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Ukrainian-American Concordia University
Department of International Economic Relations, Business & Management

Bachelor's Qualification Work

**International competitiveness management of Tesla, Inc.
during the COVID-19 pandemic**

Bachelor's student of
Field of Study 07 – Management
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Abstract:

The COVID-19 pandemic has fundamentally altered the global economy. It has simultaneously contributed to the rise of giant tech companies, and the downfall of small brick-and-mortar businesses. International competitiveness refers to the set of factors that determine the productivity of a country or company. The pandemic has had a significant impact on the global competitiveness of virtually every industry and country. This paper analyzes the impact of the COVID-19 pandemic on the ability of auto manufacturers to remain competitive internationally, with a primary focus on Tesla, Inc. and other top-performing electric vehicle manufacturers. This work compares key approaches used by Tesla and its competitors to mitigate the negative effects of COVID-19 on their global competitiveness. By examining key performance indicators, such as stock price, gross revenue, and net income of each firm pre- and post-pandemic, it arrives at the conclusion that Tesla's pro-competitiveness approach was superior to its rivals.

Keywords: automotive, coronavirus, COVID-19, electric vehicles, international competitiveness, manufacturing, pandemic, Tesla.

Пандемія COVID-19 докорінно змінила світову економіку. Одночасно це сприяло піднесенню гігантських технологічних компаній і занепаду невеликих звичайних підприємств. Міжнародна конкурентоспроможність відноситься до сукупності факторів, які визначають продуктивність країни або компанії. Пандемія справила значний вплив на глобальну конкурентоспроможність практично кожної галузі та країни. У цій статті аналізується вплив пандемії COVID-19 на здатність виробників автомобілів залишатися конкурентоспроможними на міжнародному рівні, зосереджено на Tesla, Inc. та інших найефективніших виробників електромобілів. У цій роботі порівнюються ключові підходи, використані Tesla та її конкурентами для пом'якшення негативного впливу COVID-19 на їх глобальну конкурентоспроможність. Досліджуючи ключові показники ефективності, такі як ціна акцій, валовий дохід і чистий прибуток кожної фірми до і після пандемії, він приходять до висновку, що підхід Tesla, спрямований на підтримку конкурентоспроможності, був кращим за конкурентів.

Ключові слова: автомобілебудування, коронавірус, COVID-19, електромобілі, міжнародна конкурентоспроможність, виробництво, пандемія, Tesla.

Пандемия COVID-19 коренным образом изменила мировую экономику. Это одновременно способствовало росту гигантских технологических компаний и краху небольших традиционных предприятий. Международная конкурентоспособность относится к набору факторов, определяющих производительность страны или компании. Пандемия оказала значительное влияние на глобальную конкурентоспособность практически каждой отрасли и страны. В этом документе анализируется влияние пандемии COVID-19 на способность производителей автомобилей сохранять конкурентоспособность на международном уровне, при этом основное внимание уделяется Tesla, Inc. и другим ведущим производителям электромобилей. В этой работе сравниваются ключевые подходы, используемые Tesla и ее конкурентами для смягчения негативного воздействия COVID-19 на их глобальную конкурентоспособность. Изучая ключевые показатели эффективности, такие как цена акций, валовая выручка и чистая прибыль каждой фирмы до и после пандемии, он приходит к выводу, что подход Tesla к обеспечению конкурентоспособности был лучше, чем у ее конкурентов.

Ключевые слова: автомобилестроение, коронавирус, COVID-19, электромобили, международная конкурентоспособность, производство, пандемия, Tesla.

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APPROVED

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**TASK
FOR BACHELOR’S QUALIFICATION WORK**

Behir Chehertma

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1. Topic of the work

*International competitiveness management of Tesla, Inc.
during the COVID-19 pandemic*

Supervisor of the work *Gordiienko Tetiana, Ph.D in Economics, Associate professor,*
(surname, name, degree, academic rank)

Which approved by Order of University from *“22” December 2022 №22-12/2022- 3c*

2. Deadline for bachelor’s qualification work submission *“16” May 2022*

3. Data-out to the bachelor’s qualification work *materials received during
the internship and from open data sources, reports of Tesla, Inc*

4. Contents of the explanatory note (list of issues to be developed)

*Theoretical framework of international competitiveness during the
COVID-19 pandemic; Study of activity of Tesla, Inc and its competitors
in the global electric vehicle market during the COVID-19 pandemic;
Performance analysis of the international competitiveness measures
of Tesla, Inc and its competitors*

5. List of graphic material (with exact indication of any mandatory drawings)

Fig. of the 12 pillars of competitiveness and measures of international competitiveness, graph for dynamic of daily new COVID-19 cases worldwide, Economic effects of the COVID-19 pandemic, PE STEW analysis of Tesla Inc., Global EV sales and Market share 2010-2021, Global auto industry statistics

6. Consultants for parts of the work *Tesla fin statements and*

Part of the project	Surname, name, position	Signature, date	
		Given	Accepted
1	<i>Gordienko Tetiana</i>	<i>[Signature]</i>	<i>[Signature]</i>
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7. Date of issue of the assignment

Time Schedule

No	The title of the parts of the bachelor's qualification work	Deadlines	Notes
1.	I chapter	14.02-13.03.2022	<i>Overdue</i>
2.	II chapter	14.03-10.04.2022	<i>Overdue</i>
3.	III chapter	11.04-24.04.2022	<i>in time</i>
4.	Introduction, conclusions, summary	25.04 – 01.05.2022	<i>in time</i>
5.	Pre-defense	06.06.2022	<i>in time.</i>

Student _____

(signature)

Supervisor _____

(signature)

Conclusions: *The student independently found all relevant literature for the thesis, he managed to cover all necessary subtopics and present them in a logic way. The aim and tasks of the qualification work were fulfilled, the conclusions are correct and relevant as well as written in a comprehensive style. The student used a limited range of analytical tools. Most of the analytical data were obtained from open sources, but the student gave them a correct interpretation and made relevant conclusions. The Bachelor's qualification work of Bekir Chehenta designed according to the requirements contain all necessary parts and can be recommended for defense.*

Supervisor _____

(signature)

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ABBREVIATIONS

BEV	— Battery Electric Vehicle
CEO	— Chief Executive Officer
COVID-19	— Coronavirus disease 2019
EBITDA	— Earnings before interest, taxes, depreciation, and amortization
EHS	— Environment, health, and safety
EV	— Electric vehicle
GCR	— Global Competitiveness Report
HR	— Human resources
IPO	— Initial public offering
M&A	— Mergers and acquisitions
NASDAQ	— National Association of Securities Dealers Automated Quotations
NYSE	— New York Stock Exchange
OICA	— International Organization of Motor Vehicle Manufacturers
PESTLE	— Political, economic, social, technological, legal and environmental
PP&E	— Property, plant, and equipment
Q1	— First quarter of a fiscal year
R&D	— Research & Development
S&P	— Standard & Poor's Global Ratings
SARS-CoV-2	— Severe acute respiratory syndrome coronavirus 2
SME	— Small and medium enterprises
SUV	— Sport utility vehicle
SWOT	— Strengths, weaknesses, opportunities, and threats
TTM	— Trailing twelve months
WEF	— World Economic Forum
WHO	— World Health Organization
YOY	— Year-over-year

INTRODUCTION

The relevance of this work is defined by the role of the coronavirus pandemic in terms of shaping the global economy, business, and other aspects of daily life. The importance of COVID-19 in terms of shaping the global economy is well-documented by scholars and is unquestionable by laypersons. The same is true for Tesla, Inc. an American auto manufacturer whose recent rise has given the company the top spot in the global automotive industry.

The aim of this work is two-fold. First, I intend to study the effect of the coronavirus pandemic on the global competitiveness of 1) the global economy, 2) the automotive industry, 3) the EV industry, and 4) Tesla and its competitors. Second, I want to analyze the pro-international competitiveness measures enacted by Tesla and its competitors as a response to the pandemic, and determine whether Tesla was superior at achieving this goal.

In order to achieve this paper's goal, I have divided it into five essential tasks.

First, I need to define the essence and main features of the terms "international competitiveness" and "COVID-19 pandemic". Second, I need to analyze the impact of the COVID-19 pandemic on the international competitiveness of world economies. Third, I need to explore the current state of the global electric vehicle market and explain Tesla's business model and structure of operations. Fourth, I need to analyze the effect of the COVID-19 pandemic on the global electric vehicle market, focusing on Tesla and its main competitors. Fifth, I need to establish whether Tesla's pandemic response was superior to its competitors in terms of maintaining and improving the global competitiveness of each company.

The methodological basis for this work consists of a set of peer-reviewed journal articles, acclaimed online publications, personal data analysis, and calculations.

The research object of this work is the study of the influence of the COVID-19 pandemic on the international competitiveness of the global automotive industry, and specifically, that of the American carmaker Tesla, Inc. The research subject of this work is the study of the measures, influenced by Tesla, Inc. and its competitors, that are aimed at improving their international competitiveness capabilities during the coronavirus pandemic.

Chapter 1 analyzes the theoretical framework of the influence of the COVID-19 pandemic on the competitiveness of global business. It contains three parts. Part 1 studies the essence and main features of international competitiveness. Part 2 studies the essence and main features of the COVID-19 pandemic. Part 3 assesses the impact of the pandemic on international competitiveness.

Chapter 2 analyzes essential information about Tesla and competing carmakers, and assesses the effect of the pandemic on the competitiveness of the global automotive industry. It contains three parts. Part 1 studies Tesla's market environment and organizational structure. Part 2 establishes top five competitors of Tesla, Inc. in the global EV industry. Part 3 studies the impact of the pandemic on the global car market.

Chapter 3 assesses Tesla's measures to improve competitiveness and analyzes their performance. It contains three parts. Part 1 assesses Tesla's ways of improving its global competitiveness. Part 2 studies pro-competitiveness measures enacted by Tesla's competitors. Part 3 compares the effectiveness of each company's response by comparing pre-pandemic and post-pandemic financial performance.

The conclusion includes a summary of analyzed issues and summarizes the relevance and aim of this paper. The suggestions section includes a list of issues that Tesla, Inc. should focus on to increase its international competitiveness during the coronavirus pandemic. It also provides potential solutions to those issues.

This paper consists of sixty-four pages, which contain thirty-six figures and sixty-six literature sources.

CHAPTER 1. THEORETICAL FRAMEWORK OF INTERNATIONAL COMPETITIVENESS DURING THE COVID-19 PANDEMIC

1.1. Essence and main features of international competitiveness

The term “competitiveness” has multiple definitions that share a similar idea. The World Economic Forum defines competitiveness as “the set of institutions, policies, and factors that determine the level of productivity of a country”. Other definitions of the word include “the ability of a firm to offer products of a higher value than its competitors at equal or lower cost”. Alternatively, competitiveness may also refer to “the way to achieve an organization’s advantage over other competitors”. [63]

Since 1979, the WEF has been measuring the competitiveness of various countries in terms of three areas, as stated in Figure 1.1. The first area, “Basic requirements”, ranks the institutions, infrastructure, macroeconomic environment, health, and schools. The second area, “Efficiency enhancers”, measures the market size, technological readiness, financial market development, labor market efficiency, goods market efficiency, universities, and job training. Lastly, the third area ranks innovation and business sophistication. [9]



Fig. 1.1. The 12 pillars of competitiveness. Source: [9]

The term “competitive advantage” is an economic concept similar to some definitions of the term “competitiveness”. Competitiveness advantage refers to the factors of a business that allow it to manufacture goods and deliver services in a better way and cheaper than its competitors. Various aspects of a business may be considered a competitive advantage. These include good product quality, a resilient supply chain, appealing branding, excellent customer service, and cost-efficient operations. [58]

Competitive advantage is not to be confused with the term “comparative advantage”. Comparative advantage refers to the ability of an economy to manufacture goods and deliver services at a lower opportunity cost than its competitors. This term was first used by British economist David Ricardo in his 1817

book “On the Principles of Political Economy and Taxation”. The modern economic theory acknowledges that, although trade is beneficial, it may also lead to exploitation and resource depletion. [28]

The term “international competitiveness” refers to the ability of a country to “meet the test of international markets while simultaneously maintaining and expanding the real incomes of its citizens, under free and fair market conditions”. The competitiveness of a nation depends on multiple factors, the main one being its ability to maintain a productivity growth rate that is equal to or higher than its competitors. A key driver of productivity growth is the country’s investment in research and development (R&D). [18]

Studies show there are four key aspects that affect the international competitiveness of a firm. Project price is most important for private companies that need to keep labor, material, and other costs low. Export financing is most relevant for international projects that require foreign capital. Technological and management capabilities influence the research, development, and marketing of new products. Lastly, joint ventures with local firms allow businesses to gain an advantage in new markets. Other key concepts of international competitiveness are shown in Figure 1.2. [34]

According to research, there are three key ways to measure a firm’s international competitiveness. “Performance” ranks companies in terms of their revenue, market share, profit level, as well as cost, time, and scope efficiency and effectiveness. “Potential” ranks firms in terms of employee and service quality, relationships with partners, and global reputation. Lastly, “Process” ranks businesses in terms of their international commitment and focus, management consistency, and global thinking. [17]



Fig. 1.2. Measures of international competitiveness. Source: [34]

Internationalization is the process of a company expanding its local operations into foreign countries in order to capture a larger global market share in its industry. This process significantly affects the performance of a company by requiring it to raise more capital and hire more employees. Internationalization is usually calculated as a ratio between a firm's foreign and total sales. Other measures include the geographic scope, foreign sources of capital, as well as the number of production plants abroad. [50]

1.2. Essence and main features of the COVID-19 pandemic

Also as the coronavirus pandemic, the COVID-19 pandemic is an ongoing pandemic of the coronavirus disease 2019, also known as COVID-19. This disease is caused by SARS-CoV-2, which stands for “severe acute respiratory syndrome coronavirus 2”. This virus was first discovered during an outbreak in the Chinese city of Wuhan in December 2019. Despite attempts by the Chinese government to stop the spread of the virus, SARS-CoV-2 managed to escape China and achieve worldwide status. [37]

In January 2020, the World Health Organization declared COVID-19 to be a Public Health Emergency of International Concern. In March of the same year, the WHO announced that the disease had reached pandemic status. Since December 2019, the COVID-19 pandemic has spread to 228 countries and territories. As of 2 May 2022, there have been over 500 million documented cases of COVID-19, as shown in Figure 1.3. Out of these documented cases, over 6 million deaths have been confirmed worldwide. [64]

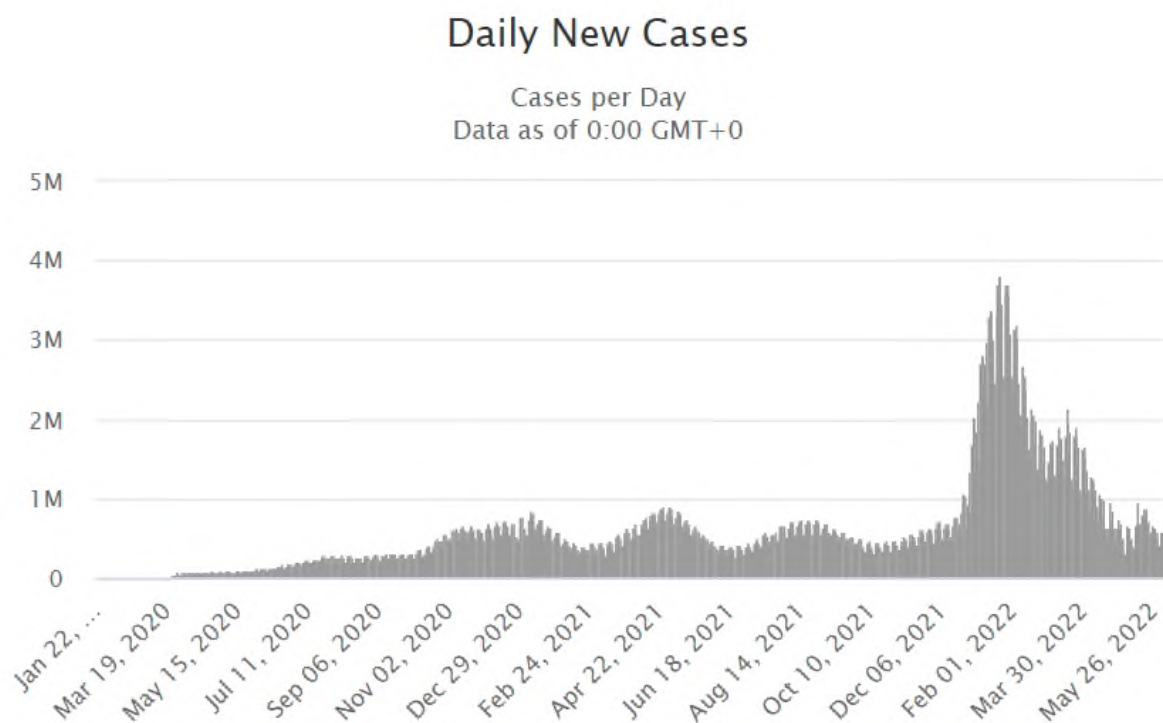


Fig. 1.3. Daily new COVID-19 cases worldwide (in millions). Source: [12]

While some patients remain asymptomatic for the duration of the illness, others experience life-threatening symptoms. Common symptoms of COVID-19 include fever, cough, tiredness, and loss of taste or smell. The disease mainly affects the elderly and people with cardiovascular and respiratory issues. COVID-19 is mainly transmitted from person to person via droplets and airborne particles. The virus is usually transmitted between people nearby, especially indoors. [64]

COVID-19 is transmitted via contaminated fluids when they come into contact with the face. Although this is rare, the virus can also spread via contaminated surfaces, such as clothes or furniture. Studies show that COVID-19 can stay alive for up to four hours on copper, two days on cardboard, and three days on plastic. Usually, infected individuals are contagious for ten days, even if they have no symptoms. Moreover, the virus can spread from being in close contact with pets and wild animals. [13]

In December 2020, the first COVID-19 vaccines were created and approved for use in the United States and the European Union. Key vaccine manufacturers include Pfizer, Moderna, AstraZeneca, and Janssen, as shown in Figure 1.4. As of 2 May 2022, more than 11 billion vaccine doses have been given, leaving over 60 percent of the global population vaccinated at least once. People must receive two vaccine doses within a month of each other, and also take additional doses called boosters every six to nine months. [15]

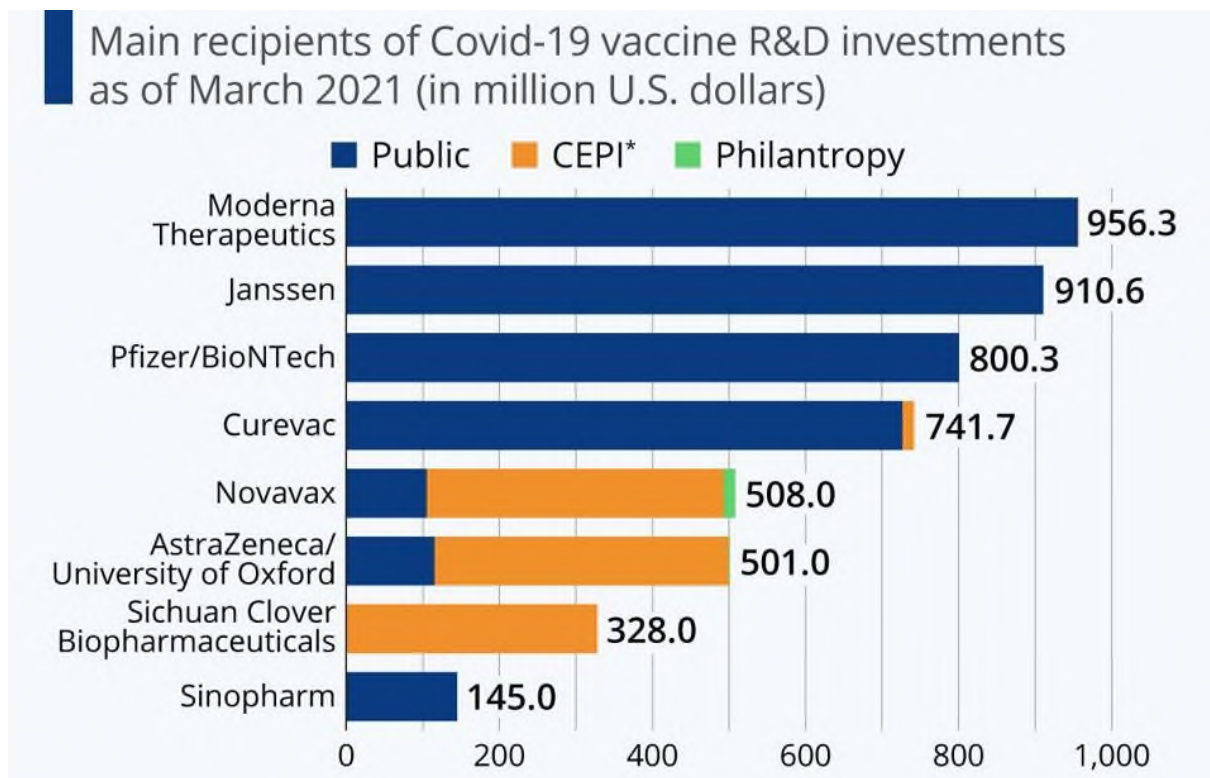


Fig. 1.4. Top recipients of COVID-19 R&D funding (in \$ million). Source: [38]

Measures that prevent COVID-19, include wearing a cloth or surgical mask, social distancing, and ventilating rooms regularly. In addition to vaccines, infected patients are sometimes prescribed monoclonal antibodies and other antiviral drugs. The coronavirus pandemic has created a wave of so-called “anti-vaxxers”, people who believe them to be harmful. Misinformation across social media has caused some to look for alternative medications, such as ivermectin, an antiparasitic veterinary drug. [14]

Governments have tried to stop the spread of COVID-19 with varying levels of success. These interventions include lockdowns, restrictions on business and travel, quarantines, and tracking of infected individuals. Across Europe and the US, many workplaces, schools, and public areas were closed fully or in part. Cinemas had to postpone movie showings, while restaurants would operate via delivery. A significant effect of the pandemic was the rise of remote work among former office employees. [65]

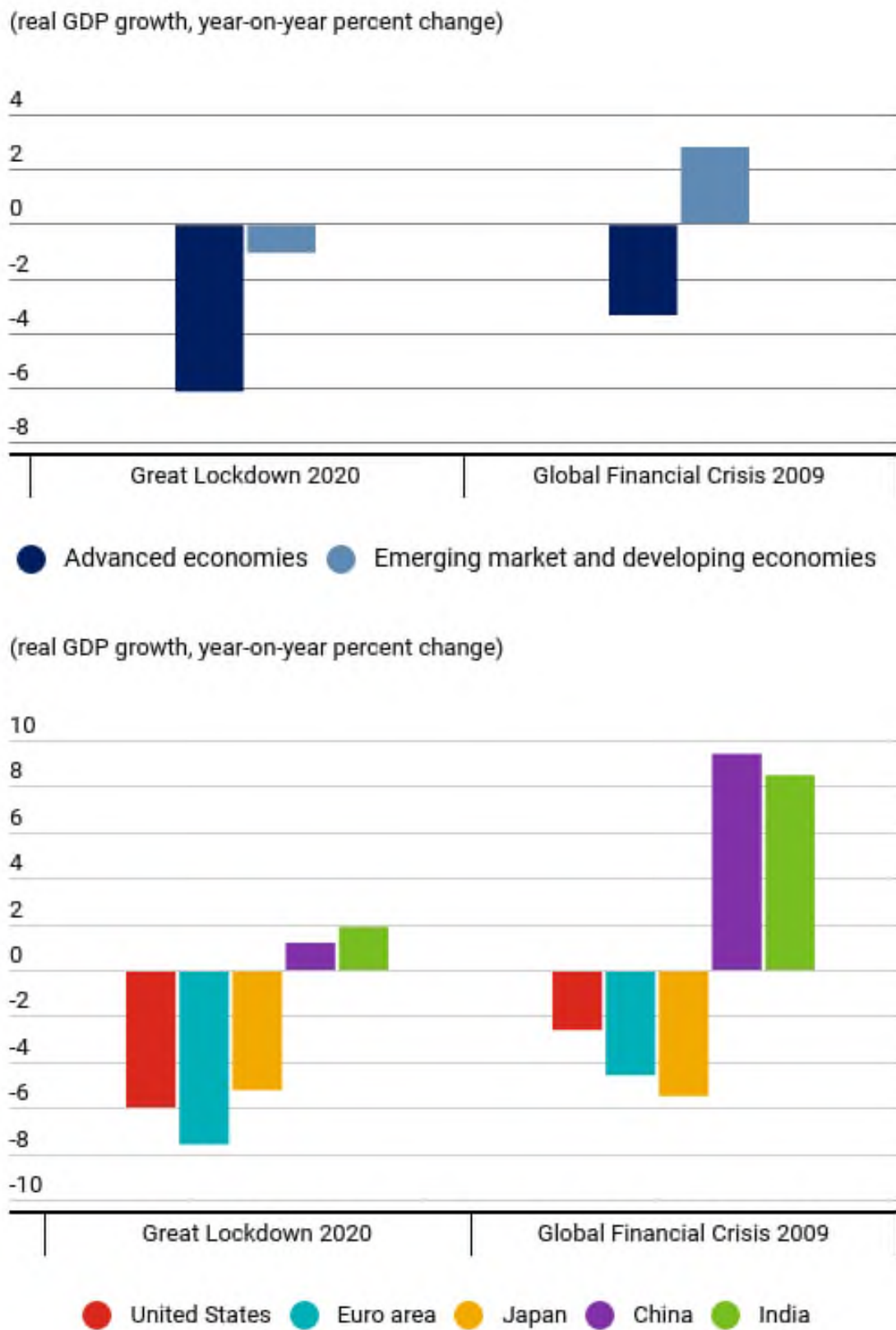


Fig. 1.5. Economic effects of the COVID-19 pandemic. Source: [55]

As shown in Figure 1.5., the “Great Lockdown of 2020” has had a worse effect

on both advanced and developing markets than the Global Financial Crisis of 2009.

The COVID-19 pandemic has had a devastating economic and societal effect on the world. Shortages of food and other goods, caused by the disruption of supply chains, resulted in both the COVID-19 recession and the 2020 stock market crash. Political tensions rose as a result of disagreements on vaccine mandates and individual rights. Despite societal and political turmoil, the reduction in consumption and travel has had a positive effect on the environment by drastically lowering CO2 emissions. [36]

1.3 Impact of the COVID-19 pandemic on international competitiveness

The 2020 edition of WEF's annual Global Competitiveness Report illustrates the many ways the COVID-19 pandemic has impacted international competitiveness. The report examines the key economic and societal issues caused by the pandemic and ranks thirty-seven economies in terms of their performance in 2020. The 2020 GCR analyzes key historical trends concerning competitiveness factors. Moreover, it provides future directions for post-coronavirus recovery and economic growth. [66]

The GCR is split into six sections. Section 1 concentrates on revitalizing and transforming the enabling environment. Section 2 focuses on reviving and updating human capital. Section 3 is devoted to renewing and changing international markets. Section 4 concentrates on restoring and altering the global innovation ecosystem. Section 5 evaluates the readiness for economic transformation. Lastly, Section 6 appraises the endurance of businesses towards disruptions caused by COVID-19. [66]

The COVID-19 pandemic has caused an erosion of global institutions, decreased ICT access in developing economies, and triggered an unprecedented rise in debt levels. [66]

- To revive the enabling environment, governments should improve the digitalization of public services, upgrade infrastructure and utilities, and establish support for the indebted.
- To transform the enabling environment, governments should improve public trust, upgrade infrastructure, broaden energy access, and introduce progressive taxation.

The coronavirus pandemic has caused labor shortages due to a lack of access to education and changed worker incentives, especially for those in the health industry. [66]

- To revive human capital, governments should introduce upskilling and

reskilling measures, create new labor market opportunities, and improve healthcare capacity.

- To transform human capital, governments should update educational programs, create new labor protection laws, and broaden access to childcare and eldercare services.

The COVID-19 pandemic has intensified the fragility of the global financial system, increased productivity and profitability gaps, and led to a rise in trade protectionism. [66]

- To revive global markets, governments should broaden access to financial services, encourage sustainable and inclusive practices, and strengthen global supply chains.
- To transform the markets, governments should increase incentives for long-term investment, create new competition and anti-trust laws, and promote private-public collaboration.

The coronavirus pandemic has encouraged the newly unemployed to create new products and delivers services, however, many were unable to reach the consumer. [66]

- To revive the innovation ecosystem, governments should increase public R&D investments to stimulate venture capital and private sector R&D, as well as create new firms and employment.
- To transform the innovation ecosystem, governments should incentivize long-term investment in R&D, and encourage creativity and diversity of thought among firms.

Country/economy	Score (0-100)	Decile	Priorities measured
Argentina	49.0	9	10 /11
Australia	62.0	4	11 /11
Austria	60.3	6	11 /11
Belgium	63.6	3	11 /11
Brazil	51.0	8	10 /11
Canada	64.2	2	11 /11
Chile	53.0	7	11 /11
China	65.6	2	10 /11
Czech Republic	64.0	7	11 /11
Denmark	66.5	1	11 /11
Estonia	61.0	5	11 /11
Finland	69.9	1	11 /11
France	62.7	3	11 /11
Germany	62.9	3	11 /11
Greece	47.2	10	11 /11
Hungary	48.1	10	11 /11
India	49.5	9	10 /11
Indonesia	55.3	7	9 /11
Ireland	60.9	6	11 /11
Israel	62.7	3	11 /11
Italy	51.9	8	11 /11
Japan	61.9	5	11 /11
Korea, Rep.	61.2	5	11 /11
Mexico	46.9	10	11 /11
Netherlands	66.3	2	11 /11
New Zealand	64.0	2	11 /11
Poland	49.8	9	11 /11
Portugal	56.1	6	11 /11
Russian Federation	50.4	8	9 /11
Slovak Republic	49.7	9	11 /11
South Africa	50.4	8	10 /11
Spain	56.5	6	11 /11
Sweden	69.5	1	11 /11
Switzerland	62.5	4	11 /11
Turkey	45.2	10	11 /11
United Kingdom	61.4	5	11 /11
United States	62.2	4	11 /11

Fig. 1.6. Economic transformation readiness performance in 2020. Source: [66]

Section 5 of the 2020 GCR evaluates the readiness of thirty-seven selected countries to revive and transform the aforementioned factors of international competitiveness, as shown in Figure 1.6. First, the section analyzes which actions and policies are required in order to create more sustainable, productive, and inclusive economies. Then, it illustrates the current state of economic transformation readiness in each one of the countries. Lastly, it highlights the gaps between different measures in terms of policies and performance. [66]

The final section of the GCR is dedicated to tracking the impact of the COVID-19 pandemic through business perceptions. First, this section measures the impact of the pandemic on selected competitiveness indicators. Various positive and negative shift factors are separate for advanced and emerging/developing economies. Lastly, it identifies the key features of competitiveness that had improve countries' response to the pandemic. [66]

According to the report, these include economic digitalization and digital skills, safety nets and financial soundness, governance and planning, as well as a health system and research capacity. [66]

CHAPTER 2. STUDY OF TESLA, INC. AND ITS COMPETITIVENESS IN THE GLOBAL AUTOMOTIVE MARKET

2.1. General information, analysis of the market environment, and organizational structure of Tesla, Inc.

Tesla, Inc. is an American electric vehicle and clean energy solutions company. The company was founded in 2003 by engineers Martin Eberhard and Marc Tarpenning in San Carlos, California. In 2004, South African entrepreneur Elon Musk, became Tesla's chairman following a \$6.5 million investment. In 2008, Musk became CEO of the company. Since going public in 2010, Tesla became the world's sixth most valued company, having reached a market capitalization of \$864.7 billion as of 2 May 2022. [47]

Tesla offers a wide range of fully electric vehicles. These include the Model S and Model 3 sedans, Model X SUV, Model Y crossover, and the Tesla Roadster, as shown in Figure 2.1. The company's clean energy product line includes the Tesla Solar Roof and inverter, as well as the Tesla Powerwall, Powerpack, and Megapack energy storage systems. In 2021, Tesla sold over 900 thousand vehicles, earning the company \$53.8 billion in revenue. As of 2 May 2022, Tesla has about 110 thousand employees worldwide. [46]



Fig. 2.1. The current lineup of released Tesla vehicles. Source: [2]

In 2006, Elon Musk published a brief strategic plan on Tesla's website that he thought would ensure the company's future success. [40]

1. Build a sports car.
2. Use that money to build an affordable car.
3. Use that money to build an even more affordable car.
4. While doing the above, provide zero emission electric power generation options.

As of 2022, Musk has been largely successful in making his plan a reality. In 2009, Tesla released the Roadster. The car had a top speed of 125 miles and a 244-mile range. However, its high price of \$109,000, was unaffordable for most buyers. [20]

In 2012, Tesla released the Model S, a luxury sedan that went on to win multiple awards for its quality and design. In the same year, it released the Model X, a luxury SUV, to capture a growing SUV market. The car was difficult to manufacture and had many issues.

In 2016, Tesla purchased SolarCity, a Californian solar energy generation provider. This acquisition marked the achievement of the last step of Musk's plan. In 2017, the company unveiled the Tesla Solar Roof, a revolutionary solar panel in the shape of roof shingles, as shown in Figure 2.2.

In 2017, Tesla released the Model 3, the company's first affordable, high-volume vehicle. Thanks to a modest price of \$35,000, the car had received over 400,000 pre-orders before production. The Model 3 had a maximum range of 358 miles and a top speed of 162 mph.

In 2016, Musk expanded his master plan, summarizing his future goals. [41]

1. Create stunning solar roofs with seamlessly integrated battery storage.
2. Expand the electric vehicle product line to address all major segments.

3. Develop a self-driving capability that is 10X safer than manual via massive fleet learning.
4. Enable your car to make money for you when you aren't using it.

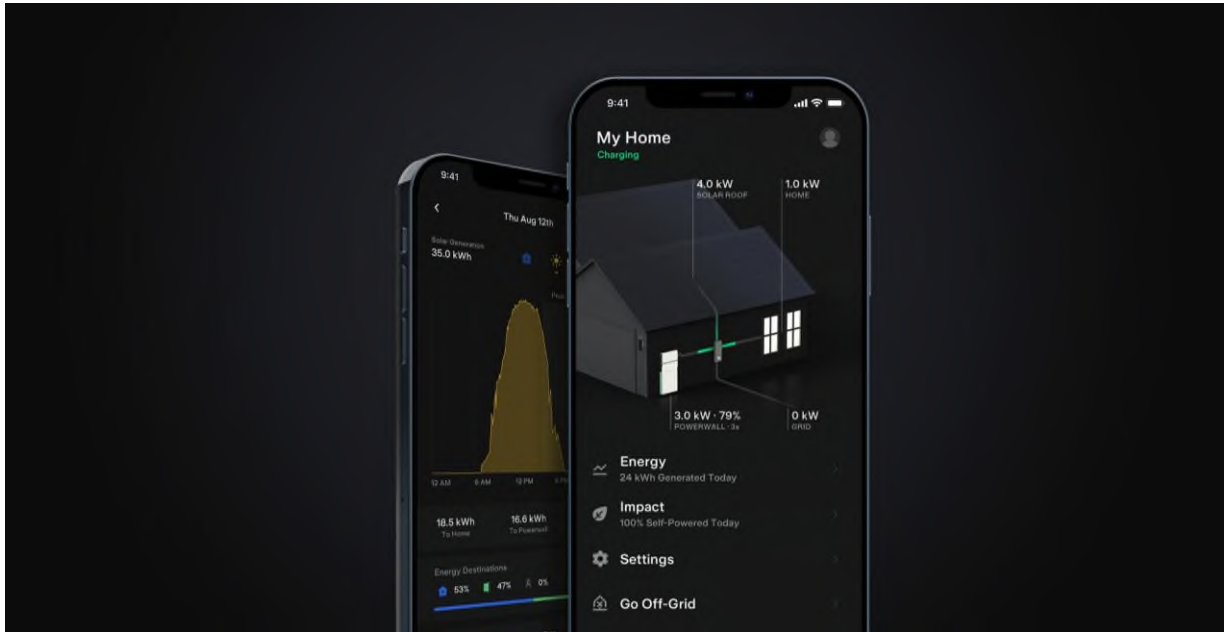


Fig. 2.2. Solar roof analytics as seen on the Tesla mobile app. Source: [41]

As of 2022, Musk is yet unable to fulfill these goals. In March 2022, Tesla paused Solar Roof installations due to supply issues and customer complaints. In 2017, the company unveiled the Tesla Semi, a fully-electric semi-truck. In 2019, Tesla unveiled the Cybertruck, an all-electric light-duty truck. The production of both models has been delayed for several years. Tesla's self-driving capability has been criticized for causing accidents, including deaths. Lastly, Musk's promise of Robotaxis that generate passive income is yet to come. [20]

The term "market environment" is used to describe the set of all factors that influence the decision-making process in an organization. The market environment of a firm is comprised of an internal and external level. The former includes the internal aspects of a company, which contribute to its performance. The latter consists of the external aspects that contribute to a company's performance, such as laws and regulations. [46]

To analyze Tesla’s internal market environment we can use the SWOT model, as shown in Figure 2.3. The purpose of this tool is to evaluate the strengths, weaknesses, opportunities, and threats of a firm. To analyze Tesla’s external environment, we can use the PESTEL model, as shown in Figure 2.4. Its goal is to assess the influence of political, economic, social, technological, environmental, and legal factors on the company’s operations and performance. [5]

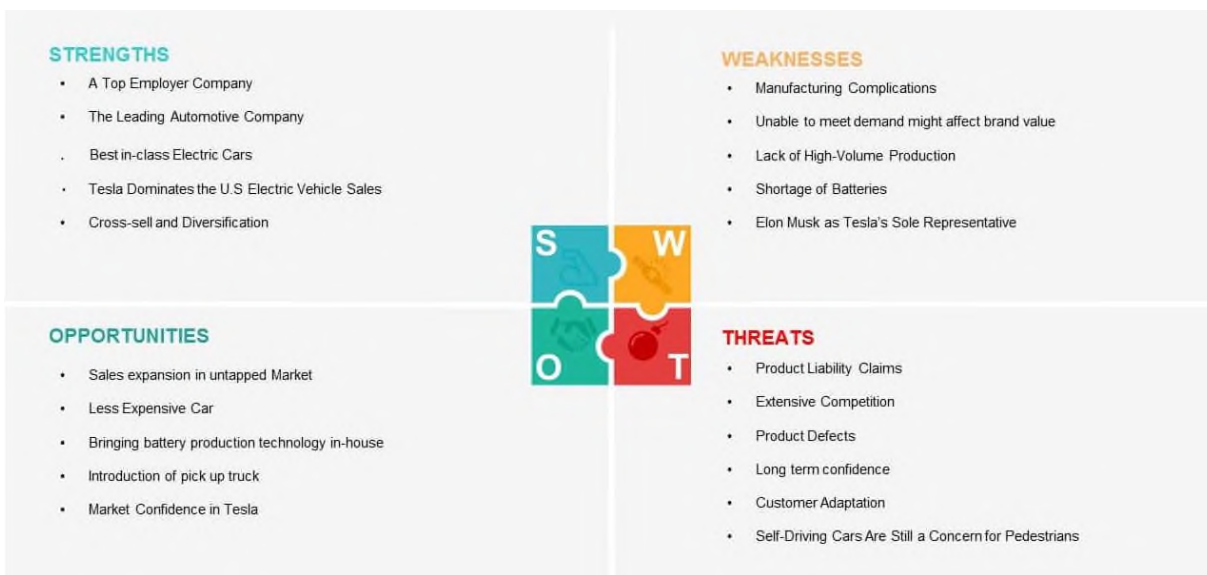


Fig. 2.3. SWOT Analysis of Tesla, Inc. Source: [27]

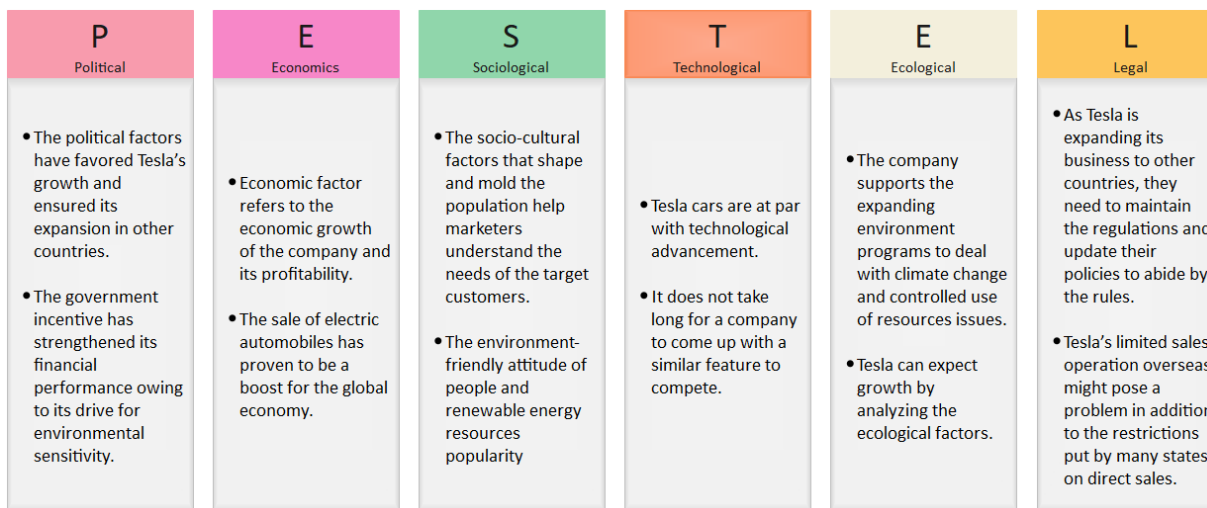


Fig. 2.4. PESTEL analysis of Tesla, Inc. Source: [19]

The term “organizational structure” refers to the system of delegating certain roles and responsibilities within an organization. Moreover, a firm’s organizational structure controls the flow of information between employees. In centralized structures, decisions are made at the top and flow downwards. Meanwhile, in decentralized structures, decisions are made throughout the company, regardless of hierarchy. There are four key types of organizational structures: [35]

Functional organizational structures are most commonly used by SMEs. A functional structure breaks down operations into departments that function separately from each other. These include marketing, finances, operations, human resources, and IT.

Divisional organizational structures are most commonly used by large companies. A divisional organizational structure separates operations into various business units. Each unit focuses on a separate product or project and may have its president.

Flat organizational structures are most commonly used by startups. A flat structure flattens the company’s chain of command and allows employees to be autonomous. The main advantage of this structure is a higher speed of project implementation.

Matrix organizational structures are the least commonly used. A matrix structure combines elements of functional and divisional organizational structures. As a result, employees may have multiple duties across various departments and divisions.

Tesla uses a functional organizational structure to delegate roles and responsibilities, and control the flow of information among its employees. The company operates global functional centers that cover all of its business activities, including technology, engineering, design, finance, and marketing. Each center has a

hierarchical structure that requires its employees to report to managers, who in turn report to the C-suite. [21]

Tesla's geographical divisions, located in the United States, China, Norway, and other countries, all report to the main headquarters in Palo Alto, California. This structure streamlines the flow of information between divisions and consolidates the span of control across departments. Tesla's board of directors is led by Chairperson Robyn Denholm and includes CEO Elon Musk, among seven other board members, as shown in Figure 2.5. [43]

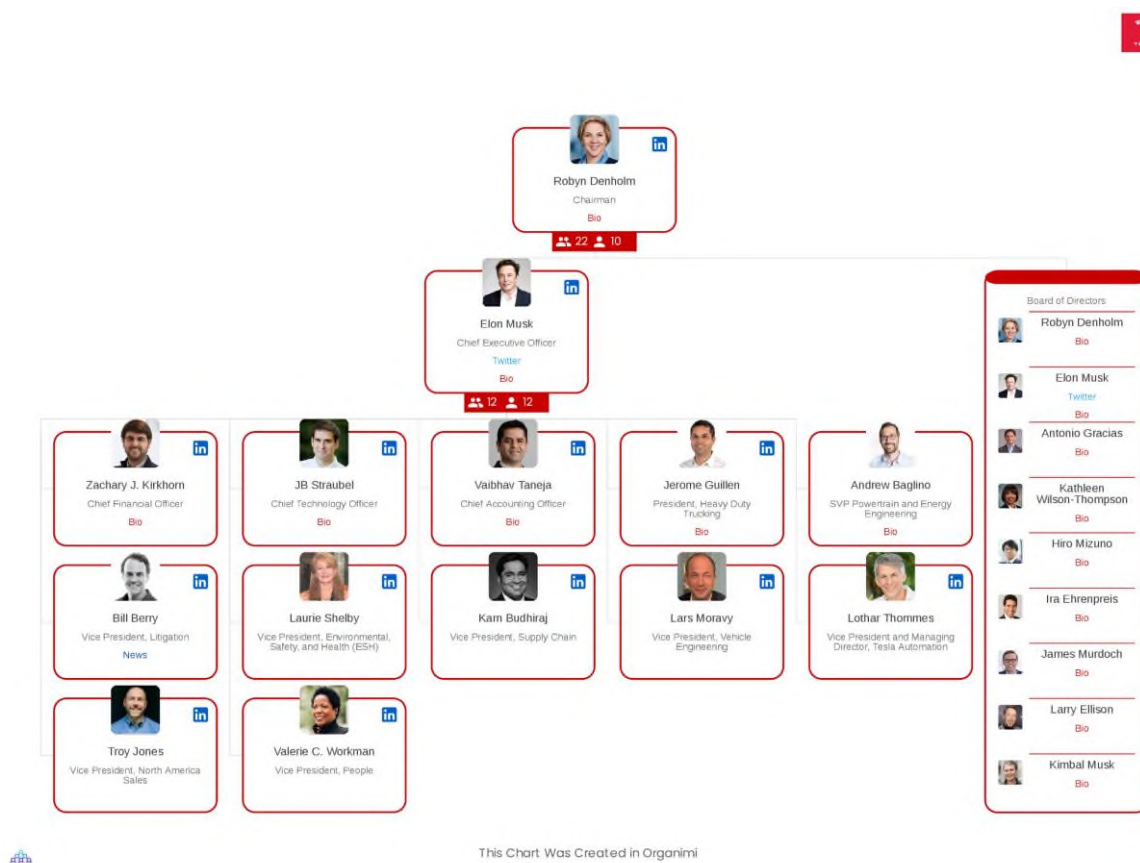


Fig. 2.5. The organizational chart of Tesla, Inc. Source: [43]

2.2. Analysis of Tesla's main competitors in the global electric vehicle market

As of May 2022, there are over 1.2 billion automobiles in use worldwide. Approximately 60 millions of those are electric vehicles. Thus, EVs currently have a 5% share of the total global car market. Despite this low figure, Tesla has been at the forefront of the EV market since the release of its first car, the Tesla Roadster, in 2008. Tesla's innovation in the manufacturing and design of electric vehicles has made EVs more affordable and more desirable for previous users of internal combustion engine cars. [44]

According to Bloomberg, the three largest markets for electric vehicles as of May 2022 are the People's Republic of China (50% market share), the United States (35%), and Europe (8%), as shown in Figure 2.6. [23]

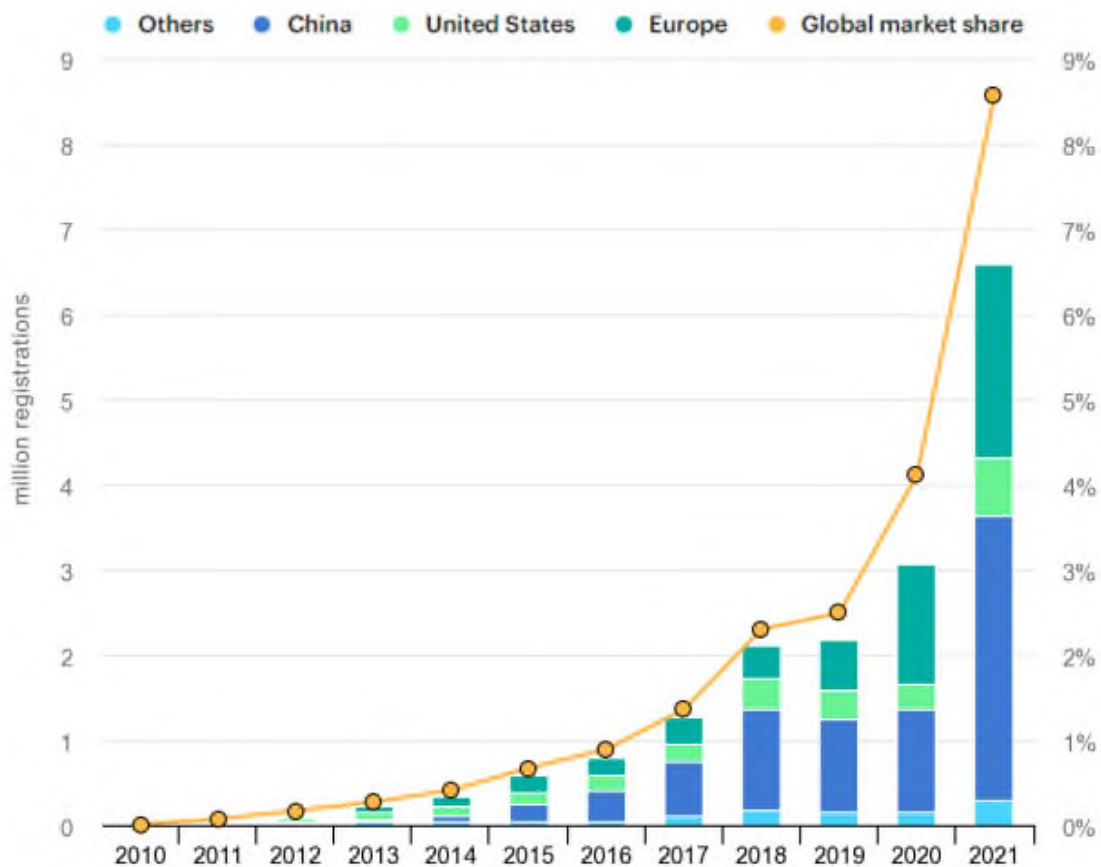


Fig. 2.6. Global EV sales and market share, 2010-2021. Source: [23]

In 2021, Tesla has sold over 930 thousand units worldwide, giving the company a 14% market share of the global electric vehicle market, as shown in Figure 2.7. In the second place, the German-based Volkswagen Group gained an 11% market share. In the third place, the Chinese-based BYD Auto earned a 9% market share. In the fourth place, the American-based General Motors obtained a market share of 7.6%. In the fifth place, the Dutch-based Stellantis N.V. earned a market share of 6%. In the sixth place, the South Korean Hyundai Motors reached a market share of 5%. [8]

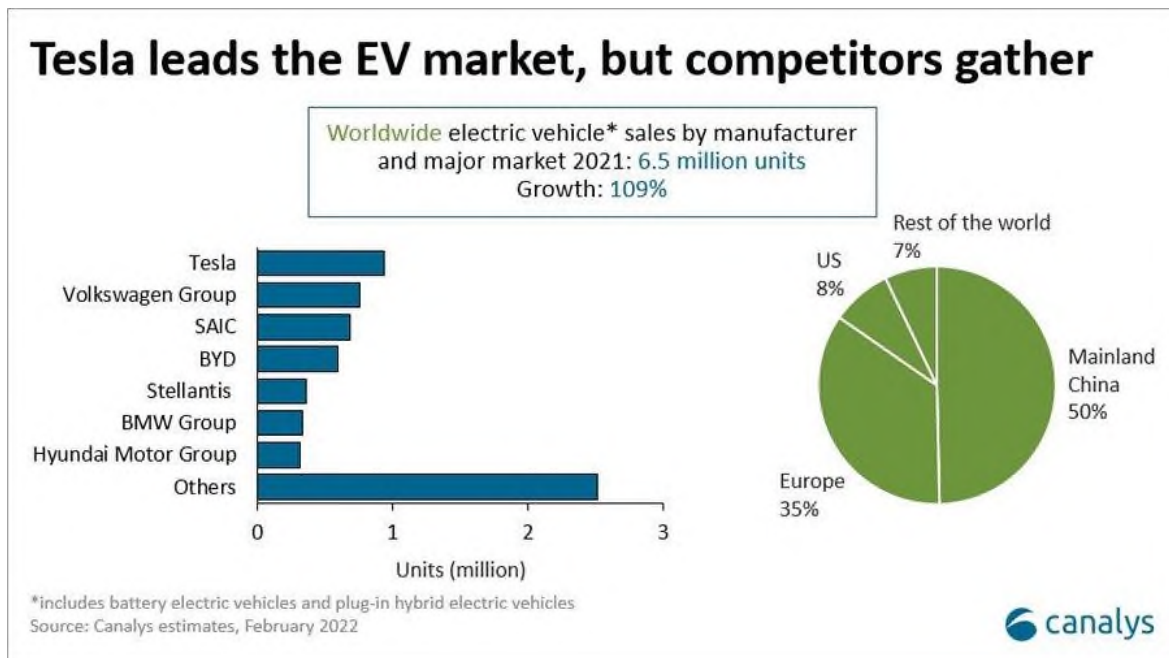


Fig. 2.7. Worldwide EV sales by the manufacturer, 2021. Source: [8]

Volkswagen Group is a German multinational car manufacturing firm. The company was founded in 1937 under the Nazi regime to create the “German People’s Car”. In 1961, Volkswagen went public on the Frankfurt Exchange. As of 2 May 2022, the company has a market capitalization of €89.12 billion, or \$103.13 billion. In 2021, Volkswagen earned €250.2 billion in revenue and €15.43 billion in net income. In the same year, the company had over 313 thousand employees worldwide.

As of 2022, Volkswagen operates in over 150 countries. The company owns a wide range of subsidiaries and brands, including Audi, Bentley, Porsche, Seat, and Skoda. Volkswagen’s largest shareholders include Porsche (31.4%), foreign institutional investors (25.9%), and Qatar Holding LLC (14.6%). In 2021, the company launched a new generation of fully electric cars called the I.D. family. Volkswagen’s most popular EV models include the e-up, e-Golf, and I.D. CROZZ SUV, and I.D. BUZZ van. [3]

BYD Auto is a subsidiary of BYD Company, a Chinese multinational manufacturer. The company was founded in 2003, following BYD’s acquisition of

another Chinese carmaker. BYD went public on the Hong Kong Stock Exchange in 2022, amassing a market capitalization of 567 trillion yuan or \$84.42 billion as of 2 May 2022. In 2021, the company earned 216 billion yuan in revenue and 3 billion yuan in net income. In the same year, the company had over 288 thousand employees worldwide.

As of 2022, BYD operates seven manufacturing plants and R&D facilities across China, as well as four factories in Brazil, Hungary, Canada, and California. The company has engaged in several joint ventures with German-based Daimler AG and Japanese-based Toyota to create luxury minivans and SUVs. BYD's current car line-up includes the e1 city car, Qin compact sedan, Tang SUV, and more. In addition to plug-in hybrids and EVs, the company also manufactures fully electric buses, coaches, vans, and trucks. [6]

General Motors is an American multinational automobile manufacturer. Founded in 1908, the company is one of the oldest in its industry and remains the largest carmaker in the US to this day. General Motors went public on the New York Stock Exchange in 2010. As of 2 May 2022, the company has a market capitalization of \$56.07 billion. In 2021, General Motors earned \$127 billion in revenue and \$9.95 billion in net income. In the same year, the company had 157 thousand employees worldwide.

As of 2022, General Motors operates 396 facilities, including eight manufacturing plants around the world. The company owns several car brands, including Cadillac, Chevrolet, GMC, and Buick. General Motors has also engaged in joint ventures with several Chinese and US companies. The company has committed to investing \$35 billion in EVs between 2020 and 2025. Its current lineup of electric vehicles includes the GMC Hummer EV Pickup and SUV, Cadillac LYRIQ, Chevrolet Silverado, and Equinox EVs. [26]

Stellantis N.V. is a Dutch multinational manufacturing company. Founded in 2021, it was created following the merger of Italian-American Fiat Chrysler and French-based PSA Group. Stellantis is publicly traded in the US, Italy, and France. As of 2 May 2022, the company has a market capitalization of \$41.98 billion on the NYSE. In 2021, Stellantis earned €152.1 billion or \$159.87 billion in revenue and €15.43 billion in net income. In the same year, the company had over 280 thousand employees worldwide.

As of 2022, Stellantis operates manufacturing plants and R&D facilities in 130 countries. The company owns 16 brands of automobiles, including Alfa Romeo, Citroen, Fiat, and Jeep. Its main stockholders are the Dutch holding company Exor N.V. (14.35%) and the French investment firm Peugeot Invest (7.16%). The company's goal is to sell 100% battery electric vehicles in Europe by 2030. As of 2022, Stellantis has developed several BEV concepts and plans to increase the number of BEV models to 75 by 2030. [33]

Hyundai Motors is a South Korean multinational auto manufacturer. Founded in 1964, the company operates the single largest car manufacturing facility in the world. Hyundai is listed on the Korea Stock Exchange and London Stock Exchange since 2010. As of 2 May 2022, the company has a market capitalization of \$19.78 billion. In 2021, Hyundai earned 117.61 trillion won or \$94.09 billion in revenue and 5.69 trillion won in net income. In the same year, the company had over 121 thousand employees worldwide.

As of 2022, Hyundai operates manufacturing facilities in 10 countries, including South Korea, India, China, and the US. The company owns three brands: Genesis, Ioniq, and Kia. Hyundai's largest shareholder is Hyundai Mobis (21.43%), while the current and former CEOs own a combined 8% stake in the company. As of 2022, Hyundai offers a wide range of hybrid, electric, and hydrogen-powered

vehicles. These include the Hyundai Avante LPI, Hyundai Ioniq 5, and Hyundai Nexo vehicles, respectively. [30]

2.3. Impact of the COVID-19 pandemic on the international competitiveness of the global electric vehicle market

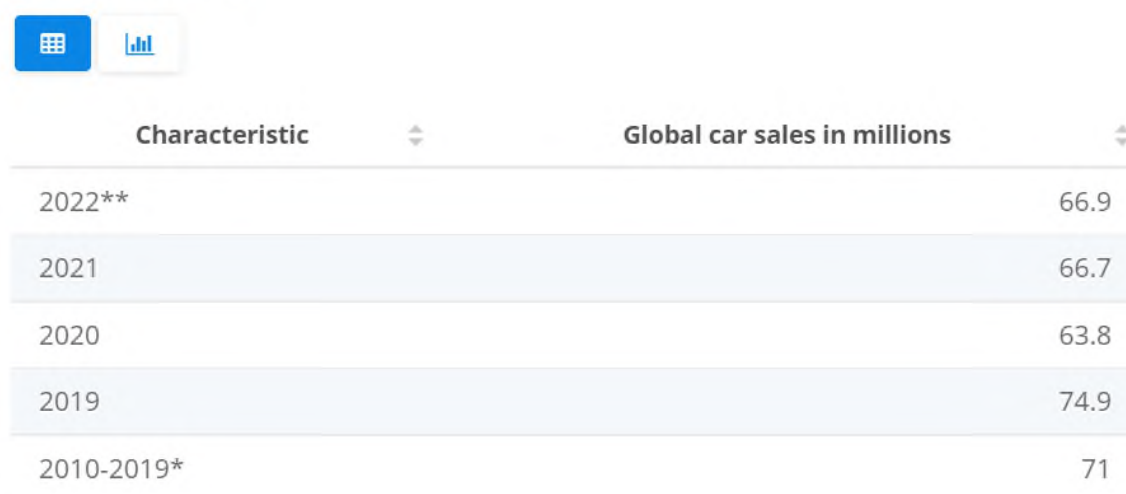
The COVID-19 pandemic has had a devastating impact on the performance and competitiveness of the global automotive industry. During the first few months of the pandemic, car companies were concerned about supply chain disruption due to delayed shipments of Chinese-made car parts. In the upcoming months, multiple car factories across Europe and the US were forced to shut down. These closures accelerated payment defaults, requiring major banks to step in to resolve the situation.

After the pandemic's first year, worldwide demand for new cars dropped significantly, leading to an increase in M&A activity among car brands. [29]

Figure 2.8. shows the sudden drop in global car sales following the COVID-19 outbreak.

Number of cars sold worldwide between 2010 and 2022

(in million units)



Characteristic	Global car sales in millions
2022**	66.9
2021	66.7
2020	63.8
2019	74.9
2010-2019*	71

Fig. 2.8. Worldwide car sales between 2010 and 2022. Source: [10]

The extended contraction of consumer demand in the global car market, caused by restrictive government measures, including lockdowns, is likely to cause a global recession. A new economic crisis will lead to a general loss of consumer confidence, thus impacting car manufacturer revenues and profitability. Car companies may be forced to exit unprofitable international markets and car segments. As decisions to cut down unprofitable operations increase, the output will lower significantly, until manufacturing capacity is fully consolidated and rationalized. [32]

Global suppliers of car parts that liquidity issues are likely to experience further disruptions in operations due to worsening market conditions. These issues will further exacerbate disruptions, leading to potentially destructive consequences across the entire ecosystem of global car manufacturing. The automotive retail sector

may be forced to significantly restructure operations, as dealers become unable to react in time to quickly changing conditions of market demand. Car manufacturers may resort to diverting capital in order to support continuous production, leading to a decrease in R&D funding for new innovative projects. [29]

Figure 2.9. shows a graph of worldwide motor vehicle sales from 2000 and 2001, demonstrating a sharp decline in sales from 2019 to 2020, and a slight recovery from 2020 to 2021.

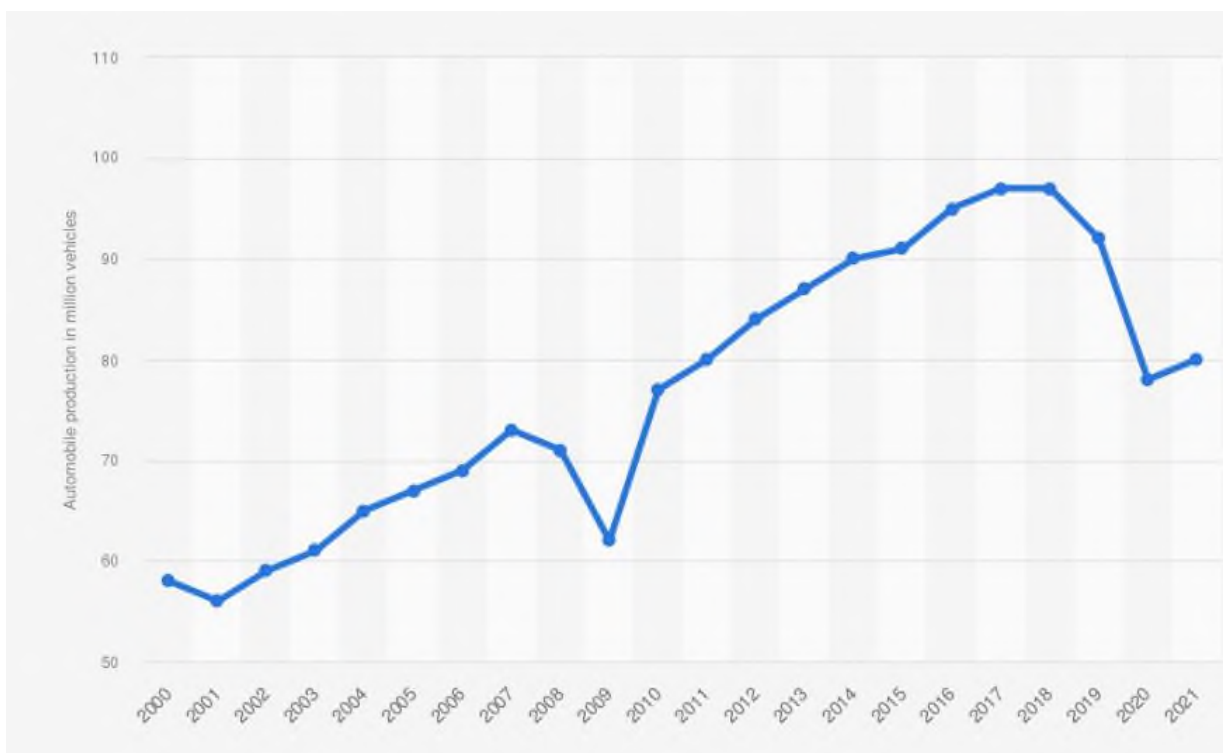


Fig. 2.9. Worldwide motor vehicle production, 2000-2021. Source: [16]

According to the French international trade association OICA, the total output of the global automotive industry equaled 78 million vehicles in 2020, down almost 16% from 2019 figures, as seen in Figure 2.10. This sudden drop marks the sharpest decline in global motorized vehicle production ever recorded.

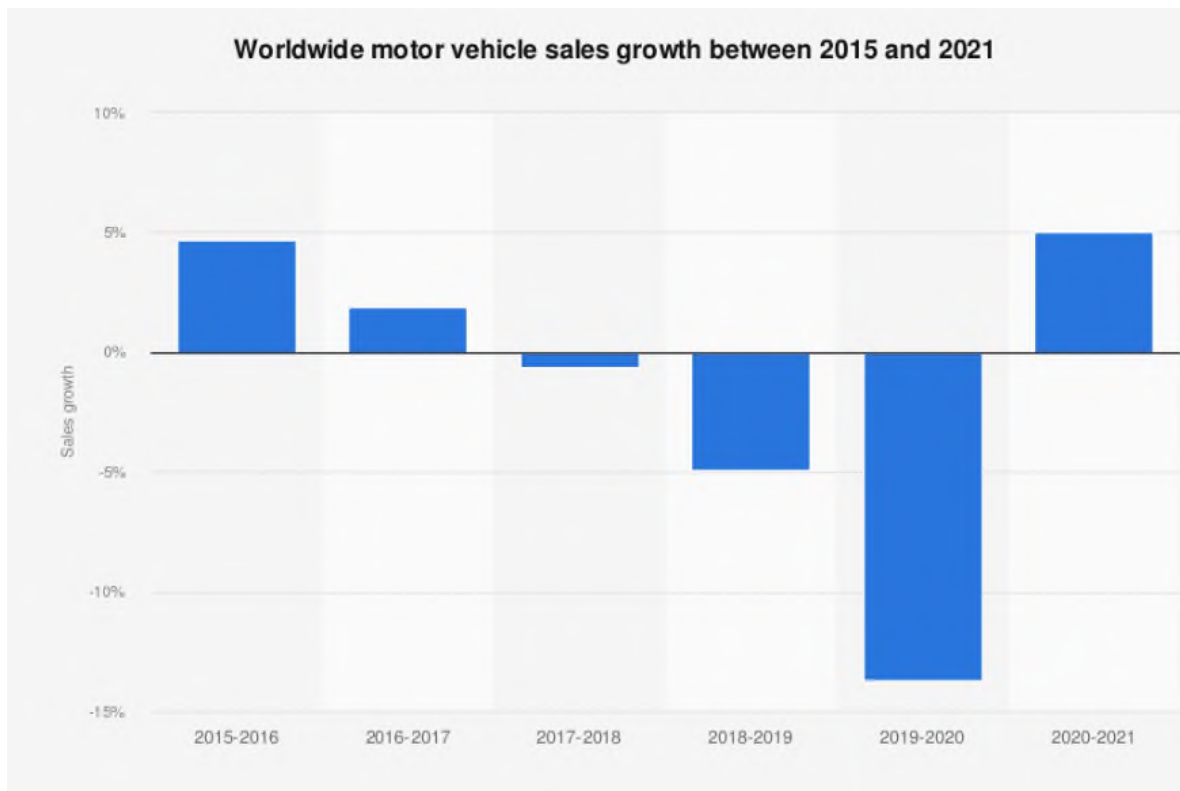


Fig. 2.10. Worldwide motor vehicle sales growth, 2015-2021. Source: [60]

According to analytics agency Statista, the global vehicle industry will grow to 8.93 trillion dollars in 2030, about 40% of which will come from new vehicle sales, as shown in Figure 2.11. This being said, future growth will depend significantly on the future state of the COVID-19 pandemic and the anti-coronavirus measures of world governments. [51]

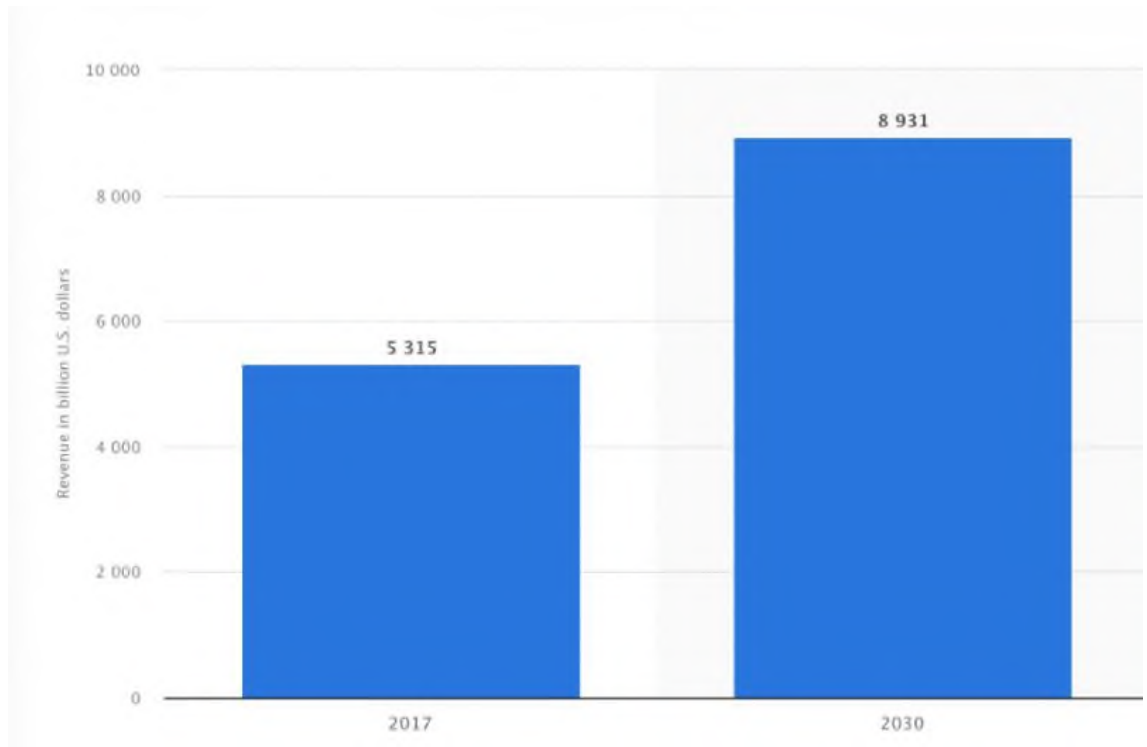


Fig. 2.11. Global auto industry revenue, 2017 and 2030 (estimate). Source: [60]

CHAPTER 3. PERFORMANCE OF THE INTERNATIONAL COMPETITIVENESS MEASURES OF TESLA AND ITS COMPETITORS

3.1. Assessment of international competitiveness measures implemented by Tesla, Inc.

In 2018, Tesla opened Gigafactory 3 (shown in Figure 3.1.) in Shanghai, a Chinese city known for its innovation and manufacturing. In December 2019, the company began planning for the spread of the coronavirus outside of China. To mitigate any potential disruptions caused by COVID-19, the factory cooperated with local businesses along with the Chinese government. Tesla's fast and calculated response to the COVID-19 pandemic ensured the company would remain competitive and profitable in the future. [4]



Fig. 3.1. Aerial view of Gigafactory Shanghai, April 2022. Source: [62]

In cooperation with various HR, Travel, Security, and EHS leaders, Tesla's management worked to assess risks and execute anti-COVID policies with minimum risk and maximum returns. Tesla's CEO Elon Musk personally spearheaded a

pandemic management team among the company leadership and created the Tesla Playbook, shown in Figure 3.2., a framework for implementing COVID-19 practices and policies. This framework consisted of six steps that would ensure a return to operations. [54]

1. Prepare the Building
2. Prepare the Workforce
3. Control Access
4. Create Social Distancing Plans
5. Reduce Touchpoints and Increase Cleaning
6. Verify

How We're Helping to Keep You Safe



Fig. 3.2. Section from Tesla's COVID-19 measures playbook. Source: [42]

Across US facilities, Tesla implemented a track-and-trace system that proved to be 99.9% effective at stopping the spread of COVID-19. Less than forty US Tesla employees had contracted the virus in 2020. Employees received training to prevent contracting the virus. In 2020, all Tesla customers were offered a touchless delivery option. In March 2021, free vaccinations were offered for senior employees. In April of the same year, vaccinations became free of charge for all employees of all ages. [1]

Despite Tesla's success in terms of ensuring the health of its factory workers in the United States and China, some of the company's decisions were met with public scrutiny and criticism. In early 2020, while other American companies began to offer remote work solutions to employees, Elon Musk instead chose to enforce strict COVID-19 testing measures. In March 2020, Tesla's CEO was reprimanded by local authorities and public officials, including Californian Governor Gavin Newsom. [39]

In late March, Musk was forced to temporarily cease operations at Tesla's Fremont factory, which employed over 10,000 workers at the time. Meanwhile, Tesla's factory in Reno, Nevada, remained open. Its employees were informed about a coworker who had caught the virus only weeks later. In May 2020, the Washington Post alleged that over 125 cases of COVID-19 were discovered at Tesla's Fremont factory. Musk's response to the article on his Twitter account, shown in Figure 3.3., was met with further public outcry. [39]



Fig. 3.3. Tesla CEO Elon Musk responds to public backlash on Twitter. Source: [39]

2.3. Assessment of international competitiveness measures implemented by the global automotive market

The COVID-19 pandemic has been the largest challenge to the global automotive industry since the Great Recession of 2009. In March of 2020, once the coronavirus had reached the United States, the US federal government and local authorities implemented a series of restrictive measures to stop the spread of COVID-19. The consequences of these measures have been devastating to the United States economy in its entirety, impacting multiple industries, which include car manufacturing. [24]

These measures forced the US car manufacturers and dealers to change alter their operations to turn new market changes into competitive advantages. These competitive advantages include the following retail digitalization, touchless service, and ownership preference. [57]

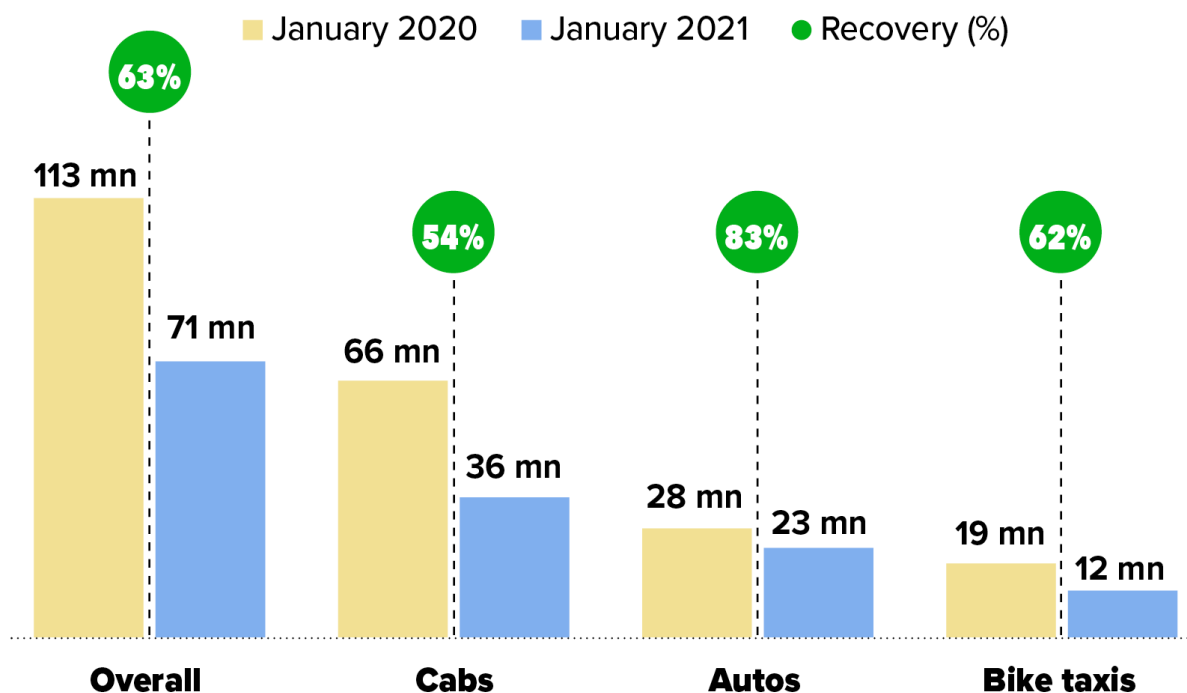


Fig. 3.4. Means of transportation preference in US consumers, 2020-2021. Source: [22]

In 2020, car dealerships were one of the heaviest adopters of digital retail. While over 70% of franchise dealers were offering a digital purchasing solution, independent dealers were lagging at only 40%. By 2021, one in three franchise dealers offered a fully online car buying experience. In the same year, close to 80% of carmakers had a plan to implement an online purchasing process. [24]

According to a survey by Cox Automotive, over 75% of US franchise dealers said that digital retail was a major source of efficiencies. Meanwhile, over 60% of respondents said that digital retail had a positive impact on car sales. According to the same survey, over 55% of heavy digital buyers said their purchasing experience had improved. Meanwhile, just under 45% of light digital buyers saw improvements.

Before 2020, most US car buyers reported that their biggest pain point was the dealership service experience. Measures that mitigate the spread of COVID-19, including social distancing and remote work, have significantly changed the car buying experience. Before 2020, the wait time for car maintenance and repair averaged between two and three hours. After 2020, wait times shrunk significantly.

In April 2020, 67% of franchise dealers offered service pick-up and delivery for repair and maintenance. In October of the same year, this number fell to 58%. By 2021, only 48% of car dealerships offered the service. Although the interest for service pick-up and delivery grew due to customer health concerns, the adoption of the service gradually declined due to high staff, financial, and time requirements.

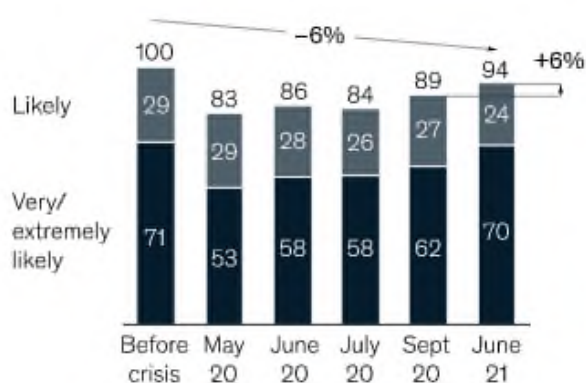
Before the COVID-19 pandemic, most Americans relied on public transportation, ride-sharing apps, and taxis for transportation needs. Social distancing, rising taxi and ride-sharing app costs per mile, and other effects of anti-COVID government measures shifted customer preference. In May 2020, 68% of respondents said they relied on a personal car for transportation. In January 2021, this number grew to 73%. [57]

Consumers' new car purchase intent is approaching pre-COVID-19 levels—aftermarket is robust and actual mobility usage is recovering.

Results of wave 1 (May 2020), wave 3 (June 2020), wave 4 (July 2020), wave 5 (Sept 2020), and wave 7 (June 2021)¹

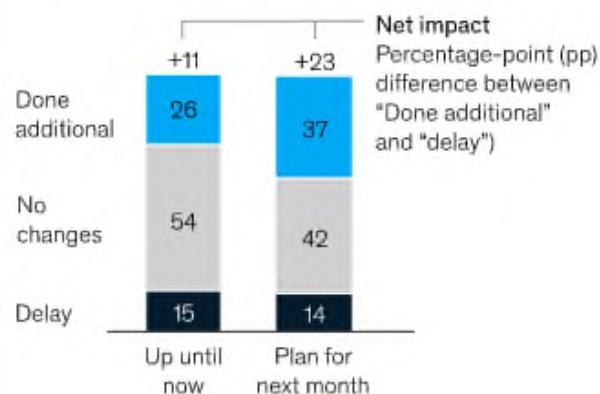
Car buying

New car purchase intent^{1,2}
% of respondents



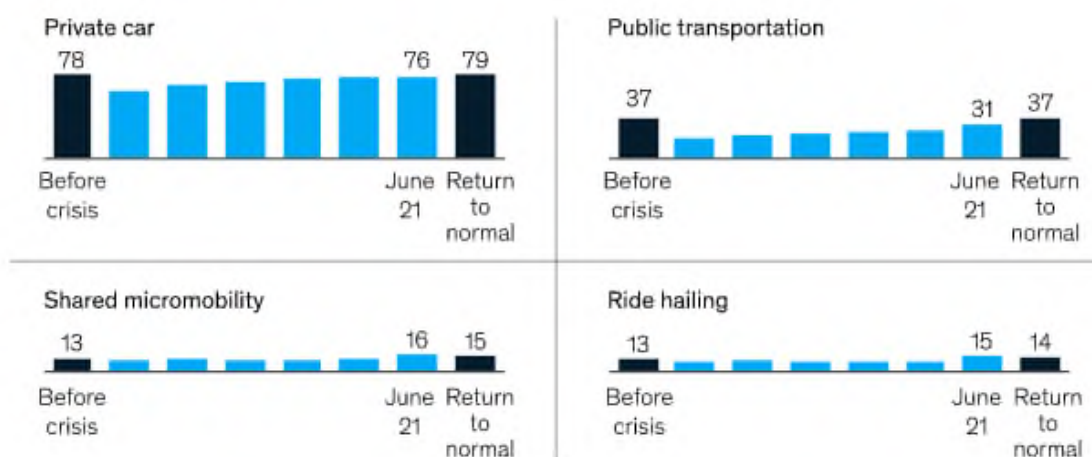
Aftermarket

Changes in maintenance and repair since beginning of COVID-19,³ % of respondents



Mobility

Change in mobility mode use
% of respondents using mode \geq once/week



¹ Q: Before the COVID-19 crisis started, how likely were you to buy a new car?

² Q: During or after the COVID-19 crisis, how likely will you be to buy a new car?

³ Q: What type of maintenance, repair, and improvement work have you delayed or done additionally?

Source: McKinsey Global COVID-19 Automotive & Mobility Consumer Survey

Fig. 3.5. Car purchasing behavior in US consumers, 2020-2021. Source: [45]

- Pre-pandemic, 88% of surveyed Americans said they preferred a personal vehicle for transportation. This figure remained the same during the pandemic.

- Pre-pandemic, 56% of respondents said they preferred ride-sharing applications for transportation. This figure fell sharply to 29% during the pandemic.
- Pre-pandemic, 48% of surveyed Americans said they preferred public transportation, such as buses and trains. This figure fell considerably to 24% during the pandemic.
- Pre-pandemic, 31% of respondents said they preferred taxis for their transportation needs. This figure fell sharply to 15% during the pandemic.
- Pre-pandemic, 20% of surveyed Americans said they preferred car-sharing applications for transportation purposes. This figure fell to 12% during the pandemic. [57]

3.3. Analysis of the performance of Tesla, Inc. and its competitors during the COVID-19 pandemic.

Total assets are the sums of all assets on a firm's balance sheet. Current or short-term assets include cash on hand, receivables, inventory, and pre-paid expenses. Noncurrent or long-term assets include PP&E, long-term investments, goodwill, and intangible assets. [11]

- In 2020, Tesla's total assets equaled \$52.15 billion, which represents a 52% increase from 2019.
- In 2021, Tesla's total assets equaled \$62.13 billion, which represents a 19.14% increase from 2020.
- In Q1 2022, Tesla's total assets equaled \$66.04 billion, which represents a 24.67% increase YOY.

Total liabilities are defined as the sum of all debts a firm owes to its creditors. Short-term, long-term, and other liabilities are located on the company's balance sheet. [52]

- In 2020, Tesla's total liabilities equaled \$29.07 billion, which represents an 8.31% increase from 2019.
- In 2021, Tesla's total liabilities equaled \$31.12 billion, which represents a 7.03% increase from 2020.
- In Q1 2022, Tesla's total liabilities equaled \$31.09 billion, which represents a 6.81% increase YOY.

Shareholder equity, also called business net worth, refers to the difference between total assets and total liabilities and illustrates whether a firm is able to cover its liabilities. [52]

- In 2020, Tesla's shareholder equity equaled \$23.08 billion, which represents a 209.03% increase from 2019.

- In 2021, Tesla's shareholder equity equaled \$31.02 billion, which represents a 34.41% increase from 2020.
- In Q1 2022, Tesla's shareholder equity equaled \$34.95 billion, which represents a 46.44% increase YOY.





















Annual Data Millions of US \$ except per share data		2021-12-31	2020-12-31	2019-12-31
Cash On Hand		\$17,707	\$19,384	\$6,268
Receivables		\$1,913	\$1,886	\$1,324
Inventory		\$5,757	\$4,101	\$3,552
Pre-Paid Expenses		\$1,723	\$1,346	\$959
Other Current Assets		-	-	-
Total Current Assets		\$27,100	\$26,717	\$12,103
Property, Plant, And Equipment		\$18,884	\$12,747	\$10,396
Long-Term Investments		-	-	-
Goodwill And Intangible Assets		\$457	\$520	\$537
Other Long-Term Assets		\$9,163	\$7,515	\$7,608
Total Long-Term Assets		\$35,031	\$25,431	\$22,206
Total Assets		\$62,131	\$52,148	\$34,309
Total Current Liabilities		\$19,705	\$14,248	\$10,667
Long Term Debt		\$5,245	\$9,607	\$11,634
Other Non-Current Liabilities		\$3,546	\$3,330	\$2,691
Total Long Term Liabilities		\$11,411	\$14,825	\$16,175
Total Liabilities		\$31,116	\$29,073	\$26,842
Common Stock Net		\$1	\$1	\$1
Retained Earnings (Accumulated Deficit)		\$331	\$-5,399	\$-6,083
Comprehensive Income		\$54	\$363	\$-36
Other Share Holders Equity		-	-	-
Share Holder Equity		\$31,015	\$23,075	\$7,467
Total Liabilities And Share Holders Equity		\$62,131	\$52,148	\$34,309

Fig. 3.6. The balance sheet of Tesla, Inc., 2019-2021. Source: [56]

Tesla Vehicle Sales (Quarterly Deliveries)

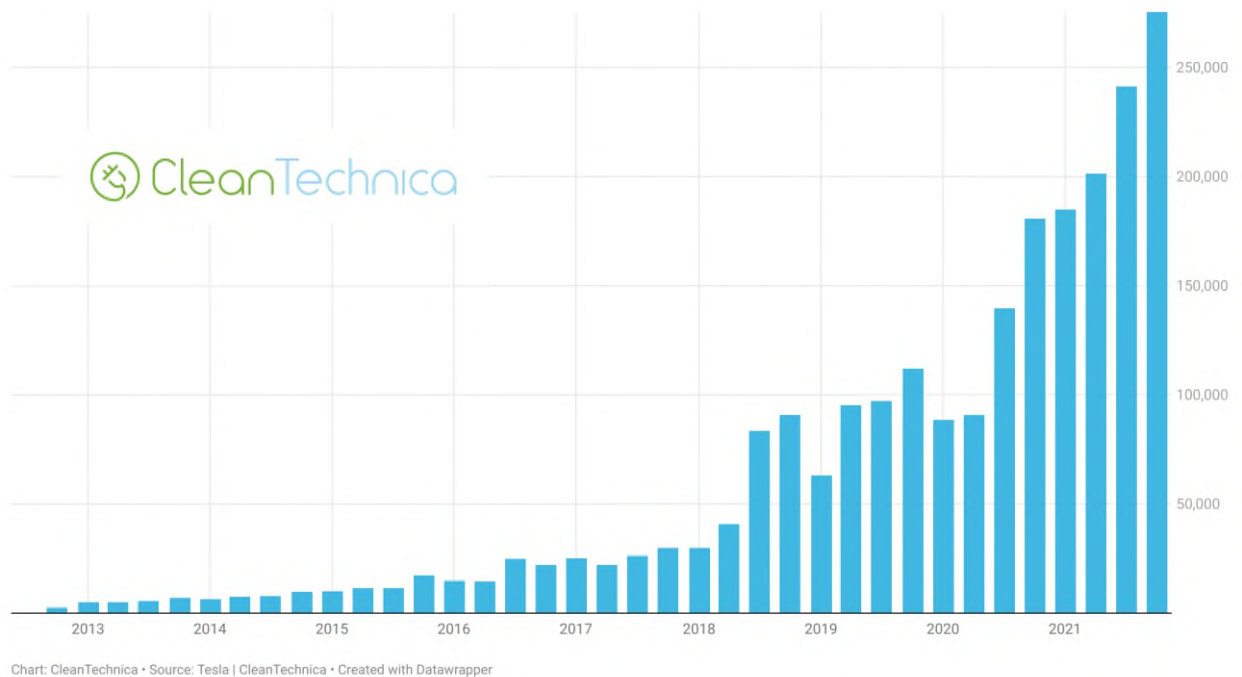


Fig. 3.7. Tesla vehicle sales, 2013-2022. Source: [48]

Revenue refers to the money a firm receives from its customers in return for selling its goods and services. Revenue is placed at the top of the income statement, a financial statement that reports a firm's financial performance over a certain accounting period. [52]

- In 2020, Tesla's annual revenue equaled \$31.54 billion, which represents a 28.31% increase from 2019.
- In 2021, Tesla's annual revenue equaled \$53.82 billion, which represents a 70.67% increase from 2020.
- In Q1 2022, Tesla's quarterly revenue equaled \$18.76 billion, which represents an 80.54% increase YOY.

Gross profit refers to the profit a firm has left once it has deducted all the variable costs directly associated with its operations. Variable costs vary in relation to production value and include the costs of raw materials, direct labor, shipping, delivery, and more. [52]

- In 2020, Tesla's annual gross profit equaled \$6.63 billion, which represents a 62.94% increase from 2019.
- In 2021, Tesla's annual gross profit equaled \$13.61 billion, which represents a 105.22% increase from 2020.
- In Q1 2022, Tesla's quarterly gross profit equaled \$5.46 billion, which represents a 146.51% increase YOY.

Operating income refers to a firm's income once operating expenses have been deducted. [52]

- In 2020, Tesla's annual operating income equaled \$1.99 billion, which represents a 2989.86% decline from 2019.
- In 2021, Tesla's annual operating income equaled \$6.52 billion, which represents a 227.13% increase from 2020.
- In Q1 2022, Tesla's quarterly operating income equaled \$3.60 billion, which represents a 506.57% increase YOY.

Net income refers to a firm's net profit or loss once all expenses are deducted. [52]

- In 2020, Tesla's annual net income equaled \$0.72 billion, which represents a 183.64% decline from 2019.
- In 2021, Tesla's annual net income equaled \$5.52 billion, which represents a 665.46% increase from 2020.
- In Q1 2022, Tesla's quarterly net income equaled \$3.32 billion, which represents a 657.53% increase YOY.

Figures 3.8. through 3.13 compare the annual income statements of Tesla and its five key competitors in the global electric vehicle market. By comparing the performance of each firm in 2018-2019 (pre-pandemic), and 2020-present, we can determine whether Tesla's anti-coronavirus measures were effective in increasing the company's international competitiveness when compared to its competitors.

Unlike its competitors Volkswagen, BYD, General Motors, Stellantis, and Hyundai, Tesla, Inc. was able to increase its revenue, operating income, EBIT, and net income, and hold positive key performance indicators, despite the negative effects of the COVID-19 pandemic on the global electric vehicle industry.

Breakdown	TTM	12/30/2021	12/30/2020	12/30/2019	12/30/2018
‣ Total Revenue	62,190,000	53,823,000	31,536,000	24,578,000	21,461,268
Cost of Revenue	45,339,000	40,217,000	24,906,000	20,509,000	17,419,247
Gross Profit	16,851,000	13,606,000	6,630,000	4,069,000	4,042,021
‣ Operating Expense	7,245,000	7,110,000	4,636,000	3,989,000	4,294,861
Operating Income	9,606,000	6,496,000	1,994,000	80,000	-252,840
‣ Net Non Operating Interest Inc...	-259,000	-315,000	-718,000	-641,000	-638,538
‣ Other Income Expense	89,000	162,000	-122,000	-104,000	-113,367
Pretax Income	9,436,000	6,343,000	1,154,000	-665,000	-1,004,745
Tax Provision	976,000	699,000	292,000	110,000	57,837
‣ Net Income Common Stockhold...	8,399,000	5,519,000	690,000	-862,000	-976,091
Diluted NI Available to Com Stock...	8,399,000	5,519,000	690,000	-862,000	-976,091
Basic EPS	-	5.60	0.74	-0.98	-1.14
Diluted EPS	-	4.90	0.64	-0.98	-1.14
Basic Average Shares	-	986,000	960,000	885,000	852,625
Diluted Average Shares	-	1,129,000	960,000	885,000	852,625
Total Operating Income as Reported	-3,514,000	-6,523,000	1,994,000	-69,000	-388,073
Total Expenses	52,584,000	47,327,000	29,542,000	24,498,000	21,714,108
Net Income from Continuing & Dis...	8,399,000	5,519,000	690,000	-862,000	-976,091
Normalized Income	8,465,346	5,494,970	690,000	-738,330	-877,371
Interest Income	74,000	56,000	30,000	44,000	24,533
Interest Expense	333,000	371,000	748,000	685,000	663,071
Net Interest Income	-259,000	-315,000	-718,000	-641,000	-638,538
EBIT	9,769,000	6,714,000	1,902,000	20,000	-341,674

Fig. 3.8. Annual income statement of Tesla, Inc. 2018-present (in \$ thousands).

Source: [53]

Breakdown	TTM	12/30/2021	12/30/2020	12/30/2019	12/30/2018
> Total Revenue	250,566,000	250,199,000	222,884,000	252,633,000	235,849,000
Cost of Revenue	203,665,000	202,959,000	183,937,000	203,490,000	189,500,000
Gross Profit	46,901,000	47,240,000	38,947,000	49,143,000	46,349,000
> Operating Expense	27,437,000	31,288,000	28,890,000	33,124,000	31,916,000
Operating Income	19,464,000	15,952,000	10,057,000	16,019,000	14,433,000
> Net Non Operating Interest Inc...	-416,000	-1,229,000	-1,993,000	-2,035,000	-917,000
Pretax Income	24,558,000	20,126,000	11,667,000	18,356,000	15,643,000
Tax Provision	5,819,000	4,698,000	2,843,000	4,326,000	3,489,000
> Net Income Common Stockhold...	18,154,000	14,843,000	8,334,000	13,346,000	11,827,000
Diluted NI Available to Com Stock...	18,154,000	14,843,000	8,334,000	13,346,000	11,827,000
Basic EPS	-	29.59	16.60	26.60	23.57
Diluted EPS	-	29.59	16.60	26.60	23.57
Basic Average Shares	-	501,295	501,295	501,295	501,295
Diluted Average Shares	-	501,295	501,295	501,295	501,295
Total Operating Income as Reported	22,786,000	19,275,000	9,675,000	16,960,000	13,920,000
Total Expenses	231,102,000	234,247,000	212,827,000	236,614,000	221,416,000
Net Income from Continuing & Dis...	18,687,000	15,382,000	8,867,000	13,886,000	12,136,000
Normalized Income	17,110,537	13,797,378	7,330,808	13,443,644	12,731,182
Interest Income	-	990,000	788,000	910,000	967,000
Interest Expense	1,158,000	1,971,000	2,268,000	2,518,000	1,547,000
Net Interest Income	-416,000	-1,229,000	-1,993,000	-2,035,000	-917,000
EBIT	25,716,000	22,097,000	13,935,000	20,874,000	17,190,000

Fig. 3.9. Annual income statement of Volkswagen AG, 2018-present (in € thousands). Source: [59]

Breakdown	TTM	12/30/2021	12/30/2020	12/30/2019	12/30/2018
‣ Total Revenue	241,975,707	216,142,395	156,597,691	127,738,523	130,054,707
Cost of Revenue	210,706,604	187,997,689	126,251,380	106,924,288	108,725,343
Gross Profit	31,269,103	28,144,706	30,346,311	20,814,235	21,329,364
‣ Operating Expense	23,862,922	20,547,527	17,301,155	13,953,184	13,296,423
Operating Income	7,406,181	7,597,179	13,045,156	6,861,051	8,032,941
‣ Net Non Operating Interest Inc...	-577,372	-1,253,603	-2,957,063	-3,144,493	-3,230,870
Pretax Income	4,916,361	4,518,003	6,882,587	2,431,131	4,385,640
Tax Provision	548,637	550,737	868,624	312,274	829,447
‣ Net Income Common Stockhold...	3,616,240	3,045,188	4,234,267	1,614,450	2,780,194
Diluted NI Available to Com Stock...	-	-	4,017,633	-	-
Basic EPS	-	1.06	1.47	0.50	0.93
Diluted EPS	-	1.06	1.47	0.50	0.93
Basic Average Shares	-	2,872,819	2,880,454	3,228,900	2,989,456
Diluted Average Shares	-	2,872,819	2,880,454	3,228,900	2,989,456
Total Operating Income as Reported	5,046,808	4,631,992	7,085,773	2,312,288	4,241,760
Total Expenses	234,569,526	208,545,216	143,552,535	120,877,472	122,021,766
Net Income from Continuing & Dis...	3,616,240	3,045,188	4,234,267	1,614,450	2,780,194
Normalized Income	3,406,800	2,973,813	4,538,513	2,124,303	3,625,522
Interest Income	876,566	631,841	214,613	353,761	187,230
Interest Expense	1,698,890	1,907,642	3,123,801	3,487,407	3,118,751
Net Interest Income	-577,372	-1,253,603	-2,957,063	-3,144,493	-3,230,870
EBIT	6,615,251	6,425,645	10,006,388	5,918,538	7,504,391

Fig. 3.10. Annual income statement of BYD Company, 2018-present (in ¥ thousands). Source: [7]

Breakdown	TTM	12/30/2021	12/30/2020	12/30/2019	12/30/2018
‣ Total Revenue	130,509,000	127,004,000	122,485,000	137,237,000	147,049,000
Cost of Revenue	113,011,000	109,126,000	108,813,000	123,265,000	132,954,000
Gross Profit	17,498,000	17,878,000	13,672,000	13,972,000	14,095,000
‣ Operating Expense	9,255,000	8,554,000	7,038,000	8,491,000	9,650,000
Operating Income	8,243,000	9,324,000	6,634,000	5,481,000	4,445,000
‣ Net Non Operating Interest Inc...	-1,062,000	-804,000	-857,000	-353,000	-320,000
‣ Other Income Expense	4,123,000	4,196,000	2,318,000	2,308,000	4,424,000
Pretax Income	11,304,000	12,716,000	8,095,000	7,436,000	8,549,000
Tax Provision	1,566,000	2,771,000	1,774,000	769,000	474,000
‣ Net Income Common Stockhold...	8,848,000	9,837,000	6,247,000	6,581,000	7,916,000
Diluted NI Available to Com Stock...	8,848,000	9,837,000	6,247,000	6,581,000	7,916,000
Basic EPS	-	6.78	4.36	4.62	5.61
Diluted EPS	-	6.70	4.33	4.57	5.53
Basic Average Shares	-	1,451,000	1,433,000	1,424,000	1,411,000
Diluted Average Shares	-	1,468,000	1,442,000	1,439,000	1,431,000
Total Operating Income as Reported	8,243,000	9,324,000	6,634,000	5,481,000	4,445,000
Total Expenses	122,266,000	117,680,000	115,851,000	131,756,000	142,604,000
Net Income from Continuing & Dis...	9,936,000	10,019,000	6,427,000	6,732,000	8,014,000
Normalized Income	9,444,104	9,572,478	6,220,035	6,660,240	7,840,190
Interest Income	-136,000	146,000	241,000	429,000	335,000
Interest Expense	926,000	950,000	1,098,000	782,000	655,000
Net Interest Income	-1,062,000	-804,000	-857,000	-353,000	-320,000
EBIT	12,230,000	13,666,000	9,193,000	8,218,000	9,204,000

Fig. 3.11. Annual income statement of General Motors, 2018-present (in \$ thousands). Source: [25]

Breakdown	TTM	12/30/2021	12/30/2020	12/30/2019	12/30/2018
‣ Total Revenue	149,419,000	149,419,000	86,676,000	108,187,000	110,412,000
Cost of Revenue	119,943,000	119,943,000	75,962,000	93,164,000	95,011,000
Gross Profit	29,476,000	29,476,000	10,714,000	15,023,000	15,401,000
‣ Operating Expense	13,617,000	13,617,000	8,480,000	10,067,000	10,369,000
Operating Income	15,859,000	15,859,000	2,234,000	4,956,000	5,032,000
‣ Net Non Operating Interest Inc...	-582,000	-582,000	-791,000	-909,000	-956,000
‣ Other Income Expense	-885,000	-885,000	-87,000	-26,000	32,000
Pretax Income	14,392,000	14,392,000	1,356,000	4,021,000	4,108,000
Tax Provision	1,911,000	1,911,000	1,332,000	1,321,000	778,000
Earnings from Equity Interest Net ...	737,000	737,000	-	-	-
‣ Net Income Common Stockhold...	14,200,000	14,200,000	29,000	6,622,000	3,608,000
Diluted NI Available to Com Stock...	14,200,000	14,200,000	29,000	6,622,000	3,608,000
Basic EPS	-	-	0.02	4.23	2.33
Diluted EPS	-	-	0.02	4.22	2.30
Basic Average Shares	-	-	1,572,020	1,564,114	1,548,439
Diluted Average Shares	-	-	1,577,313	1,570,850	1,567,839
Total Operating Income as Reported	15,126,000	15,126,000	-	-	-
Total Expenses	133,560,000	133,560,000	84,442,000	103,231,000	105,380,000
Net Income from Continuing & Dis...	14,200,000	14,200,000	29,000	6,622,000	3,608,000
Normalized Income	13,977,295	13,977,295	232,250	2,849,482	3,475,520
Interest Income	188,000	188,000	117,000	261,000	249,000
Interest Expense	484,000	484,000	842,000	937,000	957,000
Net Interest Income	-582,000	-582,000	-791,000	-909,000	-956,000
EBIT	14,876,000	14,876,000	2,198,000	4,958,000	5,065,000

Fig. 3.12. Annual income statement of Stellantis N.V., 2018-present (in € thousands).

Source: [49]

Breakdown	TTM	12/30/2021	12/30/2020	12/30/2019	12/30/2018
> Total Revenue	120,518,323,000	117,610,626,000	103,997,601,000	105,746,422,000	96,812,609,000
Cost of Revenue	97,851,192,000	95,680,131,000	85,515,931,000	88,091,409,000	81,670,479,000
Gross Profit	22,667,131,000	21,930,495,000	18,481,670,000	17,655,013,000	15,142,130,000
> Operating Expense	-	15,251,546,000	16,086,999,000	14,049,508,000	12,719,965,000
Operating Income	10,795,540,000	6,678,949,000	2,394,671,000	3,605,505,000	2,422,165,000
> Net Non Operating Interest Inc...	289,914,000	265,505,000	44,213,000	203,003,000	226,835,000
Pretax Income	8,191,911,000	7,959,562,000	2,093,256,000	4,163,766,000	2,529,582,000
Tax Provision	2,243,683,000	2,266,485,000	168,703,000	978,120,000	884,563,000
> Net Income Common Stockhold...	5,200,028,000	4,942,356,000	1,424,436,000	2,980,049,000	1,508,084,000
Diluted NI Available to Com Stock...	-	-	-	2,293,070,000	1,158,437,000
Basic EPS	-	9.49k	2.73k	5.66k	2.82k
Diluted EPS	-	9.49k	2.73k	5.66k	2.82k
Basic Average Shares	-	401,157	401,257	405,484	411,394
Diluted Average Shares	-	401,157	401,257	405,484	411,394
Total Operating Income as Reported	6,951,264,000	6,678,949,000	2,394,671,000	3,605,505,000	2,422,165,000
Total Expenses	109,722,783,000	110,931,677,000	101,602,930,000	102,140,917,000	94,390,444,000
Net Income from Continuing & Dis...	5,200,028,000	4,942,356,000	1,424,436,000	2,980,049,000	1,508,084,000
Normalized Income	5,211,234,055	4,954,988,031	1,581,360,287	3,083,095,265	1,629,086,050
Interest Income	-	348,613,000	401,347,000	512,596,000	515,103,000
Interest Expense	-	304,542,000	362,377,000	316,979,000	307,070,000
Net Interest Income	289,914,000	265,505,000	44,213,000	203,003,000	226,835,000
EBIT	11,919,758,000	8,264,104,000	2,455,633,000	4,480,745,000	2,836,652,000

Fig. 3.13. Annual income statement of Hyundai Motors, 2018-present (in ₩ thousands). Source: [31]

Figures 3.14. through 3.19. illustrate the changes in the share price of Tesla and its five main competitors. The timeframe of each figure begins on 30 January 2020, when the WHO declared COVID-19 to be a health emergency of international concern. A brief analysis, containing a price percentage increase, all-time highs, and lows, is provided for each of the six stocks, illustrating Tesla's superior performance.



Fig. 3.14. Share price chart of Tesla, Inc. (1/30/2020-5/2/2022, in \$). Source: [53]

Since 30 January 2020, Tesla's share price increased 604.54% from \$128.16 to \$902.94. The highest price was \$1,222.09 and the lowest price was \$85.51 over this period.



Fig. 3.15. Share price chart of Volkswagen AG. (1/30/2020-5/2/2022). Source: [59]

Since 30 January 2020, Volkswagen's share price increased 14.37% from \$18.51 to \$21.17. The highest price was \$37.49 and the lowest price was \$10.68 over this period.



Fig. 3.16. Share price chart of BYD Company. (1/30/2020-5/2/2022). Source: [7]

Since 30 January 2020, BYD's share price increased 88.96% from \$30.88 to \$58.35. The highest price was \$70.48 and the lowest price was \$11.22 over this period.



Fig. 3.17. Share price chart of General Motors. (1/30/2020-5/2/2022). Source: [25]

Since 30 January 2020, General Motors's share price increased 18.75% from \$33.33 to \$39.58. The highest price was \$63.40 and the lowest price was \$18.04 over this period.



Fig. 3.18. Share price chart of Stellantis N.V. (1/30/2020-5/2/2022). Source: [49]

Since 30 January 2020, Stellantis's share price increased 5.05% from \$13.26 to \$13.93. The highest price was \$21.82 and the lowest price was \$6.35 over this period.



Fig. 3.19. Share price chart of Hyundai Motors. (1/30/2020-5/2/2022). Source: [31]

Since 30 January 2020, Hyundai's share price increased 16.30% from \$31.60 to \$36.75. The highest price was \$56.94 and the lowest price was \$17.14 over this period.

CONCLUSION

Competitiveness is defined as the set of factors that determine the productivity of an organization or country. International competitiveness has been well documented for more than five decades, ever since the World Economic Forum published its first issue of the Global Competitiveness Report. This report ranks countries by their competitiveness in terms of twelve pillars, which include ICT access, macroeconomic environment, industry, institutions, and innovation.

The COVID-19 pandemic has been one of the most influential events in terms of shaping the world in recent years. After the first reported cases were discovered in Wuhan in late 2019, the virus quickly spread to other Chinese cities, soon reaching new countries and continents. As of May 2022, the virus has infected over 500 million and taken the lives of over 6 million infected people worldwide.

The COVID-19 pandemic was a great challenge to the global automotive industry. Social distancing tampered with car dealerships, maintenance centers, and taxi drivers around the world. Meanwhile, manufacturers were faced with long shipment delays and potential bankruptcy. To remain competitive on the global market, car makers had to invent new solutions to the problems caused by the coronavirus pandemic.

Tesla, Inc. is an electric vehicle and clean energy solutions company based in California. Founded in 2003, the company is led by South African innovator Elon Musk. Since its 2010 IPO, Tesla has become the world's sixth most valued company, reaching a market cap of \$864.7 billion in May 2022. As of May, the company has over 100,000 employees worldwide.

There are over 1.2 billion automobiles in use globally, as of May 2022. Electric vehicles, such as Tesla's battery-powered cars, hold a 5% share of the total global car

market. Tesla's innovative manufacturing, design, and marketing practices have allowed the firm to maintain a 14% market share of the global EV market in 2021.

In the same year, Tesla's top five competitors were the following: Volkswagen Group (Germany, 11% market share), BYD Auto (China, 9% market share), General Motors (the United States, 7.6% market share), Stellantis N.V. (the Netherlands, 6% market share), and Hyundai Motors (South Korea, 5% market share.)

While other manufacturers chose to downsize operations, divest from unprofitable projects, and introduce work-from-home solutions for their employees, Tesla chose another solution. Spearheaded by CEO and co-founder Elon Musk, the company implemented innovative health and safety measures aimed at reducing coronavirus cases among employees.

The success of these measures in terms of reducing coronavirus infections was temporary. However, Elon Musk's decision to maintain and increase operations at all costs was successful in terms of profitability and competitiveness. From 2019 to Q1 2022, Tesla's stock price, profit margins, and other key ratios outperformed its competitors, earning the company sizeable profits and expanding its customer base.

Task 1 (defining the essence and main features of the terms "international competitiveness" and "COVID-19 pandemic") and Task 2 (analyzing the impact of the COVID-19 pandemic on the international competitiveness of world economies) were accomplished in Chapter 1 of this paper.

Task 3 (exploring the current state of the global electric vehicle market; explaining Tesla's business model and structure of operations) was achieved in Chapter 2 of this work.

Task 4 (analyzing the effect of the COVID-19 pandemic on the global electric vehicle market) and Task 5 (establishing whether Tesla's pandemic response was superior to its competitors) were fulfilled in Chapter 3 of this paper.

Having successfully completed all five tasks established in the introduction, I consider this paper's goal successfully accomplished.

SUGGESTIONS

To mitigate the various negative impact of the coronavirus pandemic on the global car industry performance, I would suggest Tesla's leadership and management teams consider the following issues: [61]

- How can innovation be used to optimize the current business structure of Tesla and improve the fitness of Tesla's business operations?
- How important is the influence of social distancing on changing consumer demand conditions, and how can digital tools be used to maintain the future engagement of potential Tesla customers?
- How can strategic partnerships and M&A opportunities be used in improving the business resiliency and competitive positioning of Tesla?
- How can strategic investments, such as upgrading the IT infrastructure and digital supply networks, be used to ensure Tesla's long-term profitability?

Furthermore, I have identified several potential solutions to the issues listed above. [61]

- Recognizing, prioritizing, and accelerating measures that improve cost profitability.
- Enhancing working capital, and accelerating the delivery of potential tangible cash flows.
- Reanalyzing current forecast assumptions, assessing the need for downsizing in times of market uncertainty
- Discovering new possible sources of collateral to ensure access to additional sources of capital and bonds in the case of a low liquidity environment.
- Prioritizing the safety of and care for employees, due to the necessity of having an engaged workforce to ensure a sharp and long-lasting economic recovery.

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