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МАТЛУТИ Габриэль Эмильен Мессауд

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Научный руководитель:
Панибратов Андрей Юрьевич,
профессор,
Кафедра стратегического и
международного менеджмента

Рецензент:
Тылевич Татьяна Александровна,
генеральный директор,
Акционерное общество
«Императорский фарфоровый завод»

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ФОРМА
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ЗАЯВЛЕНИЕ О САМОСТОЯТЕЛЬНОМ ХАРАКТЕРЕ ВЫПОЛНЕНИЯ ВЫПУСКНОЙ КВАЛИФИКАЦИОННОЙ РАБОТЫ

Я, МАТЛУТИ Габриэль Эмильен Мессауд, студент второго курса магистратуры направления «Менеджмент», заявляю, что в моей магистерской диссертации на тему « Влияние COVID-19 на немецкую, французскую и российскую автомобильную промышленность», представленной в службу обеспечения программ магистратуры для последующей передачи в государственную аттестационную комиссию для публичной защиты, не содержится элементов плагиата.

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(Подпись студента)

30.05.2022 (Дата)

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I, MATHLOUTHI Gabriel Emilien Messaoud, second year master student of the program «Management», state that my master thesis on the topic « The impacts of COVID-19 on German, French and Russian automotive industry», which is presented to the Master Office to be submitted to the Official Defense Committee for the public defense, does not contain any elements of plagiarism.

All direct borrowings from printed and electronic sources, as well as from master theses, PhD and doctorate theses which were defended earlier, have appropriate references.

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30.05.2022 (Date)

ABSTRACT

Master Student's Name	Gabriel Emilien Messaoud Mathlouthi
Academic Advisor's Name	Pr. Andrey Yuryevich Panibratov
Master Thesis Title	The impacts of COVID-19 on German, French and Russian automotive industry
Description of the goal, tasks and main results the research	The study aims to identify how and what automakers do to adapt their strategies since pandemic. The theory of 5 dynamic capabilities proposed by Panibratov, Rysakova, & Luo in 2021 was applied to study Volkswagen, Renault, and Avtovaz strategy adaptations through the scope of an explanatory holistic multiple case studies approach. It allows to find similarities and differences in the industry. The findings suggest that automotive business models continue to shift toward greater digitalization inside the industry, it offers greater way to differentiate. They partly drive the choice of actions taken by companies. 34 evidence of dynamic capabilities with patterns among the companies were found. 'Innovation', 'Networking', and 'Adaptability' are the most important capabilities developed in the industry, followed by 'Absorptive' capability. 'Innovation' and 'Networking' capabilities are similar, while 'Adaptability' capability differs in nature among the case studies. The main contribution of the research is that 'Policy variable' capability was not considered relevant in the automotive industry. It was replaced by 'regionalize' capability in a new framework that now classifies studied dynamic capabilities based on their importance. The research contributes to the development of academic knowledge in the automotive industry. It helps managers to understand the dynamism of their industry and allow them to take wiser decisions. To generalize the results, new studies in other industries should be conducted.
Keywords	COVID-19 impacts, automotive industry, dynamic capabilities, strategy adaptation, business models transformation

АННОТАЦИЯ

Автор	Габриэль Эмильен Мессауд Матлути
Научный руководитель	Панибратов Андрей Юрьевич
Название ВКР	Влияние КОВИД-19 на немецкую, французскую и российскую автомобильную промышленность
Описание цели, задач и основных результатов исследования	Цель исследования - определить, как и что делают автопроизводители, чтобы адаптировать свои стратегии после пандемии. Теория 5 динамических возможностей, предложенная Панибратовым, Рысаковой и Ло в 2021 году, была применена для изучения адаптации стратегий Volkswagen, Renault и Автоваза в рамках объяснительного целостного подхода с несколькими тематическими исследованиями. Это позволяет найти сходства и различия в отрасли. Полученные данные свидетельствуют о том, что автомобильные бизнес-модели продолжают смещаться в сторону большей цифровизации внутри отрасли, что дает больше возможностей для дифференциации. Они отчасти определяют выбор действий, предпринимаемых компаниями. Было

	обнаружено 34 свидетельства динамических возможностей с использованием шаблонов среди компаний. "Инновации", "Создание сетей" и "Адаптивность" являются наиболее важными возможностями, разработанными в отрасли, за которыми следуют возможности "Поглощения". Возможности "Инноваций" и "Создания сетей" схожи, в то время как возможности "Адаптации" различаются по характеру в разных тематических исследованиях. Основной вклад исследования заключается в том, что возможность "изменения политики" не считалась актуальной в автомобильной промышленности. Он был заменен возможностью "регионализации" в новой структуре, которая теперь классифицирует изученные динамические возможности на основе их важности. Исследование способствует развитию академических знаний в автомобильной промышленности. Это помогает менеджерам понять динамизм своей отрасли и позволяет им принимать более мудрые решения. Чтобы обобщить результаты, необходимо провести новые исследования в других отраслях промышленности.
Ключевые слова	Воздействие COVID-19, автомобильная промышленность, динамические возможности, адаптация стратегии, трансформация бизнес-моделей

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INTRODUCTION

I decide to dedicate my work to the analysis of the COVID-19 impacts, effects & consequences on the European automotive industry. As such, the present paper aims to **analyse the managerial impacts and consequences of COVID-19 on International Business with a focus on the German, French, and Russian automotive industry** until the 24th of February of 2022, when the Russia-Ukraine military conflict started. The interpretation of the results provides both academical and managerial implications.

Relevance of the research

Although pandemic has disastrous consequences in many fields of the global economy so far, many researchers have already warned about this kind of Global Systemic Risk before it ultimately happened. In a globalized world economy, each part of the supply chain is essential to sustain the global organization. What would happen in case of break-off? COVID-19 provides substantial evidence related to this key question. In facts, many academics investigate and try to clarify the event, its impacts, and consequences across different fields such as health, business, or politics.

It is important to notice that some consequences linked to pandemic are still hidden yet. However, short-term and mid-term impacts are ready for observation and analysis. They reflect a part of the whole direct and indirect consequences of the pandemic. For instance, I consider consequences in response from governments policies to counter COVID-19. While they affect business environment reasonably, they vary a lot depending on each country. In facts, Germany, France, and Russia have adopted different strategies that differ in time to counter the spreading of the crisis. It reaffirms the huge power of States on people's life. The understanding of national policies help business to adapt accordingly. For instance, because Russia can be considered as a State capitalism, it supervises strategic projects investments in key sectors of its economy (Panibratov, 2016). It highlights stakes in the region and strengthens key academic research theories in the area of international business under COVID-19 period.

Hence, the aim of the paper is to study the impacts of COVID-19 on German, French and Russian business environment and to study the strategy adaptations of MNEs post COVID-19 in the context of a specific industry, in our case the automotive industry. In facts, relating consequences of the pandemic to the internationalized processes helps to provide more evidence to current academical concerns regarding the end of globalization or its transformation in terms of global value chains (GVC). Also, is provides both academical and managerial implications.

Research question:

How do companies adapt their strategies since COVID-19?

To answer this question, we ask two sub-questions:

1/ How does pandemic affect the economic development of Germany, France, and Russia?

2/ How do German, French, and Russian automotive manufacturers adapt their strategy since pandemic?

The first Chapter provides main definitions, theories, and insights about COVID-19 impacts and the automotive industry. Following main definitions, I start by presenting COVID-19 economic impacts and states policies used to fight against pandemic in Germany, France, and Russia. Then I describe the dynamism of the GVC shaped by evidence of shortage, FDI movements, regionalization, and relocation of activities.

Next, I present the evolution of the automotive industry in Germany, France, and Russia based on the supply and demand since 2019. As such, the industry comparison per country at pre-crisis and post-crisis level was made possible. From this scope, it is easier to point out similarities and differences regarding the effects of the crisis among countries. I also strive to present the main reasons behind the trends at the industry level.

Subsequently, I cover current academical knowledge – such as dynamic capabilities, digitalization & Industry 4.0 – that describe the dynamic of the automotive industry, under a new pandemic context. It serves to frame the creation of the research design. For instance, the dynamic capabilities framework is the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments (Teece, Pisano, & Shuen, 1997). Based on the theoretical background and understanding of the automotive industry in Germany, France, and Russia, seven propositions have been established and guides the study. European automotive manufacturers may be understood by German, French, and Russian automotive manufacturers:

- **Proposition 1**: Pandemic has supported the digitalization of European automotive manufacturers
- **Proposition 2**: Dynamic capabilities help European automotive manufacturers to overcome pandemic
- **Proposition 3**: European automotive manufacturers transform their business models faster since pandemic

- **Proposition 4:** Innovation capability is the main capability developed by automotive manufacturers
- **Proposition 5**: Partnerships allow automotive manufacturers to develop new knowledge
- **Proposition 6**: European automotive manufacturers regionalize to growing markets since pandemic
- **Proposition 7**: European automotive manufacturers undertake reshoring activities since pandemic

Subsequently, second chapter studies the post-COVID-19 strategy adaptations of companies in the automotive industry. It constitutes the main contribution of the paper. The aim is to look for evidence of company adaptations since pandemic. The theory of 5 dynamic capabilities proposed by Panibratov, Rysakova, & Luo in 2021 (Panibratov, Rysakova, & Luo, 2021) was applied to study strategy adaptations of automotive manufacturers through the scope of an explanatory holistic multiple case studies approach. It investigates global value chains movements, business models transformation, Industry 4.0 and digitalization development.

To reach such goal, the chosen explanatory holistic multiple case studies approach takes an automotive manufacturer as a single unit of analysis. The case selection was clearly justified to pick up three automotive manufacturers: Volkswagen, Renault, and Avtovaz. Case study methodology helps to understand real contexts and brings in-depth understanding of an ambiguous phenomena (Yin, 2009) such as pandemic. Multiple case studies provide robustness of result and allow to point out the similarities and differences of strategic decisions of leading companies. It is important to note that the Russia-Ukraine military conflict variable was removed from the analysis as it would have biased the results. More information about the methodology used can be found in the corresponding section.

Findings provide an understanding of strategy adaptation of companies under pandemic within the automotive industry in Germany, France, and Russia. The main academical contribution of the chosen approach is to extend the 5 dynamic capabilities framework identified by Panibratov et al. (Panibratov, Rysakova, & Luo, 2021). Based on study results, the review of the 5 dynamic capabilities was made possible. It led to the creation of a new framework that now considers the degree of importance of studied dynamic capabilities in the context of the automotive industry. Consequently, it contains managerial implications on how MNEs can manage and adapt to continue to develop their activities despite pandemic context. For instance, thanks to the new framework, automotive manufacturers should have the possibility to orient the development of dynamic capabilities and prioritize on them. Eventually, findings should provide space for generalization with comparisons of other industries.

CHAPTER I: COVID-19 IMPACTS AND CONSEQUENCES ON INTERNATIONAL BUSINESS

1.1 Definitions

Internationalization

It is the degree to which firms depend on foreign markets, or their foreign market penetration in terms of sales revenue. Sales, profit, investments, manufacturing, assets, R&D, personnel are different criteria used to assess the internationalized proportion of a company (Panibratov, 2021).

Multinational enterprises

A multinational enterprise, abbreviated as MNE and sometimes also called multinational corporation (MNC), just multinational or international corporation, is an enterprise producing goods or delivering services in more than one country (Hennart, 2009). A multinational enterprise has its management headquarters in one (or rarely more than one) country, the home country, while also operating in other countries, the host countries (Eurostats, 2021). EMNE abbreviation refers to a multinational enterprise whose country of origin is an emerging economy.

Globalization

According to M. Gorynia (Gorynia, 2020), the essence of Globalization is the pursuit of achieving selfish individual and group interests, the main economic actors – companies & people – locate their operations in such a way that production occurs in places that ensure the minimization of production costs, which is to maximize profit margins. Producers seek cheap production and consumers seek to maximize utility, that is at a given budget, they want to buy products at the cheapest possible prices (ceteris paribus). Through this process the technological changes emerge giving new basis to the exploitation of these fundamental.

1.2 COVID-19 socio-economic impacts

Henry Kissinger said in April 2020 that "The reality is the world will never be the same after the coronavirus. […]. Leaders are dealing with the crisis on a largely national basis, but the virus's society-dissolving effects do not recognize borders. While the assault on human health will – hopefully – be temporary, the political and economic upheaval it has unleashed could last for generations. […]. Now, we live an epochal period. The historic challenge for leaders is to manage the crisis while building the future. Failure could set the world on fire" (Kissinger, 2020). It introduces many the whole of impacts that need to be treated in close future to save and enhance societies.

Late 2019 challenged the world with an outbreak of a novel coronavirus (SARS-CoV-2), first seen in Wuhan, China (Wang, Horby, Hayden, & Gao, 2020). COVID-19, the disease caused by SARS-CoV 2, has a spectrum of symptoms ranging from mild to severe with an asymptomatic presentation also described. As such, the WHO declared a pandemic on March 11, 2020, in view of COVID-19 (WHO, 2021). Since then, the world is still suffering from the coronavirus pandemic.

Before COVID-19, academics already identified seven key features that help us to clasp the concept of pandemic (Qiu, Rutherford, Mao, & Chu, 2017): Wide geographic extension; disease movement; novelty; severity; high attack rates and explosiveness; minimal population immunity; infectiousness and contagiousness. Prior to this event, academics identified significant impacts on health, economy, social and security caused by pandemic. The impact of economic loss can lead to instability in the economy, this can be due to **direct costs, indirect costs, and long-term burden** (Qiu, Rutherford, Mao, & Chu, 2017):

The direct costs of fighting the epidemic can be very high. For example, the Ebola epidemic has seriously compromised the economy across West Africa (Ratten, 2020). The Ebola outbreak in Sierra Leone in 2015 cost $ 6 billion in direct costs (hospitals, staff, drugs), and the direct costs alone represent 3 years of funding for World Health Organization (WHO) and are well over 20 times the cost of WHO emergency response reductions in its 2014-2015 budget (Gostin & Friedman, 2015). The indirect costs are also very heavy. They highly contribute to a drop in GDP. The example of SARS, especially its impacts on the region, affected the annual GDP of China in 2003 decreased by 1% and the GDP of Southeast Asia also decreased by 0.5% (MacKellar, 2007). The long-term burden is also destructive. One of the main burdens is the loss of income of those who have died. A study estimated that the economic losses due to an influenza pandemic in the

United States would be 90 to 220 billion US dollars, of which 80% would come from the value of the future expected lifetime incomes of those who would have died (F. Prager, 2016).

Last century, 500 million of people (1/3 of the global at that time) got infected by the Spanish flu, the total deaths accounted for multiple tens of millions under several waves. Scientists must consider COVID-19 as it is strictly following its evolution through time to avoid and prevent human catastrophe (Killingray, 2003). Hospitalization and death risk influence people to change by practicing social distancing to avoid contamination. Some companies could reduce or temporarily close their business to prevent risks for their workforce or to answer the drop in demand. Such practices have been observed in all countries hit by the pandemic (Economic Governance Support Unit, 2021).

State level impacts

On State level, E. Tavoletti pointed out similarities in the early missing responses process across most nations linked to the crisis. They followed the stages below (Tavoletti, 2020):

1) Denial: it is not going to hit us
2) Underestimation: it is just a bit more than a flu
3) It is severe but the economy cannot be shut down
4) Panic and lockdown
5) Insufficient health and economic levers to come back to normal life

During pandemic, governments play a significant role in the socio-economic transformation of society following the involvement of the coronavirus pandemic (Ratten, 2020). Countries around the world have imposed several protective measures to contain the spread which is increasing exponentially. This incorporates social distancing, mobility restrictions and banning gatherings (Alon & Bretas, 2021). COVID-19 has affected all levels of the education system, from preschool to higher education. Different countries have introduced various policies ranging from complete shutdowns in Germany and Italy to targeted UK conclusion for all except children of workers in key industries (Manjula Bai, 2020).

Beata Javorcik, Chief Economist at the European Bank for Reconstruction and Development summed up the impact of COVID-19 pandemic as follow: “The combination of the US-China trade war and COVID-19 may have created a perfect storm. Each of the shocks by itself would not be enough to spark rethinking of global value chains, but their combination may just do so […]. COVID-19 has exposed what many may consider an excessive reliance of suppliers located in China.” (Javorcik, 2020). From these words, we acknowledge the fact that pandemic has been a catalyser, an accelerator of what the process of Global value chains movements worldwide.

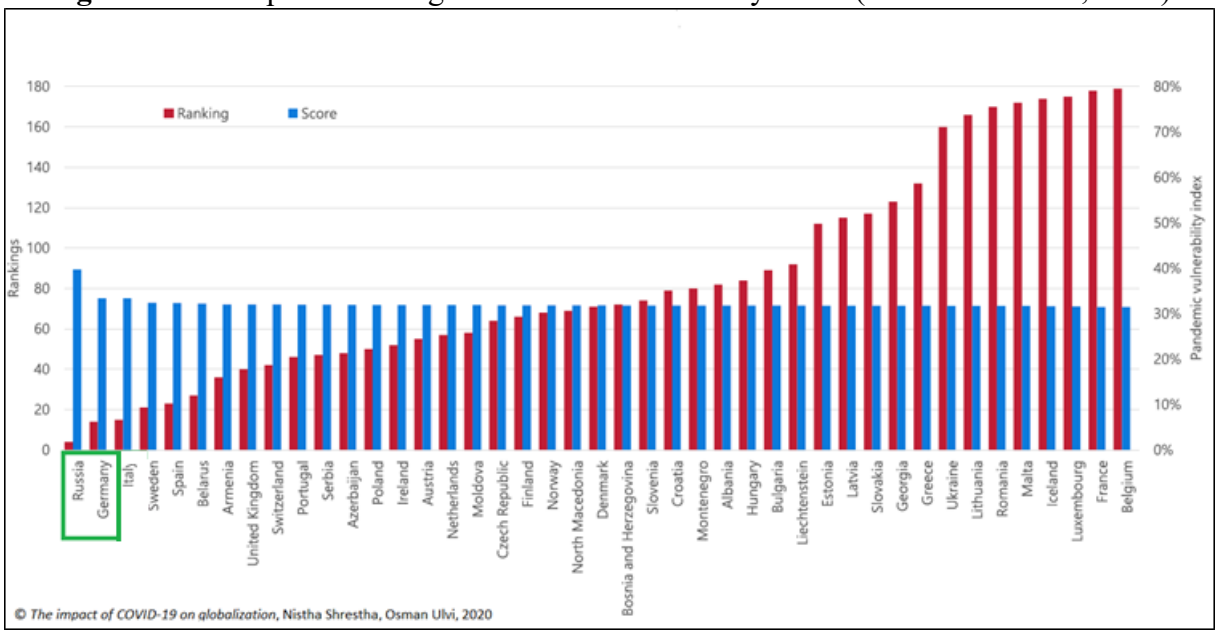
From the "Global Investment Trend Monitor" of the United Nations Conference on Trade and Development early 2021, FDI dropped in 2020 by 42% compared to the previous year (UNCTAD, 2020). This is 30% more than what we have known with the recession following the global financial crisis in 2008, returning to the 1990s. Due to foreign investors flows to safer locations, emerging markets lost more than 100 billion of dollars in foreign exchange reserves in March alone (Panibratov & Chen, 2021).

Then, government reconnaissance and uncoordinated blockages led to a disruption in the supply chain. In China, lockdown restrictions have dramatically reduced the production of goods from factories, while quarantine and self-isolation policies have reduced consumption, demand, and use of products and services. Offline social interaction is necessary for the creation of an international society. Therefore, limits placed on people mobility due to the spread of the virus led to its de-internationalization in many countries. (Ratten, 2020). This unprecedented period of COVID-19 and the lockdown measures implemented influenced uncertainties linked to economic growth (Shrestha & Shad, 2020). According to the IMF, the world knew a recession in 2020; it was twice damaging in Europe compared to Russia, in terms of growth rate (IMF, 2022).

COVID-19 brought different industries into governments priorities; like pharmaceuticals, ventilators, personal protective equipment (PPE), manufacturing, finance, and biotechnology for the case of France. Governments considered sectors and leverage them on behalf of vital for the country's economic interest. Accordingly, different measures were taken such as mandatory local production for the home market (Lacroix & Milliot, 2020). The pandemic has exposed and exacerbated the disparities between low- and middle-income countries and developed and high-income countries, and between the poor and the rich. The pandemic has also exposed inadequate surveillance systems around the world and the inability to detect and control the pandemic. That induces more control and ban measures (Shrestha & Shad, 2020).

Travel and tourism account for over 10% of global GDP and is one of the industries directly affected by COVID-19 (Feldman, 2020) & (Ratten, 2020) & (Liuhto, 2020). Many international and domestic sports, conferences and concerts have been cancelled due to the pandemic, causing massive losses in the host countries (Shrestha & Shad, 2020). The authors created an aggregate index to assess the vulnerability of each country to the impacts of the pandemic. They rated Russia and Germany as the most affected countries in Europe:

Figure 1.1: European Ranking: Pandemic Vulnerability Index (Shrestha & Shad, 2020)



In facts, this crisis can be considered as a catalyser that makes visible all the unaddressed tensions in the globalization processes (i.e. protectionism measure: the Trade war between USA & China), but also in the oppositions of governments/companies, human/artificial intelligence, ecology/growth, etc.

Organisation level

According to the World Bank, the pandemic has affected 80% of MNCs. The top 5000 MNCs made downward revisions of their 2020 earnings by 30%. UNCTAD estimates drops in terms of investment flows due to the pandemic (UNCTAD, 2020). According to it, FDI might fall below $1 trillion, coming back to 2005 amount. This fall might be worse than the 2008 financial crisis drop (Ilan Alon, 2021). The impacts on organizations vary a lot also depending on the different sectors of the economy. Taking for instance the case of the luxury market and more precisely the French industry of luxury goods with world leading players such as LVMH, Hermès, Kering and L'Oréal, researchers pointed out that the luxury sector is less financially impacted than other sectors such as petroleum, or banking when comparing equities (Nivoix & Rey, 2020).

1.3 Global value chains changes

The notion of global value chains (GVC) has been used since the 1990s to describe the phenomenon of international fragmentation of the production process. The strategy pursued by internationalizing firms such as MNEs has materialized by either relocating some activities to foreign markets, through captive or in-house offshoring or by outsourcing some activities to foreign suppliers (Barbieri, Boffelli, Elia, Fratocchi, & Kalchschmidt, 2021). The GVC model has

been challenged since the last decade. Relocations ‘of second degrees' are being actively considered by multinationals, accelerated by the pandemic. It can take the shape of a return back to firms’ home country (back-reshoring) or to a third country (further-offshoring). For instance, European firms relocate from China to Vietnam (Barbieri, Boffelli, Elia, Fratocchi, & Kalchschmidt, 2021) & (Strange, 2022). Deglobalisation is also a subject that researchers pointed out due to the acknowledgement of both MNCs and Governments that the Global Value Chains are very vulnerable from a systemic risk because of the possibility that the crisis escalates more. It can lead to several shortages (Panibratov & Chen, 2021). It means that governments must reconsider cross-border supply chains and establish a more resilient system.

Barbieri et al. recommend setting up policies in under a Pan European approach to leverage on wide and heterogeneous resources and capabilities in order to recreate the GVCs existing in Europe (Barbieri, Boffelli, Elia, Fratocchi, & Kalchschmidt, 2021). The pandemic has highlighted the urgent need to review disaster preparedness and public health response to a health crisis such as COVID-19. We need to rethink “globalized” processes. The major government involvement deployed in this mission was in the medical sphere where the World Trade Organization (WTO) reported an increasing number of export prohibitions and restrictions to mitigate the shortages at national level (World Trade Organization, 2020). Restrictive investment policies were settled to avoid acquisitions of local firms in medical field and related industries. However, such measures can have negative implications for opportunities acquisitions, spread of knowledge, and innovations across MNC subsidiaries worldwide (Liuhto, 2020) & (Ratten, 2020).

Shortage evidence

Restrictions had also huge impacts on MNCs such as Apple who experienced disruptions to its manufacturing, supply chains and logistics services due to the lockdown in China resulting in iPhone supply shortage. Similar shortages happened in Wuhan, where automobile players have manufacturing plants: General Motors, Honda, Nissan, Peugeot Group and Renault. They all had to close down which had worldwide impacts. For instance, the shortages of automobile parts produced in Wuhan forced Kia and Hyundai to stop several lines in Korea. Same for Nissan in Japan (Eduardsen, 2020) & (Barbieri, Boffelli, Elia, Fratocchi, & Kalchschmidt, 2021). Pandemic clearly has uncovered vulnerabilities of the modern MNC and its heavy global presence. Current GVC of MNCs aims to maximize efficiency rents and profits, reducing stocks and focusing on specialised suppliers. By reducing costs, they also increased risks, they now must seek for more resilience in their GVC (Khan & Teicher, 2020).

Indeed, these measures brought production and transportation issues. Blockade measures such as lockdown harm deliverables including equipments to be transported to their final destination in time. In April 2022, the latest lockdown in Shanghai, led to an overload on other departures point such as Ningbo harbour, which is the 3rd largest harbour of the country (Lloyd's List, 2022). To unclog the harbour, a whitelist for truck drivers and enlarging space and rail services (Aljazeera, 2022). Multinationals need to find solutions to this kind of issue, because currently Sea way is at the core of international trade thanks to their small cost per weight. The risk lies in the immediate stop of its usage that will create shortage and higher costs. The procurement of raw materials and semi-finished products also slowed down, which created delays in production. Therefore, most lead time of production and in fine orders were delayed, while some were cancelled (Panibratov & Chen, 2021). It led to a shortage of containers and higher costs. My personal experience in the export department of a multinational company, ECOLAB, brings more evidence of such delays as 2 more weeks on all its export orders were added due to COVID-19 measures (Mathlouthi, 2021).

FDI movements

The world might face different divestments decisions led by investors that reflects deglobalisation process. In facts, academics have already notice and wrote about this active deglobalisation process that pandemic has only accentuated. The protectionism measures already took place led by the Trump's presidency who engaged in the trade war against China (Barbieri, Boffelli, Elia, Fratocchi, & Kalchschmidt, 2021). However, divestments do not mean complete divestment, as the AHK study suggests more than 80% of the foreign business stick to their investment decision and do not plan to exit the country where they invested (Wölfer, 2018).

The pandemic crisis caused a sharp drop in foreign direct investments: it is forecasted that by the end of 2020, global FDIs declined by 40% compared with 1.54 trillion dollars in 2019 (UNCTAD, 2020). At the beginning of 2020 (March–April), there was over a 50% decrease in cross-border Mergers and Acquisitions (M&A) deals and greenfield projects compared to in 2019, the most of which were delayed or even cancelled. The service sector is also directly negatively affected by the pandemic: the foodservice and accommodation with a 94% decrease, and the storage and transportation with a 63% decrease. Manufacturing industries, especially the global value chain (GVC) intensive, experienced supply chain disruptions and were forced to regionalize their operations and value chains on raw materials (Panibratov, Rysakova, & Luo, 2021; European Raw Materials Alliance, 2020). Academics suggest that we are not assisting to the end of globalisation but to significative change of operations from plethoric actors. According to Gorynia, Globalization is good, but it is not as good as it could be (Gorynia, 2020).

Regionalization

A new trend is emerging on the business environment within the International Business field. Globalization will tend to regionalize; the local context takes more importance. As such, cooperatives are ideal examples. A cooperative is an autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly owned and democratically controlled enterprise. At least 12 percent of people in the world participates in one way or another to the 3 million existing cooperatives that represents US$ 2,034.98 billion (15 percent of the global economy) according to researchers (Kuznetsov & Kuznetsova, 2020). 180,000 cooperatives present in Europe employ 4.5 million of workforce. Together they raise an annual turnover of €1,000 billion. On average, employees are more engaged and productive in cooperatives as the internal interests are not only economic oriented but also social and often environmental oriented. Canadian research shows that after 5 years, 62% of cooperatives are still active in business whereas 35% for traditional businesses (Kuznetsov & Kuznetsova, 2020). Global supply chains changes will be led by cooperatives, that are less concerned with profit, is a strong hypothesis. A great example of successful Cooperative is the Mondragon Cooperative Corporation in Basque region in Spain. 73,000 people work together in 102 federated cooperatives in industrial and distribution sectors (Kuznetsov & Kuznetsova, 2020). It possesses its own bank, university, social welfare agency, several business incubators, and a supermarket chain. Mondragon is the first employer in the region with an annual turnover of €12 billion (equal to Visa's). Every employee participates via a democratic voting system toward the strategies/decisions of the cooperative that aims to its own well-being, and the local community as a goal – e.g., in preserving employment for instance.

Relocation activities

Researchers also pointed out different trends in the GVCs changes, notably they show the relocation of activities in the medical sector which is vital for national sovereignty as the majority of the production of pharmaceutical industry inputs are concentrated in China and India, which led to several shortages in western countries where local production could not fulfil local demand. Also, Schmitt (Schmitt, 2013) suggests that the "Proximity [is a] dimension […] important [for] future contracts. One possible mechanism is the facilitation of knowledge exchange and the reduction of risk through trust. [For instance], the nature of automobile production has always required some geographical proximity […] the growing role of suppliers in design and subassembly of components requires frequent interactions between suppliers and carmakers".

As such, reshoring activities are more likely to happen where shortage emerged. The term 'Reshoring' is commonly used to describe a heterogenous process. Actually, it refers to the process of bringing back industries and value creation activities (Raza, et al., 2021). Distinctions must be made between Backshoring and Nearshoring. Backshoring is a decision by a parent company to relocate to the home country the manufacturing activities (Kinkel, 2020). Nearshoring relocates activities to a closer country of the country of origin. The terms backshoring and nearshoring are peculiarities of the term reshoring that show the reversal of offshoring activities. Cost considerations affect the decision to reshore (De Backer, 2016).

Undertaking reshoring happens when offshoring has too many disadvantages in terms of cost and benefit (transaction costs are high and/or loss of control over offshored activities). Advantages shape the decision to reshoring as the cost and benefit improves justified by elements such a closer to market presence; synergies & knowledge seeking (Kinkel, 2020). The transaction cost theory helps to firm in the decision-making process of reshoring.

Gray et al. (Gray, 2013) proposes four different modes of reshoring:

- In-house reshoring, where firms relocate manufacturing activities performed by wholly owned offshore facilities to wholly owned onshore facilities;
- Reshoring for outsourcing, where firms relocate manufacturing activities performed by wholly owned offshore facilities back to onshore suppliers;
- Reshoring for in-sourcing, where firms relocate manufacturing activities performed by offshore suppliers to wholly owned onshore facilities;
- Outsourced reshoring, where firms relocate manufacturing activities performed by offshore suppliers back to onshore suppliers

Barbieri et al. (Barbieri P. e., 2018) argues that reshoring phenomena can be framed in: what is reshored, who is reshoring, why firms are reshoring, how they reshore, where they reshore to, and when they decide to reshore.

A great example of reshoring for in-sourcing is the pharmaceutical industry to Europe: 60-80% of active ingredients used in medicines are manufactured outside Europe (L'Express, 2020). Sanofi announced that its will to increase production on the continent by 5 to 10 percent a year to fulfil the local demand. Some evidence of reshoring from low to high wages countries are in trend as.

Another example of back-reshoring is the French company Stil, a manufacturer of measuring instruments. It decided to relocate its home country production of glass-thermometer after its Chinese suppliers were obliged to interrupt the production due to the local lockdown. The company improved its capacity of production in France thanks to the competences owned by the

oldest employees who manufactured this type of products until 2005 (Stil, 2022). This example contrasts with the reduce of transfer of knowledge, especially tacit, at both country and company levels that sanitary restrictions have on the movement of people since pandemic, including staff and the public (Panibratov, Rysakova, & Luo, 2021).

1.4 Policy response of Russia, Germany, & France

The general outcome confirms that COVID-19 having negative effects on economic activities in most European countries which have different economic structures. Germany and Russia are more industry oriented compared to France that is more service oriented:

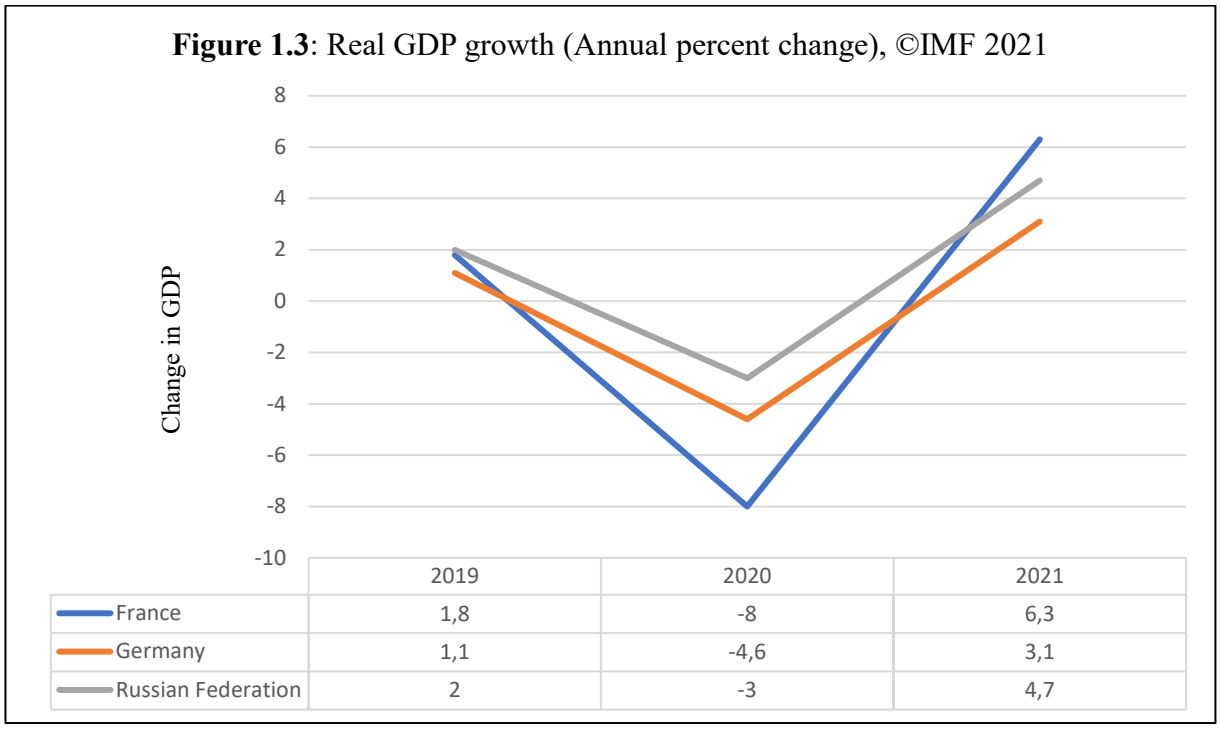
Figure 1.2: Economic structure of countries

2020	Services	Industry	Construction	Agriculture
Russia	60.1%	30.5%	5.5%	3.9%
EU	73.1%	19.4%	5.7%	1.9%
Germany	70.2%	22.9%	6.1%	0.8%
France	79.8%	13.2%	5.2%	1.8%

Source: Author based on Eurostats & Rosstat, 2021

The pandemic forced the Russian, German, and French States to undertake sanitary measures such as masks equipment, social distancing, and lockdown that led to the recession of economies in 2020. Worth to note that Russia has been the less impacted country in 2020 with only -3% decrease of GDP, while in Germany, and France knew a decrease of -4.6% and -8% respectively according to the IMF database:

Figure 1.3: Real GDP growth (Annual percent change), ©IMF 2021



	2019	2020	2021
France	1,8	-8	6,3
Germany	1,1	-4,6	3,1
Russian Federation	2	-3	4,7

The vaccination strategy has been followed by all the countries: Germany and France have more than the three-quarters of their population that is vaccinated while half of the Russian population is vaccinated (Our World in Data, 2022). Nevertheless, other aspects of the governments strategies to counteract the spread of the disease can be differentiated. A research suggests that the lockdown policy (Austermann, Shen, & Slim, 2020) can be explained through several factors: logistics & manufacturing possibilities to produce or buy protective equipments, the degree to which industries are important in the national economy, numbers of daily hospitalization & hospital beds capacity, capacity to produce an operational vaccine, or population trust toward their government. Based on these factors, government response slightly differs. Consequently, economic shut down dramatically reduced working hours and several employees lost their job, or their job contract were not renewed (Eurostat, 2020). The lay-offs spiked dramatically in Germany and France during the first wave of the COVID-19 pandemic (Economic Governance Support Unit, 2021). In these countries, trade, transport, and tourism sectors suffered the most during first steps of the crisis.

Lockdown policy

As we can see on the table below, different periods of lockdowns characterize each country. Three nationwide lockdowns were taking place in France, while only one in Russia and Germany:

Figure 1.4: Lockdowns time period per country

Countries		1st lockdown		2nd lockdown		3rd lockdown	
	Place	Start	End	Start	End	Start	End
France	National	17.03.2020	11.05.2020	30.10.2020	15.12.2020	04.04.2021	03.05.2021
Germany	regional	02.11.2020	01.03.2021 to 11.06.2021*	-	-	-	-
Russia	National	28.03.2020	30.04.2020	-	-	-	-
	Moscow	30.03.2020	12.05.2020	28.10.2021	04.11.2021	-	-

Source: Author, based on countries' Health ministry, 2022
*ending date variation depending on regions

France repeatedly used the lockdown strategy, to limit the spread of the disease and health impacts of citizens. Because France could not conduct mass testing or produce masks due to

logistic issues, it has had a relatively restrictive governmental policy, to fight against the Coronavirus (France 24, 2020). In January 2020, the government representatives declared that masks were useless to protect against the disease while two months later they announced the exact inverse and made masks compulsory (Agence France Press, 2020). French authorities started a lockdown in March. According to the French statistical office INSEE, the first 55 days of lockdown – starting from March 17 – has estimated the economic loss linked to COVID-19 at -33%, and a decrease in households consumption of -32% inside the country (INSEE, 2020). Also, an Italian study (Medda, Toccaceli, Gigantesco, & Angelo Picardi, 2021) showed that such policy increases the risk of depression. It pointed out that the presence of depressive symptoms was 14% before and 33% after the lockdown.

Germany only launched a partial lockdown in early November 2020 to reduce the numbers of cases (Deutsche Welle, 2021) because the total infections crossed the 1 million cases threshold (Euronews, 2021). Later from 15 December 2020, a tougher lockdown was initiated with compulsory masks – FFP2 when available – in public areas such as transportation and stores. Lockdown ends in regions depended on infections cases. The manufacturing industries in Western Europe, represented by Germany faced more shortages in terms of containers, raw materials, semi-products, computer chips, etc. (J.P. Morgan, 2021) that led to shutdowns. It also delayed the recovery of manufacturing in 2021 of Germany (The local DE, 2022), that slowly recovers from pandemic effects compared to France and Russia.

In Russia, only one nationwide lockdown took place for one month in April 2020. Services and mining/exploitative of raw material industries have been impacted by the lockdown during the first wave of the pandemic but less impacted afterwards due to less restrictive measures in following waves, compared to other countries. Because the regions of Moscow and Saint Petersburg represent 28% of the total volume of retail & services markets they were the most impacted (L'Observatoire Franco-Russe, 2021). The highest drop concerns the restauration sector with a decrease of 21% in 2020 compared to 2019 (L'Observatoire Franco-Russe, 2021). Similarly, during the first trimester of 2021, bars and cafés slowed by 6% due to lasting restrictions to fight against the pandemic. However, Moscow, Krasnodar and Rostov region recover fast with an increase from 4 to 7% (L'Observatoire Franco-Russe, 2021). Other types of services diminished by 17% in 2020, concerning every region of Russia. Moscow is the most impacted (-29%), due to longer and strict covid-19 restrictions (i.e., public transport measures) (Rosstat, 2021). The second sector impacted is the extractive industry, which production dropped by 7% in 2020. It can be explained by the limitation of exportations. The diminution of the global demand of several raw

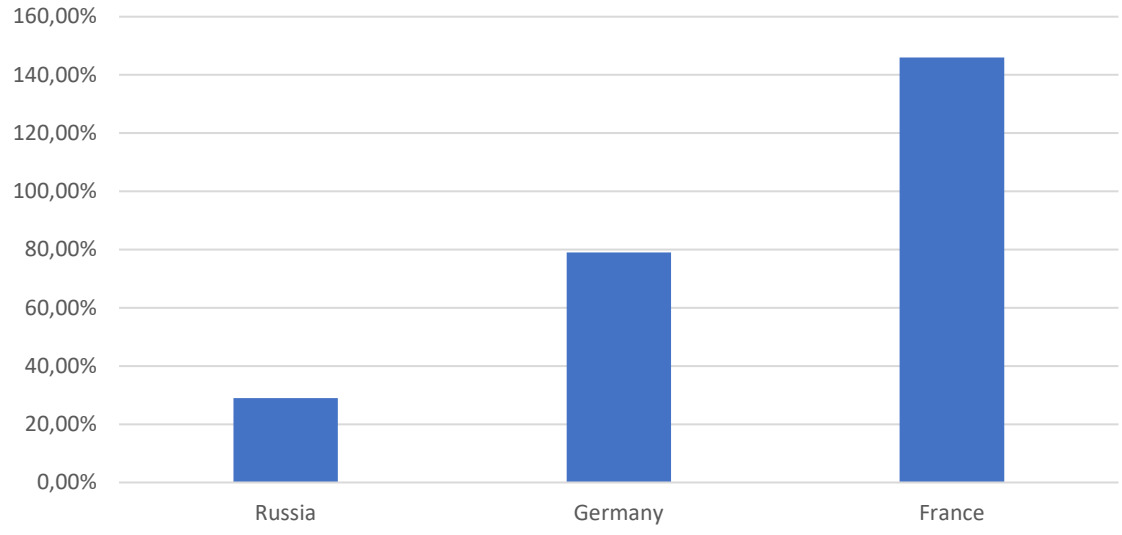
materials such as petroleum, coal, diamonds, gas, and others on the international market is linked to lockdowns in several countries, where productions were stopped (CNBC, 2020).

States economic support

In order to support the economic activities, all of the States have developed investment and tax-free programs. However, the investments decisions slightly differ depending on the country. Although all countries consecrated spendings on investments linked to digitalization, Russia support more its defense industry with State orders (L'Observatoire Franco-Russe, 2021): some regions continued to grow significantly in 2020: Tyumen and Vladimir (19 to 21%) and Tula and Moscow (9-12%). Also, Prime Minister A. Siluanov declared in June 2020 (The Moscow Times, 2020) a launch of a 5 trillion rubble ($73 billion) recovery plan to act against economic effects of the pandemic. Three main stages: “stabilisation”, “recovery”, and “growth”. Meanwhile, Germany and France focus their spendings on the digitalization and green energy transition, according to the EU Recovery and Resilience Plan launched in March 2022 (European Parliamentary Research Service, 2022).

The government investments have increased in every country to support the economic activity, underlining a net loss in the government budget. Consequently, all the governments faced deficit at the end of 2020. National debt of Russia increased to reach 29%, Germany 79%, and France 146% of GDP:

Figure 1.5: 2020 Government debt (% of GDP), ©OECD



A special concern remains on the solvability of France that reached an incredible amount of government debt that both suggest a relaunch of the economic activities due to COVID-19 consequences and an adoption of a coherent fiscal policy responses regarding its debt sustainability

(European Parliamentary Research Service, 2022). Moreover, poor management and communication of the governments on strategy to counter the pandemic crisis characterized by several lockdowns in different periods led to a distrust of the citizens to their government. According to a study of the Eurofund in April 2021, more than 80% of the German and French people thought that rules about pandemic were not clear and transparent, even worse, on average, 90% of them said that the support measures were not fair (Eurofound, 2021). On the contrary still in April 2021, 58% of the Russian population trust their president (Russia Public Opinion Foundation, 2022).

Russian response was less damaged economically by the pandemic because of its less restrictive sanitary measures and its single shorter lockdown compared to Germany and France. Another possible reason lies in how western sanctions in 2014 led to a 'Russification' process that could be in part responsible of the resilience the country has developed through the usage of its owned domestic resources (Connolly, 2018). On the other hand, the Russian foreign economic policy seeks to develop relations with non-occidental countries on the African and South American continent. The objectives are clear: greater investments in national capabilities at home in key industries, and investigations of new sources of knowledge and capital from abroad.

1.5 Automotive industry in Germany, France, and Russia under pandemic

The characterisation of the automotive industry is the production of multiple vehicles plants that are distributed in different countries. Suppliers have increasing weight in the sub-assembly of auto pieces, closer locations, just-in-time deliveries, efficient production, and high-quality production (Schmitt, 2013).

1) Automotive industry in Russia under pandemic

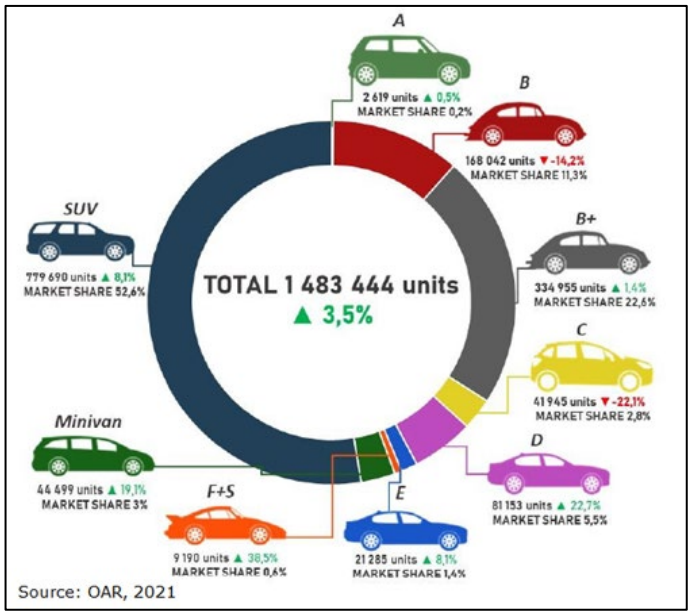
In Russia, one of the leading sectors of the economy is the automotive industry that accounts for almost 1% of the national GDP in 2020. Its added value in cross-engineering industries reached 40%. Moreover, 320,000 people are directly employed in the automotive industry while 3.5 million are employed with partners such as material manufacturers, maintenance and repairment, and vehicle operation. National constructors established gigantic plants during the 20th century like Avtovaz in Togliatti and Kamaz in Naberezhnye Chelny. Since then, different partnerships were created with foreign constructors willing to implement the market such as the successful Renault-Nissan alliance and Avtovaz joint venture (Reuters, 2009). The Association of Russian Automakers – in Russian Объединение Автопроизводителей России (OAR) – was founded in 2003 (Объединение Автопроизводителей России, 2022) by the first leading automobile manufacturers in Russia such as Avtovaz, Kamaz, Ruspromavto (now GAZ Group) and Severstal

Auto (now Sollers). Now it represents, develops, coordinates, implements, and creates strategic activities in the automotive industry (Automotive World, 2012).

The Russian automobile market bounced back to growth in 2017, after a long-lasting recession. In 2018, national and international car manufacturers based in Russia produced 1,770,000 motor vehicles (+14% increase) (Объединение Автопроизводителей России, 2022). The following two years encountered a production decline of and reached 1,720,000 units (-2.8%) in 2019, then 1,430,000 units (-16.6%) in 2020. In parallel, sales of vehicles in the country (registered as new cars) dropped to 1,630,000 units in 2020 (-8.3%) relatively to 2019. Russia registers more than 56,000,000 passenger cars, trucks, and buses as a whole (Объединение Автопроизводителей России, 2022). Nevertheless, vehicles older than 10 years occupies more than the half of the total vehicles in circulation, they poorly perform. In facts they are low fuel efficient, insufficiently active, and unsafe (Объединение Автопроизводителей России, 2022).

Thus, one of the of current objectives of the Russian State is to renovate the current vehicle fleet by supporting the production of cleaner car that are more energy efficient and safe. In 2021, the most car type sold was the SUV type cars. It represents more than half of new vehicles sold ahead of B+ type of car (20%) as the following chart shows us:

Figure 1.6: Sales of new passenger cars in Russia in December & 12 months 2021 by class:



The top 5 car brands that Russians buy are: 1st – Lada (Granta, Vesta, Largus, & Lada4*4 models); 2nd – Hyundai (Creta & Solaris models); 3rd – Renault (Duster, Logan & Sandero); 4th – Toyota (Rav4 & Camry models); 5th – Kya (Rio, Sportage, & Kia K5. In Russia, half part of the new car sold composes the Moscow and Saint-Petersburg regions (Объединение Автопроизводителей России, 2022).

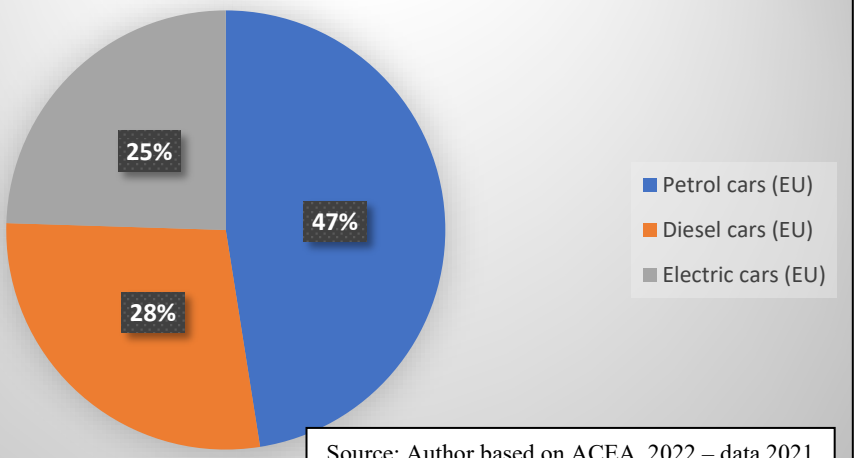
In 2020, the decrease of production was reported among all of the segments of manufactured vehicles: -17.3% in car output; -9.1% in truck output; -17.8% in bus output; -11% in LCV output (Объединение Автопроизводителей России, 2022). In all the segments, the total output decline of foreign companies located in Russia was higher than domestic companies located in Russia, except for the minibus segment (ASM Holding & OAR, 2021). The decline in production is essentially explained by shortages of essential elements such as chips; sanitary restrictions frightening the labour input; and a decline in demand for cars in general (J.P. Morgan, 2021).

2) Automotive industry in Germany & France under pandemic

In Europe, the automotive industry employs 13,000,000 people – 2,600,000 workers in direct, it represents 6.1% of EU employment. France and Germany are main members in the EU that is the first the investor in terms of R&D in the sector: €58.8 billion in R&D annually – 32% of total EU spending (European Commission, 2022). The EU Commission supports the technological development through subsidiaries and legal framework. It ensures its worldwide leadership in the automotive industry. The sector represents over 7 % of EU GDP and connects other industries such as steel, chemicals, textiles, ICT, repair, and mobility services. According to the European Automobile Manufacturers' Association (ACEA), the average age of cars in the EU zone is 11.8 years (European Automobile Manufacturers' Association, 2022).

Undoubtedly, Germany leads the automotive industry inside the zone. In 2020 the country accounted for 57% of the EU total exports in motors cars, while it was 2.9% for France. The automotive industry creates a trade surplus of €76.3 billion for the EU. European cars are among the most demanded cars worldwide (Eurostat, 2022). In 2021, export went to top 3 destinations such as the USA with 25,510 units, China with 21,180 units, and the UK with 20,301 units. In 2021, the UK diminished by 27.8% its importation of European cars while the strongest growth noticed was Russia (+40%), followed by Norway, Australia, and China (ACEA, 2022). The reason behind can be directly associated to Brexit and COVID-19 restrictions that combined are unfavourable for the import of cars in the country.

Figure 1.7: 2021 Sales of cars inside the EU per motor type



Source: Author based on ACEA, 2022 – data 2021

In 2021, 9,700,000 new cars were registered (-2.7% compared to previous year) in the EU (Germany -10.1%; France +0.5%) with higher importance of electric cars. However, it is the only segment that went negative. On the opposite the van segment increased by 8.5% across the EU (-0.8% Germany; +7.5% in France), the truck segment increased by 16.8%, and the bus segment increased by 2.8% (+0.2% in Germany; +13.4% in France) (Eurostat, 2022). The overall recession is the result of the semiconductors and chips shortage that impacted the car segment of the automotive industry, particularly during the 2nd part of 2021 (J.P. Morgan, 2021). In facts, domestic demand for commercial vehicles rose as vaccination plans developed across the region – i.e., domestic incoming orders were up 6% in Germany (ACEA, 2022). Also van segment increased because of the boom of deliveries, a more suitable channel of distribution responding to pandemic constraints.

Volkswagen, the largest automaker in Europe, declared a decline of 800 thousand fewer cars in terms of production (-35%) in 3rd quarter of 2021, compared to the same quarter in 2020, because of the semiconductor shortage (J.P. Morgan, 2021). Toyota Motor declared a 40% decline in new motor vehicle production around the world in October 2021, also due to the shortage of computer chips but combined with COVID-19 restrictions (J.P. Morgan, 2021). Constraints for steel and transportation in general has also undermined production. Shortage issues questions the global supply chain and might redefine the Global Value changes to more regional connected supply chain (ACEA, 2022). It will elevate prices. Consequently, expected inflation might put a pressure on household purchasing power. However, step-by-step removal of pandemic restrictions and increase in demand for new passenger cars, trade activities picked up in 2021 (OICA, 2021). In 2022, a growth in the market is expected as the chips supply is supposed to stabilise during the year. Also, BMW expects chip supply issue for lasting another 6-12 months (Verband Der Automobilindustrie, 2022).

The ACEA's Director General the transformation of the automobile declared in June 2021 (ACEA, 2021): "Our mission is to drive Europe's mobility transformation, while at the same time ensuring that the EU auto industry remains a strong Global & Competitive player. Ready to face the challenges on the road ahead.". According to him the future of the automotive industry will focus its activities on 4 key priority areas such as Green & Clean, Smart & Efficient, Safe & Reliable, Global & Competitive. The focus will be held on more renewable cars not only for laudable purposes but also for economic reasons as buyers of new cars have incentives to buy electric cars because of State grants and higher expected price on fuel (OICA, 2021). This change also involves some infrastructure creation with for instance the creation of 6.8m public charging points for electric cars will be required by 2030 (ACEA, 2022).

3) Supply and demand comparison per country

The supply and demand comparison is held on production of new motor vehicle (market supply) and sales of new vehicles (market demand) in each country based on the International Organization of Motor Vehicle Manufacturers database. The institution represents the global automotive industry. Then, I provide elements of explanations to qualify the trends, the stakes of the industry, and solutions undertaken by countries.

i) Supply and demand

Figure 1.8: MOTOR VEHICLE PRODUCTION BY COUNTRY/REGION

UNITS	YTD* 2019	YTD* 2020	YTD* 2021	VARIATION 2021/2019	VARIATION 2021/2020
ALL VEHICLES	**Q1-Q4**	**Q1-Q4**	**Q1-Q4**		
EUROPEAN UNION 27 countries + UK	18 002 188	13 797 533	13 092 506	-27%	-5%
FRANCE, cars, and LCV** only	2 175 350	1 316 371	1 351 308	-38%	3%
GERMANY, cars, and LCV** only	4 947 316	3 742 570	3 308 692	-33%	-12%
RUSSIA	1 719 146	1 435 551	1 566 317	-9%	9%
DEVELOPED COUNTRIES/REGION	44 086 110	35 163 935	34 373 418	-22%	-2%
EMERGING COUNTRIES/REGIONS	48 096 901	42 547 790	45 772 571	-5%	8%
TOTAL	**92 183 011**	**77 711 725**	**80 145 988**	**-13%**	**3%**

DEVELOPED COUNTRIES/REGIONS = EU15 + NAFTA+ JAPAN + SOUTH KOREA+AUSTRALIA
EMERGING COUNTRIES/REGIONS = ALL OTHERS
*Year to date (YTD) **Light Commercial Vehicle (LCV)
Source: Author, based on International Organization of Motor Vehicle Manufacturers statistics, 2021

In 2019, the pre-crisis level of production in Germany was 4,947,316 units, in France 2,175,350 units, and in Russia 1,719,146 units. According to the table above, we clearly identify a negative impact of the pandemic in both regions. The COVID impacts on the automotive industry in terms of motor vehicle production was more severe in western European countries such as France and Germany (-38% and -33% respectively) compared to Russia (-9%) for 2021 over 2019 period. In 2021 compared to previous year, only Germany continues its drop in terms of production (-12%) while other countries start their recovery (+3% in France; +9% in Russia). However, none of them has overcome 2019 pre-crisis production level, suggesting that the crisis has a long negative impact. This is even more problematic for the EU as Germany accounts for almost 30% of the EU vehicles production in the region. Russian automotive industry was the less impacted and the quickest actor to recover from the crisis with a +9% increase in 2021 allowing the country to reach 1,566,317 motor vehicle units and overtake France level of production by 215,009 units, which was improbable without the crisis.

Figure 1.9: REGISTRATIONS OR SALES OF NEW VEHICLES - ALL TYPES

REGIONS/COUNTRIES	Q1-Q4 2019	Q1-Q4 2020	Q1-Q4 2021	2021/2019	2021/2020
EU 27 countries + EFTA + UK	18 424 199	14 079 756	14 133 619	-23%	0.4%
FRANCE	2 755 728	2 100 030	2 142 284	-22%	2%
GERMANY	4 017 059	3 266 759	2 973 319	-26%	-9%
RUSSIA	1 778 841	1 631 163	1 741 965	-2%	7%
TOTAL OICA MEMBERS	**79 592 152**	**69 601 556**	**72 349 154**	**-9%**	**4%**

Source: Author, based on OICA statistics, 2021

The pre-crisis level of sales of new vehicles in Germany was 4,017,059 units, in France 2,755,728 units, and in Russia 1,778,841 units. According to the table above, we clearly identify a negative impact of the pandemic in both regions. The COVID impacts on the automotive demand market in terms of sales of new vehicles was more severe in western European countries such as France and Germany (-22% and -26% respectively) compared to Russia (-2%) in 2021 over 2019 period. In 2021 compared to previous year, only Germany continues its drop in terms of sales of new vehicles (-9%) while other countries grew. Nevertheless, Germany is the only self-sufficient

country in terms of motor vehicles as its production is always superior to its sales of vehicles in the time period. It also means that France and Russia have imported cars from abroad to fulfil their demand. In facts, Germany has a clear competitive advantage in the industry as it exports a lot of cars. None of the countries has overcome the 2019 pre-crisis sales of new vehicles level, suggesting that the crisis has a long negative impact. French and Russian automotive demand have slightly recovered from the crisis in 2021 compared to previous years with a +2% and +7% increase respectively. However, the Russian demand was the most resilient in 2021 as it almost reached pre-crisis level of 2019 sales of new vehicles. In 2021, the country reached 1,741,965 new motor vehicles sold.

ii) Rational of the trends

The reasons behind the overall negative trend mainly lie in evidence of worldwide shortage of chips and semiconductors due to pandemic and a quick rise in demand in 2021. Semiconductors accounts for almost 10% of global GDP (ESIA, 2020). In facts in the automotive industry, chips and semiconductors are needed for everything from entertainment systems to power steering. In European countries, lockdowns caused immense concerns in production planning of vehicles that led the manufacturers to reduce their planned backlog orders. Suppliers of semiconductors in automotive industry were announced to reduce their production, so they did not improve their capacity in time or invest in new pieces generation. As such, it undermined sustainability of carmakers to follow the demand that knew a quick positive bounce back. As demand grew, automakers competed for the semiconductor capacity mainly located in Asian foundries. Hence it led to shortage of chips. In the EU, manufacturers rely more on last technology for chips as a way to build high quality cars, a factor of their competitive advantage. Combined with other shortage on steel and transportation inside the EU, it allowed the Russian automotive industry to show more resilience in the industry overall.

As the COVID-19 infections diminishes, restrictions are step by step removed. It is expected that most supply chain issues due to chips will dissipate by the end of 2022 thanks to added capacity in chips production located in Asia. Because the chip industry is cyclical, an oversupply of auto semiconductors is expected in 2023 according to Jose Asumendi, Head of European Automotive Research at J.P. Morgan (J.P. Morgan, 2021). The long-term outlook seems positive for the European automotive industries, for instance Mercedes-Benz is supposed to stabilize its sales (ACEA, 2022). McCabe the CEO of AutoForecast Solutions LLC declared that vehicle manufacturers might vertically integrate their chip production, indicating that Volkswagen has already taken this direction (Detroit Free Press, 2021).

4) Countries' policy in the automotive industry

Every States have supported the automotive industry through investment in R&D in Europe and loan facilities for cars in Russia for instance, it is consistent with previous research (Barbieri, Boffelli, Elia, Fratocchi, & Kalchschmidt, 2021). In Europe, investments will focus on electrification and sensors volume with the development of software combined with artificial intelligence in the automation of vehicle from product development to customer service. This digitalization process is expected to increase the return on investment. Inside the EU, batteries production is considered as a new and important opportunity for the automotive industry. According to research, the industry will undertake large transformation that will focus more on technologies and less on labour inputs – technology replacement (Nevskaya, 2021). It is expected to attract investments. Sustainable, low carbon, circular plastic technology is a key aspect of the EU's technological economy (Wang L. , 2020). The European Battery Alliance ambitions to support the automotive industry necessary infrastructures. With just 20% of digital SMEs, it aims to transform manufactures with automation and robotics. Meanwhile, Russian exports to Europe will be limited due to new EU standards in the automotive industry that will restrict export supplies of raw materials for combustion-based engines (ACEA, 2022).

To support the automotive industry threatened by the pandemic, the Russian State has allocated 25 billion rubbles as the Prime Minister Mikhail Mishustin announced: "Of the funds, five billion rubbles will be spent on purchasing ambulances" during a government meeting. The aids were used for preferential car loans, leasing, and for the promotion of Russian-made vehicles towards firms with State participation (Xinhuanet, 2020). In facts, Russia's top-selling brands all reported strong results in March 2021, with sales at market leader Lada, followed by Hyundai, Kia, and Renault (Automotive News Europe, 2021).

European authorities try to attract investments in chips production because the automotive industry is highly demanding of semiconductors: 37% of semiconductors produced inside the EU supplies the industry (ESIA, 2020). 70% of global manufacturing is located in Asia – in Europe it is 6%, respectively (Decision, 2020). The semiconductor industry has high R&D investments, so it is very sensitive to capital: about USD 100 billion is spent on capital each year (IC Insights, 2019). The Electronic Components And Systems For European Leadership is responsible for the development of electronics components and systems industry in the European Union (ECSEL, 2022). Several projects are in progress such as Connect, R2power300, or 3Ccar project. For instance, the 3Ccar project aims to provide high quality and affordable components for electrified cars. The use of semiconductor technology maximizes functionalities. This kind of project leads to cheaper, reliable, and sustainable automotive systems that are essential for the economic growth

and jobs creation in the European automotive industry (Deloitte, 2022). As such, reshoring activities of chips are more likely to happen.

According to a study on reshoring in the automotive industry (BECKER, 2021), several cost-related factors in the semiconductors suppliers getting closer to their original equipment manufacturers explain the reshoring process:

- Operating more efficient,
- Access to qualified and skilled employees
- Reduction on import duties and taxes.
- Logistics benefits such as shorter routes, better lead times or less control effort

Also, combined with cost, time-to-market, and the capacity to meet customer requirements were the most important factors mentioned in relation to reshoring in this industry.

Yet, the biggest barriers to reshoring activities are linked to the huge amount of capital needed – a chip factory can cost up to €10 billion, and to the highly skilled workforce requisite (Kinkel, Pegoraro, & Coates, 2020). Also, the replacement of the current electronics industry from Asia to Europe would involve several layers of the supply chain, not only plants of assemblage. It would increase even more the cost of such strategy (Deloitte, 2022). Although, digitalization plan in Europe for production and organisation would increase the probability to undertake the reshoring of semiconductors, the associate cost of such strategy still threats investors that rely more on a future oversupply in 2023 (J.P. Morgan, 2021).

1.6 Industry 4.0 and business models transformation in the automotive industry

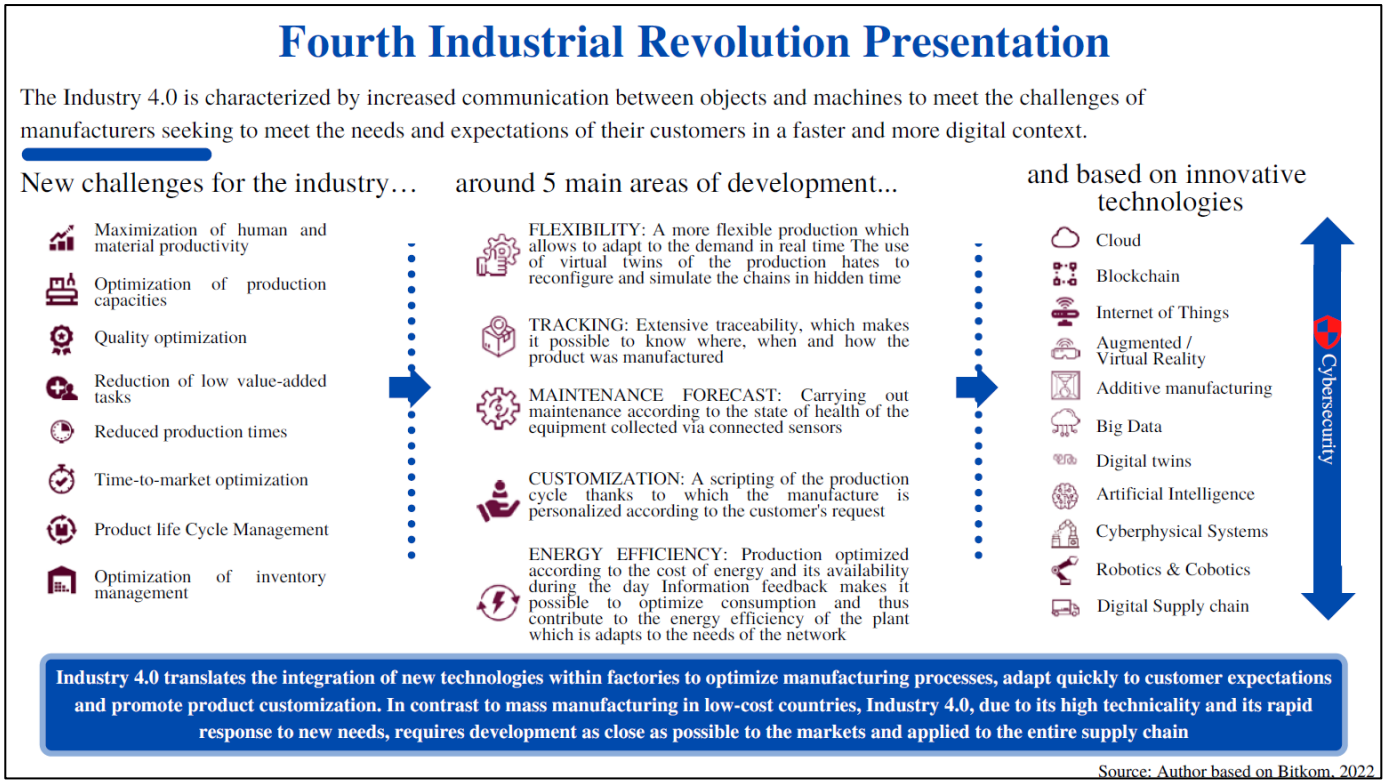
Academics define the digitalization as the social implications of increased computer-assistance, new media and communication platforms for economy, society, and culture. It links all activities in society and affects most of fields from micro to macro level (Schumacher, Sihn, & Erol, 2016). According to academics, COVID-19 has reinforced the shift toward greater digitalization. The use of social media, computing services, and online platforms as way to communicate like Zoom, Skype, DingTalk, Teams and others are increasing. It helps to continue all type of activities in society under the pandemic. Moreover, new technologies such as cryptocurrencies are more and more considered (Panibratov, Rysakova, & Luo, 2021). For instance, Telemedicine is a fast-growing market segment of the Digital Health sector. This industry almost doubled its value in three years: in 2018 it was US$26 bln while in 2021 it was US$41 bln (Panibratov, 2020). ICT companies strengthened their position in their market, shifting to monopoly (Ganicheva & Koshovetsa, 2021). Capitalizing on their know-how, investments flow-

in as they proposed more added-value services. Countries should get involved to some extent in the digitalization of their economy, from the creation of digital infrastructure to the transformation of government systems, healthcare, etc.

Since people spend more time online, businesses adapted their services to internet even more. Businesses connect to their clientele through social media and online communities (Ratten, 2020). In Germany and France, the social distancing and restrictions established by European States to fight against pandemic forced marketplaces to either close or to adapt the consumer experience. Consequently, the online format is introduced is democratised as the customers prefer more to consume online. For instance, delivery service providers & pick-up points were created during the pandemic to support distribution. Moreover, digital services offer added value to the consumers.

Industry 4.0 translates the integration of new technologies within factories to optimize manufacturing processes to adapt quickly to customer expectations and promote product customization (Ghobakhloo, 2019). It is the new source of added value in manufactures, especially in the automotive industry. Due to its high technicality and its rapid response to new needs, Industry 4.0 requires development as close as possible to the markets and applied to the entire supply chain. I gathered essence of Industry 4.0 (Appendix 1 – Industry 4.0) advantages by presenting the challenges, opportunities and associated innovative technologies.

Appendix 1 – Industry 4.0



Source: Author based on Bitkom, 2022

Several studies identified several opportunities linked to Industry 4.0 to adapt to pandemic. Spieske & Birkel, revealed that big data analytics improve the most the supply chain resilience

(Spieske & Birkel, 2021). G. Czifra & Z. Molnár pointed out that introducing such solutions, Industry 4.0 create jobs by transforming the industry, commerce, and logistics (Czifra & Molnár, 2020).

New digitalized business models

Digitalization affects all stages of the production process – from product development to after-sales service (Nevskaya, 2021). Combined with the standardization, it allows to maximize ROI and control over the sales market. The modularity of production equipment should improve the agility and flexibility (Nevskaya, 2021). The alignment of a new strategy offers massive opportunities for higher production efficiency and productivity across the manufacturing supply chains development (Ghobakhloo, 2019).

The concept of digital production in the automotive industry is understood as a set of tools for optimizing the workflow through software and hardware solutions (Osipov, 2021). In facts, digitalization will completely transform the automotive business models with the introduction of industrial software, new services disposal to customers, and hardware infrastructures such as electric chargers. The automotive possibilities to differentiate expand thanks to the digitalization and software services proposal. Automotive manufacturers are more likely to vertically integrate by investing in software projects and start-ups. For instance, since 2011, BMW i Ventures (BiV) has driven the company strategy in terms of factory digitalization and innovations of connected, electric and self-driving cars by collaborating with start-ups (Balzé & Bodner, 2019). The German automaker facilitates the traditional relationship with start-up that is not ready to be a real supplier by purchasing the technology. Then it integrates the innovation in small business units' projects. Such strategy allowed the company to develop electric cars, automobile applications, and mobility services (Balzé & Bodner, 2019).

Nevskaya considers that in the automobile industry, the ultimate strategy to counter COVID-19 risks is to combine local supply sources and industry 4.0 power (Nevskaya, 2021). According to the researcher, Big Data Analytics play a significant role by providing real-time information on various supply chain activities to overcome the challenges posed by COVID-19 (Nevskaya, 2021). But it could be made only with the support of governmental entities and stakeholders cooperation that should focus on the digital technologies development (Belhadi, et al., 2021).

1.7 Dynamic capabilities

The pandemic crisis forced organizations to respond to business environment changes, although they were impacted differently depending on the sector of activity. Historically, a

dynamic capability is the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments (Teece, Pisano, & Shuen, 1997). Panibratov et al. (Panibratov, Rysakova, & Luo, 2021) propose 5 capabilities to help organizations to move from current competitive advantages – elements that provide a company to produce goods or services better than competitors – to dynamic capabilities in order to overcome such crisis:

- **Adaptability**: it translates the capacity to face uncertainty and external pressure. This capacity is essential regarding the incoming changes in the world supply chain and Global Value chain
- **Innovation**: constant improvements of goods and services or processes to stay ahead of the market and uncertainty. Tools of communication such as Zoom, Skype, DingTalk, Teams and others were indispensable during lockdowns
- **Networking capabilities**: it refers to the capacity to call external helps/resources developed externally
- **Absorptive capacity**: it the ability to use the external acquired knowledge inside the company
- **Policy variable**: the political decisions made by States should always be considered due to its direct impacts on firms. For instance, some countries supported the development of enterprises to counteract the pandemic.

These capabilities must benefit the firms resilience that warrantee pliability in uncertainty markets. Companies will have to align new strategies and rethink current business models. Nation-States may play more in supporting investment policies to regionalized markets but also and mainly in framing the business environment (Barbieri, Boffelli, Elia, Fratocchi, & Kalchschmidt, 2021).

1.8 Research gap & propositions

The literature about impacts of COVID-19 is a trendy subject in the academic world, it concerns many fields such as medicine, economy, society, etc. In facts, in international business the pandemic was a catalyser of already existing dynamics of GVC initiated since the US trade war. As such, academics identified worldwide shortage, FDI movements, regionalization, and relocation trends, etc. Germany, France, and Russia have all used the lockdown policy to fight against the pandemic. However, its usage was different in terms of restrictiveness and time period of action. For instance, France knew three consecutive and restrictive lockdowns while it was only one in Russia.

The COVID-19 impacts on the automotive industry helps to build a solid basis for comparison of countries under pandemic. This way, it is easier to grasp the essence of COVID-19 on international business. Previous chapter findings suggests that the impacts on the automotive industry are overall negative in the three countries. The Russian automotive industry is less impacted in terms of supply and demand compared to Germany and France. The industry faces semiconductor shortage that partly explain the negative outcome. Also, tougher sanitary measures have more harmed economic activities in Germany and France compared to Russia. Academics (Barbieri, Boffelli, Elia, Fratocchi, & Kalchschmidt, 2021) recommended the support of States to develop economic activities. Since the beginning of the pandemic, all the States have supported their automotive industry through tax deferred or investments programs – for instance axed on synergies in the EU, as suggested by previous research.

According to previous research (Osipov, 2021; Nevskaya, 2021), digitalization is expected to progress with COVID-19. For the case of the automotive industry, academics argue that the development of the Industry 4.0 is a potential solution to fight against pandemic (Nevskaya, 2021). Digitalization will transform the automotive business models (Osipov, 2021) as it brings more possibilities to differentiate. Evidence of successful Industry 4.0 initiatives (i.e., BMW i Venture previous example) already existed before the crisis. However, since pandemic outbreak, research still lacks an understanding of the dynamics of companies' strategies in the automotive industry, probably because they have not fully reacted yet. Moreover, reshoring activities (Schmitt, 2013) and vertical integration (Osipov, 2021) linked to the chips shortage in the industry are more likely to happen to avoid long-term structural problem in the production of new vehicles. It gives space for investigation in the academical world.

As such, the analysis of the strategy adaptation of MNEs in the automotive industry through 5 dynamic capabilities (Adaptability, Innovation, Networking capabilities, Absorptive capacity, Policy variable) proposed by Panibratov and al. (Panibratov, Rysakova, & Luo, 2021) is relevant. In facts, these 5 dynamic capabilities were identified to benefit the firms resilience in uncertain environment such as pandemic. Also, the research should point out evidence about the ongoing transformation of the current automotive's business models into digital business models, with the introduction of industrial software for instance. In facts, concrete initiatives automotive manufacturers take during pandemic is valuable to investigate for the academical world as it is suspected to describe the GVC movements taking place in the automotive industry. It could also be compared to other industries to generalizable the result.

Thus, the research aims to provide an understanding of strategy adaptation of companies since pandemic within the automotive industry in Germany, France, and Russia. It should highlight

Industry 4.0 development, business models transformation, and some global value chains movements. It should also provide a point comparison between the automotive manufacturers to understand similarities and differences in terms of strategy adaptation inside the European (German, French, and Russian) automotive industry.

On behalf of previous chapter, I establish following propositions:

- **Proposition 1**: Pandemic has supported the digitalization in European automotive manufacturers
- **Proposition 2**: Dynamic capabilities help European automotive manufacturers to overcome pandemic
- **Proposition 3**: European automakers transform their business models faster since pandemic
- **Proposition 4:** Innovation capability is the main capability to develop in the automotive industry
- **Proposition 5**: Partnership strategy allow European automotive industry to acquire new knowledge
- **Proposition 6**: European automotive manufacturers regionalize to growing markets since pandemic
- **Proposition 7**: European automotive manufacturers undertake reshoring activities since pandemic

2. Plan of empirical study

2.1 Methodology

Based on previous chapter and propositions, the research aims to investigate how and what automakers do to adapt their strategies since the context of the pandemic through 5 dynamic capabilities (Adaptability, Innovation, Networking capabilities, Absorptive capacity, Policy variable) proposed by Panibratov et al. (Panibratov, Rysakova, & Luo, 2021). Identification of capabilities should permit to define the most to the least important capability in the European automotive industry. The result should allow to compare the strategies of companies to find similarities and differences among automakers in the industry. Moreover, evidence such as business models transformation, Industry 4.0 development, and global value chains movements should be pointed out as previous research highlighted such potential trends. Hence, the methodology chosen is an explanatory holistic multiple case studies approach based on automakers as a single unit of analysis.

A case study is a study in which one case or a small number of cases are selected (Dul & Hak, 2007) in order to investigate a contemporary phenomenon in depth and within its real-life context (Yin, 1981), especially when the boundaries between phenomenon and context are not clearly evident. Case study takes advantage from the prior development of theoretical frameworks to guide data collection and analysis (Yin, 2009). According to research in international business field, case study methodology is appropriate to test, check, refine and review existing theory (Medda, Toccaceli, Gigantesco, & Angelo Picardi, 2021). In facts, qualitative case study research is in trend in the international business field (Reuber & Fischer, 2022).

As the pandemic context is an ambiguous phenomenon, the choice of case study methodology is relevant. The potential power of case studies to contextualise theory and generate causal explanations allow to question existing theories (Medda, Toccaceli, Gigantesco, & Angelo Picardi, 2021). As such, the study of strategies adaptation of automotive manufacturers since COVID-19 in the contextualisation of the theory of 5 dynamic capabilities proposed by Panibratov et al. (Panibratov, Rysakova, & Luo, 2021) can help to extend the current academic knowledge in the international business field. According to research, the interpretive approach of case studies would promote the advantages to identify relevant content that allow to contribute to the academic knowledge (Medda, Toccaceli, Gigantesco, & Angelo Picardi, 2021; Yin 2009).

Multiple-case designs offer more advantages compared to single-case designs. their findings are often appreciated because the result is considered as being more solid (Herriott & Firestone, 1983). It furnishes more compelling support towards propositions validation or exclusion. They follow a replication logic that permit to conclude similar and contrasting results (Yin, 2009), which is also one of the aims of the research. The use of the pattern-matching technique (Trochim, 1989) among the cases studies allows to establish predicted pattern(s) based on repeated empirical evidence. If the patterns coincide, the results can help a case study to strengthen its internal validity (Yin, 2009). Subsequently, the study establishes patterns on behalf of the number and the nature of each capability found across the case studies. It allows to internally validate the findings of the research.

The study relies on multiple sources of evidence, with data converging in a triangulation to provide relevant result (Yin, 2009). The opportunity to use different sources of evidence assures lines of inquiry and aims to corroborate the evidence linked to a phenomenon (Yin, 2009). Therefore, data triangulation method also favourites result validity. Triangulation has been made

on the basis of companies reports and press announcements (1), specialized journals in automotive and technology (2), and economical and non-economical newspapers (3).

Case selection

Adequate sampling of cases of automaker improves relevance and better validates result for the understanding of behaviours of MNEs (Eisenhardt, 2021). The single unit of analysis is represented by an automotive manufacturer. The sampling of three cases study allows the research to address stated propositions in a limited comparison of cases studies.

First, I made a list of available automotive companies worldwide. Second, each of the manufacturer was involved on a global scale in order to fit the global value chains requirements. Thirdly, I sorted out automakers which still operate in their country of origin focusing on Germany, France, and Russia. Finally, I picked up automotive manufacturers that are recognized as leaders in their country of origin. As such, three companies have been selected that represents automotive leaders based on their country of origin**: Volkswagen (Germany), Renault (France), and Avtovaz (Russia).**

To ensure contextualisation and causal explanations (Medda, Toccaceli, Gigantesco, & Angelo Picardi, 2021; Yin 2009), each case study starts by a small presentation of the company, the context of the pandemic impacts on the company and then deepens the analysis of strategy adaptations axed on the 5 dynamic capabilities (Adaptability, Innovation, Networking capabilities, Absorptive capacity, Policy variable) proposed by Panibratov et al. (Panibratov, Rysakova, & Luo, 2021). The dynamic capabilities assessment of the companies decisions across the case studies is made on the basis of the definitions given by Panibratov et al. of the 5 proposed capabilities. As such, it is not impossible that several capabilities can emanate from a single decision made by the automotive manufacturer studied. In each case study, evidence of such capabilities is every time highlighted in brackets in order to facilitate the interpretation of the results further on. Also, findings should provide space for comparison with current research on digitalized business models of automotive manufacturers (Osipov, 2021; Nevskaya, 2021) and GVC movements (Schmitt, 2013).

Also, an interview was run with a direct actor responsible of the digitalization transition of firms. Result was not interpreted in the research as it did not meet the principal aim of the study. However, it is still available in Appendix part (Appendix 3 – Interview) and could be useful for future research.

2.2 Data collection

The case studies only rely on secondary data. Secondary data was considered sufficient to run the study as information is already largely available. First, we go through and analyse reports and press announcements of studied automotive manufacturers: Volkswagen Group, Renault Group and Avtovaz issued after pandemic. It allows to grab a first understanding of their adaptations post pandemic. Then, the triangulation of data helps to refine the results. As such, specialized journals in automotive and technology such as the Automotive World, Automotive Logistics, Automotive Manufacturing Solutions, L'argus Pro and The Verge help to strengthen the analysis. These are useful sources of information as for they provide strategy analysis based on evidence. For instance, one article delivers a valuable in-depth face-to-face interview with Herbert Dies, the CEO of Volkswagen, upon the strategy of the company. Finally, economical journals such as the Financial Times, The Economic Times, Challenges combined with standard newspaper articles issued from Reuters, The Guardian, Le Figaro, and La Tribune French newspapers, and TACC Russian newspaper complete the analysis. Consequently, it assures and smooth lines of inquiry thanks to triangulation (Yin, 2009).

CHAPTER II: CASES STUDIES OF VOLKSWAGEN, RENAULT, AND AVTOVAZ SINCE PANDEMIC

1. Volkswagen

a) Company presentation

Volkswagen was created in 1937. It is the biggest car maker in terms of sales worldwide originated from Germany. The Volkswagen Group holds 120 production locations worldwide, whose 37 Volkswagen factories in Europe. The headquarters of the Group are located in Wolfsburg, Germany. It has two divisions: automotive and financial services division. The automotive division includes Passenger Cars, Commercial Vehicles and Power Engineering operations. It holds ten car brands such as Volkswagen, Volkswagen Commercial Vehicles, ŠKODA, SEAT, CUPRA, Audi, Lamborghini, Bentley, Porsche, and Ducati. The group produced more than 8 million vehicles in 2021 and reach €250 billion in terms of sales revenue (Volkswagen, 2022). China is now the biggest market for the company as it represents 40% of the company's sales (Volkswagen, 2021). Volkswagen has developed and maintained its competitive advantage by investing on Research & Development technologies introducing digitalization and Industry 4.0 breakthroughs to its core business activity and by enlarging its product portfolios (Volkswagen, 2022).

Focusing on its strategy to reach neutral carbon emission worldwide by 2050, the Group is now focusing on electric vehicles with the launch of Volkswagen's ID: ID.3 and ID.4 production started in Zwickau, Germany. Two factories in China have also started the production of the ID.4 model, while it will start in 2022 in the US (Volkswagen, 2021). In facts, this targeting works as the Volkswagen ID.3 model was the most successful electric car in 2020 despite pandemic with 56,000 units sold.

The Global logistics of Volkswagen is sustained by more than thousands of suppliers acting to transform raw materials into the integration to the Volkswagen vehicle. The raw materials are processed into 15,000 stations from production to installation on a vehicle (Volskwagen, 2022). The just-in-time management characterizes the production processes. Thus, any type of shortage would severely affect the production of Volkswagen vehicles. Since years, Volkswagen has developed a modular structure that allow the organisation to reach flexibility with the possibility to split and reunite the business structure depending on the encounter of opportunities and threats of the market. The company strategy also consists of the cut of labour force in the process of production. Suppliers are in charge of components production and of deliveries to Volkswagen factory that in fine assembles the automotive components to the final vehicle.

Volkswagen has invested a lot in the implementation of digitalization instruments in its core business activities. R&D is one of the key resources shaping the competitive advantage the company has developed since years. In 2016, the group already announced its will to provide to the market 30 fully electric new vehicles, inhouse self-driving technology and set electric battery technology as core competencies of the Group (Capistrano Volkswagen, 2016). In the supply chain, the objectives of IT are to lower the costs and to innovate in order to stay competitive in the market. On this behalf, a central group IT division was created before way before pandemic, hiring more than 2,000 IT employees three after its launch in 2016 (Automotive Manufacturing Solutions, 2019). For instance, it implemented ERP system to improve communication in the production process.

In 2019, the group created a partnership with Minespider to reach its sustainability and environmental goals by eradicating mistakes in the supply process. Minespider is a blockchain technology provider that allow to track back raw materials with digital certificates associated with origin points. Thus, it optimizes the supply chains and assures transparency of the (sub-)suppliers in the value creation process as Marco Philippi, the Head of the Strategy Group Procurement declared: "Digitalization provides important technological instruments that enable us to track the path of minerals and raw materials in cross-border supply chains in ever greater detail" (Volkswagen, 2019). Such evidence highlights the transformation of the automotive industry with more digitalized processes.

In facts, Volkswagen will to develop fully autonomous robots in the production process. By 2035, the Wolfsburg plant, no more production lines should exist. Instead, more than 10,000 3D high-speed printers, 100 design offices, 500 marketing companies and 300 assembly and test centres will take care of the production (Eckl-Dorna, 2013). However, traditional processes of production are more cost effective than high technologies-based processes of production that require higher investments.

b) Pandemic impacts context

According to the company report in 2020, sales revenue decreased by almost 12% to €223 billion essentially due to volume effects with -20% sales on average in European and American continents. The augmentation of vehicles sales in the Asia-Pacific region represented by China, where the group has joint venture, allowed the company to attenuate its loss. As China was the first to be affected by the pandemic, it has also recovered faster, and demand rose for the rest of the year, which led to positive result in the region (Volkswagen, 2021). In 2021, the chips shortages hit the group, the vehicles sales dropped by 6.3% again (Volkswagen, 2022).

Volkswagen had to shut down several plants in Europe for one month and a half, and in Mexico for almost three months (Reuters, 2020). Then, plants reopened and restarted to produce vehicle with limited capacity – from 60 to 70% of pre-pandemic production dealing with restrictive sanitary measures.

The pandemic has negative impacts on the company, it must be acknowledged that COVID-19 damages have been considerable in Volkswagen. In facts many suppliers were forced to shut down production, some of them even bankrupted. It led to severe delays and bottlenecks. The strongest shortage worldwide that affected the company was the semiconductor (Volkswagen, 2022). Thus, intermediate components necessary for further stages of production could not be delivered.

This disruption also led to uncertainty to forecast future performance based on previous results (Reuters, 2020). Algorithms are no longer sufficient to forecast the demand without human judgement. It could mean that common sense of teams in collaboration with suppliers will take more importance.

c) Strategy adaptations

Supply chain management

The Volkswagen Group Logistics is in charge of the upstream supply chain management. Every day, it manages a network of 250,000 containers of materials from 8,500 different suppliers to 69 car assembly plants worldwide (Automotive LOGISTICS, 2020). Volkswagen purchases more than one hundred thousand different components to build its vehicles by using 'global sourcing'. It concerns thousands of suppliers that go through more and more strict rules for collaboration such as principle of resource cycle management (Volskwagen, 2022). For instance, it should not exceed a certain amount of CO2 emission or provide renewable raw materials. The company assures cost-effectiveness by preferring relatively close suppliers to production plants to reduce shipping costs.

At the beginning of the pandemic, the division identified where to store inventory to avoid incoming disruptions with lockdowns risks in several countries, especially in Italy from which 18,000 parts exit the country every day (Automotive LOGISTICS, 2020). To do so, the Group created a platform for its partners to connect directly to the factories (Volkswagen, 2020). The platform was matured by Amazon Web Services and Siemens, to accelerate and facilitate the creation of the interface (Volkswagen, 2020). The industrial cloud allowed various Volkswagen plants and their respective partners to synchronize in a more effective way actual business needs

and to be immediately aware of ongoing events affecting the operations **[Networking & Innovation capabilities]**.

Group's consolidation centre (KCC) was a key instrument to fulfil containers within the available disposal centres regulating trans-shipment points. Thanks to this strategy, the consolidation of components had facilitated the transfer between suppliers and Volkswagen plants located worldwide. Also, the full truck load allowed to have remained cost-efficient way implemented in the good practice. Matthias Braun, head of digitalisation and concept development, Volkswagen Group Logistics declared that "Bundling volumes from regions and areas where we don't have full trucks for each and every plant from different suppliers will always be efficient but it is a matter of distance, volumes and frequency; it is always a decision we take depending on the numbers and the business case" (Automotive LOGISTICS, 2020) **[Adaptability capability]**.

Now, the will of the Group is to implement a full digitalized supply chain in order to standardize transactions with suppliers and automate when it is possible. Thus, it will increase the organization effectiveness and efficiency by allowing synergies leverage associated with the creation of a shared database and the use of innovative technologies such as the AI and machine learning (Volkswagen, 2021). In growth markets such as China, the Group aims to train local suppliers to generate cost advantages **[Networking capability]**. Hence, it fosters start-ups and software suppliers. As such in 2020 despite the crisis, the Group carried out 31 starts-up for new products and 48 for product upgrades (Volkswagen, 2021). For instance, one of them based in the IT labs in Munich is working on the potential of quantum computers for commercial application areas. The focus is on the optimization of traffic flows, and materials and alloys simulation **[Innovation capability]**.

Another adaptation the manufacturer took within the COVID-19 context was to use its own charter ships. For example, the Volkswagen Wolfsburg plant in Germany is one of the largest automobile plants worldwide. The export deliveries of new Volkswagen vehicles produced in Wolfsburg's are shipped to the Emden plant that has a direct access to the sea. The Emden harbour ships goods destinated to North America, starting by the US and then to Mexico (Volkswagen, 2021). In facts, many delays were announced from ocean forwarders due to COVID-19 implications, which extended most of companies' lead-time worldwide. So, the company dispatches at least 4 ships a month to America. Thanks to it, the company was able to meet its deliveries schedule by gaining higher control on its distribution channel **[Adaptability & Absorptive capabilities]**. Moreover, Volkswagen ships back some automotive components to its manufacture in Germany. The whole trip lasts up to 50 days. Since Volkswagen has its own fleet,

it can fulfil its vessels with 'Full Container Load' of 20ft or 40ft containers. It maximizes the space used and thus reduces cost.

The company accounts its fleet and containers as inventory. They are considered as work-in-process inventory (WIP), materials in the process of production. So, the sea way delays associated to pandemic rise costs. Harbours remain considerable bottlenecks. Volkswagen was flexible in the redirection of its ships when it was possible. For instance, it dispatched its vessels through diverse ports in North America to meet delivery's schedules. When one shipment is held up, another could navigate faster to another port. The strategy adaptation of Volkswagen shows great resilience in regarding its downstream supply chain. However, just like any automotive manufacturer, Volkswagen still faces microchips shortage, even with its own fleet because It has few leverage on such suppliers.

Digitalized processes

The pandemic did not change the vision of the company regarding its strategy strongly linked to IT high value potential. However, it accelerated the planned IT projects – it correlates with previous findings that suggests COVID-19 acts as an accelerator of the processes of Global value chains movements worldwide from first chapter. For instance, just like any company, Volkswagen implemented online meetings and remote working as way to protect its employees from the pandemic when it was possible **[Innovation capability]**. Moreover, these new working conditions are more likely to remain after the crisis. Also, a rose in the usage of VPN was used to safeguard the IT infrastructure (Volkswagen, 2021). Volkswagen has continued to use the industrial cloud it has implemented in order to coordinate its plants worldwide. Industrial cloud also allows the company to easily coordinate with its external suppliers **[Absorptive capability]**. Hence, the production of vehicle operations was quick to restart (Reuters, 2020; Automotive LOGISTICS, 2020).

During the crisis, Volkswagen has connected and provided essential information to its supplier through Excel format and Skype calls at first steps. According to Matthias Braun, the head of digitalisation and concept development at Volkswagen Group Logistics, "You [should] look for something you are used to and Excel was that […] We have worked with it for 25 years" (Automotive LOGISTICS, 2020). Then, to reach cost-effectiveness, the company has since developed new IT systems that aim to provide higher confidence and transparency with its suppliers **[Innovation capability]**.

In January 2021, the board management of the Group decided to create two new board positions: Purchasing and Technology that will be responsible for the components worldwide, the

marketing of the new Volkswagen platforms to third parties, the development of battery cells manufacturing and its associated charging systems (Volkswagen, 2021). According to the board, such decision was made on the basis of reallocating existing expertise to form economies of scale, boost synergies and accelerate decision making **[Adaptability capability]**. It also facilitates the management structure in a leaner and more effective way thanks to more autonomy given. It aims to provide higher decisions powers to business operation on a lower competent level.

In that sense, Volkswagen has developed a strong and effective IT governance strategy that is closely related to IT monarchy combined with the ease of using known tools in uncertainty position. In facts, Information and Communication Technologies allows to build transparency and trust with suppliers (Automotive LOGISTICS, 2020).

Regionalization

Main investments made by the Group directly follow its growth market development, especially in the Chinese market that increases a lot even under pandemic. As such, the company increased its stake in the Volkswagen (Anhui) joint venture to 75% in order to ease the electrification in its largest market. The Group also announced its intention to acquire 26% of the Chinese battery maker Gotion to develop its long-term presence in the local market. It also allows to strengthen its battery expertise worldwide. Also, Sinotruck, the largest truck manufacturer in China made an agreement with the Group in 2020 (Volkswagen, 2021) in a long-term partnership involving the Group in the local market **[Absorptive capability]**.

In 2021, the US Navistar manufacturer of vehicles becomes a member of the Group as it now holds all Navistar common shares. The purchase price was close to $3.7 billon (Navistar, 2021). The purpose was to reach strategic technology and supply cooperation and create a procurement joint venture in the US **[Absorptive capability]**.

To address chips shortage issue, the CEO of the company Herbert Diess announced in an interview on 18th January 2022 that “a task force [is] running to help, to improve, to get higher margins for the chip industry, because [in] a car, it gets a much higher contribution, so we’re trying to really push and squeeze.” (The Verge, 2022). Volkswagen is currently too dependent on second and third tier suppliers in terms of chips, to resolve this structural problem the CEO announced an investment plan oriented to chip design and supply in direct sourcing. Also, the new business model based on electric cars require sufficient infrastructures to support the charging of all vehicles. As such, in Europe, the company will need six massive factories to reach its 2030 goal in terms of sales of Electric vehicles (The Verge, 2022).

Digitalized business model

According to Herbert Diess CEO of Volkswagen, the automotive industry is changing: "it is transforming into an electric automotive world where you will have less differentiation when it comes to engines." (The Verge, 2022). Instead, the differentiation will come in terms of digital services coming from software directed to the consumers. According to him 90% of the competitiveness and customer experience will be driven by software. As such, Volkswagen created CARIAD that will develop software internally in the automaker company. It provides the brand the capacity to differentiate by the creation of its own digitalized tools **[Innovation capability]**.

In the opinion of the businessman, a new and profitable source of revenue in the next 10 years will come from the sharing mobility services: "we think this business model of sharing usage will increase fast" (The Verge, 2022). It explains why the Group bought Europcar (Reuters, 2021) to develop such services **[Networking capability]**.

Volkswagen is becoming a combination of a car manufacturer, a software company and services company. In facts, it remains an excellent car manufacturer, and now it ambitions to turn into a software company to develop its differentiation and to build economies of scale (The Verge, 2022). It also develops mobility services to adapt to consumer behaviors changes by implementing Pay-by-use sharing fleets and autonomous cars **[Innovation capability]**.

2. Renault

a) Company presentation

Renault is a French car manufacturer officially founded in 1899. It became a Group through its triple alliance with two Japanese car manufacturers Nissan in 1999 and Mitsubishi in 2017. The Renault-Nissan-Mitsubishi became the worldwide leader in 2017 (Le Figaro, 2017). Renault operates in 134 countries with 38 plants worldwide (Renault, 2022). The headquarters are located in Boulogne-Billancourt, France. Align with Nissan and Mitsubishi, the French automaker counts 5 brands: Renault, Dacia, LADA, Alpine and Mobilize (Renault, 2022).

In 2019, Carlos Ghosn, then CEO of Renault, Nissan and the Renault-Nissan-Mitsubishi alliance was involved in a financial affair case regarding suspicions of financial malfeasance (Le Monde, 2019). The CEO is the subject of four indictments in Japan: two for deferred income not declared to the stock market authorities by Nissan and two others for aggravated breach of trust. On April 3, 2019, Renault indicated that Mr. Ghosn was leaving its board of directors (Le Figaro,

2019). He was replaced by Luca de Meo in 2020. In part due to the event, Renault ended the fiscal year with a €55.54 billion, -3.3% compared to previous year (L'argus Pro, 2020).

The strategy of Renault is characterized by its internationalization the Renault company has undertaken since the 2000s. It is characterized by the establishment of the brand in new markets, but also by a large relocation of the means of production. Between 2005 and 2010, production in France fell by more than half. Following the development of its international sales and production facilities, in 2010 the share of passenger cars manufactured by Renault in France was less than 20% (La Tribune, 2011). During that time, the French maker developed its strategy that is axed on volume effects. It allows to produce massively and to rely on economies of scale to compete (L'argus Pro, 2021).

On February 14, 2021, the Renault Group's new strategic plan called "Renaulution" was officially unveiled137. It plans to:

- Produce less in volume and reduce costs to restore margins
- Modernize the offer with a "new wave" of 24 new models in 5 years
- Transit to new range of products with electric models such as the electric Renault Mégane, new generation Renault 5, Dacia Spring, Mobilize EZ1, etc
- The creation of a new brand: Mobilize, to promote new forms of mobility merger of Dacia and Lada 138 and expansion of ranges with new SUVs: Dacia Bigster and a new generation of the legendary Lada Niva.

b) Pandemic impacts context

First of all, just like any other company, Renault has been badly impacted by the worldwide shortage of chips enhanced with pandemic. In 2021 Renault calculated the semiconductor shortage reduced its production by 100,000 units (Reuters, 2021), while in its first quarter of 2022 forecast another 300,000 vehicles drop for the coming year (Renault, 2022).

According to the CEO of the Group, Renault “markets cars in 130 countries but it is Europe that concentrates three quarters of profits […] only five European countries that alone generate half of our profits. Our geographic expansion into 100 new countries only brought us 25% more margins.” (Renault, 2021). During the first year of the pandemic, several lockdowns happened in France, Italy, Germany. Therefore, the car manufacturer had to cut 15,000 – almost 5,000 in France – to save €2 billion according to its restructuring program (The Guardian, 2020).

It also curtails its capacity production by 20% to by 2024 (Financial Times, 2020). In 2021, Groupe Renault managed to deliver almost 2,700,000 vehicles worldwide (Renault, 2022). This is 4.5% less than in 2020, when, in the context of an emerging pandemic, 2,949,849 vehicles were sold. This score already marked a drop of 21.3% compared to 2019 (Challenges, 2022).

The only positive result lies in the market development of hybrid and electric vehicles in Europe. In 2020, the French automaker doubled its electric vehicles sales on the European market with 115,888 vehicles sold. The Renault ZOE city car was still the best-selling electric car in Europe, with growth of 114% (Challenges, 2022). In 2021, hybrid and electric vehicles represented 30% of its sales in 2021 (Renault, 2022).

In China, Dongfeng-Renault joint-venture plant – opened in 2013 (South China Morning Post, 2013), was located nearby Wuhan. Hence, the plant had to stop, and its French representatives returned home. Similar cases happened with its alliance partners who faced temporary closures in India for instance due to uprising diseases cases (The Economic Times, 2021).

c) Strategy adaptations

Luca de Meo, the group's CEO, presented on January 14, 2021, the strategy called Renaulution. The watchword: put an end to the race for volume, reduce costs, rationalize, and lay new foundations to gain profitability. "to reorient the Renault group's strategy from the race for volume to the creation of value" focused on cost reduction and rationalization (Renault Group, 2021). From 6 to 3 platforms and from 8 to 4 powertrains should allow the new models to be launched on the market within 3 years at maximum **[Adaptability capability]**. By using such standardization strategy, the automaker aims for cost-effectiveness. Resizing of industrial capacity from 4 to 3.1 million units by 2025. Also, the activities should be concentrated on profitable markets such as Russian, Brazilian, Indian, and South Korean markets.

The first called "Resurrection" aims, over the next two years, to bring back the company's competitiveness by reducing its costs (Renault Group, 2021). The occupancy rate of the facilities will be increased, time cars' development reduced, and the group's purchasing policy optimized through digitalization (Renault Group, 2021).

The Renovation phase lasts until 2025 to renew and enrich the ranges, contributing to the profitability. The idea is to "regain ground in the C and D segments with a total of 11 new electric or hybrid models while to maintain its control in the A and B segments by offering 5 new electric or hybrid models over the next 5 years (Renault Group, 2021).

The Revolution phase, which will start in 2025, will shift the group's economic model to technology, energy, and mobility, making Renault a forerunner in the new value chain au automotive manufacturers. The objective here is to develop the group's economic model "towards technology, energy and mobility" to make Renault a "precursor in the value chain of new mobility" (Renault Group, 2021). Concretely, activities “outside automobile production” will be launched or amplified in car-sharing, taxi/VTC services or even last-mile logistics (Renault Group, 2021). The sale of data and energy are also part of this diversification program **[Innovation capability]**. For Luca de Meo, Renault will go “from an automotive company using technology to a technology company using cars” (Renault Group, 2021).

Digitalized services

These new activities should represent 20% of the income of the Group in 10 years (Renault, 2021). As such the Group created a new business unit: Mobilize. It aims to develop data, mobility, and energy-related services, highly valuable for customers. Car sharing, second-life batteries, energy services and partnership ecosystems are essential elements of the new business unit (Renault, 2021). For instance, Mobilize Share offers self-rental service of 15,000 cars in Europe, whose 4,000 are electric **[Innovation capability]**.

Also, The Renault Group plans to encourage remote work conditions in the future (Reuters, 2021) as it made an agreement with different trade unions **[Policy variable capability]**. Since the COVID-19 such habits are more likely to happen as academics identified, Renault case is another evidence for such habit.

Regionalization to China

In August 2020, to cut their losses, Renault decided to give up its production of combustion engine cars in China (Financial Times, 2020). The French manufacturer transfer its stake of the Dongfeng joint venture to its partner. According to Bill Russo, CEO of the Shanghai-based Automobility Ltd, a specialized consultancy of the Chinese vehicle market, Renault “reassessed their investment plans” because the French automaker “have not been historically a very strong performer in the market” (RFI, 2020).

The specificity of the Chinese market forces foreign manufacturers to create a partnership with local companies that will own at least 51% of stakes of the new entity. Also, the latest technology should be implemented during investments and the Chinese counterpart could have several foreign partners at the same time. The Chinese Dongfeng counterpart of Renault had two more joint ventures with competitors such as Peugeot/Citroën and Honda. Renault decided to leave Dongfeng

to rearrange its investments in China by focusing more on electric cars with two others of its joint ventures based in China **[Adaptability & Absorptive capabilities]**: the eGT New Energy Automotive Co, Ltd (eGT) and the Jiangxi Jiangling Group Electric Vehicle Co. Ltd (JMEV) (RFI, 2020). At the same time, it made sense for the automaker to leave Dongfeng joint venture as in 2019 it reported an operating loss of $212 million (Reuters, 2020).

Knowledge acquisition

In summer 2020, a new partnership with Google Cloud was launched to ease the digitalization and foster Industry 4.0 **[Networking capability]**. It aims at optimizing the data management platform with the help of Google expertise (Renault Group, 2020). Google experience in machine learning, artificial intelligence, smart analytics, etc. will upgrade the supply chain and manufacturing processes of the Group by creating new industrial solutions. It takes the form of a vertical solution inside the automotive industry. Also, the employee training will be considered as crucial in the projects development. Working together, the two giants will train the employees to reach new skills in processes such as engineering, manufacturing, and IT through workshops through coworking and trainings sessions (Renault Group, 2020).

In the context of its Mobilize new business unit, Renault business launched a project called "Smart Island Project" on the Île d'Yeu island in the Atlantic coast of France, with Enedis and Qovoltis companies along with the support of local authorities (Mobilize, 2021). The aim is to enhance adaptation toward electric vehicles with mobility service, new charging equipment and solar energy usages **[Innovation capability]**.

Another partnership with a German startup called 'betteries AMPS GmbH' ambition to develop a mobile and interchangeable energy storage device made with old electric batteries (Mobilize, 2021). The technology should be transportable, quiet, and meets neutral carbon emission and it could be used in many ways: from construction fields to electric motors engines **[Networking capability]**. As such, Renault ambitions to meets its ESG objectives and develop its expertise in electric batteries.

Eventually, to boost its new car sharing activities, Renault unveiled the Mobilité360 project involving strong player of the transportation market in France and Europe such as BlaBlaCar, the RATP Group (French State-owned public transport) and Uber (Mobilize, 2021). The ambition is to foster knowledge exchange and to develop know-how to provide ergonomic usage and reduce environmental impact through sustainable shared mobility solutions in towns **[Networking capability]**.

3. Avtovaz

a) Company presentation

Avtovaz car maker was founded in 1966 in the Soviet Union, currently Russia. It has acquired high reputation as its Lada vehicles still represent first sales in Russia with cars such as Lada Granta, Vesta, Largus, & Lada4*4 models (Объединение Автопроизводителей России, 2022). Many subsidiaries produce vehicles in Russia, but the biggest Avtovaz plant is located in Togliatti with capacity of almost 1 million cars a year with three assembly lines (Renault Group, 2019). In 2008 the Renault-Nissan group purchased few stakes in the company. Since then, the collaboration had continued and nowadays Avtovaz is owned by the French Group Renault that controls 67% of the stake. In facts, it allowed the Russian car maker to settle high-quality technological equipment, improve production processes, and develop new technological projects to reach higher car quality. For instance, Avtovaz developed the new Lada XRAY model in 2012 that was the 1st compact city crossover in the history of the company.

In 2017, Lada brand was incorporated as the 5th brand of the brands' Renault Group. In 2018, Renault and Rostec formed a joint venture, the Alliance Rostec Auto BV (ARA BV) to enhance the future international development of Avtovaz in Asia. According to Carlos Ghosn, CEO at that time, it was done "to enable our faster growth in Russia and will help the competitiveness of AVTOVAZ, the Russian automotive industry leader." (Rostech, 2018). Thanks to such strategy, more than 350,000 LADA cars were produced and sold in Russia each year. It represents an income increase of 2% compared to 2020. According to the company's report, the Lada brand retained its strong leadership in the Russian market thanks to a 21% market share (Renault Group, 2019).

Following the Renaulution strategy plan of the Renault Group announced on the 14th of January 2021, Avtovaz will stimulate its chance to compete on the international automotive market. As such, Lada will maintain its 20% market share on the Russian market, provide 4 new NIVA car models by 2025, and form a new business unit "Dacia & Lada" to support industrial synergies (Lada, 2021).

b) Pandemic Impacts context

Early February 2020, Avtovaz has been informed by its Chinese suppliers about potential interruptions of car components deliveries due to the pandemic (Авто Mail, 2020). Fortunately, the Russian automaker had the necessary stock of concerned components. According to TASS, a conference of employees of Avtovaz was held in order to create a special working group at

Avtovaz to minimize the consequences of the crisis with Chinese supplies to the Togliatti plant (TACC, 2020).

In March, company employees were prohibited from business trips abroad. It slightly undermined company strategy with European partners. Also, all employees returning from a business trip of high-risk countries or personal trips were required to undergo quarantine for 14 days (Лада, 2021). Few days after, Avtovaz began to experience problems with the supply of components from China. The Russian automaker had to stopped assembling Lada X-ray Cross due to a lack of components. Similarly, shortage of parts, notably the semiconductors was emerging for Renault Sandero and Renault Logan production (Лада, 2021).

Also, the President Vladimir Putin introduced a decree of non-working days from March 30th to April 03rd 2020 in the country to limit the spread of the virus in Russia. AVTOVAZ, within the framework of the decree, had to suspend the assembly of cars during a week (риа новости, 2020).

On September 12th, 2020, Avtovaz calculated an approximate amount of 14 billion of rubbles (~€160 mln) of losses directly attributable to sanitary measures such as the one-week shutdown of the plant, disinfection, antiseptics, and masks (Лада, 2021). It would have been enough to pay 10 months salaries of its employees.

The worldwide shortage of semiconductors during the second part of 2021 affected Avtovaz in terms of production. The emergence of bottlenecks delayed the deliveries to the dealer network (Automotive World, 2022). Only by the end of the year, the supply of chips improved. Still in February 2022, the average number of unemployed at AVTOVAZ due to illness ranges from 20 to 40 percent. This personnel shortage adjusts the car production plan.

c) Strategy adaptations

Despite the pandemic outbreak in 2020, Avtovaz has continued to develop its line-ups with facilities modernization to deal with the crisis **[Innovation capability]**. It released the Niva SUV Avtovaz and did all the needed sanitary measures announced by Rospotrebnadzor (Russian Federal Service for Surveillance on Consumer Rights Protection and Human Wellbeing) such as plant's shutdown and protective equipments (disinfection, antiseptics, and masks) to fight against the COVID-19 and its spread (Group Renault, 2020). The plant located in the Samara region was able to quickly reopen with the close support of local authorities **[Policy variable capability]**. Also, to celebrate the 50 years of the VAZ-2101 vehicle, the Russian President Vladimir Putin came to felicitate Avtovaz workers (Group Renault, 2020).

During the first year of the pandemic, since Renault European plants stopped because of lockdowns, the Group redistributed many engine components to Avtovaz to carry on the production of H4m/HR16 engines which are installed on Lada Vesta and Lada XRAY (Лада, 2021). The strategy allowed to follow the annual production plan **[Adaptability capability]**.

Early 2021, the vaccination of Avtovaz workers began. It allowed the company to promptly resume the production and to contribute to tremendous result as during the year 350,000 Lada vehicles were sold in Russia **[Adaptability capability]**. This is already 2.1% more than previous year although it did reach pre-pandemic level of 2019. Lada positions itself as a true leader on its local market with 21% of market share with models such as Vesta and Granta on 1st and 2nd positions in terms of sales rating in the Russian automotive market (Automotive World, 2022).

One of the main corporate events was the spring conference of the company`s employees, following which it was decided to continue the most important social project - the program to improve working conditions. Measures related to the deep repair and modernization of social infrastructure facilities were developed and structured due to the high activity of factory workers. The "Program for improving working conditions 2021-2024" is divided into 10 main areas, which are implemented based on the total amount of funding, it amounts to 4 billion 700 million rubles. This is 50% more than was provided for the first 3-year program in 2018-2020.

New business unit

Following the Renaulution strategy of the Renault Group, the Lada and Dacia brands forms united a single business unit. The Group ambitions to create synergies to snowball on Lada's brand potential internationally. The strategy is based on cost-competitiveness through limited flexible car platforms and new Niva generation models release in 3 years' time.

For instance, Lada Niva Travel model was released early 2021. The model received a new exterior design, including new brighter headlights and LED lights, while maintaining its uncompromising cross-country ability.

Figure 2.1: Lada Niva Travel

Source: Lada, 2022

The union of Lada and Dacia helps to build synergies as the range of products will become highly competitive in terms of cost as the current number of platforms will be reduced from 4 to 1 and the body types from 18 to 11 (Lada, 2021). The new entity is made to improve cost

competitiveness and ergonomic facilities to platform integration as the two companies historically ambition to deliver the best possible car with a low price **[Adaptability & Absorptive capabilities]**.

Digitalized services

Avtovaz created a new Lada EnjoY Pro multimedia system, developed based on client's needs. It offers full panel a car features linked to a smartphone. It integrates full services of Yandex as it is the main internet services provider in Russia (Automotive World, 2022). Also, the Lada Granta got introduced with high-tech service such as the LADA Connect tool. It should be expanded to other Lada models (Lada, 2021). It allows to remotely control the vehicle and its system with a smartphone **[Innovative capability]**.

The Brand started to equip the cars with the new high-class and user-friendly EnjoY and EnjoY Pro multimedia systems with embedded Yandex services, already chosen by more than 32,000 LADA customers. The brand-new LADA Connect system offering a wide range of extra benefits to Granta drivers was growing in demand, too (Automotive World, 2022).

Thanks to its renovated assembly lines combined with high-tech, the company will facilitate the hiring process of young talents in order to develop necessary innovative technologies (Brics magazine, 2022). The company is actively working on common projects with international partners within the Renault Group.

Regionalization in Asia

In the second quarter of 2021, Avtovaz and Allur Group of Companies from Kazakhstan contracted a cooperation agreement. The new Kazakh ally is making a broad range of Lada cars in Kostanay (Lada, 2021). In the same quarter, Avtovaz contracted a distribution agreement with ORION Distribution (Lada, 2021) to develop the dealer network services in Kazakhstan, which remains its first export market **[Networking capability]**.

Another Avtovaz new production location nearby its home country is located in Uzbekistan. In the second part of 2021, the Russian automaker officially declared the launch of the serial assembly of cars in partnership with Roodell (Lada, 2021), which settle the production of Lada vehicles at the new ADM-Jizzakh plant **[Networking capability]**. Uzbekistan is another key export markets for Lada cars, that are well-known in the country.

4. Discussion of the findings

a) Result

The analysis of the different strategies followed by Volkswagen, Renault, and Avtovaz since pandemic was made on the basis of the five capabilities identified by Panibratov et al. (Panibratov, Rysakova, & Luo, 2021). They characterise the (1) Adaptability, the capacity to face uncertainty and external pressure; (2) Innovation, the constant improvements of goods and services or processes; (3) Networking capabilities, the capacity to call external helps/resources developed externally; (4) Absorptive capacity, or the ability to use the external acquired knowledge inside the company and; (5) the Policy variable, the variable of political decisions made by States that influence the development of enterprises.

These capabilities help organizations to move from current competitive advantages to dynamic capabilities (Panibratov, Rysakova, & Luo, 2021). They represent the firm's ability to integrate, build, and reconfigure internal and external competences. They can benefit company to overcome a crisis such as the pandemic. In facts, multiple sources of evidence with data converging in a triangulation, helped to strengthen the internal validity of the result (Yin, 2009). The below table outlines the number of dynamic capabilities found per type and per case study:

Table 1.1: Number of dynamic capabilities evidence found per case study

Capabilities Automakers	Adaptability	Innovation	Networking	Absorptive	Policy variable	Total
Volkswagen	3	6	3	4	-	16
Renault	2	3	3	1	1	10
Avtovaz	2	2	2	1	1	8
Total	7	11	8	6	2	34

Source: made by the author, 2022

In total 34 evidence of such capabilities have been found among the 3 cases studies. Dynamic capabilities were found in priority at Volkswagen (47%), followed by Renault (30%), and Avtovaz (23%). As such, it can be concluded that more evidence of internal and external competences reconfiguration could be identified in Volkswagen compared to Renault and Avtovaz. Moreover, the result of the study highlights some dynamic capabilities patterns across the case studies. Considering the general outlook, Innovation capability (32.5%) is the most important followed by Networking (23.5%); Adaptability (20.6%); Absorptive (17.6%); and Policy variable capability (5.8%), that is the least important in the industry. Similar ranking orders, innovation types (i.e., electric chargers infrastructures development), and analogous networking strategies with

partnerships and external knowledge acquisition (i.e., Volkswagen & Europcar; Renault & Google.; Avtovaz Orion DISTRIBUTION) converge across the three cases studies to form patterns. For instance, each case study follows the same order type per case study except for Volkswagen where more evidence of absorptive capabilities where found compared to adaptability or networking capabilities. It can be explained by the facts that Volkswagen has made a lot of investments outside the company since many years dealing with Research & Development (Volkswagen, 2022). The German manufacturer now benefits from previous innovation developments, which are highlighted by an upper outlier of absorptive capabilities evidence in the result. As such, patterns identification on ranking orders can still be established. Such patterns help to strengthen the internal validity of the results. They contribute for the interpretation of adaptations followed by automotive manufacturers since pandemic and extend the development of both theoretical and managerial knowledge.

b) How automotive manufacturers adapt since pandemic?

The business models evolution toward greater digitalization since pandemic with software and services development inside the automotive industry partly drives the choice of actions taken by automotive manufacturers. According to the findings, inside the European automotive industry, companies adapt by developing dynamic capabilities. Driven by the current changes, they range from the most to the least important. Consequently, it can be established that Innovation, Networking capabilities and Adaptability capabilities are the top three capabilities developed in the European automotive market. It also contributes to the five theoretical dynamic capabilities theory identified by Panibratov et al. (Panibratov, Rysakova, & Luo, 2021) in the context of the automotive industry.

c) What automotive manufacturers do since pandemic?

Competitive advantages owned by each company led to the development of dynamic capabilities that allow them to move ahead during crisis time. The development of dynamic capabilities is beneficial for companies to overcome pandemic (Proposition 2). It benefits the firms resilience in uncertainty markets as they can reconfigure internal and external competences to answer rapidly changing environment influenced by pandemic.

Inside the automotive industry, Innovation is the most preferred capability to develop in order to stay ahead of market and uncertainty (Proposition 1; 2; 4). Industry 4.0 evidence affecting the transformation of all of production process from development to customer services were found across all the case studies. For instance, Volkswagen IT labs in Munich works on quantum computers for commercial application areas; Renault works on its improvements of cost-efficiency

by reducing the platforms – a way to improve resilience according to previous research (Khan & Teicher, 2020); and Avtovaz focuses on car features linked to a smartphone. In facts, such initiatives provide higher production efficiency and productivity across the manufacturing supply chains development, especially under pandemic context. It also improves customer value and return on investment for shareholders. As such, it continues previous research (Ghobakhloo, 2019; Nevskaya, 2021; Osipov, 2021; Panibratov, Rysakova, & Luo, 2021; Spieske & Birkel, 2021) in the pandemic context.

The concept of digital business model in the automotive industry takes the shape of a set of tools for optimizing the workflow through software and hardware solutions (Osipov, 2021). Since the pandemic, the transformation of business models of automakers is accelerating in Europe as case studies' result suggests (Proposition 1; 3). First of all, the transition to electric vehicles requires new business model with Electric vehicles infrastructures at disposal. Osipov previously estimated that automakers are more likely to vertically integrate (Osipov, 2021). Indeed, it verifies. As an example, Volkswagen ambitions to vertically integrate a lot of its electric batteries suppliers in Europe to create massive factories to reach its 2030 goals of at least 70% of electric vehicles.

Strategies followed by studied automotive manufacturers follow the same logic regarding the improvement of customer value. As such, they adapt their business models toward more digitalized services to ensure their differentiation. Their core business activities of vehicles manufacturing are now evolving toward software and services developments which correlate with previous research (Osipov, 2021; Nevskaya, 2021). Volkswagen and Renault Groups are developing mobility, sharing and software services activities, factor of growth in the industry (Osipov, 2021; Nevskaya, 2021; The Verge, 2022).

To develop such new activities, automotive manufacturers use partnerships strategy to acquire external knowledge and develop it internally (Proposition 5). For example, Renault collaborates with Google to develop software services, and Volkswagen bought Europcar rental services. According to academics (Schmitt, 2013; Kuznetsov & Kuznetsova, 2020) proximity is a dimension important for future contracts and the nature of automobile production has always required some geographical proximity regarding the core activity of vehicles manufacturing.

Consequently, the automotive industry tends to regionalize (Proposition 6). In the automotive industry, it takes the shape of partnerships that are established with local actors in growing markets such as China for Volkswagen and Renault, or Kazakhstan and Uzbekistan for Avtovaz. It supports previous research that suggests that we are not assisting to the end of globalisation but to significative change of operations from plethoric actors (Panibratov, Rysakova, & Luo, 2021;

Gorynia, 2020). According to the result, in the automotive industry, the change of operations is led by the Asian market that offer significant growth for the actors. The most important country in the region is China.

Also, Adaptability capabilities development constitute the main difference in nature among the case studies. They correspond to owned competitive advantage each company has developed internally and now use to overcome the crisis. For instance, Volkswagen has developed its own charter ships to reduce delays of shipments, Renault aims to reduce from 6 to 3 the number of its platforms for cars and Avtovaz has managed to carry on the production with redirection of semi-products inventory from stopped factories of the Group in Europe to its Russian plant.

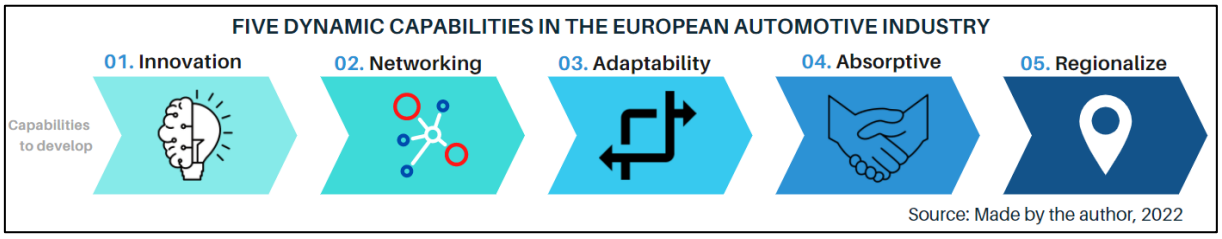
Eventually, there were no direct reshoring activities evidence to answer semiconductors shortage. Volkswagen announced potential actions it might undertake (The Verge, 2022), but it is more likely to not happen as capacity of Asian suppliers of semiconductors are improving. On the contrary, an oversupply of auto semiconductors is expected in 2023 according to first chapter findings (J.P. Morgan, 2021). As such, proposition 7 on reshoring activities cannot be supported. Also, policy variable capability seemed not to be an important driver considered by studied automotive players, but more a conventional rule of doing business. It questions the significance of policy variable capability in the five dynamic capabilities proposed by Panibratov and al. in the context of the automotive industry.

5. Theoretical implications

Main contribution of the paper is to extend the five dynamic capabilities identified by Panibratov et al. (Panibratov, Rysakova, & Luo, 2021). They were used to study strategy adaptations since pandemic of German, French, and Russian automotive manufacturers because they benefit the firms resilience by reconfiguring internal and external competences to answer rapidly changing environment. As such, it has been identified that Innovation, Networking, Adaptability, and Absorptive capabilities were developed by all the studied automakers. However, the policy variable capability could not be considered as significant capability automakers undertake to develop because of the limited evidence found.

Therefore, I propose a quick review of the 5 capabilities identified by Panibratov et al. (Panibratov, Rysakova, & Luo, 2021) in the case of the European automotive industry (Appendix 2: FIVE DYNAMIC CAPABILITIES IN THE EUROPEAN AUTOMOTIVE INDUSTRY). It replaces the policy capability by the regionalize capability. As such, it incorporates present findings of the study that pointed out the regionalization trend in the automotive industry and relies on previous research on regionalization (Kuznetsov & Kuznetsova, 2020; Schmitt, 2013) that suggests that local context takes more importance in GVC as "Proximity is a dimension important for future contracts", especially in the automotive industry.

APPENDIX 2: FIVE DYNAMIC CAPABILITIES IN THE EUROPEAN AUTOMOTIVE INDUSTRY



Moreover, the framework now prioritizes on the degree of importance of capabilities developed by actors in the automotive industry based on the number of evidence of each capability found in the study. As such, it helps to improve the current academical knowledge to better understand the dynamic of the automotive industry post pandemic. Further studies in other industries could be held to check the validity, extend, and refine the framework.

Result of the research also refreshes and strengthens previous academical knowledge on digitalization and business models transformation in the automotive industry. From 6 to 3 platforms reduction at Renault is an example that digitalization plays more and more importance with the integration of new technologies to optimize manufacturing processes (Ghobakhloo, 2019;

Spieske & Birkel, 2021; Panibratov, Rysakova, & Luo, 2021) combined with the standardization (Nevskaya, 2021), it allows to maximize return on investment.

Evidence found of business models transformation of automotive players enhance previous research (Osipov, 2021; Nevskaya, 2021) that pointed out that automotive manufacturers turn into a combination of car producers, software, and mobility shared services. Such transformation offers possibilities to differentiate and to expand thanks to the digitalization and software services. Osipov previously estimated that automakers are more likely to vertically integrate (Osipov, 2021). Findings of the study revealed that Volkswagen ambitions to vertically integrate a lot of its electric batteries suppliers in Europe to create massive factories to reach its 2030 goals of at least 70% of electric vehicles. Also, Belhadi et al. (Belhadi, et al., 2021) has noticed that the support of governmental entities and stakeholders cooperation should focus on the digital technologies development. Evidence at the industry level argue that the European Battery Alliance aims to support the automotive industry necessary infrastructures.

Limitations of the academical implications concern the generalization of results to broader industries. Indeed, the findings rely only on the automotive industry, new studies should be conducted to extend the new 5 capabilities framework to other industries in order to attempt to generalize the result. Also, the human resource activities, design of products and strategies of companies must be aligned with Industry 4.0. Human resource activities should facilitate the employees to embrace the changes. The lack of knowledge in new technologies implementation could restrain employees to innovate. Further research in the topic could be beneficial to improve digital transition in the automotive industry. For instance, Renault has partnered with Google to train its employees in the field.

6. Managerial implications

The review of the five dynamic capabilities identified by Panibratov and al. that led to the creation of a new framework (Appendix 2: FIVE DYNAMIC CAPABILITIES IN THE EUROPEAN AUTOMOTIVE INDUSTRY) can help managers in the industry to understand the dynamism of the automotive industry. They can visualize the changes post pandemic in their industry and orient the development of dynamic capabilities. They can also prioritize on which dynamic capabilities to develop depending on the classification made, their internal resources, and defined goals.

Also, the transformation of the business models inside the automotive industry should be considered by each of the player. The market moves faster and is very sensitive to each player's actions. When one player undertakes a new activity, it is most likely that competitors will follow and slightly differentiate. In facts, digitalization offers possibilities to differentiate in the automotive industry through differentiation thanks to the digitalization and software and shared mobility services development. For instance, Volkswagen and Renault Group both undertake such services' development. It brings the necessity to control new infrastructures. Vertical integrations are being processed in the industry, particularly regarding electric chargers, e.g. Volkswagen with electric charger infrastructures development. It is more likely, that main players in the industry will undertake more and more new opportunities. Investments axed on digitalization are being developed faster since pandemic.

Finally, the shortage of semiconductors in the automotive industry that led to an incapacity to fulfil vehicles demand in Europe is the main threat in the industry. The Electronic Components And Systems For European Leadership aims to support the development of electronics components and systems industry in the European Union. Its support is essential as a chip factory can cost up to €10 billion and take two years to build (CNBC, 2021). In facts, chips used in the automotive industry are not the most advanced chips produced, they range from 26 to 40 nanometer chips, while current technology allow to produce 5 nanometer chip (CNBC, 2021). Thankfully, the chips shortage in the automotive industry is suspected to finish by 2023 according to market analysts (J.P. Morgan, 2021).

CONCLUSION

This paper studies COVID-19 impacts on the European automotive industry represented by Germany, France, and Russia. First chapter overviews COVID-19 impacts and policies used by the States to fight against pandemic and present main theories such as dynamic capabilities, GVC and digitalization in the European automotive industry in order to strengthen the research design. The chapter also describes the negative evolution of the automotive industry since pandemic essentially due to lockdowns policies followed by States and chips shortage. Second chapter illustrates how and what automotive companies do since pandemic context based on 7 propositions established at the end of the previous chapter. Volkswagen, Renault and Avtovaz were chosen to understand the post COVID-19 adaptation of automotive manufacturers with the help of 5 capabilities (Innovation, Networking, Adaptability, Absorptive, Policy variable) identified by Panibratov et al. (Panibratov, Rysakova, & Luo, 2021). An explanatory holistic multiple case studies approach was chosen in order to understand the real life-context of automotive manufacturers and to bring an in-depth understanding of the industry evolution since pandemic (Yin, 2009). The contextualisation of the chosen theory applied to case studies that generate causal explanations helps to extend the current academic knowledge in the international business field. Multiple case strengthens the result as it points out the similarities and differences between the case studies, while patterns identification in terms of number and nature of capabilities among the case studies pushed for internal validity of the results. The Russia-Ukraine military conflict variable was removed from the analysis as it would have biased the results.

The main contribution of the research is that it extends the 5 dynamic capabilities identified by Panibratov et al. (Panibratov, Rysakova, & Luo, 2021). First of all, I identified a total of 34 evidence of such capabilities across all companies (Volkswagen 47%; Renault 30%; Avtovaz 23%) revealing the degree of importance of each of them. The findings suggest that choices of actions, reflected in highlighted dynamic capabilities, are partly driven by the business models shift toward greater digitalization with software and services development inside the automotive industry, in accordance with previous research (Spieske & Birkel, 2021; Nevskaya 2021; Osipov 2021). Consequently, inside the European automotive industry, companies adapt by developing dynamic capabilities – top 3 capabilities are Innovation (32.5%), Networking (23.5%) and Adaptability capabilities (20.6%).

Automakers innovate to stay ahead of market and uncertainty (Nevskaya 2021; Osipov 2021; Panibratov, Rysakova, & Luo, 2021). For instance, Volkswagen IT labs in Munich works on quantum computers for commercial application areas (Proposition 1; 2; 4). Automakers ally with

qualified associates to develop new knowledge (e.g. car sharing services) from external resources (Schmitt, 2013; Panibratov, Rysakova, & Luo, 2021). As an example, Renault partners with Google to develop its software services and train its employees (Proposition 3; 5). Automakers relies on their own resource and competitive advantage that characterize their adaptability capabilities. As such, Avtovaz managed to carry on the production with redirection of semi-products inventory (Proposition 2). Automakers regionalize (Schmitt 2013; Kuznetsov & Kuznetsova) to growing Asian markets driven by China (Proposition 6). To implement them, they establish partnerships with local actors in growing markets such as China for Volkswagen and Renault, or Kazakhstan and Uzbekistan for Avtovaz.

Policy variable capability seemed not to be an important driver considered by studied automotive players, but more a conventional rule of doing business. More importantly, reshoring activities were more likely to happen to answer semiconductors shortage, but no such evidence among the case studies was found. Consequently, the proposition 7 ("European automotive manufacturers undertake reshoring activities since pandemic") has been rejected.

Consequently, theoretical implications of the research propose a review of the 5 capabilities identified by Panibratov et al. (Panibratov, Rysakova, & Luo, 2021) by shifting the Policy variable capability with a new one: 'regionalize' capability. As such, it incorporates present findings of the study and relies on previous research on regionalization (Schmitt, 2013; Kuznetsov & Kuznetsova, 2020). Moreover, the creation of a new framework (Appendix 2 – FIVE DYNAMIC CAPABILITIES IN THE EUROPEAN AUTOMOTIVE INDUSTRY) adds a ranking order that now considers the degree of importance of each of the studied dynamic capabilities identified in the European automotive industry.

Business models transformation of automotive players shift toward a combination of car producers, software, and mobility shared services. The study showed that the transition accelerates since pandemic. In facts, findings refresh and strengthen previous research on digitalization (Spieske & Birkel, 2021; Nevskaya 2021; Osipov, 2021). Software services expand possibilities to differentiate, it is a new factor of growth in the industry. Previous research identified vertical integrations as potential strategies followed by automotive manufacturers (Osipov, 2021). As such, Volkswagen is a great example. The findings suggest that the company ambitions to vertically integrate a lot of its electric batteries suppliers in Europe to create massive factories (The Verge, 2022).

In terms of managerial contribution, the new proposed framework can serve managers to understand the dynamism of their industry. Thanks to the framework, they can orient the

development of dynamic capabilities and prioritize them depending on goals and resources available. The differentiation offered by digitalization in software and shared mobility services brings the necessity for automotive manufacturers to control new infrastructures such as electric batteries chargers. Therefore, vertical integrations are more likely to happen in the industry. The findings showed that Volkswagen is already heading to this direction.

Business models are changing in the industry: it is now a combination of hardware (vehicles), software developments and digitalized services. Consequently, main players will continue to undertake new opportunities focused on growing market such as the Asian market, led by China. Since pandemic, many investments axed on digitalization are being processed, and the regionalization trend is suspected to reinforce. It aligns with previous research that considered the best strategy to counter COVID-19 risks would be to combine local supply sources and industry 4.0 power in the automobile industry (Nevskaya, 2021).

Eventually, to generalize the results, new studies in broader industries should be conducted to extend the new 5 capabilities framework. Also, because the human resources, design of products and strategies of companies must be aligned with Industry 4.0, further research in the topic could be beneficial to improve digitalization in the automotive industry. For instance, the lack of knowledge of employees in new technologies, among other factors, is suspected to restrain employees to change. To deal with it, Renault has partnered with Google to train its employees in the field.

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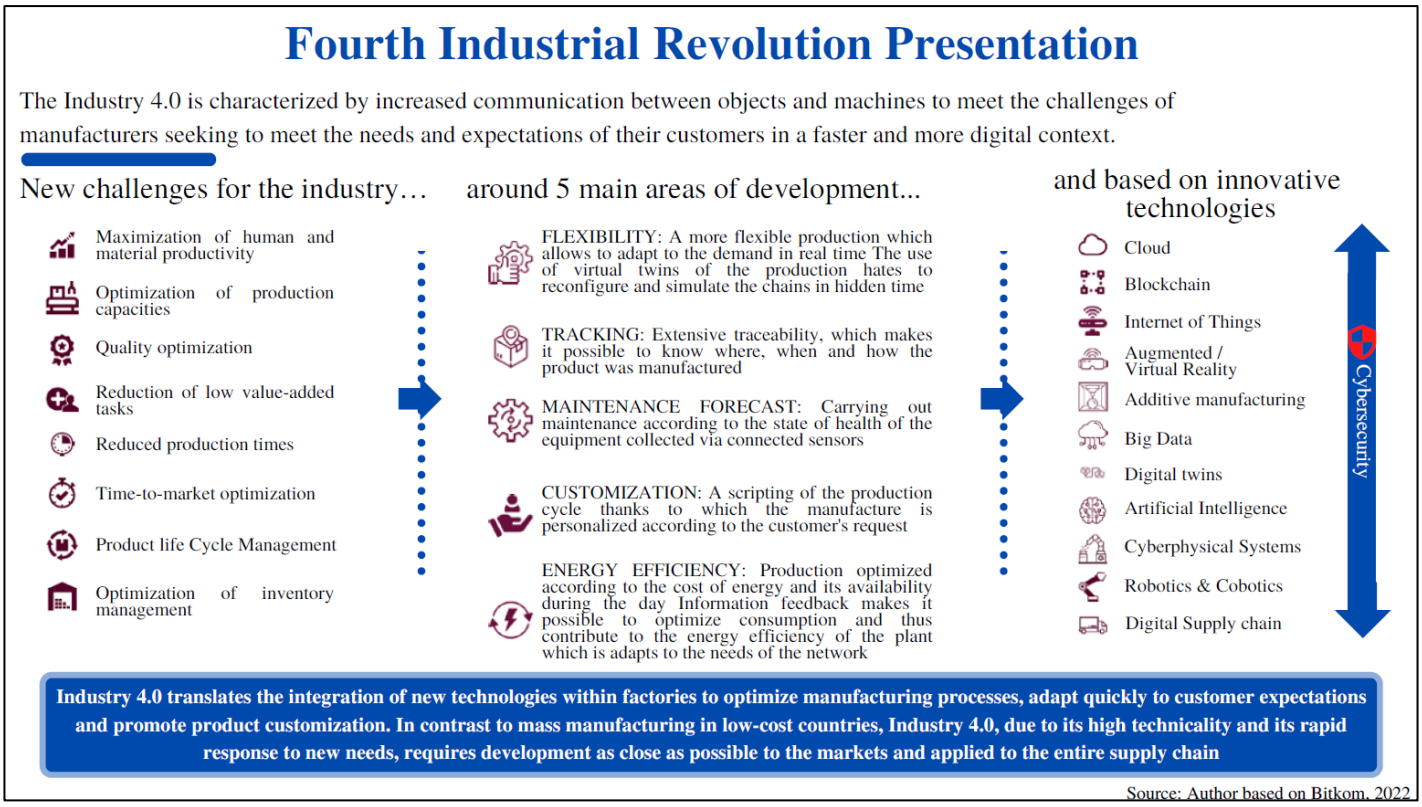
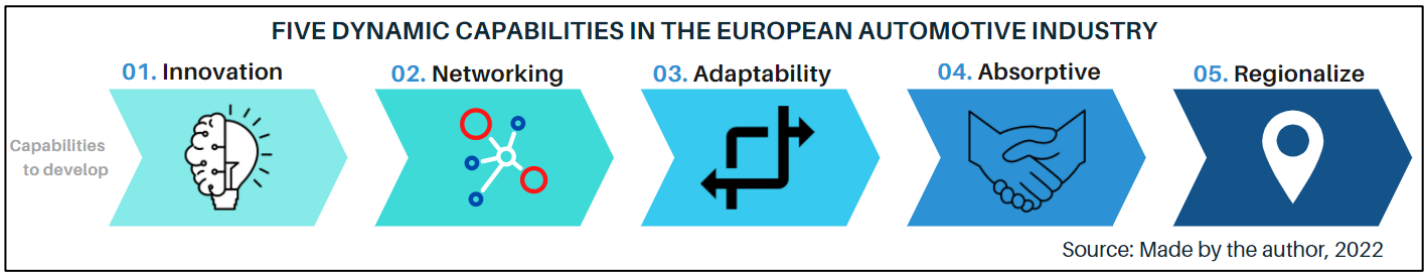
APPENDIX 1 – INDUSTRY 4.0



Source: Author based on Bitkom, 2022

APPENDIX 2 – FIVE DYNAMIC CAPABILITIES IN THE EUROPEAN AUTOMOTIVE INDUSTRY



APPENDIX 3 – INTERVIEW

Interviewer [00:00:00] Dear Toni, first thank you so much for accepting this interview. I am convinced it will be valuable for my research and academical sphere also. This is a face-to-face interview which aims to understand more about the digitalization process that is happening in business in general with a focus on COVID-19 impacts. So, I will ask you different questions about this topic. First of all, could you present yourself.

Toni Ventura [00:00:21] My name is Toni Ventura. I am an account executive for the insurance and banking industries at Genesis International, which is an American company that provides contact center solutions and customer experience solutions. So, we have customers like Uber, Royal Bank of Scotland, Microsoft, Swiss government, mainly big customers, and so on.

Interviewer [00:00:45] So I have to ask this question, do you have any customers in Russia?

Toni Ventura [00:00:52] Yes I think. I don't take care of the Russian market, but we do have Russian customers. For instance, we have Yandex as a customer. Yandex drive is one of our customers.

Interviewer [00:01:11] So maybe can you provide some insights about what you experienced during the first stages of the pandemic? How did it impact your sales operation? Finance, for instance. Did you lose some orders because of that. Did you encounter any risk of bankruptcy?

Toni Ventura [00:01:32] So no, in terms of bankruptcy, there was no risk at all. I joined, though, in the middle of the pandemic. I joined in early 2021, in February 2021. So, it was in the middle of the pandemic. And, um, I know that the year of the fiscal year of the company ends on the 31st of January instead of the 31st of December. So, when I joined, I know that there were some reports and so on and so forth of extremely good numbers. And I think because they use the opportunity, obviously, that everyone had to go home to sell our solution. So, our solution is a solution that you can also use from home. And that's why there was a lot of upsell and cross-sell. But there was also a lot of new logos.

Interviewer [00:02:46] Mm hmm. Maybe can you provide some information about this solution you talk about, so we have a clear understanding of the solution.

Toni Ventura [00:02:53] Yeah. So basically, we are providing the contact center solution. This means that, you know, a very basic level when you call a bank or someone that is using our solution, the first thing that you will hear is:

“Hello, welcome to Genesis for English Press one – для русского нажмите 2 – pour le français appuyer sur le 3“

These are the solution that we are providing. And then there is a routing strategy or routing engine behind. And then if you press one, you will be sent to the agents that speak English. If you press two, to the agents that speak Russian. If you press three, to the agents that speak French. So that is the solution that we are selling and also this is the basic part we sell.

We also sell integrations with WhatsApp, with email, with chat bots, voice bots and so on and so forth. And we also do employee schedules, plannings, workforce management. So, everything you need to run a contact center. We sell it.

Toni Ventura [00:04:10] Yeah. So, I was saying. Okay, I know that the numbers were way better. They increased compared to the year before, and this year again. But I'm talking about crazy numbers like maybe 100% increase… No, I think it was 30% increase, but based on what they achieved the previous year, which was more than what they planned.

Interviewer [00:04:42] Okay. So, it's like basically in two years about like 160% increase.

Toni Ventura [00:04:49] Yeah.

Interviewer [00:04:50] That's pretty decent.

Toni Ventura [00:04:52] Yeah, really crazy. Really crazy.

Interviewer [00:04:55] So, I understood that you integrated the company during this crisis, but did you hear about any decision making process the company used to deal with the situation at that time. Did you still use this kind of decision-making process? Did you change? Innovate?

Toni Ventura [00:05:18] So there was there was indeed a task force group created and the CIO of the company was the one leading it. It was basically a task force that was made to monitor the

situation in all the countries, because we have 7000 employees, and we are in 190 countries or more. So, a lot of countries and each country had its own rules. So, there was this task force created, and they were meeting every week or every two or three days, something like that, to monitor how the situation was evolving. And based on that, they were making decisions, a framework to make or to protect system for decision making, I don't think was established. But the way of engaging it was like that.

Interviewer [00:06:17] And these people, they were like internal workers. Or did you also have some external people? Only internal.

Toni Ventura [00:06:26] Internal workers.

Interviewer [00:06:28] Okay.

Toni Ventura [00:06:29] Like the majority of them were SVPs and VPs [Senior Vice Presidents & Vice Presidents].

Interviewer [00:06:33] Okay. So, it was kind of … Let's say crisis management response.

Toni Ventura [00:06:38] Right.

Interviewer [00:06:39] Okay.

Interviewer [00:06:42] Okay. So, you didn't ask for any outside knowledge to deal with it? Or did you, for instance, contact your competitors as well to have, somehow, additional help?

Toni Ventura [00:06:56] I mean, I'm not at that level where I can see what they're doing. But I don't really think so. I mean, at the end, everyone talks with everyone. So, I assume that they created this task force, based on what they saw, that other countries who are doing. But I don't have information to say if they really met with competitors or external companies to help them.

Interviewer [00:07:28] Hmm. Okay. The industry just blew up [positively], so I guess everyone was taking advantage of it.

Toni Ventura [00:07:37] Yeah.

Interviewer [00:07:38] So, my next question was regarding [potential] opportunity benefit that this crisis allowed you to take into reality. Except like this huge turnover. I mean, it probably accelerated your projects in the company, but to what extent?

Toni Ventura [00:08:04] So there's a major thing, which is the acceleration of digitization and the acceleration to go to the cloud. Many many companies understood that having "unprimed" systems that were – so unprimed systems are systems that were not flexible, it [is] a bad thing because suddenly they [have] to send home all their employees and still keep running operations. So basically, the opportunity was laying on the digitization and going to the cloud [for our customers].

Interviewer [00:08:44] Okay.

Toni Ventura [00:08:46] That's why a lot of things that we were able to capitalize on were the move to enable the employees of our customers to work from home.

Interviewer [00:09:01] Okay.

Toni Ventura [00:09:02] They'll be able to work from whatever they wanted.

Interviewer [00:09:05] That's very interesting. And did you notice any patterns in this customer change of behaviors. Are there like key industries that went for this digitalization process?

Toni Ventura [00:09:20] Yeah. Mm hmm. Um, so obviously, utility companies and manufacturing companies couldn't do much because they are main business is on site.

But other industries like the banks or insurances really quickly had to shift and [also] take some risks. Because one thing is when you're working in the office, the computer stays in the office – No problem. But if you go home, you don't know if your computer opens, so they have to deal with new risks. But they all adapted really quick because they had no other options.

Interviewer [00:10:10] Yeah. Okay.

Toni Ventura [00:10:12] So in terms of patterns, I cannot give you a clear pattern. On how they behave. But they basically decided: “okay, we need to keep running operations, so we're going to switch to remote”.

Interviewer [00:10:29] So you mentioned the risks they also faced, but do you mean, uh, like, could you define it? Is it like cybersecurity risk or is it something else? Essentially cybersecurity?

Toni Ventura [00:10:43] Yeah, I'd say yeah, it's cybersecurity. Risk is risk about, uh, confidential data, customer data. Because if you take your computer home and you are with friends and you leave your computer open, uh, and then someone sees that this person has 2 million, then probably nothing is going to happen, but it's a risk. So, it's mainly about always around customer data.

Interviewer [00:11:22] Okay. Makes sense. So far, I think we covered essential stakes of the industry you work for. But, um, how do you consider the future of your activities right now? Will you know higher success than before or is going to stagnate now?

Toni Ventura [00:11:57] Um. I think there's going to be… So, in a capitalistic system, the goal is to always sell more and otherwise your stocks get devaluated. My company personally is not in the in the stock market. Um, but for the other companies, I believe that there are still many years. And by many years I mean. Five, ten, 20 years of still massive growth because the tech world and the world are all booming. Now, a lot of parts of companies that are still being moved to more technological way of doing things.
I was in a seminar the other day. And they were talking about “codification”.

Interviewer [00:12:50] What does that mean?

Toni Ventura [00:12:54] Parts of your business. It's basically transforming something that exists in the real world into code. It's not only about replacing humans or enhancing the world. The world of humans, but also speaking of processes that exist in real life and codifying it.

Interviewer [00:13:26] It's like the metaverse of Facebook for instance? Something like that?

Toni Ventura [00:13:32] No, it's, for example, um, Boeing. They produce engines for planes. I don't know what the number was, but right now I think 80% of the engine is made by 3D printers.

Interviewer [00:13:55] Okay.

Toni Ventura [00:13:56] So with this 3D printing model. You can adapt really quick and just produce new engines, different types of engines, and you need only one line of business and each printer will print a different engine. So that's the type of qualification that I'm talking about.

But also, for the accounting department, for the financial department, for operations, there's many things that can be moved from paper to digital. And that's why I think for many years to come, you know, five, ten, 20 years. I.T. is going to be a great, great, great business to be in because there's a lot of opportunities.

Interviewer [00:14:48] Okay, so, uh, your company will definitely follow then the growth strategy and like, do you have any information about this strategy that it is following? Can you maybe give a few words about that? Like, do you hire people? I guess. Do you make new projects?

Toni Ventura [00:15:07] Yeah. We keep hiring a lot of people. We're 7000. And I think this year we plan to sell. We plan to hire 700 people again. Um, so we are growing massively. We're acquiring companies, two companies the year before were acquired.

Interviewer [00:15:26] Is it, is it to acquire a knowledge or to just, uh, expand like, uh, the market shares.

Toni Ventura [00:15:31] You know, it's actually to acquire knowledge. Because the companies that we hire are… For example, we acquired a company called Bold 360. And this company does chat and chat bots with A.I. and their A.I. capabilities were really, really, really good. So that's why we acquired them. And now they're part of the Genesis portfolio.

Interviewer [00:16:01] Okay. Very interesting. So, maybe more questions about, uh, let's say the key characteristics like people should have in order to just adapt in this very changing world like you mentioned.

Basically, every field are concerned and if you don't adapt to this digitalization, like as a person, it's going to be very hard. So, what are like the key aspects of the personality people should have to just develop and have a great career in the future?

Toni Ventura [00:16:44] Mm hmm. Um, you mean in in it.

Interviewer [00:16:49] According to you and your experience.

Toni Ventura [00:16:52] Yeah. So, there's one thing… Well, I think there are several things. And even though I hate this, this, this, this buzz word, but getting out of the comfort zone really helps. Meaning that when you have to deal with a new tool, when you have to deal with a new process, when you have to deal with something new. Embrace it and just do it. Not for the tool or the process itself, but because it's going to train you to stay.

Interviewer [00:17:28] It's like adaptation. Would you classify it as intelligence as well? A form of intelligence?

Toni Ventura [00:17:34] Yeah. I mean, that's like the theory of adaptation.

Interviewer [00:17:43] Yes.

Toni Ventura [00:17:44] It helps you to be trained. You know, it's like if you if you go running, then you need to train to run. And this is the same. If you want to change them, you need to train the change. And it can be from switching. And also on a personal level, you know, you can switch from an iPhone to a Samsung to be uncomfortable and to learn new things. It can be for developers learning new languages all the time.

And I think it's also important to understand where are the market? Where is the market going? What are the hot topics? Now, I know, for example, the cyber security in the cloud is a hot topic. Ai is a hot topic. What can I do to learn more about these topics once they come to my life? Because they will arrive sometimes soon.

Interviewer [00:18:54] So you advise [people] like me to study these subjects then basically?

Toni Ventura [00:18:59] Well, yes... Well to get to know these topics, you know, read… I wouldn't say PhD papers, but you know, journals like The Economist or something that is more…

Interviewer [00:19:20] Business oriented. I mean like pragmatical or business case studies, I guess.

Toni Ventura [00:19:26] I mean, imagine you would have read about Bitcoin ten years ago.

Interviewer [00:19:31] Haha, haha… You know, I have some friends who bought it just to have some fun. And now he is freaking rich. It's crazy.

Toni Ventura [00:19:37] Yeah. I mean. Well, I also do trading but uh, that's another topic. Yes. It's not easy. It's not, it's not easy to wait that it's the more the most difficult part.

Interviewer [00:19:51] Well, th…

Toni Ventura [00:19:53] There is a guy that [has] a wallet. He bought $8,000 of Shiba Inu for a year and a half, and that is today US$5.7 billion. He could buy a country, you know.

Interviewer [00:20:18] Yeah. And by the way, are the cryptocurrencies also studied in your company?

Toni Ventura [00:20:28] No, no, no.

Interviewer [00:20:30] Okay. Well, thank you very much. I don't know if you have anything else to add because we already have [more than 20] minutes in this interview. Which is what was planned. Thank you very much for your time?

Toni Ventura [00:20:51] Do you have more questions like right now?

Interviewer [00:20:30] Well, yes, but in a more personal way. So maybe one day we can meet?

Toni Ventura [00:21:02] **(in French)** Well let's switch to French if you want to and we can discuss about that.

Interviewer [00:21:06] **(in French)** Sure, let me just turn off the recording.