2017). Cross-border merger waves. *Journal of Corporate Finance, 46*, 207-231. Retrieved from https://www.sciencedirect.com/science/article/pii/S0929119917301426

12. Appendices

12.1. Appendix A - Partner Friction within a Wave
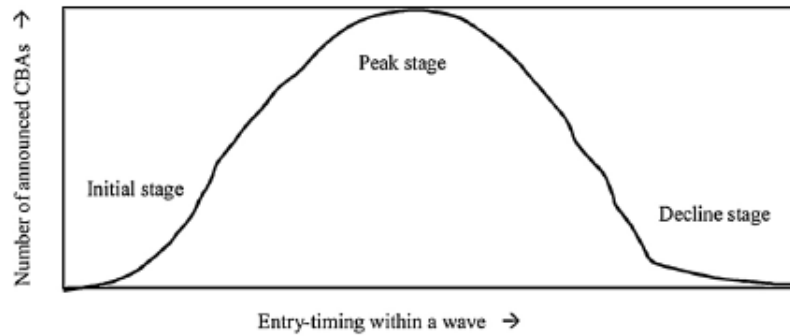
	Initial Stage	Peak stage	Decline Stage
Number of targets	High	Medium	Few
Target's valuation	Low	High	Medium/Low
Target's readiness	Low	High	High
Number of acquirers	Few	High	Few
Acquirer's readiness	High	Medium	Low
Target's Perspective	Delay acquisition	Complete acquisition	Complete acquisition
Acquirer's Perspective	Complete acquisition	Complete acquisition	Delay acquisition/lack of interest
Partner-friction	High	Low	High

Figure 7 Partner Friction within a Wave. Source: Galpin, T. J., and Herndon, M. (2007), *The Complete Guide to Mergers and Acquisitions*, *Process Tools to support M&A Integration At Every Level*, Second Edition, John Wiley & Sons, Inc.

12.2. Appendix B - The Key Activities, Issues & Risks of the Deal Flow Model
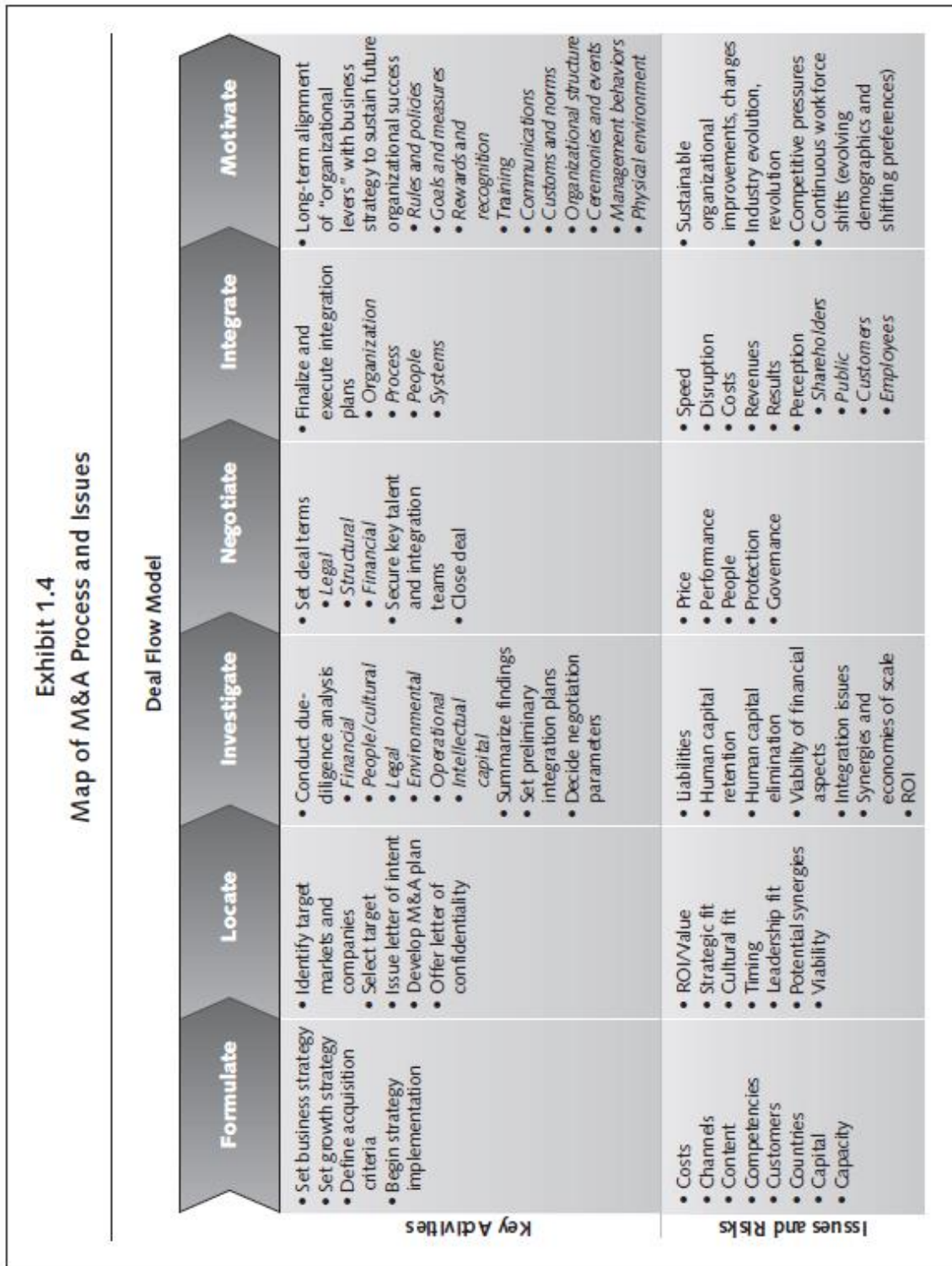

Figure 8 The Deal Flow Model. Source: Galpin, T. J., and Herndon, M. (2007), *The Complete Guide to Mergers and Acquisitions, Process Tools to support M&A Integration At Every Level,* Second Edition, John Wiley & Sons, Inc.

12.3. Appendix C - European Commission: Abandonment of Concentrations Guidelines

**DG Competition Information note on Art. 6 (1) c 2ⁿᵈ sentence of Regulation 139/2004
(abandonment of concentrations)**

The revised EC Merger Regulation[1] introduced a new provision related to the closure of merger control procedures without a final decision after the Commission has initiated proceedings under Art. 6 (1) c 1ˢᵗ sentence. That sentence reads as follows: "Without prejudice to Article 9, such proceedings shall be closed by means of a decision as provided for in Article 8(1) to (4), unless the undertakings concerned have demonstrated to the satisfaction of the Commission that they have abandoned the concentration". Prior to the initiation of proceedings, such requirements do not apply.

This note sets out the requirements for this satisfaction to be achieved.

As a general principle, the requirements for the proof of the abandonment must correspond in terms of legal form, format, intensity etc. to the initial act that was considered sufficient to make the concentration notifiable. In case the parties proceed from that initial act to a strengthening of their contractual links during the procedure, for example by concluding a binding agreement after the transaction was notified on the basis of a good faith intention, the requirements for the proof of the abandonment must correspond also to the latest act.

In line with this principle, in case of implementation of the concentration prior to a Commission decision, the re-establishment of the *status quo ante* has to be shown.

In other cases, the mere withdrawal of the notification is not considered as sufficient proof that the concentration has been abandoned in the sense of Article 6(1)c. Likewise, minor modifications of a concentration, for example as regards the agreed time of implementation or minor changes in the shareholding percentages which do not affect the change in control or the quality of that change, cannot be considered as an abandonment of the original concentration[2].

- Binding agreement: proof of the legally binding cancellation of the agreement in the form envisaged by the initial agreement (i.e. usually a document signed by all the parties) will be required. Expressions of intention to cancel the agreement or not to implement the notified concentration, as well as unilateral declarations by the parties will not be considered sufficient.

- Good faith intention to conclude an agreement: In case of a letter of intent or memorandum of understanding reflecting such good faith intention, documents proving that this basis for the good faith intention has been cancelled will be required. As for possible other forms that indicated the good faith intention, the abandonment must reverse this good faith intention and correspond in terms of form and intensity to the initial expression of intent.

Figure 9 DG Competition Information note Part One, Retrieved from
https://ec.europa.eu/competition/mergers/legislation/abandonment.pdf

[1] Council Regulation No 139/2004 of 20 January 2004 on the control of concentrations between undertakings; OJ L 24/1, 29.1.2004.

[2] The qualification of a modification as "minor" in the sense of this paragraph does not prejudge the assessment whether the modification requires to submit additional information to the Commission under Art. 5 (3) Reg. 802/2004.

Figure 10 DG Competition Information note Part Two, Retrieved from
https://ec.europa.eu/competition/mergers/legislation/abandonment.pdf

- Public announcement of a public bid or of the intention to make a public bid: a public announcement terminating the bidding procedure will be required. The format and public reach of this announcement must be comparable to the initial announcement.

- Implemented concentrations: In case the concentration has been implemented prior to a Commission decision, the parties will be required to show that the situation prevailing before the implementation of the concentration has been re-established.

It is for the parties to submit the necessary documentation to meet these requirements.

This information is without prejudice to the interpretation of Community law which may be given by the Court of Justice or the Court of First Instance of the European Communities.

Figure 11 DG Competition Information note Part Three, Retrieved from
https://ec.europa.eu/competition/mergers/legislation/abandonment.pd

12.4. Appendix D - Automobile Industry Key Figures

EMPLOYMENT		
Manufacture of motor vehicles (EU)	2.6 million people = 8.5% of EU employment in manufacturing	2017
Total (EU manufacturing, services and construction)	13.8 million people = 6.1% of total EU employment	2017

PRODUCTION		
Motor vehicles (world)	98.1 million units	2018
Motor vehicles (EU)	19.2 million units = 20% of global motor vehicle production	2018
Passenger cars (world)	79.3 million units	2018
Passenger cars (EU)	16.5 million units = 21% of global passenger car production	2018

REGISTRATIONS		
Motor vehicles (world)	97.2 million units	2018
Motor vehicles (EU)	17.6 million units = 18% of global motor vehicle registrations/sales	2018
Passenger cars (world)	78.7 million units	2018
Passenger cars (EU)	15.2 million units = 19% of global passenger car registrations/sales	2018
Petrol (EU)	56.7%	2018
Diesel (EU)	35.9%	2018
Electrically-chargeable (EU)	2.0%	2018

TRADE		
Exports (extra-EU)	€138.4 billion	2018
Imports (extra-EU)	€54.0 billion	2018
Trade surplus	€84.4 billion	2018

*Figure 12 Automobile Industry Key Figures Part One, Retrieved from https://www.acea.be/statistics/tag/category/key-figures*

VEHICLES IN USE		
Motor vehicles (EU)	308.3 million units	2017
Passenger cars (EU)	268.0 million units	2017
Motorisation rate (EU)	602 vehicles per 1,000 inhabitants	2017
Average age of cars (EU)	11.1 years	2017
ROAD SAFETY		
Road fatalities per million inhabitants (EU)	49 people (global average = 182)	2017
ENVIRONMENT		
Average CO2 emissions (EU)	120.6g CO2/km	2018
INNOVATION		
Automotive R&D investment	€57.4 billion	2017
TAXATION		
Fiscal income from motor vehicles (EU15)	€428 billion	2017

Figure 13 Automobile Industry Key Figures Part Two, Retrieved from
https://www.acea.be/statistics/tag/category/key-figures

12.5. Appendix E – Employment

Employment Trends
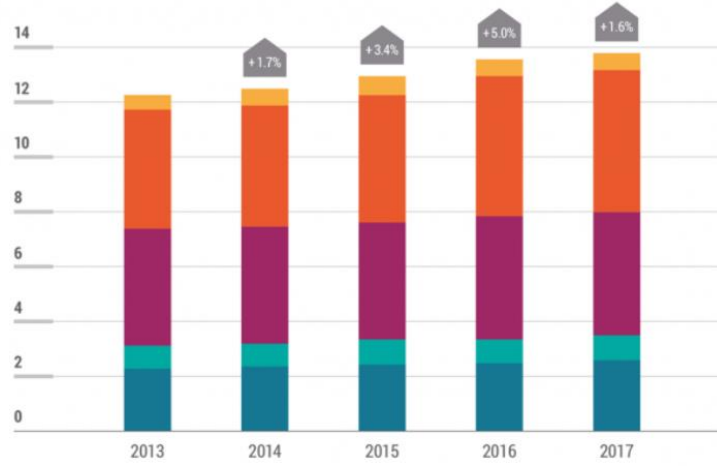
The automotive sector provides direct and indirect jobs to 13.8 million Europeans, representing 6.1% of total EU employment.
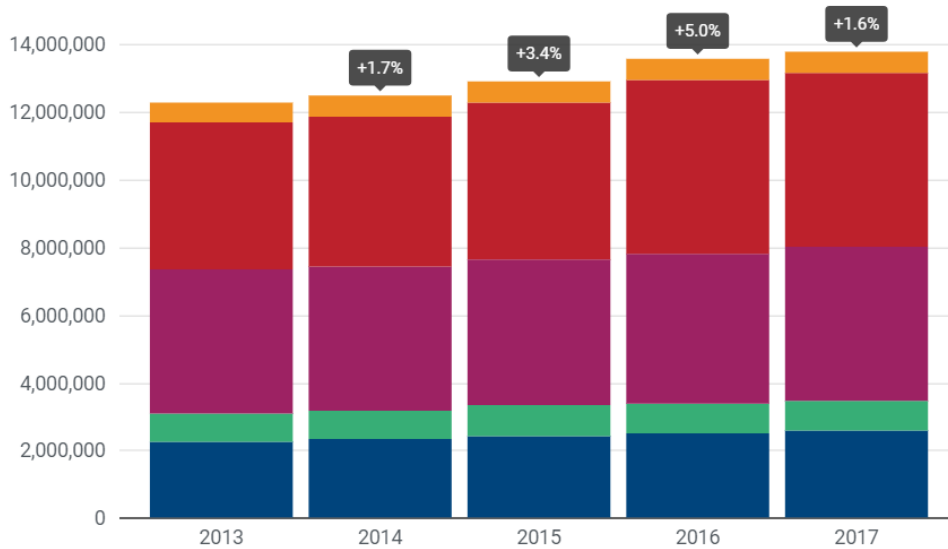
Moreover, 11.4% of all EU manufacturing jobs – some 3.5 million – are in the auto industry.

Figure 14 Employment Trends in the EU automotive sector Part One, (ACEA, 2019)

Employment in the EU automotive sector

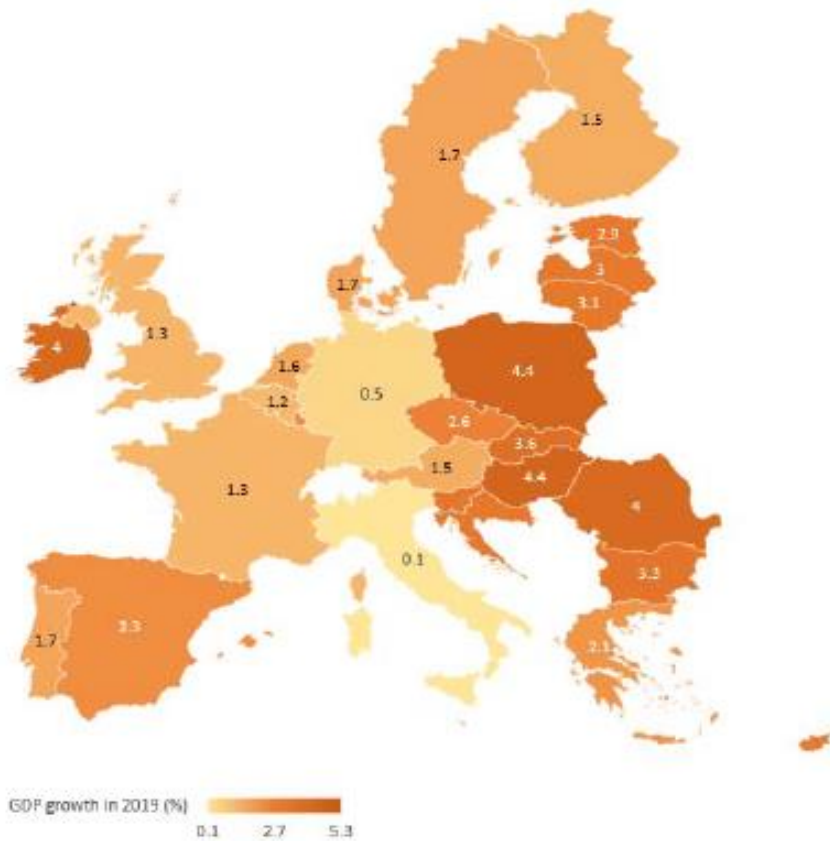■ Manufacturing direct ■ Manufacturing indirect ■ Automobile use ■ Transport ■ Construction

Created with LocalFocus   Source: EUROSTAT

Figure 15 Employment Trends in the EU automotive sector Part Two, (ACEA, 2019)

12.6. Appendix F - EU GDP growth, forecast for Summer 2019

Figure 1: EU GDP growth – Summer 2019 forecast

Figure 16 EU GDP Growth - Summer 2019 Forecast, (ACEA, 2019)

12.7. Appendix G - World new passenger cars registrations, first half of 2019 and first hald of 2018

Table 2: World new passenger car registrations

	H1 2019[a]	H1 2018	% change 19/18	% share 2019
EUROPE	9,507,464	9,897,554	-3.9	25.6
EU[b]	8,183,562	8,449,689	-3.1	22.0
EFTA	242,628	246,538	-1.6	0.7
RUSSIA	779,089	799,280	-2.5	2.1
TURKEY	156,379	275,870	-43.3	0.4
UKRAINE	38,458	37,361	+2.9	0.1
OTHERS-EUROPE[c]	107,348	88,816	+20.9	0.3
NORTH AMERICA[d]	8,043,813	8,349,744	-3.7	21.6
of which the US	6,753,570	6,982,999	-3.3	18.2
SOUTH AMERICA	1,721,058	1,833,032	-6.1	4.6
of which Brazil	1,065,362	946,538	+12.6	2.9
ASIA	16,343,052	18,309,190	-10.7	44.0
CHINA	9,835,545	11,496,834	-14.4	26.5
JAPAN	2,271,202	2,281,917	-0.5	6.1
INDIA	1,565,012	1,763,647	-11.3	4.2
SOUTH KOREA	709,441	750,389	-5.5	1.9
OTHERS-ASIA[e]	1,961,852	2,016,403	-2.7	5.3
MIDDLE EAST/AFRICA	1,564,535	2,021,614	-22.6	4.2
WORLD	37,179,922	40,411,134	-8.0	100.0

SOURCE: IHS MARKIT, ACEA

[a] Provisional figures

[b] Data for Malta not available

[c] Includes Belarus, Bosnia-Herzegovina, Kazakhstan, North Macedonia, Serbia and Uzbekistan

[d] Based on production type

[e] Includes Hong Kong, Taiwan and all the other South Asian countries, excluding India

Figure 17 World New Passenger Car Registrations, (ACEA, 2019)

12.8. Appendix H - New passenger car registrations in the EU, first half 2019 and first half 2018

Table 3: Top 5 – New passenger car registrations in the EU

	H1 2019	H1 2018	% change 19/18
GERMANY	1,849,000	1,839,031	+0.5
UNITED KINGDOM	1,269,245	1,313,994	-3.4
FRANCE	1,166,442	1,188,150	-1.8
ITALY	1,082,197	1,121,649	-3.5
SPAIN	692,472	734,671	-5.7
EU[7]	8,183,562	8,449,689	-3.1

SOURCE: ACEA

_____

[7] Data for Malta not available

Figure 18 New Pssenger Car Registrations in the EU, first half 2019 and first half 2018, (ACEA, 2019)

12.9. Appendix I - New passenger car registrations in the EU by alternative powertrain, first half 2019 and first half 2018

Table 4: New passenger car registrations in the EU by alternative powertrain

	H1 2019	H1 2018	% change 19/18
ECV[8]	197,813	143,501	+37.8
of which BEV	125,344	65,672	+90.9
of which PHEV	72,469	77,829	-6.9
HEV[9]	398,915	292,295	+36.5
APV other than electric[10]	127,871	132,418	-3.4
of which LPG	98,773	86,801	+13.8
of which NGV	28,995	44,841	-35.3
Total APV	724,599	568,214	+27.5

SOURCE: ACEA

[8] Electrically-chargeable vehicles, including battery electric vehicles (BEV), extended-range electric vehicles (EREV), fuel cell electric vehicles (FCEV) and plug-in hybrid electric vehicles (PHEV)

[9] Hybrid electric vehicles, including full and mild hybrids

[10] Alternatively-powered vehicles other than electric, including natural gas (NGV), LPG-fuelled and ethanol (E85) vehicles

Figure 19 New passenger car registrations in the EU by alternative powertrain, first half 2019 and first half 2018, (ACEA, 2019)

12.10. Appendix J - Alternatively- powered car registrations in the five key EU markets, for the first half of 2019
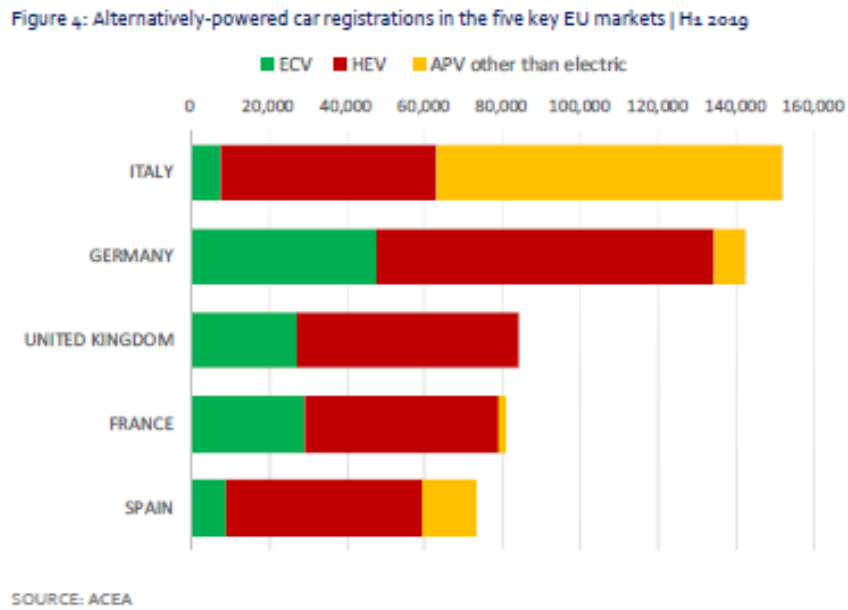
Figure 4: Alternatively-powered car registrations in the five key EU markets | H1 2019

Figure 20 Alternatively- powered car registrations in the five key EU markets, for the first half of 2019, (ACEA, 2019)

12.11. Appendix K - Key Performance Indicators and Estimated Synergies

Values in Million (€)

Calculations	KPI	FCA Earnings Report 2018	Renault Earnings Report 2018	SUM FCA &Renault	Estimated Synergies	Combined Firm
(1)	Debt	71.970,00	78.851,00	150.821,00		150.821,00
(2)	Cash and Cash Equivalents	12.450,00	14.777,00	27.227,00		27.227,00
(1)-(2)	Net Debt	59.520,00	64.074,00	123.594,00		123.594,00
(3)	Net Financial Expenses	1.056,00	-353,00	703,00		703,00
(4)	Profit Before Taxes	4.108,00	4.174,00	8.282,00		8.282,00
(3)+(4)	EBIT	5.164,00	3.821,00	8.985,00		8.985,00
(5)	Amortization & Depreciation	5.507,00	3.245,00	8.752,00		8.752,00
(3)+(4)+(5)	EBITDA	10.671,00	7.066,00	17.737,00	579,33	18.316,33
[(1)-(2)]/[(3)+(4)+(5)]	**Net Debt to EBITDA**	**5,58**	**9,07**	**6,97**		**6,75**
(6)	Equity	24.903,00	36.145,00	61.048,00		61.048,00
(1)/(6)	**Debt/Equity**	**2,89**	**2,18**	**2,47**		**2,47**
(7)	Revenues 2018	110.412,00	57.419,00	167.831,00	15.000,00	182.831,00
(8)	Revenues 2017	105.730,00	58.770,00	164.500,00		164.500,00
[(7)-(8)]/(8)	**Revenue Growth**	**0,04**	**-0,02**	**0,02**		**0,11**
[(3)+(4)]*(1-t)	EBIT*(1-t)	4.301,10	3.182,51	7.483,61	482,52	7.966,13
(9)	Non Current Assets 2018	58.581,00	45.021,00	103.602,00		103.602,00
(10)	Non Current Assets 2017	60.025,00	42.390,00	102.415,00		102.415,00
(9)-(10)	Delta Non Current Assets	-1.444,00	2.631,00	1.187,00		1.187,00
(11)	Working Capital 2018	20.426,00	49.456,00	69.882,00		69.882,00
(12)	Working Capital 2017	23.149,00	47.506,00	70.655,00		70.655,00
(11)-(12)	Delta Working Capital	-2.723,00	1.950,00	-773,00		-773,00
[[(3)+(4)]*(1-t)]-[(9)-(10)]-[(11)-(12)]	**FCFF**	**8.468,10**	**-1.398,49**	**7.069,61**		**7.552,13**
[[(3)+(4)]*(1-t)]/[(3)+(4)+(5)]	**CCR minimum**	**0,40**	**0,45**	**0,42**		**0,43**
(13)	Cost of Sales	95.011,00	45.417,00	140.428,00		140.428,00
(7)-(13)	**Gross Margin**	**15.401,00**	**12.002,00**	**27.403,00**		**42.403,00**
[(1)-(2)]+(6)	Capital Employed	84.423,00	100.219,00	184.642,00		184.642,00
[[(3)+(4)]*(1-t)]/[[(1)-(2)]+(6)]	**ROCE (EBIT*(1-t))**	**0,05**	**0,03**	**0,04**		**0,04**
[(3)+(4)+(5)]/[[(1)-(2)]+(6)]	**ROCE(EBITDA)**	**0,13**	**0,07**	**0,10**		**0,10**

Figure 21 Key Performance Indicators & Estimated Synergies

The values were obtained with the Earnings Reports from FCA and Renault. All the necessary calculations are written in column "Calculations", and the value of the "Estimated Synergies" column was calculated in the following manner:

$$Estimated\ Synergies\ EBITDA = \frac{\frac{Average\ Minimum}{1.000.000,00}}{(1-t)} = \frac{\frac{482.520.000,00}{1.000.000,00}}{1-16,71\%} \quad (10)$$
$$= M\ 579,33€$$

$$Estimated\ Synergies\ Revenues\ 2018 = \frac{Annual\ Sales}{1.000,00} = \frac{15.000.000,00}{1.000,00} \quad (11)$$
$$= M\ 15.000,00€$$

$$Estimated\ Synergies\ EBIT * (1-t) \quad (12)$$
$$= Estimated\ Synergies\ EBITDA * (1-t) =$$
$$= M\ 579,33€ * (1-16,71\%) = M\ 482,52€$$

The "Average Minimum" and the "t" variables were calculated accordingly to what was explained in *8.1 Appendix K Assumptions*.