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Prospects for the Development of Vehicle Assembly Plants of Chinese Automobile Brands in Kazakhstan: An Example of Multi-Sectoral Diversification of the Economy to Increase Its Sustainability

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Abstract: This article discusses the problems that arise and must be resolved in order to ensure the efficiency and sustainability of Chinese-brand automobile assembly in Kazakhstan. Kazakhstan is shown as a model of an oil-driven economy seeking industrial modernization and the most dynamic car assembly case in Central Asia in the past 5 years. Since the automotive industry development strategies in different countries have various specific characteristics and provide an overview of the main global and regional trends in the development of the automotive industry, the problems of industry development also leverage the accumulated experiences of different countries where government initiatives have fostered the growth of their domestic automotive industry. Although we use standard and well-proven methods of analysis, planning, and forecasting, the novelty of the approach lies in the fact that any new company entering the market and opening a new production facility should focus on maintaining the sustainability of the country's automotive industry within the framework of the adopted industry development strategy. We have developed such an algorithm for planning a strategy. The blend of traditional methodologies and their adaptation makes the suggested methodology new. We also considered the fact that, due to a lack of knowledge, there are significant challenges when determining whether localizing automobile components is feasible. An assessment of the prospects for the automotive industry in Kazakhstan based on data from open sourcesmade it possible to develop options for possible strategies from which the most appropriate one can be selected. The conclusion chapter presents findings, limitations of the study, and directions for future research. The use of this approach allows for considering the interplay of the factors at the stage of an industry development strategy emerging and establishing long-term plans that take into account the specific characteristics of Kazakhstan's development.

Keywords: automotive industry; assembly production; localization; auto components; SWOT analysis

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1. Introduction

Sustainable development is one of the leading trends of the 21st century, which fully applies to transport systems. The automotive industry makes a crucial contribution to ensuring sustainable transport systems, since it is a driving and backbone industry for many countries, serving as a system-forming industry with a significant multiplier effect on economic development. The globalization of industry has led to the formation of industrial interstate ties based on the division of labor and the internationalization of capital and innovation. It has become common for countries with strong automotive industries to expand their market share by opening assembly plants abroad. This usually entails localizing the manufacturing of auto components [1].

The importance of the automotive industry for developing countries is confirmed by the fact that its share of the world's GDP is 15%, and its development leads to the growth of related industries. Thus, one job in the industry stimulates the formation of another 8–10 jobs in related sectors [2]. The automotive industry stimulates the growth of the middle class: car owners' costs for purchasing and maintaining a car are on average almost equal to food costs (10–15% of their budget) [1].

In the last decade, after opening assembly plants in countries with cheap labor, European automakers eventually faced the fact that Asian countries, primarily China and India, moved from assembling production of foreign brands to developing their own. With a production volume of nearly 24 million passenger vehicles in 2022, China ranked first among countries in passenger vehicle production [3] and is already opening assembly plants abroad.

The development of the global automotive industry is facilitated by factors such as knowledge intensity, which can give impetus to the development of other sectors of the economy; the presence of growing demand for products; high profitability; and belonging to strategically prioritized national industries [4]. The growth of the middle class in developing countries is shifting the focus of development to their territory from traditional automotive manufacturing countries in Europe and North America [5].

Convenient types of mobility may have an impact on the automotive industry: carsharing, carpooling, and online methods of ordering a taxi—in large cities, there may be a decrease in demand for the purchase of personal cars, but at the same time this will lead to the replenishment of public car fleets since the car remains indispensable and the most common means of transportation. At the end of 2021, the total volume of global car production amounted to 80.2 million units, while the top five countries in terms of production volumes are China (26.1 million cars), the USA (9.2 million), Japan (7.9 million), India (4.4 million), and South Korea (3.5 million) [2].

Reducing the time it takes to design, test, and release new models into production is becoming an increasingly common approach in the automotive industry. At the same time, the automotive industry is a leader in reducing production times compared to other high-tech industries. While, for example, in the civil aircraft industry the time it takes to bring new products to market increased from 4 to 7.5 years, in the automotive industry it, on the contrary, decreased from 7 to 1.5 years [6]. Using advanced driver assistance technologies, automobile companies strive to design and improve the car in terms of safety, comfort, and ecology.

Section 2 provides an overview of the automotive industry's global and regional development trends and issues, as well as different countries' experiences with the government initiatives that contributed to the growth of the respective domestic automotive industries. Section 3 describes the methods and analytical tools used to achieve this goal. Although we use standard and well-proven methods of analysis, planning and forecasting, the approach's novelty lies in the fact that any new company entering the market and opening a new production facility should focus on maintaining the sustainability of the country's automotive industry within the framework of the adopted industry development strategy. An algorithm has been developed to advance a strategy. Section 4 is devoted to the Kazakhstani market analysis and prospects for ensuring the sustainability of the automotive industry assessment in Kazakhstan based on open-source data, such as https://www.statista.com/, accessed on 23 January 2024. Furthermore, in the Results and Discussion Chapter, we test our proposed approach by developing a strategy to improve the Kazakhstani automotive industry's sustainability.

2. The State of the Problem of Ensuring the Sustainability of the Automotive Industry: A Literature Review

Sustainability issues are currently being addressed in all areas of the economy and human activity. The automotive industry differs from other industries in that the car, as a means of mobility and transportation of goods, is an important part of supporting pro-

cesses in all other industries. For the industry dynamic and sustainable development, it is necessary to assess the main trends of the automotive industry in defining a strategy and then analyze those markets that have received the greatest development in recent years. Therefore, we examined trends in the automotive industry and their impact on the development of the region (Section 3), as well as trends in the development of the automotive business and ensuring its sustainability using the example of developing countries in Asia—a region close to Kazakhstan. As an example, we selected countries that differ from each other in terms of choosing an industry development strategy.

2.1. Key Trends in Improving the Sustainability of the Automotive Industry

Sustainable development is one of the important tendencies of the 21st century. This is equally true for transport systems. Their sustainability guarantees the sustainability of the automotive industry. Therefore, the principles of implementing the SDGs and a closed-loop economy, influencing the improvement of the environmental friendliness of the automotive industry, have been considered by many authors, including [7–11], in which the authors come to the conclusion that the availability of data that take into account various aspects of industry development will allow the implementation of strategies aimed at achieving the SDGs and will ensure the sustainability of the industry. Original equipment manufacturers are working to reduce CO_2 emissions by introducing green technologies [12–14], while many analysts and researchers believe that it is necessary to consider all stages of the life cycle from the production stage to the operation and disposal of vehicles [15–17]. Green supply chain management in this context becomes a paramount issue for ensuring the environmental sustainability of organizations [18,19], which the authors of [20] believe will assist managers in selecting green suppliers and achieving sustainability.

Since the sustainability of any industry, including the automotive industry, is influenced by external stress factors that change the external environment, a good example was the COVID-19 pandemic, as a result of which supply chains were disrupted. The articles [21,22] were devoted to the situation in the automotive industry under these conditions, in which the authors discuss the need for deglobalization and localization in the industry. The authors of [23] used a comparative analysis and synthesis of information on the degree of the localization of enterprises included in global unions which, in their opinion, will ensure the scientific and technological progress of the country. Automotive companies must accurately forecast future demand for auto parts because production plans and inventory levels are closely linked to forecast costs, which impact inventory costs and customer satisfaction [24].

In the coming years, manufacturers of automobiles and their parts will confront the impact of electromobility [25–27], autonomous driving, connectivity, and digitalization. According to the authors of the article [28], new trends will significantly degrade the standard patterns of the current vertical structure of automotive manufacturing and supply chains.

The study [29] discusses the transition from mechanical automotive systems to electronic automotive systems and its impact on the automotive industry. As levels of vehicle autonomy increase, it is important to ensure its reliability and safety [30]. In the contemporary landscape, data mining and machine learning tools have become readily accessible for harnessing extensive datasets garnered throughout both the product development phase and real-world operational contexts, so vehicle testing preceding warranty claims can be used to quickly and effectively predict reliability [31].

2.2. International Alliances of Automakers and Their Impact on Industrial Development within Expanding Markets

Since the automotive industry is a high-tech industry, international cooperation is a necessary condition for the development of technologies in new markets. It is inevitable for developed countries to open assembly plants in countries that have a resource base in order to maintain the competitiveness of their products. Numerous scientific studies

are devoted to the analysis of this direction of industry development. The Chinese and Indian automobile industries are analyzed in study [32], which serves to depict the co-evolution of domestic firms and new entrants evolving into advanced multinational enterprises (AMNEs). The gradual liberalization orchestrated by governments has benefited Chinese and Indian manufacturers. In recent times, the Indian manufacturing industry has changed significantly, adopting a customer-centric approach as a natural response to market dynamism. Study [33] outlines the development of commercial vehicle production within the framework of Industry 4.0 based on requirements and adaptability. In article [34], the authors outline the core concepts of Industry 4.0 and conduct an evaluation of the effectiveness of the Indian Government's initiative in the manufacturing sector "Make in India". Article [35] highlights the distinctive facets of automotive component manufacturing in India, which comprises both organized and unorganized sectors. The organized sector encompasses original equipment manufacturers (OEMs) specializing in the production of high-value precision instruments. In contrast, the unorganized sector primarily focuses on the manufacturing of lower-value aftermarket products.

Article [36] underscores the significance of technological competitiveness with regard to differences in production attributes and consumer demands based on geographical location, highlighting a significant discrepancy between the United States of America (USA) and the People's Republic of China (PRC). Integration inclusions of Western companies in Chinese business groups, and the impact of these processes on the innovative level of the host and investing side require further study [37].

Article [38] explores how the format of supplier interactions influences the implementation of product innovation strategies of multinational corporations from emerging and developed economies and how this affects cross-country scientific collaborations and the competitiveness of mid-priced cars.

In study [39], the authors investigate the significance of compact organizational space in the context of technological catch-up by conducting a comparative analysis of China's automaker groups.

It is worth noting that South Korea's extraordinary economic progression has been taken under consideration in numerous studies. Article [40] underscores the remarkable advancements in the South Korean automotive industry, primarily in the production of passenger cars, with a particular focus on Hyundai and other brands (Kia and Daewoo, as well as Samsung and Ssangyong).

Local governments frequently provide substantial subsidies to attract vehicle assembly plants to their region [41]. These incentives are offered because assembly plants tend to draw component suppliers to locate nearby, thereby generating employment opportunities. On average, an assembly plant results in the creation of 500 additional jobs for parts suppliers. It is plausible that assembly plants may catalyze the formation of a self-reinforcing cluster of auto parts suppliers.

2.3. Current Situation in the Global Automotive Market

This chapter analyzes the situation in the automotive market from the point of view of sustainability and changes in the main vector of development.

The automobile industry has a multiplier effect and "drags" along with it a number of related industries, including the petrochemical and light industries. It is capable of creating 7–8 additional jobs. In addition, this industry in total (directly and indirectly) accounts for 15% of the world's GDP.

An analysis commissioned for Polestar and Rivian by the consulting firm Kearney found that the auto industry must look for ways to reduce its carbon footprint, including by reducing global sales of new fossil fuel-powered vehicles. This encourages the transition to renewable energy sources. Automotive companies see the future in electrification but recognize the need to address the issue of making batteries more environmentally friendly. Another source of increasing environmental friendliness in car production is increased recycling. Thus, Volkswagen has abandoned the use of chromium in the production of

a number of parts (e.g., doors, dashboard, and steering wheel) and is introducing more recycled materials, including those removed from the marine environment.

Sustainable materials from renewable resources can help reduce vehicle weight, which is important, and reduce emissions.

By the end of 2021, about 80 million cars were produced in the world while the five largest countries according to production volumes are considered to be the following [2,42]:

1. China—Chinese automakers produced just over 26.1 million vehicles in 2021. From open sources, it follows that the Chinese automobile industry provides approximately 10% of the GDP.
2. USA—Based on the results of 2021, 9.2 million passenger/light commercial vehicles and SUVs were assembled in the United States. Automotive production accounts for 3% of the GDP, with 1.7 million people directly employed in the US auto industry and another 8 million in related industries.
3. Japan—Japanese automobile factories produced 26.1 million cars, the share of the automotive industry is 10% of the GDP; 5.9 million people work directly in the automotive industry and related industries.
4. India—India only began to truly and actively develop its auto industry in the last 15 years, but production volume for 2021 has already grown to 4.4 million units. The importance of the automobile industry in the Indian national economy has increased in recent years thanks to targeted government actions and reached 7.1% of the GDP. About 2.72 million people work directly at Indian automobile industry enterprises and an equal quantity work in related industries.
5. South Korea—South Korea produced over 3.5 million vehicles in 2021, with approximately 60% of the vehicles exported to foreign markets. The automobile industry in South Korea is traditionally one of the country's main "economic engines": in this country, the industry's share exceeds 10% of the GDP.

According to specialists from the consulting company Kearney (A.T. Kearney, Inc., 227 West Monroe Street, Chicago, IL 60606, USA), cars around the world serve as a driving force for regional development. This is because, as a rule, industrial clusters of original equipment manufacturers (OEMs), raw material processing enterprises, after-sales service points, and suppliers are formed around large full-cycle automobile plants and transport services, which leads to the development of infrastructure and municipalities, the creation of new residential areas, growth of individual incomes, etc. In addition, the growth of the automotive industry gives additional impetus to small businesses. For example, South Korea systematically developed and expanded the national automotive industry, which led to the development of local metallurgy; thus, steel sales by South Korean companies increased from 55 thousand tons in 2002 to 210 thousand tons in 2012.

In recent years, among the CIS countries, special attention has been paid to the development of the automobile industry by Uzbekistan. The share of the automobile industry in the structure of manufacturing industries in Uzbekistan reached 8.5%.

As can be seen from the previous review, the state of the automotive industry, global trends, as well as crises caused by various reasons lead to industry changes in the automakers' ratings. This gives developing countries the opportunity to make the automotive industry one of the driving forces for their economies, strengthening their position in the ranking of global automakers.

When building a strategy for the development of the Kazakhstani automotive industry, it is necessary to select the best practices and take into account possible risks, based on an analysis of local specifics and the experience of other Asian countries that show significant growth. For this purpose, a preliminary review of trends in the automotive industry in Asian countries was carried out.

2.4. Localization of Auto Components as One of the Sustainability Factors When Opening Auto Assembly Plants in Asian Countries

The automotive industries of the ASEAN member states differ both in terms of history and the current state of the industry. One of the competitive advantages of developing countries is cheap labor, ensuring low costs. Developing countries are primarily interested in increasing the level of localization and placing high-tech industries in their territories. However, whereas localization processes are in stagnation in Vietnam, with automakers hesitating to purchase local parts [43], in India, by contrast, automakers are turning their attention to the local supplier ecosystem, shortening the supply chain; as a result of this, a roadmap has been developed for the Indian automobile industry, integrating best localization practices in the context of the "Make in India" and "Atma Nirbhar Bharat" visions [22].

Such advanced technologies as eco-design [44]; the symbiosis of CAD, CAE, and engineering knowledge [45]; the Internet of Things [46]; Big Data; digital technologies; the blockchain [47]; and software asset management [48] are used at all stages of the life cycle [5] of both auto components and the vehicle as a whole.

In order to increase the sustainability of the automotive industry and move from the assembly stage to the production of their models, Asian countries are using different strategies, but the common step is the localization of auto components.

2.4.1. Automotive Industry in Vietnam

Although the Vietnamese car market is predominantly small, it is one of the quickest-expanding markets in Southeast Asia [49]. The Vietnam Automobile Manufacturers Association (VAMA) represents most of the country's automakers.

In 2018, 90% of spare parts came from foreign markets, the remainder came from local manufacturers. In Thailand and Indonesia, local production accounted for 80% of auto parts. In Vietnam, locally made cars are generally more expensive than foreign-made cars, as the cost is increased by imported spare parts [50]. The degree of localization of Vietnamese cars is no higher than 10% and lower than in Thailand, Malaysia, and Indonesia.

One of the prioritized areas of the Vietnamese automotive industry is the stimulation of the development of core production and an increase in the level of localization, which will contribute to the development of related industries. The main problems of the Vietnamese automotive industry include low productivity and a small market size.

Compared to Thailand and Indonesia, Vietnam's automobile production lags significantly. Vietnam produces about 300 thousand cars a year, Indonesia produces four times more, and Thailand produces about 2 million cars.

Vietnam has the potential to become one of the first ASEAN member states to absorb the growing demand for electric vehicle consumption and production. As an example, VAMA predicts that the number of owners will reach 1 million by 2028 and will reach 3.5 million by 2040.

According to Kia Motors, Vietnam has always been its main market in the Southeast Asia region and Asia in general. As part of its global brand strategy, the company showcased its latest car models here, featuring luxurious designs, high-tech equipment, and safety and security protocols. The Quang Nam-based automaker produced and sold vehicles for several automakers, including South Korea's Kia, Japan's Mazda, and the French giant Peugeot. Thaco produces and assembles cars, trucks, and buses in Vietnam, with its localization rate increasing from 16 percent to 46 percent.

2.4.2. Automotive Industry in India

It can be stated that India has recently shown the highest dynamics of economic growth among the countries of the world. This should also include the growth in the real incomes of the population, increased investment in infrastructure, and strengthened production incentives. Under the influence of these positive trends, the automotive industry has accelerated its development.

That is why this sector of the Indian economy has acquired the status of the most important industry. Following the growing demand for Indian cars in the domestic and foreign markets, the market capacity for spare parts and automotive components needed directly for production and during the repair process to maintain vehicles in good condition has also expanded. It is formed by two sectors. The first is the unorganized sector.

Additional efficiency, reliability, and environmental safety of the transport system are added by the popular types of transport on alternative fuel (electric, hybrid). The Indian government announced the prospects of this type of transport and its readiness to bring the level of security by electric cars to 30% by 2030. For this, stimulating measures have been taken. Improving the quality of production and investing in new technologies for sustainable growth are mandatory conditions for the development of the auto component sector [51,52].

First of all, efforts are aimed at localizing the production of electronic components, currently imported mainly from China [53]. Localization refers to the practice in which various vehicle components are manufactured in the country where the vehicle is intended for sale. The base of the industry is made up of suppliers of auto components and accessories [54]. As leading automakers around the world embark on a path to mitigating "China Plus One" risks, India's Motown sees double the benefits of localization: cutting imports of critical vehicles by a fifth in five years and securing a greater share of the world's spare parts in the future. It is necessary to organize local production even of those components that are now more profitable to import from China due to lower prices [55].

As for the Chinese automobile market, it is important to correctly determine the brand name. For example, Volkswagen was one of the first to enter the Chinese market, where it is now firmly established. This approach has worked well for the brand, and it is now widely known in China under the local name 大众 rather than VW. Top sports car brands Porsche and Lamborghini have taken a completely different approach to building their luxury brands in China. Both retained their international brands and avoided localizing production, preferring to import cars from abroad rather than produce them locally.

As for India, during the period of rapid changes in technology (such as the transition from BS4 to BS6), the Indian automobile industry was unable to maintain the same level of content of indigenously produced components. Meanwhile, it was at 95% during its BS4 period [12]. China's leadership in the global market is due to its large production resources. However, the situation related to COVID-19 has forced countries to rethink the required level of production independence and realize the need to develop their own production. Success in this matter depends largely on the availability of qualified personnel. Therefore, the ASDC (Automotive Skills Development Council) and ACMA have opened training centers to acquire modern competencies in the field of mechatronics, design systems, etc.

ACES (Automated, Connected, Efficient, Safe and Sustainable) processes will form the basis of sustainable manufacturing in the future. They will reduce the environmental load on the planet, and on the other hand, save energy and natural resources. The production of environmentally neutral cars involves the implementation of the principles of a green economy and sustainable production processes that will not harm the environment and will help preserve it for future generations.

In fact, electric vehicles can be considered as the transport of the future, as they minimize environmental impact. Currently, the widespread introduction of electric vehicles is hampered by a number of problems: electric vehicles take a long time to charge, it is difficult to find charging points due to the underdevelopment of the infrastructure, and the production of the batteries necessary for their operation is not an environmentally friendly process. But, active research in these areas allows us to hope for the nearing availability of long-lasting, energy-intensive batteries produced in accordance with environmentally acceptable standards.

Automotive companies consider the concept of sustainable development as a guideline when drawing up a strategic development plan. Therefore, it is important to understand that the new 3P definition of sustainability—"Pollution Prevention Pays"—will con-

tinue into the future and allow them to become innovative and competitive enterprises. According to experts, by 2026, the volume of the auto components production sector will reach $200 billion. Therefore, mastering and increasing the production of auto parts and auxiliary materials looks like a very attractive and promising strategy for Indian automobile enterprises. In line with the government's Atmanirbhar Bharat and Make in India programs, Indian organizations have started planning production, preparing safety stocks, forecasting demand, and optimizing supply chains.

The automobile and related sectors provide employment to more than 37 million people, the largest volume in the country as a whole. In addition, the automotive industry has the status of the technological and innovative locomotive for the development of the economy as a whole. It is expected that by 2030, India could take the world's third position across countries manufacturing automobiles and auto components.

According to various reports and market studies, the industry is expected to continue its growth trajectory driven by such factors as rising disposable incomes, increasing urbanization, and developed government policies supporting sustainable mobility through the development of areas such as (1) the electric vehicle (EV) market; (2) the launch of new brands and models of passenger cars; the commercial vehicle market; and the two-wheeler market.

Evidently, the symbiosis of data analytics and artificial intelligence is expected to enable greater automation, cost efficiency, and customization of manufacturing, the supply chain, and service delivery processes. Moreover, modern technologies such as 5G networks and blockchains will create new opportunities for the industry and create possibilities to improve connectivity, security, and transparency.

When introducing technological innovations, issues related to cybersecurity risks and, as a consequence, violations of data confidentiality, inevitably arise. For the automotive sector, which is actively moving towards the development of connected cars and the actual organization of their production within the framework of smart factories (a set of interacting cyber-physical systems) involving data transfer via wireless channels, these problems become extremely relevant and must be solved using the latest trends in science and technology. Only in this case will it be possible to guarantee the sustainability and competitiveness of products.

In this regard, examples of successful technology collaboration are emerging, such as Vitesco Technologies and Infineon AURIX TC4x. These companies are going to jointly develop and produce efficient and reliable microcontrollers meeting the high requirements of the automotive industry, including functional safety and cybersecurity.

The automobile and auto components manufacturing sector, having reached a level of 7 percent of the gross domestic product, began to play a key role in the economic growth and development of the potential of Kazakhstan. Strategic planning and forecasting based on Asian countries' positive experiences are considered to be an important stage in the expansion of the industry.

3. Materials and Methods

To evaluate the prospects for the development and sustainability of the high-tech industry and a specific enterprise in conditions of intense competition, strategic planning and prognostication methods are applied [56–58]. These plans and methods are based on the analysis of current market conditions and information from open sources. As this involves forecasting, it is necessary at the initial stages to identify factors that can either contribute to the success of the industry as a whole and a specific enterprise or have a negative impact on it. If the possibility of "embedding" a new enterprise into an existing industry is being explored, then it is necessary to consider not only those factors that are traditionally studied for conducting strategic analyses but also the possible impact of the new enterprise on the industry's sustainability, market (including domestic), as well as the economy in general (through related industries). Typically, well-established qualitative analytic methods

and their combinations are used for evaluating the situation and strategic planning in the automotive industry [59–61].

To effectively manage a functioning enterprise, tools of financial, managerial, comprehensive economic, and strategic analysis are used. At the same time, the goal is to obtain information about the external and internal environment of the enterprise, to identify factors that will allow for achieving success in the long term, and to choose a reasonable development strategy. Taking into account the significant length of the product life cycle in the automobile company, the strategy is developed for a long period. To do this, it is necessary to obtain reliable data about an enterprise's internal characteristics and processes to identify long-term risks, including political, economic, and social, as well as the technological background of the enterprise and the environment in which it operates.

Once the strategy is determined, a system is created to monitor its implementation effectiveness. In the case of automotive assembly production, the primary focus of assessment lies in the quality control process of auto components.

The novelty of our approach lies in the fact that we adapted classical qualitative methods and used them in combination. Since the automobile sector of Kazakhstan is still being formed, there is not enough data to evaluate the chosen strategy in the classical sense. However, the development strategy for the industry as a whole must be developed and adjusted as internal and external conditions change. At the same time, the emergence of new participants in the market can lead to the disruption of the industry's stability if strategic goals and objectives are not taken into account. Therefore, at the stage of deciding the feasibility of building an enterprise, launching production, choosing a business management mode, as well as choosing a range of products, there are certain difficulties, since there is not enough information to build forecast development models. Thus, we chose qualitative methods that allow us to assess various aspects of the competitive environment, which determines the opportunities and prospects for industry development, risks and threats of doing business, and ways to ensure sustainability.

At the first stage, we used Porter's 5 forces method to assess what factors will influence the development of the automotive industry in Kazakhstan. Then, using PESTEL analysis, we described the main factors influencing the formation of localized enterprises in the automotive industry, taking into account the important role of the state in the form of the adoption of regulations that support the task. Particular attention was paid to the environmental group of factors as a mandatory element of sustainable development and in the context of the high risks of the environmental impact of the automotive industry. The obtained factors were taken as the basis when conducting a SWOT analysis, which made it possible to formulate strategic measures that take into account the specifics of Kazakhstan's development.

In this chapter, we briefly outlined the methods chosen for evaluating the prospects for the development of automotive assembly production in the Republic of Kazakhstan.

3.1. Strategic Analysis: Development of an Algorithm for Applying Qualitative Methods to Find Sustainable Solutions in the Automotive Industry

The majority of strategic analysis methods are based on expert assessments, typically provided by the company's top management and leading specialists [62,63]. The quality of expert assessments is determined by the quality of marketing research aimed at the in-depth monitoring of the external environment. This often includes competitor and consumer analysis, as well as investigations into suppliers and the analysis of substitute goods markets [64–67]. In cases where there is not enough data to analyze factors, the use of qualitative methods and their combinations is necessary to select the development option that poses the least risk.

If we consider the strategic management of industry development, then to ensure sustainability, it is necessary to manage based on feedback with regular adjustments of the goals and objectives, as well as plans for implementing the strategy (Figure 1).

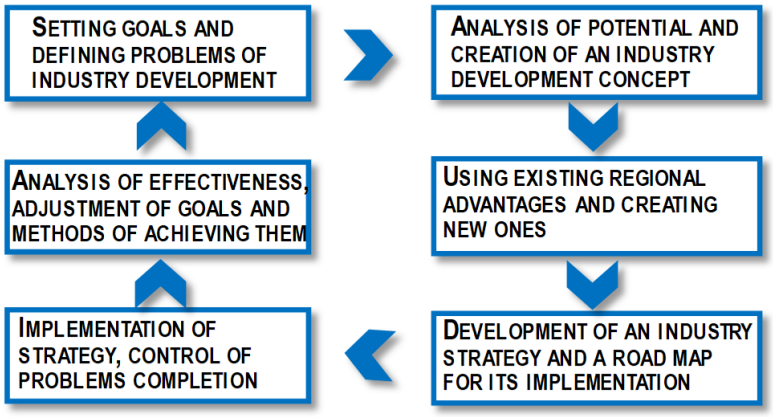

Figure 1. Strategic management based on feedback.

A diagram of the levels of information for developing an industry development strategy is presented in Figure 2. As a rule, the development strategy of various industries is developed by the relevant industry ministry and approved by the government, so the main focus is given to taking into account the factors of the country (as internal), as well as factors of the region where the country is located (as external).

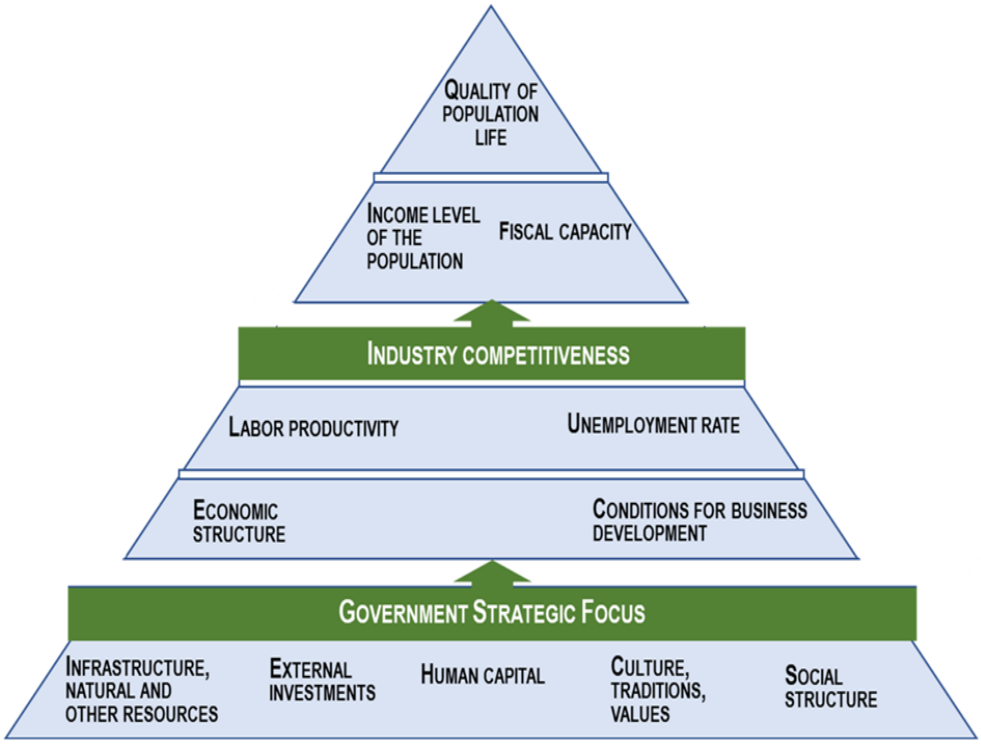

Figure 2. Information for developing industry strategy.

The algorithm for the strategic planning of industry development is presented in Figure 3.

When a new company enters the market, in order not to disrupt the stability of the industry, it is logical to apply the following methods of strategic analysis, where the company is considered as a subsystem, that is, an industry subject:

- Macroenvironment—concerns parties interested in the firm's activities (excluding the firm itself). There is a predominant use of Michael Porter's "Five Forces" model [68,69].
- External Environment—refers to the forces that influence the prospects and conditions of the firm. These may be competing firms and industry enterprises as a whole.

The most commonly used analysis is the STEP analysis (PEST analysis) [70], or modifications, as described in Section 2.2.

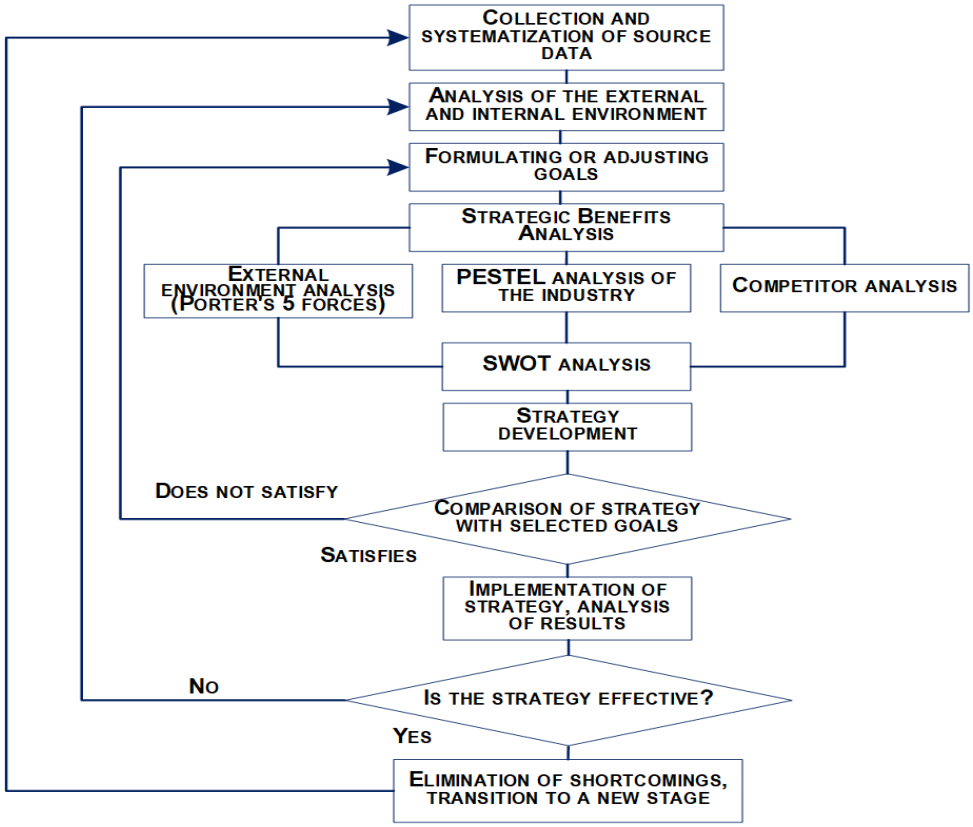

Figure 3. Algorithm of the strategic planning of industry development.

The results of the above types of analyses are accumulated in the form of a SWOT analysis. It includes all the most significant factors identified during the analysis of the market environment (Section 2.3). And then, based on it, a number of possible strategies are proposed, from which the most acceptable one is selected.

3.2. PESTEL Analysis (as a Modification of STEP (PEST) Analysis)

The external macroenvironment is typically examined using the STEP (PEST) analysis model. According to this method, the analyst describes factors that are combined into 4 groups: the social, technological, economic, and political.

Currently, there are modifications to the method that recommend taking into account environmental and legal factors (PESTEL). Another modification of the method for identifying external environmental influences is the DRETS model, which takes into account economics, demographics, regulations, and technological and sociocultural factors. DRETS is particularly useful when a firm relies heavily on local conditions and populations to address opportunities and risks associated with environmental influences. Figure 4 illustrates PESTEL analysis model.

3.3. SWOT Analysis

SWOT analysis [71] is a widely used method to identify growth areas in the automotive industry, as it provides a framework to evaluate external opportunities and challenges, alongside the strengths and vulnerabilities of the entity being assessed.

SWOT analysis is a qualitative analysis of perspectives that includes the description of the following:

- The strengths of the firm;

- The weaknesses of the firm;
- Opportunities provided by the external environment;
- Threats posed by the external environment.

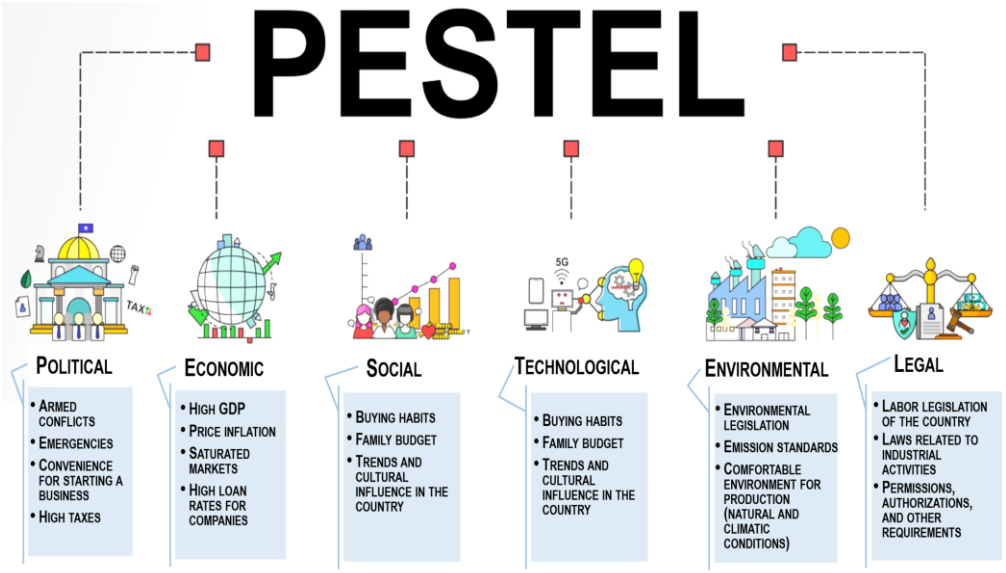

Figure 4. PESTEL analysis.

In the first stage, it is necessary to determine the list of factors influencing the company's competitive position. Considering that the external environment has its own characteristics, these factors can create opportunities and threats for its development. Next, using methods for coordinating expert assessments, an aggregate of opinions from competent experts and industry professionals is formed regarding the influence of external factors in the external surroundings on the development of the company.

In the second stage of SWOT analysis, one should examine the company's internal environment and identify its strengths and weaknesses. Then, it is necessary to estimate how each factor influenced changes in the company's competitiveness and construct a matrix of strengths and weaknesses, where degrees of their impact on changes in the competitiveness of the company are reflected.

It is possible to implement several forms of SWOT analysis:

- Express SWOT analysis: due to clarity and simplicity, this is the most frequently used form.
- Comprehensive SWOT analysis: This type of analysis allows for the evaluation of the identified factors that characterized the organization's activities in quantitative terms. This analysis must be strictly followed after all types of strategic analysis. The analysis depends on the depth of factor elaboration.
- Hybrid SWOT analysis: This type is a combination of the previous two, having the advantages of both approaches. In this case, several methods for selecting factors are used before the main analysis (STEP analysis, analysis using Porter's Five Forces model, and analysis of the internal environment using one of the techniques). The analysis ends with the construction of a cross matrix, but it is possible not to use a quantitative assessment of factors. Its advantage lies in the depth of the analysis performed.

4. Results and Discussion

An analysis of the development of the automotive industry in the countries of the ASEAN region indicates that despite the many factors that objectively influence the development of the industry, when framing a development strategy for both the industry as a whole and a separate segment, the main attention should be paid to regional characteristics and the opportunities for countries. In this chapter, we reviewed the current state

of the automotive industry in Kazakhstan, including prospects and development opportunities, as well as risks (Section 4.1), and then examined the main stages of configuring a development strategy for one of the new automobile assembly enterprises, conducting a qualitative comprehensive analysis of the prospects for its development (Section 4.2)

4.1. Prospects for the Automotive Industry in Kazakhstan in Light of the Sector Development Strategy

Mechanical engineering is one of the system-forming sectors of the economy, ensuring the necessary industrial development. Without it, the stable functioning of such related industries as the agro-industrial and transport sectors and the energy and metallurgical industries is impossible. That is why government programs aimed at ensuring the economic security and independence of states contain measures for its systematic development. Since 2000, car production has increased 24-fold. Having started with the production of individual components and assemblies, the automotive industry of Kazakhstan is now producing full-fledged assembled cars in all possible categories [72].

The development of the automotive industry causes synergistic effects. It introduces the necessary elements of scientific and technological progress, causes both economic growth as a whole and increases in the competitiveness of the state on the world stage. In addition, the level of social tension is decreasing and the labor market is expanding. Thus, when one job is created, the necessity arises for the creation of 7–8 full-fledged jobs in related industries. During the crisis caused by the COVID-19 pandemic, enterprises in the mechanical engineering industry of Kazakhstan continued their work almost without stopping. Among them, the highest percentage of growth was shown by automobile manufacturing enterprises. The following measures can be identified that contribute to these dynamics [72]:

- Increasing the percentage of localization by including a minimum acceptable level in the contractual obligations of manufacturers;
- Establishing foundry technologies for the production of parts by casting;
- Attracting government funding by concluding contracts for the purchase of enterprise products that have not yet been produced;
- Development of preferential loan programs and leasing systems;
- Bringing the share of the reimbursement of costs for the production of export products by the state to 80%.

By analyzing the history of the automotive industry development, one can accurately establish the reasons for its forceful role in the development of mechanical engineering as a whole. The start was made in 2003 with the production of the first NIVA car. At that time, Kazakhstan mainly imported cars, and in the country itself only one brand was produced—VAZ. The next milestone in development was supposed to be the 2010 agreement, according to which motor vehicles began to be assembled. However, his conclusion did not live up to expectations: in 2016, domestic cars accounted for only a quarter of the total market. That is why the state has developed new measures that have become key in the development of the automotive industry in Kazakhstan. Thus, VAT preferences, a recycling fee, preferential lending and leasing programs, an industrial cooperation program, and facilitating the export of products were introduced. Kazakhstan attracted SMC-JAC Motors—SaryarkaAvtoProm LLP—as investors and strategic partners. The development of the industry was also facilitated by the arrival of the global automotive technology companies KamAZ (2005), Daewoo, Hyundai, IVECO, and ANKAI. These events inevitably led to the formation of the once practically empty automotive sector, laying the basis for healthy competition and the creation and development of the industry itself.

In 2020, there were more than 77 thousand vehicles produced in Kazakhstan's automobile industry. The automotive industry is equal to 33.4% of the country's engineering industry. In 2019, just over 50 thousand vehicles were produced in Kazakhstan, which is equal to 26.3% of the engineering industry [73]. One of the important indicators in the automotive industry is the localization level. It was widely acknowledged that there is only

a "screwdriver" assembly in Kazakhstan where ready-made components are simply connected to each other. This is partly true, but some enterprises have already reached a 50% localization level, and large-scale assembly brings significant benefits to the economy.

If we consider the import process, for example, of a South Korean fully assembled car, it is quite transparent [74]. After all, assembly processes are completed, taxes and customs duties are paid from the prepared vehicle, and then its direct owner. The tax deductions accrued on a finished car are higher than if it were assembled in the country of sale; this justifies its increased price.

If we consider the concept of producing a car on the territory of the manufacturing plant and selling it in the final country in the form of individual components, then between these stages the car that comes off the assembly line is sent to the metro station for disassembly to the minimum level of disassembly allowed in the country of implementation. Evidently, the greater degree of disassembly of the car increases the labor intensity of its assembly on site. It is noteworthy that tax rates for fully finished exported cars and those transported in the form of components can differ greatly, and in the first case, they amount to the full cost of the car. The differentiation of rates is explained by the authorities' interest in the latter option, in which new jobs are created in the territory of the importing country. Welding and painting work are usually not provided; the process includes only assembly operations. This method of car production is most popular in newly developed markets that do not have an established supplier base and where the number of incoming cars is small. Large-unit assembly organized in this way takes place in many markets.

Over the past decade, the automotive industry of Kazakhstan has moved from large-scale assembly (KKA) to small-knot assembly (SKA). Today, three out of five cars sold in Kazakhstan are the result of the work of local manufacturers. The localization level reached 33–50% [73]. The largest car manufacturer SaryarkaAvtoProm has a market segment of 50%. On 15 October 2020, the production of Hyundai passenger cars was launched in Almaty by Askar Mamin, the Prime Minister of the Republic of Kazakhstan. The capacity of the line at the initial stage is 30 thousand units per year. The modern technologies and installation of equipment were used with the involvement of South Korean experts. The number of new jobs, taking into account related industries, amounted to 1000.

By 2026, the automotive industry of Kazakhstan will be able to produce 500 thousand cars per year, with an emphasis on deepening localization; one model of each brand must be assembled through small-scale assembly (this is more than 2 thousand operations). Taking into account the prospects for the production of electric vehicles, Kazakhstan is taking active steps in this direction. Thus, at SaryarkaAvtoProm, the JAC iEV7s electric car was prepared for production launch and received all the necessary certificates after testing at the Russian NAMI test site. It has also received permitting certificates from the Customs Union, which gives it the right to operate in the EAEU countries. The company also produces electric buses. The popularization of electric cars is facilitated by the abolition of the transport tax for their owners and the minimum size of the recycling fee.

SaryarkaAvtoProm, together with the Uzbek automaker, is promoting the joint production of Ravon and Chevrolet cars (DAMAS, LABO, Cobalt, and Malibu), as well as a project to produce a new type of bus and special automobile, Yutong, for the city of Saran. On 30 July 2020, the JSC Allur Group of Companies and PJSC Tatneft came to an agreement and signed the necessary documents to start the creation of a plant for the production of tires for individual and commercial vehicles. On the territory of the Kostanay region, in partnership with KAMAZ PJSC, initiatives are being implemented to produce a foundry and main gear reducers for truck drive axles.

Having 28 years of experience, Astana Motors has every chance of becoming an international player by creating a car manufacturing plant with a localization level of 51%. On 15 October 2020, work on the welding and painting shop, assembly lines, and warehouse areas was launched, allowing for small-scale assembly. One of the key components of the success of any company is its personnel, so four out of five employees of Hyundai Trans Kazakhstan graduated from higher or secondary specialized educational institutions. As-

tana Motors plans include launching a production line of auto components. The launch of these initiatives will contribute to the creation of an automobile cluster in the Almaty region [75].

The Kazakhstani authorities expect to turn Almaty into a powerful automobile assembly cluster. Since 2020, a Hyundai Trans Kazakhstan plant has been operating in the city. Last year, it reached its design capacity of 45 thousand cars per year. The total productivity of the two Chinese multi-brand sites is 170 thousand cars per year. The capacity of the automobile market in Kazakhstan at the end of 2022 was 124 thousand units. Therefore, new car assembly plants will be export-oriented, that is, 60 percent of Chery, Haval, and Changan assembled in Kazakhstan are going to be supplied abroad.

Astana Motors signed a memorandum with three Chinese automakers—Chery, Changan, and Great Wall Motor. The document confirms the right to produce cars of the listed brands at a new multi-brand plant in Kazakhstan under licensing agreements. As the portal "Chinese Cars" reports with reference to a representative, the plant will be completed in 2025, and the production of Chery, Changan, and Haval models (owned by GWM) will be organized there. The cars are planned to be produced exclusively using the small-knot method with welding and body painting. According to their plans, the production capacity of the new multi-brand enterprise will be 90–10 thousand cars per year, and 60 percent of this volume (approximately 55 thousand cars) will be exported to the CIS countries.

In the picture (Figure 5), you can see the location of the workshops in an area of 100 thousand square meters.

Figure 5. Location of workshops moderated from the open media source. Translated from the open media source: https://xn----7sbbeeptbfadjdvm5ab9bqj.xn--p1ai/2022/09/15/multibrendovyj-zavod-kitajskih-avtomobilej-v-kazahstane/?tgm (accessed date 15 September 2022) [75].

The map contains (Figure 6) welding and painting shops, assembly shops with an area of 25 thousand square meters, as well as several supplier factories producing car seats, multimedia systems, rugs, and plastic parts. Storage areas have also been marked. The new plant will be adjacent to Hyundai Trans Kazakhstan.

Figure 6. Design of plants moderated from the open media source. Translated from the open media source: https://inbusiness.kz/ru/news/kto-i-zachem-v-kazahstane-lokalizuet-avtokomponenty (accecced date 12 April 2022) [76].

Investments in the project to build a new automobile plant in Astana will amount to "about $200 million". About 2.2 thousand jobs will be created at the plant.

From 2017 to 2021, the annual growth in car selling in the Kazakhstani market amounted to 20–25%. Taking into account the increasing popularity of cars produced in Kazakhstan, domestic manufacturers are solving problems by increasing the supply of components from around the world, building new logistics routes, and organizing the production of auto components in Kazakhstan. In particular, Astana Motors localizes components of South Korean brands in Almaty and has already signed agreements with Youngsan Glonet Corp. Ltd. (Seoul, Republic of Korea) for granting the right to produce car seats using Youngsan technology, as well as with Motrex Co., Ltd. (Seongnam-si, Republic of Korea), having received the right to produce multimedia devices using Motrex technology.

Currently, Astana Motors is at the design stage of construction, on an area of more than 10 hectares in the Industrial Zone of Almaty, of three factories for the production of car seats, polyurethane mats, fender liners, mudguards, and multimedia systems for Hyundai cars, together with foreign partners who have experience in the production of auto components in foreign countries. The complex of new enterprises will be located near the existing plant, Hyundai Trans Kazakhstan. The area of production premises will be 7.7 thousand square meters. The launch of the enterprises is scheduled for early 2024. It is planned that about 90 specialists will work at three enterprises for the production of automotive components.

As part of the working trip, the President of the Republic of Kazakhstan, Kassym-Jomart Tokayev, launched the construction of a multi-brand automobile plant in Almaty for the production of cars of the Changan, Chery, and Haval brands, the opening of which is scheduled for the fourth quarter of 2024. There has been credit granted to the Orbis Distributor Group for building another multi-brand plant in Almaty within five years, where Geely and Exeed cars will be assembled. Moreover, in Kazakhstan, Geely and Exeed intend to assemble under one roof, and in the Chinese market, the cars of these two brands are competitors.

The construction of the first real localization project in Kostanay is being completed. The localization center will produce components for all Kazakhstani manufacturers, thanks

to which enterprises will be able to increase the share of domestic content in their products. The total area of the production facilities will be more than 27,000 sq. m. The project provides modern technological equipment (welding robot, painting line, laser cutting, press brake, sheet bender, pipe bender, etc.). The project completely covers the needs of the agricultural machinery industry for the localization of products (plastic parts, cabins, balers, seeders, components, and attachments for tractors and combines). The development of the production of component parts for the automotive industry has begun. The localization center also includes a project for an innovative engineering center for the development of human capital, as well as a dormitory for specialists. All new projects are significant components of the production belt of the Republic of Kazakhstan, where factories of a new format are united, focused on working with an emphasis on developing the production of components. Moreover, Kazakhstani enterprises are integrating into global chains for the production of automotive components, providing export markets with their closest neighbors—Russia, China, and Uzbekistan [77].

According to the Association of Automotive Business of Kazakhstan (AKAB), the average level of localization of the Kazakhstani automobile industry is 33%, and the maximum for individual models is more than 50%. About 4.1 thousand people work at the production sites of automobile industry enterprises, and more than 12 thousand work in related industries.

Full-scale production of Chinese cars will begin in Kazakhstan in 2025. The year before, construction of a multi-brand plant began in the Industrial Zone of Almaty, which will produce nine models of three different brands from China. The new enterprise will produce nine models of the Chery, Haval, and Changan brands at the beginning of the life cycle, with a generation change or complete restyling, that is, mastering production models as they enter the global market. But, the list of models has indeed already been determined. Thus, in Kazakhstan they are going to start production of Chery Tiggo 2 Pro, Tiggo 4 Pro, and Tiggo 7 Pro; Haval Jolion, H6, and M6 Plus; as well as Changan CS35, CS55, and CS75. Great Wall Motor has a rich history of joint ventures, including with competing brands at the factory site.

Sales of new cars in Kazakhstan continue to grow, and in January–March 2023 amounted to 37.3 thousand units, which is 66.7% more than in the same period last year. Chinese brands are leaders in auto sales, and their share has grown to 17.7%. Production growth is also noted, and in January–March 2023, 19.5 thousand cars were already produced, which is 36.7% more than in the same period last year. Despite rising prices for fuel and lubricants and fuel shortages, Kazakhstanis continue to purchase new cars and also pay attention to economical small cars and electric vehicles.

The export-oriented nature of the factories demonstrates the high quality of the equipment produced and the trust in it from foreign clients. In 2020, Kazakhstan exported 8122 units of cars to neighboring countries, which is three times more than in 2019 (2629 units). In general, over the calendar year, more than 10% of all manufactured equipment worth KZT 55.9 billion was exported from the country. Recently, automakers have been creating strategic alliances in order to join forces to enter new markets, expand sales geography, and acquire breakthrough technologies. The main strategic goals of improvement lie in the area of searching for methods to reduce fuel consumption through the use of alternative types of fuel, the introduction of new structural materials in order to increase comfort levels, the expansion of the model range in terms of the level of functionality, costs, and consumer characteristics.

The immediate plans of the automotive industry include measures to increase production volumes to 100,000 units, of which 10,000–15,000 are expected to be sent to the markets of countries such as Russia, Kyrgyzstan, Uzbekistan, Tajikistan, Belarus, Azerbaijan, etc. Long-term planning strategies for the automotive industry include the following [73]:

- Intensification of measures to increase the presence of Kazakhstani manufacturers in this market through the conclusion of agreements on the localization of assembly plants from the start of 2021;

- Development of a strategic line of production associations with Kazakhstani partner manufacturers of automotive components;
- Expansion of the electric vehicle sector.

Kazakhstan should soon turn into a large regional hub for automobile production. After all, Hyundai/Kia and JAC cars are already being assembled in the country, and Jetour, Chevrolet, and Volkswagen will soon begin to be assembled. The country is actively moving forward in terms of localization; the technopark being created in the Industrial Zone of Almaty contributes to the development of the automotive industry and the formation of a system of qualified personnel in the field of mechanical engineering, deepening localization and developing a cluster economy.

According to Artur Miskaryan, director of the agency for the monitoring and analysis of the automotive market: "The creation of capacities for the production of auto components is a logical stage in the "maturation" of the automotive industry in any country in the world, which directly depends on the market capacity. Despite all the difficulties in the global market, the Kazakh auto industry continues to develop according to all the laws of the industry. It is clear that the localization of auto components, on the one hand, requires a certain investment potential and regulatory stability. On the other hand, this process always entails the creation of new, qualified jobs, an increase in tax deductions and, most importantly for the consumer this is price stabilization" [78].

Investments in the construction of an automotive component production complex in Almaty will total about KZT 6.8 billion, including about KZT 0.9 billion for organizing multimedia production, up to KZT 4.3 billion for a plant for the production of car seats, and about KZT 1.6 billion for an enterprise for the production of mats, fender liners, and mudguards.

Considering the small volumes of the domestic market of Kazakhstan, automakers have come to the conclusion that they need to actively develop exports. At the end of 2020, 77.4 thousand cars were produced in the country, every 10th was sent for export. Exports amounted to 8122 vehicles, which is three times more than in 2019. Revenues reached almost KZT 56 billion (USD 132.3 million).

Considering the current state of the automotive industry and the prospects for its sustainable and efficient development, it is necessary to consider the possibility of a new automobile assembly plant appearing on the market from the standpoint of analyzing the development strategy of the industry as a whole. Then, as part of the implementation of the strategy, it will be necessary to choose the appropriate strategy for a particular enterprise, taking into account the possibilities of its "embedding" into the existing market.

4.2. Strategy for Increasing the Sustainability of the Automotive Industry: The Case of Kazakhstan

As can be seen from the previous chapters, the automotive industry in Kazakhstan is one of the most dynamically developing. However, when opening a large number of automobile assembly plants of various brands, one should not forget that this can create both positive development factors and, by creating internal competition, slow down the growth rate and lead to negative consequences in the case of an incorrectly chosen development strategy.

To develop a strategy for the automotive industry in Kazakhstan, applying the algorithm described in Section 2, and then proceeding to the strategic planning of a specific company is appropriate.

Since we are considering a new company that does not allow us to perform a quantitative analysis based on statistical data on its functioning, then for building a strategy, in our opinion, it is best to use a combined analysis of the strategic management of the industry as a whole (described in Section 2), and as the company develops, the industry as a whole and market, reconsidered based on the "feedback" method (see Figure 3).

4.2.1. Porter's Five Forces

In the first stage, we will study the external microenvironment (internal macroenvironment), using Porter's Five Forces model. At this stage, we must highlight the most significant factors that can affect the sustainability of the industry.

Bargaining power of suppliers:

The bargaining effectiveness of suppliers due to the presence of competition sur-rounded by suppliers of auto parts will be low, due to the fact that the level of localization is low, but in the event of the emergence of monopolists in the market with the development of new technologies, it may increase in some segments. However, automakers have the opportunity to move away from low-quality materials as auto component localization, specialization, and supply chain development are supported by new technological advances.

The trading power of clients:

At the initial stage of a product's entry into the market, customers' bargaining power will be moderate since customers will not have sufficient information about the characteristics of certain models, as well as other factors influencing their decision-making: price–quality ratio, the brand image of the manufacturer, cost of ownership (development of the service system), and impact on the environment. This is due to the large number of automakers on the market, as well as the similarity of the declared technical characteristics and the fact that models of different brands belong to the same price category.

The rivalry between existing players:

Competition among automobile manufacturers is aimed at satisfying customer needs in terms of lower prices, better product differentiation, more efficient distribution strategies, and stronger business relationships with the supply chain. In addressing these issues, the market winner will be the one who better defines its target audience and understands consumer preferences before segmenting its products. Here, both the cost of the product itself and the cost of after-sales service (more favorable conditions for maintaining operability) will play a significant role.

The threat of substitutes:

The threat of substitutes is moderate because rival automakers are trying to offer customers models that have their own distinctive features. As stated, if the manufacturer initially focuses on "his" consumer, that is, he has competently studied the preferences of his target audience, then the client will choose "his" car, taking into account factors such as price, quality, and design. Gradually, as production develops, stable trust in the brand is formed. If similar models with more attractive prices appear, the level of threat may increase.

4.2.2. PESTEL Analysis

Since much attention is currently paid to the environment and, in addition, the government can play an important role by supporting enterprises in the sector through the adoption of various regulations and industry development strategies, we decided that the most appropriate for the first stage of assessment would be the use of PESTEL analysis (Figure 4), as a modified PEST (STEP) analysis type.

Political factors:

Political factors significantly affect the state of the automobile branch. These can be both external and internal conflicts that affect the sustainability of both the enterprise and the general economic climate in the country.

Economic factors:

The increase in car prices is associated with the general rise in prices and the depressed state of the economy. In addition, industry depends on the cost of energy resources. Changes in supply and demand in the industry are influenced by payments to the local budget, the cost of raw materials, the number of people living in the country, purchasing power, range of economic activities, level of freight and passenger transportation, dependence on the degree of fuel efficiency, etc. The profitability of the automotive branch is largely related to the financial capabilities of customers, so the growth of the

share of the middle class in the country will have a positive impact on the exploitation of the automotive industry.

Social factors:

Sociocultural factors that influence the development and growth of the automobile industry include demographic situation, educational levels, quality of life, security issues, features of ethnographic culture, as well as the influence of consumer habits and the degree of acceptance of environmentally friendly car models. The growth of the automobile industry depends on the preferences of buyers who purchase it for family needs, taking into account its cost, number of passenger seats, etc.; hence, the need to take into account the demographics of the country while planning production is clear.

Technological factors:

Technical and technological factors dominate the development of the automotive branch, as new technical solutions improve driving standards. Innovations concern increasing fuel efficiency, environmental friendliness, and the level of vehicle automation. This makes it possible to simplify the process of driving a car, and together, new solutions (such as seat belts and airbags, child restraints, and others) satisfy customer requirements for safety issues and help them avoid injuries sustained in accidents. Thus, modern braking systems contribute to extending the braking distance even on wet asphalt and allow for the avoidance of collisions. The automotive industry needs to expand funding for research projects in order for new technologies to be useful and meet customer requirements.

Environmental factors:

There are environmental issues that are getting worse as the industry develops, including fuel consumption and reduction in air quality due to CO_2 pollution. These problems can only be solved using breakthrough technologies in the automotive industry. The release of cars on alternative fuels (electricity, biofuels) will help change environmental habits and consumer behavior, and shift attention towards more energy-efficient transport.

Legislative factors:

In fact, there are some legal requirements that car manufacturers must comply with. When designing and producing new types of cars, the first goal is to comply with environmental regulations and requirements. On the other hand, this type of car requires large investments and preferences from the state due to the higher initial cost of the vehicle. That is why the success of the initiative to popularize and increase the share of environmentally friendly cars will depend on the willingness of governments to develop and adopt development programs with appropriate financial funds. In addition, the state influences the development of the automotive industry by regulating the level of taxes and customs duties.

4.2.3. Case Study: Application of SWOT Analysis to Assess the Prospects for the Development of the Automotive Industry in Kazakhstan

We have considered the possibility of localizing an automobile assembly plant for passenger cars of Chinese brands in the Republic of Kazakhstan; the factors taken into account during the analysis are given in Figure 7. All factors are divided into groups representing internal strengths, internal weaknesses, external threats, and external opportunities.

1. Consider the following potential internal strengths:

Economic factors determining strengths include the following:

- Creation of a new product, which will lead to GDP growth.
- Diversification of the economy through the development of the non-resource sector.
- Development of local manufacturers in the event of localization of production, which will lead to the displacement of foreign companies from new potential market segments.

Social factors,

- Reducing unemployment due to new jobs
- Increase in the share of the working population engaged in intellectual work.

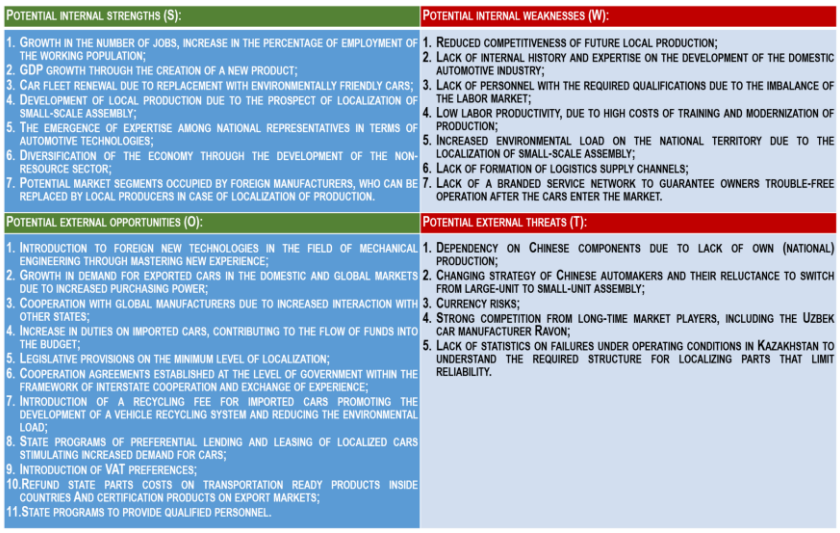

Figure 7. Factors taken into account when conducting a SWOT analysis.

Technological factors,

- Development of local production due to the prospect of localizing small-scale assembly.
- Development of new technologies.
- Accumulation of experience in the field of automotive technology among national personnel, improving product quality.

Environmental factors,

- Vehicle fleet renewal.
- Replacement of cars with more environmentally friendly ones.

2. Consider the following potential internal weaknesses:

Political factors determining potential internal weaknesses include the following:

- Lack of internal history and experience in the development of the domestic automotive industry.
- Lack of support from the state.

Economic factors determining potential internal weaknesses include the following:

- Low labor productivity due to high costs of personnel training and production.
- Lack of established logistics supply channels, which will affect the cost of the car.

Social factors,

- Lack of workers with the necessary qualifications, imbalance of supply and demand in the labor market.
- The need for a system of training highly qualified personnel.

Technological factors,

- Reduced competitiveness of future local production due to niche occupation by foreign manufacturers and increasing technological gap.
- Lack of a proprietary service network, due to the need to develop, repair, and maintain technology that guarantees owners trouble-free operation after the cars enter the market.

Environmental factors,

- Increased environmental load in the country due to the localization of production of auto components for small-unit assembly.

3. Potential external opportunities (O) include the following:

Political factors determining potential external opportunities include the following:

- Cooperation with global manufacturers against the backdrop of growing interaction with other countries.
- Cooperation agreements concluded at the government level, which will lead to interstate cooperation and exchange of experience.

Economic factors determining potential external opportunities include the following:

- Increased demand for export cars in the domestic and global markets due to increased purchasing power.
- Increase in duties on imported cars, contributing to the flow of funds into the budget.
- Government programs for preferential lending and leasing of localized cars, leading to increased demand for cars.
- Reimbursement of government costs for transportation of finished products within the country and certification of products for export markets, which will lead to increased competitiveness of domestic products.
- Introduction of VAT benefits, which will lead to an increase in purchasing power.

Social factors,

- State programs to provide qualified personnel.

Technological factors,

- Introduction of new foreign technologies in the field of the automotive industry, facilitating the acquisition of new competencies.

Environmental factors,

- Introduction of a recycling fee for imported cars to develop a system for recycling used vehicles and reduce the environmental load.

Legislative factors,

- Legislative provisions on the minimum level of localization.

4. Consider the following potential external threats (T):

Economic factors determining potential external threats include the following:

- A change in the strategy of Chinese automakers and their reluctance to move from large-unit assembly to small-unit assembly, which will lead to a decrease in competitiveness.
- Strong competition from long-time market players, including the Uzbek automaker Ravon, which will affect the market value of the car.
- Currency risks, which may lead to an increase in production costs.

Technological factors,

- Dependence on Chinese components due to lack of in-house production.
- Lack of statistics on failures during operation in Kazakhstan to understand their durability, which is necessary to predict the localization structure of parts that limit reliability due to the appearance of defects during operation.

The most significant factors influencing the construction of an effective strategy were grouped and indicated in Figure 7.

The matrix of assessments of internal and external factors is formed by the expert method (Figures 8–11).

Experts assign strengths and weaknesses to an A_i score on a scale of 1 to 7 (the maximum score corresponds to a significant manifestation of the factor). To assess external factors, two parameters are used:

- Probability of achieving event p_j on a scale of 0 to 1, where 1 corresponds to the maximum probability of the event occurring;
- The significance of the factor K_j, characterizing the degree of influence of the factor on the company's activities on a scale of 0 to 4, where the maximum number of points corresponds to a high degree of influence.

				Strengths						
				1	2	3	4	5	6	7
				Estimates A_i [1;7]						
				6	7	2	4	3	5	1
Possibilities	1	P_j [0;1]× K_j [0; 4]	0.3x4	7.2	8.4	2.4	4.8	3.6	6	1.2
	2		0.3x3	5.4	6.3	1.8	3.6	3.24	5.4	1.08
	3		0.8x4	19.2	22.4	6.4	12.8	11.52	19.2	3.84
	4		0.3x2	3.6	4.2	1.2	2.4	2.16	3.6	0.72
	5		0.8x4	19.2	22.4	6.4	12.8	11.52	19.2	3.84
	6		1x3	18	21	6	12	10.8	18	3.6
	7		0.5x2	6	7	2	4	3.6	6	1.2
	8		0.6x3	10.8	12.6	3.6	7.2	6.48	10.8	2.16
	9		0.5x3	9	10.5	3	6	5.4	9	1.8
	10		0.4x1	2.4	2.8	0.8	1.6	1.44	2.4	0.48
	11		0.8x4	19.2	22.4	6.4	12.8	11.52	19.2	3.84

Figure 8. Opportunities and Strengths Assessment Matrix.

				Weak sides						
				1	2	3	4	5	6	7
				Estimates A_i [1;7]						
				1	5	6	2	3	7	4
Possibilities	1	P_j [0;1]× K_j [0; 4]	1.2	1.2	6	7.2	2.4	3.6	8.4	4.8
	2		0.9	0.9	4.5	5.4	1.8	2.7	6.3	3.6
	3		3.2	3.2	16	19.2	6.4	9.6	22.4	12.8
	4		0.6	0.6	3	3.6	1.2	1.8	4.2	2.4
	5		3.2	3.2	16	19.2	6.4	9.6	22.4	12.8
	6		3	3	15	18	6	9	21	12
	7		1	1	5	6	2	3	7	4
	8		1.8	1.8	9	10.8	3.6	5.4	12.6	7.2
	9		1.5	1.5	7.5	9	3	4.5	10.5	6
	10		0.4	0.4	2	2.4	0.8	1.2	2.8	1.6
	11		3.2	3.2	16	19.2	6.4	9.6	22.4	12.8

Figure 9. Opportunities and Weaknesses Assessment Matrix.

				Strengths						
				1	2	3	4	5	6	7
				Estimates A_i [1;7]						
				6	7	2	4	3	5	1
Threats	1	P_j [0;1]× K_j [0; 4]	0.9x4	21.6	25.2	7.2	14.4	10.8	18	3.6
	2		0.3x4	7.2	8.4	2.4	4.8	3.6	6	1.2
	3		0.6x2	7.2	8.4	2.4	4.8	3.6	6	1.2
	4		0.6x2	7.2	8.4	2.4	4.8	3.6	6	1.2
	5		0.7x3	45.36	52.92	15.12	30.24	22.68	37.8	7.56

Figure 10. Threats and Strengths Assessment Matrix.

				Weak sides						
				1	2	3	4	5	6	7
				Estimates A_i [1;7]						
				1	5	6	2	3	7	4
Threats	1	P_j [0;1]× K_j [0; 4]	3.6	3.6	18	21.6	7.2	10.8	25.2	14.4
	2		1.2	1.2	6	7.2	2.4	3.6	8.4	4.8
	3		1.2	1.2	6	7.2	2.4	3.6	8.4	4.8
	4		1.2	1.2	6	7.2	2.4	3.6	8.4	4.8
	5		2.1	2.1	10.5	12.6	4.2	6.3	14.7	8.4

Figure 11. Threat and Weakness Assessment Matrix.

To determine strengths and weaknesses, potential external threats, and favorable opportunities, a matrix of mutual influences of factors is compiled. For each pair of factors, a score of their interaction a_{ij}, (from −1 to 1) is entered: with a direct (inverse) dependence, the score is positive (negative), and the stronger the dependence, the higher the modulus score. The result is presented in Figure 12.

		Strengths							Weak sides						
		1	2	3	4	5	6	7	1	2	3	4	5	6	7
Possibilities	1	0.1	0.1	0.5	1	1	1	1	−1	−1	−1	−1	−1	−1	−1
	2	0.7	0.3	0	0	0	1	0.8	−0.5	−0.5	0	−0.5	−0.5	−1	−1
	3	0.1	1	0.1	0.3	0.8	0.4	1	−0.2	−0.2	0	0	−0.5	−1	0
	4	0	0	1	0.2	0.8	0.5	0.3	−0.3	−0.7	0	0	0	0	0
	5	0	0	0	0	1	1	1	−0.3	−0.4	0	0	−0.8	0	0
	6	0	0	0	0	0	1	1	−0.3	−0.4	0	0	−1	−1	0
	7	0	0	0.3	0	0	1	0.5	0	0	0	0	0	0	0
	8	0	0.5	0	1	0	0.6	0.7	−0.5	−1	0	0	−1	0	0
	9	0	0.7	0	0	0	0.6	0.5	−1	−0.3	0	0	−0.6	0	0
	10	0	0.7	0	0	0	0.6	0.7	−1	0	0	0	0	−1	0
	11	1	0.7	0	0	0	1	1	−1	−1	−1	−1	0	0	0
Threats	1	−0.5	−0.5	0	−1	−1	−1	−1	1	1	1	1	0.6	1	0.1
	2	0	−0.5	−1	−1	−1	−1	−0.7	1	1	1	0.6	0.7	1	1
	3	0	−1	0	−1	−0.4	−1	−1	0	0	0	0.3	0	1	0.6
	4	0	0	−1	−1	−0.1	−1	−1	1	0.4	0.3	0.8	0	0.8	1
	5	0	0	−1	0	0	0	−1	1	0	0	0	0	1	1

Figure 12. Assessment matrix for the interaction of SWOT analysis factors.

The estimates form complex parameters A_{ij}:

$$A_{ij} = p_j \times K_j \times A_i \times a_{ij}, \quad (1)$$

where A_i represents the rating of the company's strengths (weaknesses);

K_j—signifies the extent of the impact of an opportunity or threat;
p_j—denotes the likelihood of an environmental factor manifesting;
a_{ij}—indicates the degree of interrelation between elements of pair-wise analysis.

The importance of each factor from a strategic formation perspective is evaluated:

$$W = \sum A_{ij}, \quad (2)$$

Figures 13 and 14 show the final values of the SWOT matrices, which contain the sum of weighted assessments. Quantitative assessments are assessed modulo, and the most significant strategy is selected.

		STRENGTHS							
		1	2	3	4	5	6	7	$\sum A_{ij}$
POSSIBILITIES	1	0.7	0.8	1.2	4.8	3.6	6.0	1.2	18.36
	2	3.8	1.9	0.0	0.0	0.0	5.4	0.9	11.93
	3	1.9	22.4	0.6	3.8	9.2	7.7	3.8	49.54
	4	0.0	0.0	1.2	0.5	1.7	1.8	0.2	5.42
	5	0.0	0.0	0.0	0.0	11.5	19.2	3.8	34.56
	6	0.0	0.0	0.0	0.0	0.0	18.0	3.6	21.60
	7	0.0	0.0	0.6	0.0	0.0	6.0	0.6	7.20
	8	0.0	6.3	0.0	7.2	0.0	6.5	1.5	21.49
	9	0.0	7.4	0.0	0.0	0.0	5.4	0.9	13.65
	10	0.0	2.0	0.0	0.0	0.0	1.4	0.3	3.74
	11	19.2	15.7	0.0	0.0	0.0	19.2	3.8	57.92
		25.62	56.42	3.64	16.32	26.06	96.60	20.75	
THREATS	1	−10.8	−12.6	0	−14.4	−10.8	−18	−3.6	−70.20
	2	0	−4.2	−2.4	−4.8	−3.6	−6	−0.84	−21.84
	3	0	−8.4	0	−4.8	−1.44	−6	−1.2	−21.84
	4	0	0	−2.4	−4.8	−0.36	−6	−1.2	−14.76
	5	0	0	−15.12	0	0	0	−7.56	−22.68
	$\sum A_{ij}$	−10.80	−25.20	−19.92	−28.80	−16.20	−36.00	−14.40	

Figure 13. Final SWOT matrix (strengths–opportunities, strengths–threats).

		WEAK SIDES							
		1	2	3	4	5	6	7	$\sum A_{ij}$
POSSIBILITIES	1	−1.2	−6.0	−7.2	−2.4	−3.6	−8.4	−4.8	−33.6
	2	−0.5	−2.3	0.0	−0.9	−1.4	−6.3	−3.6	−14.9
	3	−0.6	−3.2	0.0	0.0	−4.8	−22.4	0.0	−31.0
	4	−0.2	−2.1	0.0	0.0	0.0	0.0	0.0	−2.3
	5	−1.0	−6.4	0.0	0.0	−7.7	0.0	0.0	−15.0
	6	−0.9	−6.0	0.0	0.0	−9.0	−21.0	0.0	−36.9
	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	8	−0.9	−9.0	0.0	0.0	−5.4	0.0	0.0	−15.3
	9	−1.5	−2.3	0.0	0.0	−2.7	0.0	0.0	−6.5
	10	−0.4	0.0	0.0	0.0	0.0	−2.8	0.0	−3.2
	11	−3.2	−16.0	−19.2	−6.4	0.0	0.0	0.0	−44.8
		−10.3	−53.2	−26.4	−9.7	−34.5	−60.9	−8.4	
THREATS	1	−10.8	−12.6	0	−14.4	−10.8	−18	−3.6	−70.20
	2	0	−4.2	−2.4	−4.8	−3.6	−6	−0.84	−21.84
	3	0	−8.4	0	−4.8	−1.44	−6	−1.2	−21.84
	4	0	0	−2.4	−4.8	−0.36	−6	−1.2	−14.76
	5	0	0	−15.12	0	0	0	−7.56	−22.68
	$\sum A_{ij}$	−10.80	−25.20	−19.92	−28.80	−16.20	−36.00	−14.40	

Figure 14. Final SWOT matrix (weaknesses–opportunities, weaknesses–threats).

Following the outcomes from the SWOT analysis, a strategic action matrix is assembled (Figure 15): SO implies actions required to leverage strengths to augment the company's capabilities; WO refers to actions necessary to overcome weaknesses and seize the present opportunities; ST encompasses actions that employ the organization's strengths to ward off threats; WT represents actions that mitigate weaknesses to deter threats.

SO	WO
DIVERSIFICATION OF THE ECONOMY THROUGH THE DEVELOPMENT OF THE NON-RESOURCE SECTOR WILL BE FACILITATED BY GOVERNMENT PROGRAMS TO PROVIDE QUALIFIED PERSONNEL.	COOPERATION WITH GLOBAL MANUFACTURERS WILL PROVIDE EXPERIENCE IN FORMING TRANSNATIONAL LOGISTICS SUPPLY CHANNELS.
ST	**WT**
ADOPTION OF LEGISLATIVE ACTS, DEVELOPMENT OF NATIONAL EXPERTISE IN THE FIELD OF MECHANICAL ENGINEERING, ATTRACTION OF INVESTMENTS AND OTHER MEASURES TO ACHIEVE LOCALIZATION OF SMALL-UNIT ASSEMBLY IN ORDER TO REDUCE DEPENDENCE ON CHINESE COMPONENTS	DEVELOPMENT AND IMPLEMENTATION OF METHODS FOR CALCULATING VOLUMES, FREQUENCY AND METHODS OF SUPPLY, ORGANIZING LOGISTICS CHANNELS, TOOLS AND INFORMATION TECHNOLOGIES TO FORM AN OPTIMAL SUPPLY SYSTEM FOR PARTS AND SPARE PARTS FOR AUTOMOBILES IN ORDER TO REDUCE LOGISTICS RISKS

Figure 15. Matrix of strategic activities in relation to the competitive environment.

4.2.4. Options for Firm Strategies

When constructing a roadmap for the development of an enterprise as part of the implementation of the development strategy, the best possible option is selected for the specific conditions prevailing at the moment. The selection options are shown in Figure 16.

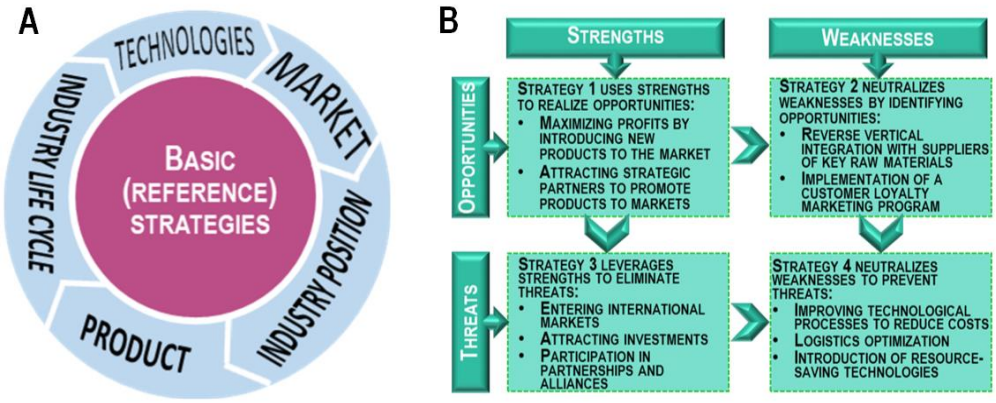

Figure 16. (**A**) Cycle of strategic management in the industry; (**B**) options for implementing the company's strategy.

5. Conclusions

In conclusion, the automotive industry, influenced by globalization forces and guided by principles of localization, occupies a prominent position in the pursuit of sustainable development within the 21st century. Transport has the property of a powerful catalyst; it directly and indirectly increases the level of industrial and commercial activity in all areas of practical activity. Expanding the scale of automotive production makes it possible to develop new territories and incorporate new resources into circulation, and also makes it possible to connect production structures and transport corridors.

Taking into account the peculiarities of Kazakhstan, including the prospects for the development of its logistics potential, which increases the country's investment attractiveness as an important node of the regional transport corridor, the development of the au-

tomotive industry can become an important component of the sustainability of the social sphere and the economy of Kazakhstan as a whole.

The article examines the problems and opportunities associated with the creation of plants for the assembly of foreign brands of cars in developing countries, as well as the subsequent development of the industry. At the same time, it is shown that localization plays a key role in achieving sustainability in both this industry and related industries.

The practice of establishing automotive assembly plants in foreign markets engenders a symbiotic relationship where both the brand-owning country and the host country can reap benefits.

The challenges encountered during the establishment of assembly plants in foreign markets are multifaceted and different. However, comprehending and proactively addressing these challenges is indispensable for ensuring the long-term sustainability and efficiency of such efforts. At the same time, the potential rewards in terms of economic growth, technological advancement, and environmental responsibility provide the country's development synergetic effect. Notably, varying legal and regulatory bases in different countries can present formidable obstacles to successful results.

In the discourse of Chinese political rhetoric, this is often described as "win-win" cooperation. In this context, the brand-owning country, such as China, broadens its global market presence, while the host country, exemplified by Kazakhstan, gains from increased investments, job creation, and the transfer of technological expertise.

Notably, different legal and regulatory bases in different countries can present significant barriers to successful operations.

In this article, we have tried to show the intricacies of advancing sustainable development in the automotive industry through globalization and localization, using the case of Kazakhstan as a newcomer to the industry and China as a growing and dynamic leader.

As the world is on its evolution, the automotive sector is poised to play a great role in forming a more sustainable future. To achieve this objective, collaboration, adaptability, and innovation stand as essential parts of progress.

The approach peculiarities are that when considering the prospects for the development of the industry as a whole, at the strategic analysis stage, it is necessary to assess the possibility of "embedding" an enterprise entering the market, taking into account regional factors and focusing on ensuring the industry's sustainability.

The case of Kazakhstan is an illustration of the intricacies and potential surrounding the establishment of automotive assembly plants in foreign markets. This nation has taken significant strides toward becoming a regional hub for automotive manufacturing. Its experience underscores the significance of a comprehensive approach to localization, which encompasses infrastructure development, regulatory alignment, and workforce development.

After a thorough analysis of positive examples of sustainable development of the automotive industry in Asian countries, we summarize that when choosing a firm's strategy, it is necessary to be guided by the goal of achieving sustainability of the industry as a whole.

The journey of Kazakhstan stands as a testament to the commitment and determination required to surmount the challenges associated with establishing automotive assembly plants in foreign markets. At the same time, the success guarantor for such initiatives is a strong partnership and cooperation between the host country and the country coming for localization. The experiences of countries like Kazakhstan provide valuable insights to the global automotive community, highlighting the importance of overcoming obstacles and charting a course towards a more sustainable and connected future.

The novelty of the methodology used lies in the fact that we adapted classical methods and used them in combination. Since the automotive cluster of Kazakhstan is just being formed, at the initial stage of decision-making on strategic development vectors it is necessary to focus on the industry development strategy; the strategic management algorithm is given in Section 2. When a new company enters the market, there is no data on its activities and one can only be guided by long-term plans: At this stage, you can consider the most important groups of factors using Porter's Five Forces method. Then, using PESTEL

analysis, we described the main factors influencing the formation of localized enterprises in the automotive industry, taking into account the high role of the state in the form of the adoption of regulations that support the task. An environmental group of factors was also highlighted as a mandatory element of sustainable development in view of the high risks of environmental impact from the automotive industry. And, finally, using the factors identified in the previous stage, we have carried out a SWOT analysis. It made it possible to formulate strategic measures that take into account the specifics of the Kazakhstani development. The algorithm for developing a company strategy is given in Section 2.

Since in the article we analyzed the prospects for the development of the Kazakhstani automotive industry in the light of the construction of new automobile assembly plants, it was not possible to use quantitative methods to select strategic directions for development, including the assessment of threats and challenges, as well as development opportunities. However, as statistical data are collected, adjustments to the strategy are possible, including using quantitative methods of analysis. Therefore, in the future, it is planned to create a risk management system that will allow for the adjusting of the industry development strategy based on the collection of statistical data, risk analysis, and development forecasts for both specific enterprises and the industry as a whole.

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