SWOT-AHP hybrid method for ranking the relaunching strategies of an industrial company*

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Abstract

Our paper aims to assess the current situation of an industrial company, which is in a difficult situation caused by two factors: the Covid-19 pandemic and the situation created by reducing the production of cars with diesel engines in favour of electric/hybrid, and defining and prioritizing the most efficient strategies for relaunching the company's activity and for reorienting it towards other components instead of those in current production. The company's current situation was determined by identifying the environmental factors (SWOT) and using the TOWS matrix, and the most appropriate strategies were defined. The research is based on a case study using information collected from the company managers and existing annual reports. To quantitatively determine the importance of each factor in the SWOT matrix, classify the defined strategies, and verify the views of the study participants, the AHP (Analytical Hierarchy Process) method has been used. The calculations were performed with Excel software. The results obtained showed that the top three strategies for developing the company are: investment programs in high-performance equipment, increasing the degree of the processes integration, and attracting new strategic suppliers to develop essential projects.

Keywords: SWOT-AHP method combination, global priorities of the strategies, overall priorities of the sub-factors, pair-wise comparisons, internal and external environment of the company.
JEL Codes: C02, C88, L10

Introduction

Currently, most companies use strategic planning to support the company to become more productive, focus better in terms of allocating resources, and achieve their goals. Strategic planning gives the company the advantage of generating above the average revenue in the market by producing an exceptional value compared to its rivals (Huy/Hien 2010). This requires a competitive approach, viable now and in the future (Dicinta et al. 2021).

Strategic planning focused on managing a company is based on adapting to changes in the internal and external environment while considering the objectives that the company aims to achieve (Trung et al. 2020). Starting from the fact that companies have limited resources, it becomes necessary to develop and

* Received: 07.09.2021, accepted: 25.01.2022, 2 revisions.

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 DOI: 10.5771/0949-6181-2022-4-709

analyse alternative strategies to select the best options to implement (Gürel/Tat 2017). The diagnosis of the internal and external environment of a company is the precondition for elaborating the strategy to fit the company's situation. (Thompson et al. 2013).

The case study within the paper was conducted on a company with an essential role in the Romanian economy (COMPA) specialising in production and sale of the components and parts for the machine-building industry, services, thermal energy, technical assistance, foreign trade, engineering etc. COMPA is one of the first companies with Romanian capital in the top 100 Romanian exporters, covering 23 countries on three continents.

The company has made steady progress technically and technologically, throughout its 130 years of existence, by significant investments in the quality of the products and services offered. Due to the Covid-19 pandemic and the new guidelines in the automotive industry to reduce the production of cars with diesel engines in favour of electric or hybrid cars, the company's activity has suffered. As a result of this situation, the company's strategy is oriented towards developing the projects for the gradual replacement of components in the automotive or other fields to ensure a stable future (Individual Annual Report COMPA 2020).

As the evolution of the automotive industry is uncertain, as a supplier of the components of this industry, COMPA must consider several hypotheses in formulating strategies, as a misdiagnosis of the direction of action would mean substantial costs. Starting from the main strategic objectives that the company has set itself to increase its turnover, which is on a downward trend (a decrease of 26.7 % in 2020 compared to 2019), as well as increasing the profitability, value for the customer and achieving the operational excellence, a study is needed to allow, based on the analysis of the current situation, relaunching the entire activity of the company (Individual Annual Report COMPA 2020). By studying this company with complex activity, the paper brings a plus in applying the SWOT-AHP method by taking into account the two causes that generated the crisis to formulate strategies, to ensure relaunching the activity and reorienting production in agreement with current requirements.

The study aims to determine the current situation of the company, based on the SWOT matrix, and to define and rank the most effective development strategies of the company, having as criteria the sub-factors of the SWOT matrix. This was possible by combining the SWOT with AHP.

The paper includes the following items: literature review in section 2, the research methodology in section 3, the case study in section 4, and conclusions.

Literature review

Combining the SWOT method with AHP has gained popularity and has allowed adopting strategies that have led to significant advances in various fields of activity. Given that the SWOT method cannot quantitatively measure the importance of the factors and sub-factors in decision making, a significant number of works use the SWOT-AHP hybrid method, which allows the quantitative determination of the importance of each factor in the SWOT matrix in selecting the strategies (Nikolića et al. 2015; Ozdemir/Demirel 2018).

Several scientific works have used the SWOT method or the SWOT-AHP hybrid method to define strategies in tourism, an essential field for the economy of a country, and the quality of the tourists' life and people working in the field. Thus, the issue of rural tourism is addressed by Zhang (2012). Using SWOT analysis, the author identified the favourable internal and external environmental factors (geographical position, natural landscape, Wu culture, agricultural products, and rural crafts) and the unfavourable factors, such as inadequate infrastructure, tourism products with low quality, lack of initiatives and professionals in local tourism planning. He offered suggestions for the sustainable development of rural tourism in Suzhou. Also, Sariisik et al. (2011), based on a qualitative analysis performed with the SWOT method, formulated some relevant strategies for yacht tourism in Turkey. The estimates of the strategies were interpreted in a case study for two agreement ports in Istanbul. The strategies suggested by the authors refer to the intensive development of the market for yacht tourism, aggressive marketing, product offer for all markets, low prices for yacht tourism.

A number of works that applied the SWOT-AHP hybrid method were focused on the industrial field. After identifying and quantifying the importance of the environmental factors, the strategies that help companies grow up and improve their competitiveness have been formulated. Thus, Shinno et al. (2006) have proposed a newly structured SWOT analysis to weigh and evaluate the individual SWOT factors, using pair-wise comparison matrices, to identify the most effective strategy for the machine tool industry in Japan. The SWOT method has been used in combination with AHP to formulate effective strategies to obtain competitive advantages for the analysed industry. Ling et al. (2009) used SWOT analysis for Vietnamese architecture, engineering, and construction firms. Using this analysis, the authors have concluded that the Vietnamese companies in these fields are behind foreign companies in terms of financial capacity, project experience, and advanced technologies. Zavadskas et al. (2011) recommend SWOT analysis to formulate strategies on which it depends the success of a construction company. The selection of the best strategies is made based on AHP. These strategies are then classified according to the permutation method of the feasible alternatives. Görener et al. (2012) highlighted the usefulness of

the SWOT-AHP technique in the case of a hood manufacturer. Making classification of the SWOT groups, the authors have concluded that the most important factors are: rising living standards and increasing modern buildings. Jayalakshmi/Pramod (2013) have used the SWOT-AHP model to analyse the possibility of implementing a wireless remote-control system in the industrial environment. They have observed that this method is viable and efficient in the case of complex decisions and have applied it to study the feasibility and monitoring of industrial plants. Posh et al. (2015) applied a hybrid method by combining an analysis of the SWOT factors with an analytical ranking process in energy. The most important factors directly related to energy costs, energy efficiency, and the energy market have been identified. The authors consider that AHP is a valuable tool of strategic energy management, especially for energy-intensive companies, that allows the decision-makers to make strategic decisions due to the systematic understanding of the main issues. Dicinta (2021) presented in their paper the differences and similarities in applying the SWOT-AHP method in two case studies. They referred to a company in the food industry and another one in the beverage field. The authors have pointed out that the strategies generated for market expansion tend to be the same in both cases.

Shareef (2012) has aimed to evaluate an e-government stage model for developing countries using the SWOT-AHP method in the electronic field. The subject studied shows interest because e-government is vital for the states that want to provide better services to their citizens. In evaluating the proposed model, three significant criteria were used for such states: cost stability, transparency and responsibility, and economic development. The empirical data obtained by the author have shown that the most critical problems are the development of the projects for e-government in institutions and the lack of a strategic plan to protect the information in the electronic system. The author has developed an e-government model based on the following concepts: a roadmap for each stage that identifies the opportunities for electronic system development; the technological opportunity that considers the installation of new technologies; system security; the financial criterion for allocating resources. After evaluating the e-government model, the author guided practitioners and policymakers. Finally, it has been successfully tested in the Kurdistan region of Iraq institutions.

Applying the SWOT-AHP hybrid method is also met in recent kinds of research that aim at the most diverse aspects in the industrial field. Thus, Gottfried et al. (2018) have applied a SWOT-AHP-TOWS analysis in the biogas production sector in China, biogas being an essential source of renewable energy. After analysing the environmental factors and quantifying the importance of each factor in decision making, the authors have formulated a series of strategies designed to serve policymakers to promote private investment in the biogas sector. The strategies refer to the promotion of the biogas products, direct investments of the main actors, the encouragement of public-private partnerships, and

guidance in a career to improve cooperation in the project. Ashutosh (2020) turned their attention to the fiber-cement industry in India. The authors have performed a strategic analysis to classify the key variables that affect a fiber-cement company through the SWOT-AHP methodology. They have noted that the most critical factors that affect the company are: management capacity and technical equipment, brand name, product quality, customer service efficiency, and marketing distribution. The study has led to the formulation of the strategies meant to save this industry, which due to the ever-changing technology and demographic profiles of the consumption and the increasing availability of substitutes, make it difficult for this industry to survive.

The application scope of the hybrid method was extended by the paper done by Muzahidul et al. (2020) in the pottery industry in Bangladesh. This industry has a primitive character and is on the verge of extinction due to insufficient technologies, lack of modern equipment, inadequate training of people, and substitute products on the market. The disappearance of this industry would endanger the survival of many rural people. By applying the SWOT-AHP methodology, the authors have explored strategies to save this industry. They have suggested several measures for authorities, such as: providing financial assistance to the pottery sector, introducing modern equipment, exploring entrepreneurial opportunities for this industry, establishing local training centres in the field of e-business and e-marketing for expanding the business on the digital market, organising exhibitions or trade fairs of products in the country and abroad.

A series of recent papers presents the relationship between smart factory performance, sustainable industrial big data, and product decision-making information systems (Kovacova/Lewis 2021; Novak et al. 2021; Gibson/Macek 2021). Thus, Kovacova/Lewis (2021) presented analyses and estimates regarding intelligent processing capabilities, automation technologies, and decision support algorithms in smart industrial systems. Novak et al. (2021) explored product decision-making information systems, real-time sensor networks, and artificial intelligence-driven big data analytics in sustainable Industry 4.0. Gibson/Macek (2021) analysed the outcomes of an exploratory review on sustainable industrial big data, automated production processes, and smart networked factories in cyber-physical system-based manufacturing. The relationship between sustainable organisational performance, real-time process monitoring, and industrial artificial intelligence is highlighted by the following works, such as Kovacova/Lăzăroiu 2021; Nica/Stehel 2021; Cohen, 2021. Thus, Kovacova/Lăzăroiu (2021) has analysed how data-driven supervision, predictive analytics, and optimisation systems integrate product traceability, manufacturing maintenance, and process performance in smart manufacturing. Nica/Stehel (2021) referred to the interconnected data processing in smart manufacturing and business analytics. Cohen (2021) synthesised and analysed the existing evidence on cyber-physical

process monitoring systems, real-time big data analytics, and industrial artificial intelligence in sustainable smart manufacturing.

Research methodology

SWOT-AHP hybrid method

The research question that arises is the following: how can the situation of the analysed company be improved after the problematic situation in which is it generated by two causes: the Covid-19 pandemic and the new changes in the automotive industry? First, it is necessary to assess the current situation and define effective strategies for relaunching the company's activity. These strategies must be correlated with the decision maker's objectives, and their formulation involves making long-term plans after it has first established the company's mission and vision, and combinations of the internal and external environmental factors have been achieved (Freire 2006). For the analysis of the internal and external factors in which the company operates, of the interaction between them, to obtain support in the decision making, the SWOT method is frequently used (Markovska et al. 2009; Sanchis-Palacio/Melián-Navarro 2011). This method has the disadvantage that it performs only a qualitative analysis of the environmental factors without quantitatively measuring the importance of the factors in decision making to determine which factor has the most significant influence on the strategic decision, which makes it difficult to establish their impact on defined strategies (Gürel/Tat 2017). This shortcoming can be removed by combining the SWOT method with quantitative information such as the AHP method. The combination of the AHP method with SWOT can quantitatively determine the importance of each factor in establishing the strategies, verifying the points of view, and removing subjectivism, allowing a systematic approach in problem-solving and simplicity in the group decision making (Görener et al. 2012; Jayalakshmi/Pramod 2013; Gottfried et al. 2018; Ashutosh et al. 2020; Muzahidul et al. 2020).

The AHP method introduced by Saaty (1977) is one of the most used methods in multi-criteria decisions for prioritizing strategies. The method involves reducing the complex decision-making process to pair-wise comparisons, deriving weights, using a scale of judgments, capturing both the decision's subjective and objective aspects. The SWOT-AHP model is often used in the literature to prioritize strategies in various areas: developing an e-government model (Shareef 2012); defining strategies for developing a tourist resort (Nikolića et al. 2015); strategic energy management (Posh et al. 2015); strategic analysis in the case of a fiber cement company (Ashutosh et al. 2020).

Steps in the hybrid SWOT-AHP model

The steps followed in this process are (Wickramasinghe/Takano, 2010):

Step 1: Development of the SWOT and TOWS matrices in order to define the strategies

Based on the respondents' answers, the SWOT matrix has been created, and through logical combinations between the identified environmental factors, the TOWS matrix has been obtained to define the most efficient strategies for relaunching the activity.

Step 2: Achieving the hierarchical structure

At this stage, the hierarchical structure of the studied problem is made "(see Figure 1)".

Figure 1 presents the research objective on level 1, followed by the SWOT matrix on level 2. Level 3 presents the internal environment factors (strengths and weaknesses) and the external environmental factors (opportunities and dangers). Lastly, the strategies to be compared are included on level 4.

Step 3: Combining the SWOT and AHP methods

Next, pair-wise comparisons are made between the 4 groups (factors) in the SWOT matrix and between the factors in each group (sub-factors). Based on these comparisons, the relative local priorities of each group/sub-factor in the SWOT matrix are determined, which are further used in setting the overall priorities of all sub-factors. These comparisons are made based on the judgment of the respondents, using Saaty's numerical scale "As can be seen in Table 1".

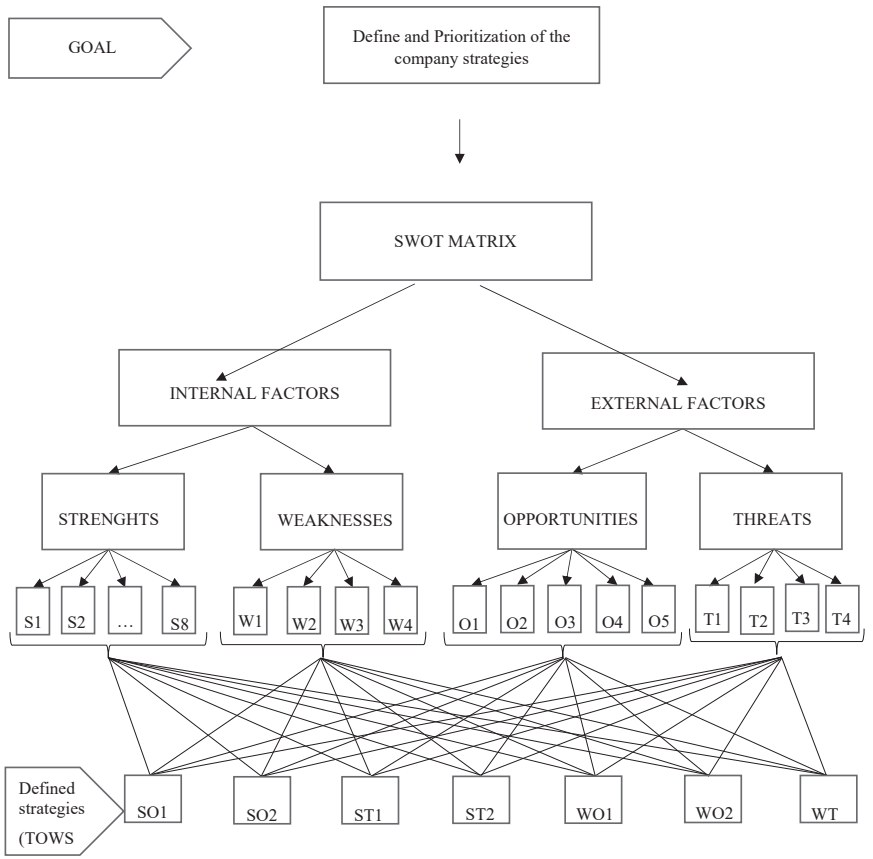

Figure 1: Hierarchical structure regarding defining and ranking the strategies for re-launching the company's activity

Table 1: The values on the Saaty's scale used in the AHP method for pair-wise comparison (Saaty 1980)

Value	Interpretation judgment
1	equally as the importance
3	slightly more important
5	much more important than another one
7	strongly more important
9	absolutely more important
2,4,6,8	intermediate judgments

To obtain the relative weight of each factor, n (n-1)/2 pairs of factors have been compared, where n is the number of the factors considered. This involves creating the decision matrix Y (n × n). In this matrix, each input y_{jk} represents the importance of the criterion j compared to the criterion k. If y_{jk} is 1, the two criteria are equally as important (Saaty 1977). When the criterion j is more important than the criterion k then $y_{jk} > 1$. When the criterion j is less important than the criterion k then $y_{jk} < 1$. After the matrix Y is obtained, the normalized matrix ($Y_{normalized}$) is deduced. Each y_{jk} input of the normalized matrix is calculated as:

$$\overline{y} = \frac{y_{jk}}{\sum_{l=1}^{n} y_{lk}} \tag{1}$$

The weight vector for the SWOT factors that have been compared is denoted by W (n-dimensional column vector), and it is calculated as follows:

$$W_j = \frac{\sum_{l=1}^{n} \overline{y_{lk}}}{n} \tag{2}$$

The CR consistency ratio verifies the consistency of the decision factors' evaluation. This indicator is determined as the ratio between the consistency index (CI) of the matrix, which contains the judgments of the decision-makers, and the consistency index (RI) of a matrix that contains judgments that are entered randomly, the values calculated for RI being provided by Saaty (1980). For the randomly generated matrix the consistency indices are presented "As can be seen in Table 2". A ratio CR is accepted to continue the AHP analysis if the value obtained from the calculation is less than or equal to 0.1.

Table 2: Consistency indices for the randomly generated matrix (Saaty 1980)

n	4	5	6	7	8
RI	0.9	1.12	1.24	1.32	1.41

The CI calculation is performed according to λmax (the largest eigenvalue), based on the formula (Saaty 2003):

$$CI = (\lambda max - n)/(n-1) \tag{3}$$

$$CR = CI/RI \tag{4}$$

Step 4: Hierarchy of the strategies

At this moment, the pair-wise comparisons of the formulated strategies are made for each sub-factor of the SWOT matrix separately in the same way as for

the SWOT groups/sub-factors. Between two strategies that are compared, the one that is chosen is the one that maximizes the strengths and minimizes the weaknesses or makes better use of the opportunities and avoids the threats. The strategy with the best performance is considered the one that gets the highest score. In order to prioritize the strategies, the vector of the global priorities of strategies is calculated ($W_{\text{global priorities of the strategies}} = W_{\text{weights of the strategies to sub-factors}} \times W_{\text{overall priorities of sub-factors}}$). In the situation of the m strategies and n sub-factors, a number of n (n-1)/2 comparisons is made, based on which the weight vector is constructed for the formulated strategies ($W_{\text{weights of the strategies to sub-factors}}$).

Case study

The case study was conducted for the Romanian company COMPA, which has a vital role in the national economy.

Data collection

The data were collected based on the questionnaire addressed to the ten managers of the company face to face in June 2021. The critical internal and external environmental factors identified were: eight strengths, four weaknesses, five opportunities, and four threats were identified. The definition of the most effective strategies for the company in detail was made following individual interviews with the managers involved in the study. Seven strategies were defined (Figure 2). Applying the SWOT-AHP method, the local and global priorities of the SWOT groups/sub-factors were determined by their pair-wise comparisons.

In the same way, pair-wise comparisons were made between strategies in relation to each SWOT sub-factor. The CR consistency ratio (Saaty 1980) has been calculated to verify the judgments' consistency.

		Internal factors	
External factors		STRENGTHS ■ Well-qualified workforce (S1); ■ An integrated system of quality – environment – occupational health and safety (S2); ■ High level of processes integration (S3); ■ Own performance know-how for various auxiliary processes (S4); ■ Performing production facilities (S5); ■ Partnerships with renowned clients (S6); ■ Modern manufacturing processes in the field of processing and assembly (S7); ■ Large company development projects (S8).	WEAKNESSES ■ Cumbersome management of information flow (W1); ■ Manufacture of some products with a small share in turnover (W2); ■ Loss of the position of the significant supplier in the Romanian automotive industry (W3); ■ Limited know-how in the product design activity (W4).
	OPPORTUNITIES ■ Accelerated development of the Romanian business environment (O1); ■ Accessing of EU funds (O2); ■ Development of car manufacturing in Romania (O3); ■ Availability of clients for the development of collaboration (O4); ■ Availability and resources for business development in other areas (O5).	**SO strategies – strengths of the company can be used to harness the opportunities** ■ investment programs in high-performance equipment (SO1); ■ increasing the degree of the processes integration (SO2).	**WO strategies – the opportunities are used to reduce the weaknesses of the company** ■ attracting new strategic suppliers for the development of important projects (WO1); ■ digitalization of the documents flow and cost optimisation (WO2).
	THREATS ■ Insufficient resources regarding the labour market (T1); ■ Accelerated increase in labour, materials, and energy costs (T2); ■ Expensive loans (T3); ■ A relatively small number of customers (T4).	**ST strategies – strengths of the company are used to minimize the threats** ■ improving the image through promotion, advertising, and publicity activities (ST1); ■ concentration of resources on a small number of projects developed by COMPA or in partnerships with renowned companies (ST2).	**WT strategies – weaknesses of the company must be reduced to avoid the threats** ■ changing the organisational culture in the sense of encouraging stability within the company (WT1).

Figure 2: Environmental factors and the strategies formulated based on the SWOT/TOWS matrices

Results

The results obtained for the pair-wise comparisons of the SWOT groups and the CR index, in the case of the analysed company, are presented "As can be seen in Table 3". The data obtained show that the opportunities have the highest share (0.394), followed by strengths (0.382), while weaknesses (0.142) and threats (0.082) have low shares. The consistency index obtained (CR = 0.084 <0.1) shows that the decision process is consistent and AHP can continue.

Table 3: Priorities of the SWOT groups and consistency ratio

SWOT groups	S	W	O	T	Priority of SWOT groups
Strengths	1	3	1	5	0.382
Weaknesses	0.333	1	0.200	3	0.142
Opportunities	1	5	1	3	0.394
Threats	0.200	0.333	0.333	1	0.082
CR=0.084					

Next, the pair-wise comparisons of the sub-factors within the SWOT groups (strengths, weaknesses, opportunities, threats) were performed, obtaining their local priorities, as well as the related consistency indices "As can be seen in Table 4".

Table 4: Consistency indices of the sub-factors in the SWOT matrix

Sub-factors within SWOT groups	S1 S8	W1 W4	O1 O5	T1 T4
CR	0.087	0.06	0.088	0.07

From the data obtained regarding the pair-wise comparisons of the sub-factors, "As can be seen in Table 5a and Table 5b", it can be observed which are the sub-factors that have the highest weight.

Table 5a: Overall priorities of the strengths and weaknesses

SWOT group	Group Priority	SWOT Factors	Factor Priority within the group	Overall Priority of factor
(1)	(2)	(3)	(4)	(5)=(2) x (4)
Strengths	0.382	Well-qualified workforce (S1)	0.071	0.027
		An integrated system of quality – environment – occupational health and safety (S2)	**0.270**	**0.103**
		High level of process integration (S3)	0.068	0.026
		Own performance know-how for various auxiliary processes (S4)	0.027	0.010
		Performing production facilities (S5)	0.136	0.052
		Partnerships with renowned clients (S6)	0.148	0.056
		Modern manufacturing processes in the field of processing and assembly (S7)	0.055	0.021
		Large company development projects (S8)	0.225	0.086
Weaknesses	0.142	Cumbersome management of information flow (W1)	0.094	0.013
		Manufacture of some products with a small share in turnover (W2)	0.219	0.031
		Loss of the position of the significant supplier in the Romanian automotive industry (W3)	**0.594**	**0.084**
		Limited know-how in the product design activity (W4)	0.094	0.013

For the internal environment, the sub-factors from the group of the strengths with the highest value of local priorities are (S2–0.270) and (S8–0.225), and the sub-factors from the group of the weaknesses are (W3–0.594) and (W2–0.219). For the external environment, the most significant weight of the sub-factors belonging to the opportunities are (O1=0.405) and (O3–0.262), and for the sub-factors in the threats, group are (T4–0.548) and (T2–0.220).

Table 5b: Overall priorities of the opportunities and threats

SWOT group	Group Priority	SWOT Factors	Factor Priority within the group	Overall Priority of factor
(1)	(2)	(3)	(4)	(5)=(2) x (4)
Opportunities	0.394	**Accelerated development of the Romanian business environment (O1)**	**0.405**	**0.159**
		Accessing of EU funds (O2)	0.181	0.071
		Development of car manufacturing in Romania (O3)	0.262	0.103
		Availability of clients for the development of collaboration (O4)	0.104	0.041
		Availability and resources for business development in other areas (O5)	0.049	0.019
Threats	0.082	Insufficient resources regarding the labour market (T1)	0.068	0.006
		Accelerated increase in labour, materials, and energy costs (T2)	0.220	0.018
		Expensive loans (T3)	0.165	0.013
		A relatively small number of customers (T4)	**0.548**	**0.045**

Regarding the global priorities, the highest values were obtained for the following sub-factors: an integrated system of quality – environment – occupational health and safety (S2–0.103), loss of the position of the significant supplier in the Romanian automotive industry (W3–0.084), accelerated development of the Romanian business environment (O1–0.159) and high dependence on a relatively small number of customers (T4–0.045). The vector of global sub-factor priorities is:

$$W_{\text{overall priorities of sub-factors}} = \begin{bmatrix} S1 \\ S2 \\ S3 \\ S4 \\ S5 \\ S6 \\ S7 \\ S8 \\ W1 \\ W2 \\ W3 \\ W4 \\ O1 \\ O2 \\ O3 \\ O4 \\ O5 \\ T1 \\ T2 \\ T3 \\ T4 \end{bmatrix} = \begin{bmatrix} 0.027 \\ 0.103 \\ 0.026 \\ 0.010 \\ 0.052 \\ 0.056 \\ 0.021 \\ 0.086 \\ 0.013 \\ 0.031 \\ 0.084 \\ 0.013 \\ 0.159 \\ 0.071 \\ 0.103 \\ 0.041 \\ 0.019 \\ 0.006 \\ 0.018 \\ 0.013 \\ 0.045 \end{bmatrix}$$

The evaluation of the strategies regarding relaunching the analysed company's activity is performed considering the hierarchy "As can be seen in Figure 1". For this purpose, the weights of the strategies are determined to each sub-factor in the SWOT matrix by pair-wise comparisons of the strategies "As can be seen in Tables 6 ", and based on them, it resulted in vector W_{weights} strategies the sub-factors. Consistency ratios are also calculated for each sub-factor.

Table 6 shows that:

- concerning the four strengths (S2, S4, S5, and S8), the strategy with the largest weight is investment programs in high-performance equipment (SO1);
- concerning the weakness that refers to the cumbersome management of the information flow (W1), the strategy with the highest weight (0.406) is the digitalization of the document flow and cost optimisation (WO2) and to the weakness that refers to limited know-how in the product design

activity (W4), the strategy with the highest weight (0.315) is the investment programs in high-performance equipment (SO1);

Table 6: Priorities of the strategies concerning the environmental factors

Priorities of the strategies concerning Strengths	Priorities of the strategies concerning Weaknesses	Priorities of the strategies concerning Opportunities	Priorities of the strategies concerning Threats
S1(CR=0.09): SO1: 0.027; SO2: 0.062; **WO1: 0.300;** WO2: 0.085; ST1: 0.223; ST2: 0.170; WT: 0.132	W1 (CR=0.09): SO1: 0.192; SO2: 0.134; WO1: 0.072; **WO2: 0.406**; ST1: 0.091; ST2: 0.062; WT: 0.042	O1 (CR=0.096): **SO1: 0.368**; SO2: 0.070; WO1: 0.090**;** WO2: 0.100; ST1: 0.168; ST2: 0.149; WT: 0.054	T1 (CR=0.089): SO1: 0.142; SO2: 0.146; WO1: 0.068; WO2: 0.107; ST1: 0.188; **ST2: 0.303**; WT: 0.046
S2 (CR=0.09): **SO1: 0.344**; SO2: 0.221; WO1: 0.112; WO2: 0.149; ST1: 0.087; ST2: 0.056; WT: 0.031	W2 (CR=0.09): SO1: 0.242; **SO2: 0.260**; WO1: 0.087**;** WO2: 0.109; ST1: 0.137; ST2: 0.104; WT: 0.061	O2 (CR=0.04): **SO1: 0.332**; SO2: 0.177; WO1: 0.147; WO2: 0.036; ST1: 0.147; ST2: 0.122; WT: 0.038	T2 (CR=0.06): **SO1: 0.315**; SO2: 0.229; WO1: 0.168; WO2: 0.108; ST1: 0.079; ST2: 0.071; WT: 0.029
S3(CR=0.09): SO1: 0.181; **SO2: 0.324**; WO1: 0.124; WO2: 0.181; ST1: 0.094; ST2: 0.065; WT: 0.031	W3 (CR=0.09): SO1: 0.178; SO2: 0.156; **WO1: 0.356;** WO2: 0.042; ST1: 0.147; ST2: 0.086; WT: 0.036	O3 (CR=0.06): SO1: 0.150; SO2: 0.141; WO1: 0.177; WO2: 0.031; **ST1: 0.258**; ST2: 0.192; WT: 0.050	T3 (CR=0.09): **SO1: 0.437**; SO2: 0.082; WO1: 0.116; WO2: 0.059; ST1: 0.169; ST2: 0.091; WT: 0.047
S4 (CR=0.09): **SO1: 0.296**; SO2: 0.267; WO1: 0.148; WO2: 0.098; ST1: 0.072; ST2: 0.084; WT: 0.036	W4 (CR=0.056): **SO1: 0.315**; SO2: 0.237; WO1: 0.203**;** WO2: 0.039; ST1: 0.084; ST2: 0.084; WT: 0.039	O4 (CR=0.075): **SO1: 0.226**; SO2: 0.187; WO1: 0.167; WO2: 0.084; ST1: 0.145; ST2: 0.156; WT: 0.035	T4 (CR=0.07): **SO1: 0.300**; SO2: 0.188; WO1: 0.129; WO2: 0.039; ST1: 0.204; ST2: 0.103; WT: 0.037
S5 (CR=0.09): **SO1: 0.369**; SO2: 0.228; WO1: 0.159; WO2: 0.088; ST1: 0.061; ST2: 0.067; WT: 0.027	-	O5 (CR=0.031): **SO1: 0.255**; SO2: 0.174; WO1: 0.217; WO2: 0.045; ST1: 0.130; ST2: 0.139; WT: 0.040	
S6 (CR=0.09): SO1: 0.245; SO2: 0.117; WO1: 0.056; WO2: 0.056; ST1: 0.193; **ST2: 0.286**; WT: 0.046	-	-	
S7 (CR=0.09): SO1: 0.302; **SO2: 0.307**; WO1: 0.148; WO2: 0.049; ST1: 0.061; ST2: 0.106; WT: 0.028	-	-	
S8 (CR=)0.09: **SO1: 0.279**; SO2: 0.204; WO1: 0.174; WO2: 0.040; ST1: 0.128; ST2: 0.141; WT: 0.034	-	-	

- concerning all the identified opportunities, except for (O3), the strategy with the highest weight is the investment programs in high-performance equipment (SO1);

- concerning all the established threats, except for (T1), the strategy with the highest weight is the investment programs in high-performance equipment (SO1).

Based on the values obtained "As can be seen in Table 6" for the priorities of the strategies in relation to the sub-factors, the vector $W_{\text{weights of strategies to sub-factors}}$ was constructed. Based on the obtained data it results:

$$W_{\text{global priorities of the strategies}} = W_{\text{overall priorities of sub-factors}} \times W_{\text{weights of the strategies in relation to sub-factors}}$$

$$W_{\text{global priorities of the strategies}} = \begin{bmatrix} SO1 \\ SO2 \\ WO1 \\ WO2 \\ ST1 \\ ST2 \\ WT \end{bmatrix} = \begin{bmatrix} 0.273 \\ 0.168 \\ 0.155 \\ 0.079 \\ 0.149 \\ 0.129 \\ 0.043 \end{bmatrix}$$

The strategies' relative importance formulated results based on the weighted arithmetic mean of the company managers' responses are strategy SO1–4.6; strategy SO2–4.7; strategy WO1–4.2; strategy WO2–3; strategy ST1–3.9; strategy ST1–3.6; strategy WT1–2.8. All calculations were obtained using the Likert scale from 1 to 5, where 5: extremely important; 1: extremely unimportant. The most important strategies are SO1 (Investment programs in high-performance equipment), SO2 (Increasing the degree of processes integration), and WO1 (attracting new strategic suppliers for the development of important projects). The average value given to the seven strategies is 3.83, which means that the method chosen in this study is appropriate.

Discussion

Based on the literature study on the application of the SWOT-AHP hybrid method, this method is a relevant approach in supporting the strategic processes being often applied in many fields of the activity. In this study, the method has been chosen because it allows relatively easy questions to which the respondents can provide decision support, and also that its validity has been proven in several studies: determining the best strategy in building sustainable business performance (Dicinta et al. 2021; Kajanus et al. 2012), defining strategies in tourism (Wickramasinghe/Takano 2010; Nikolića et al. 2015; Ozdemir/Demirel 2018), determining significant strategic factors for a production company (Görener et al. 2012), strategic planning of a forest research station (Kajanus et al. 2012), implementing of a remote control system in the industrial environment (Jayalakshmi/Pramod 2013), analysis of the groups' perceptions interested in

the benefits, challenges, and opportunities offered by joint forest management (Etongo 2018), strategic analysis in the fiber-cement industry (Ashutosh 2020).

Based on these studies, we aim to present a systematic methodology for assessing the current situation of the COMPA company that it is in a difficult situation as a result of the crisis caused by the Covid-19 pandemic and the changes in the automotive industry, in order to define appropriate strategies for relaunching the activity and reorienting production. The authors have considered this company because it is of national importance, with complex activity. In order to objectively identify the internal and external environmental factors and to define strategies appropriate to the company's situation, its managers have been contacted, considering that they know best the environmental factors in which it operates and the problems it faces. In addition, there is access to information about the company contained in the annual reports and the availability of the managers to participate in this study. In the study, the managers involved identified the environmental factors of significant importance for the company, and then based on their interactions the most effective strategies for the company's development were defined. The formulated strategies aim at a rapid relaunching of the activity in order to improve the company's position and obtain a sustainable competitive advantage. The results obtained based on the steps presented in section 3, using the SWOT-AHP combination, led to the following descending order of the strategies for relaunching the company's activity: SO1; SO2; WO1; ST1; ST2, WO2; WT. The investment programs in high-performance equipment (SO1) strategy are a priority. This strategy can obtain high-quality products with high added value, increasing labour productivity and market competitiveness, profitability, and customer satisfaction. The use of high-performance equipment involves their service by the highly qualified workforce, efficient management of the staff skills, and stimulating their professional development. The strategy of increasing the degree of the processes integration (SO2) can lead to increasing the performance of the integrated processes in terms of costs and product quality. In developing the company, a unique role can be played by the strategy regarding attracting new strategic suppliers for the development of essential projects (WO1) by capitalizing on the opportunities in the external environment to reduce the weaknesses of the internal environment. Equally important is the strategy of concentrating the resources on a small number of projects developed by COMPA or in partnerships with renowned companies (ST2). These projects aim at efficient management of the resources, rapid assimilation in manufacturing of new technologies and essential components necessary to achieve a large number of high-tech products and industrial complexity, projects to improve and optimise the technological processes with an impact in reducing costs, accessing EU funds. Promoting the strategy of improving the image through promotion, advertising, and publicity activities (ST1) can put worth the company's products and services that differentiate it from the competition, and the strategy that

aims at digitalization of the documents flow and cost optimisation (WO2), can allow more efficient management of the flow of the documents, their electronic archiving, security and confidentiality of data, with an impact on increasing the competitiveness and productivity. By applying the strategy regarding changing the organisational culture in the sense of encouraging stability within the company (WT1), it could be created a strong organisational culture with the stimulation of loyalty to the company, which would create a favourable climate for innovation and creativity, improving the company's performance.

Conclusions

Theoretical implications. The study is helpful for the business environment by drawing attention to the possibilities of defining and prioritizing the development strategies based on knowledge of the environmental factors and achieving logical combinations between them depending on the context analysed. The study also supports researchers who aim to improve the results obtained using the SWOT method by combining it with AHP in strategic planning within the organizations in various fields of activity. Pair-wise comparisons of the SWOT factors offer the possibility of a better assessment of their importance.

Managerial contributions. The paper makes an essential contribution to assessing the current situation and defining and evaluating the relevant strategies to solve the problems and challenges facing a company of national importance for the Romanian economy in order to relaunch the activity after the critical situation caused by the Covid-19 pandemic and the significant changes in the global automotive industry. A ranking of these strategies would allow the company to develop and gain competitive advantages to deal with this situation. The defined strategies were classified as follows: on first place, with a weight of 0.273, is the strategy for investment programs in high-performance equipment (SO1), followed by the strategy of increasing the degree of processes integration (SO2) with a weight of 0.168. The strategy for attracting new strategic suppliers for the development of essential projects (WO1), with a weight of 0.155, the strategy for improving the image through promotion, advertising, and publicity activities (ST1) with a weight of 0.149 and the strategy that refers to the concentration of resources on a small number of projects developed by COMPA or in partnerships with renowned companies (ST2) with a weight of 0.129 have been ranked on the following places. In the last place was the strategy regarding changing the organisational culture to encourage stability within the company (WT1) with a weight of 0.043. The proposed model has a universal character and can be used by any industrial company, guiding the interested decision-makers. Because the analysed company is considered a prestigious brand of the Romanian car industry, we consider that the paper can provide a reasonable basis for solving the problems for similar companies.

Future research. Based on the literature studied, we can say that a SWOT-AHP method is a promising approach to support strategic decision-making processes. Research on the connection of the SWOT method with other multi-criteria methods is a future concern.

Limitations. The first limitation of the study is that only one company has been considered, which has not allowed comparisons with companies with similar situations. Another limitation is that the differences in applying other multi-criteria methods from the strategic planning perspective in SWOT have not been analysed. A third limitation is the lack of a sensitivity analysis to observe how the rank of the strategies is affected by changing the weights of the SWOT groups and sub-factors.

Acknowledgments

The authors would like to thank the anonymous reviewers and the editor for their excellent comments and suggestions. We thank the editor for his encouragement.

We also would like to thank the company managers for their help in conducting this study.

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