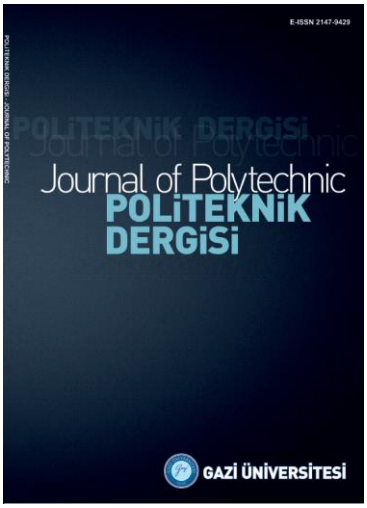

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Ranking the importance levels of SMEs' rapid growth factors using multi-criteria decision-making methods

KOBİ'lerin hızlı büyüme faktörlerinin çok kriterli karar verme yöntemleri ile önem derecelerinin sıralaması

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Ranking the Importance Levels of SMEs' Rapid Growth Factors Using Multi-Criteria Decision-Making Methods

Highlights

- *Small and medium-sized enterprises constitute the foundation of the national economy. They play a crucial role in economic and social advancement.*
- *The expansion of SMEs will facilitate the emergence of new business sectors and generate employment opportunities.*
- *Understanding the primary growth determinants of SMEs is crucial for economic methodology. Contributes to the efforts of strategists and policymakers.*
- *The factors influencing the growth of SMEs were identified and ranked, and the most significant factor was determined using DEMATEL, the AHP method, and the average ranking technique. The workflow diagram of the study is provided.*

Grafik Özet (Graphical Abstract)

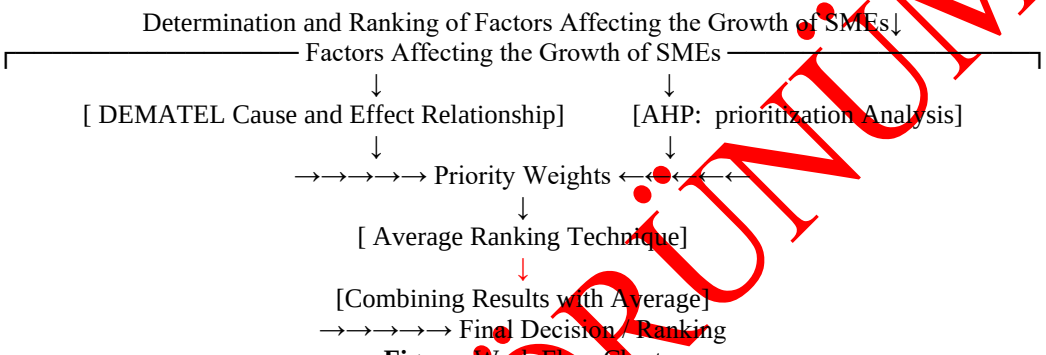

Figure. Work Flow Chart

Objective

This study seeks to ascertain the parameters affecting the swift expansion of SMEs through a review of current literature and to rank these factors from most to least influential utilizing the DEMATEL and AHP approaches. The aggregation methodology involves determining the mean ranking through the average ranking method.

Design & Methodology

The DEMATEL and AHP techniques, both multi-criteria decision-making approaches, were chosen. The results of the two methodologies were employed using the average ranking technique, an aggregation method, for the final ranking.

Originality

Research utilizing multi-criteria decision-making methodologies was discovered. Nonetheless, there is insufficient research to illustrate the importance of development drivers for SMEs using a multi-criteria decision-making framework and identifying the most pivotal element.

Results

Factors affecting SMEs' growth were identified in the literature. Export, financial accessibility, sector, ownership structure, innovation, and environmental factors were acknowledged. Expert comments from entrepreneurs were gathered and analyzed using DEMATEL and AHP approaches to ascertain the significance of these components, then ranking them based on the average ranking technique. Both techniques and the mean ranking methodology produced analogous outcomes. The principal factor influencing firm growth is exports, followed by financial accessibility, innovation, ownership configuration, industry, and, ultimately, environmental factors. We see exports, financial accessibility, and innovation as the foremost determinants of SMEs' success, occupying the top three rankings.

Conclusion

Exports serve as the principal catalyst for SME growth, with financial access identified as the second most critical factor, indicating the importance of foreign sales and financial aspects in corporate expansion. Businesses may obtain support to enhance their financial structure and augment their exports. Providing loan interest support to SMEs engaged in export activities can substantially influence their growth. Offering security for loans demanded by SMEs may facilitate their expansion. Enhanced access to cash may motivate firms to broaden their operations.

Declaration of Ethical Standards

The author(s) of this article declare that the materials and methods used in this study do not require ethical committee permission and/or legal-special permission.

Ranking the Importance Levels of SMEs' Rapid Growth Factors Using Multi-Criteria Decision-Making Methods

Araştırma Makalesi / Research Article

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ABSTRACT

Small and medium companies (SMEs) are essential to economies because of the substantial value they contribute to national economies. The advancement and expansion of these firms are crucial for the sustained contribution to the economy. Understanding the determinants influencing the growth of SMEs will facilitate the development of initiatives aimed at enhancing their competitiveness.

This study seeks to ascertain the determinants influencing the swift expansion of SMEs from existing literature and to prioritize these aspects from the most impactful to the least impactful utilizing the DEMATEL and AHP methodologies. It also encompasses establishing the final rating using an average ranking approach derived from integration procedures. The primary determinant of corporate growth is exports, succeeded by financial access, innovation, ownership structure, sector, and environmental considerations. The findings indicate that exports, financial access, and innovation are the primary elements facilitating quick growth, with exports in the foremost position, financial access second, and innovation third; organizations that are innovative, receptive to global markets, and possess simple access to finance have accelerated growth.

Keywords: MCDM, SME, Factors for Fast Growth.

KOBİ'lerin Hızlı Büyüme Faktörlerinin Çok Kriterli Karar Verme Yöntemleri İle Önem Derecelerinin Sıralaması

ÖZ

Küçük ve orta ölçekli işletmeler (KOBİ'ler) ülke ekonomilerine sağladıkları önemli katma değer nedeniyle ekonomiler için değerli olmuşlardır. Bu işletmelerin gelişmesi ve büyümesi ekonomiye katkılarının devamlılığı açısından önemlidir. KOBİ'lerin büyümesini etkileyen faktörlerin bilinmesi, rekabet güçlerini artırmaya yönelik programların geliştirilmesinde avantaj sağlayacaktır.

Bu çalışma, KOBİ'lerin hızlı büyümesini etkileyen faktörleri literatürden tespit ederek ve bu faktörleri DEMATEL ve AHP yöntemlerine göre en etkili faktörden en az etkili faktöre doğru sıralamayı amaçlamaktadır. Ayrıca, bütünleştirme tekniklerinden ortalama sıralama yöntemi kullanılarak ninahi sıralamanın belirlenmesini içermektedir. Firma büyümesinde en etkili faktör ihracat olurken, bunu finansal erişim, inovasyon, mülkiyet yapısı, sektör ve çevresel faktörler takip etmektedir. Elde edilen bulgulara göre ilk sırada yer alan ihracatın, ikinci sırada yer alan finansal erişimin ve üçüncü sırada yer alan inovasyonun hızlı büyümeyi sağlayan faktörler olduğu; dış pazarlara açık ve kolay finansman sağlayan yenilikçi firmaların daha hızlı büyüdüğü söylenebilir.

Anahtar Kelimeler: ÇKKV, KOBİ'ler, Hızlı Büyüme Faktörleri.

1. INTRODUCTION

Small and medium-sized enterprises (SMEs) are pivotal to the economic and social advancement of nations. Their capacity to create employment across various industries, their adaptable frameworks, and their responsiveness to change render them a crucial catalyst in national economies, owing to their beneficial influence on societal advancement. Small and medium-sized enterprises (SMEs) have attained considerable expansion by augmenting their contributions to exports, investment, and value addition in the overall economy [1]. Small and medium-sized enterprises (SMEs) are crucial to the national economy, and their swift expansion will augment their economic contributions. The swift expansion of SMEs is of significant importance to national economies.

Rapidly expanding enterprises have garnered the attention and interest of scholars owing to their

substantial contributions to economic advancement. The literature designates these firms as "gazelles" and emphasizes their distinctive growth rates, which set them apart from other enterprises. Their contributions to employment and value added are disproportionately substantial, and they exhibit much greater productivity levels than the average. In this setting, comprehending the determinants of SME growth is advantageous for policymakers, business practitioners, and researchers [3]. Small and medium-sized enterprises (SMEs) enhance the national economy through their production capabilities, export activities, and job opportunities. The advancement and swift expansion of SMEs would elevate their contribution to the national economy. The swift expansion of SMEs is a significant concern. This study aims to identify the factors influencing the rapid expansion of SMEs from existing literature and to establish the hierarchy of importance of these factors in Türkiye by employing the DEMATEL and AHP methodologies concurrently.

2. CONCEPTUAL FRAMEWORK

This section encompasses data regarding the proportion of SMEs within the Turkish economy, rapidly expanding firms, and the determinants of enterprise growth.

2.1. SMEs

Small and medium-sized enterprises are regarded as catalysts for economic development in emerging economies. Small and medium-sized enterprises are the foundation of the economy, generating employment, fostering innovation, and promoting diversification. By creating new employment opportunities, they foster innovation and competition within the market [3]. Given the significant importance of SMEs to national economies, economic administrations implement initiatives to promote their growth [4].

The Regulation on Small and Medium-Sized Enterprises was issued in the Official Gazette on May 25, 2023, under number 32201. This rule defines SMEs in Türkiye as enterprises with less than 250 employees and yearly net sales or financial statements not exceeding 500 million Turkish Liras. In 2023, Türkiye's total number of enterprises reached 3,530,000. Small and medium-sized enterprises constitute 99.8% of all businesses in Türkiye. As per 2023 figures, these enterprises represented 74.50% of employment, 46% of total turnover, and 38.50% of production. These enterprises accounted for an average of 37.50% of exports and 22% of imports from 2019 to 2023. Small and medium-sized enterprises significantly contribute to Türkiye's ecosystem through production, exports, and employment. Table 1 illustrates the proportion of SMEs in the Turkish economy from 2019 to 2023 [6].

2.2. Fast-Growing Companies

Rapidly expanding enterprises possess distinct characteristics compared to other companies. Rapidly expanding companies typically exhibit superior cash flow and increased profitability [7]. They possess a competitive edge over typical enterprises that experience marginal growth [8]. Their contribution to the economy is disproportionately significant. They possess a productivity value exceeding the average productivity level [2].

More dynamic industries and geographical areas often host fast-growing businesses [9]. They help make the area where they operate more dynamic and competitive. Because of their capacity to generate new employment, they support economic expansion
as well as the expansion of certain industries.

Moreover, high-growing enterprises account for a disproportionate share of employment growth [10]. Innovative behavior and managerial skills largely determine the success of high-growth companies [8].

Since 2016, the Turkish Statistical Institute has consistently published data regarding rapidly growing businesses in Türkiye. This data encompasses both large enterprises and small- to medium-sized enterprises (SMEs). More than 92% of rapidly expanding enterprises in Türkiye are small and medium-sized enterprises (SMEs). Following 2016, the number of businesses experienced an initial increase, subsequently declined, and then rose again [11]. Table 2 presents data regarding

Table 1. Share of SMEs in the Economy

Year	Total Number of Enterprises	Share of SMEs in Total Enterprises (%)	Proportion of Employment (%)	Turnover Share (%)	Production Value Share (%)	Export Share (%)	Import Share (%)
2019	3 221 000	99.80	72.40	50.40	44.10	36.60	21.50
2020	3 300 000	99.80	73	50.50	44.50	37	21.70
2021	3 380 000	99.80	73.50	51	45	37.50	22
2022	3 460 000	99.80	74	51.50	45.50	38	22.20
2023	3 530 000	99.80	74.50	52	46	38.50	22.50

(Source: TurkStat, Access Date: 5.3.2025)

Table 2. Fast Growing Enterprises in Türkiye

Year	Total Number of Fast Growing Enterprises	Total Number of Fast Growing SMEs	Fast Growing SMEs (%)	Number of Fast-Growing Large Enterprises	Fast Growing Large Enterprises (%)
2016	4398	4115	93.57	283	6.43
2017	4588	4235	92.1	353	7.69
2018	4549	4328	95.14	221	4.86
2019	3837	3606	93.98	231	6.02
2020	3722	3537	95.03	185	4.97
2021	4562	4312	94.52	250	5,48
2022	5222	4921	94.24	301	5.76
2023	5493	5207	94.79	286	5.21

Source:(TurkStat, Access Date: 10.3.2025)

Table 3. Factors Affecting the Growth of Enterprises

Criteria Name	**Sources**
Access to Finance	Serrasqueiro et al, (2010)[12]. Fadahunsi, (2012) [13]. Brown, (2005) [14]. Jovanovski, et al, (2015) [15].'Nichter and Goldmark, (2009) [16].'
Sector	Mateev and Anastasov, '(2010)[17]. Dragnić, (2014) [18]. Močnik and Širec, (2015) [19]. Yeboah (2021)[5]. Fadahunsi, (2012)[13].Vaz, (2021)[20]. Nichter and Goldmark, (2009)[16].
Export	Karaöz and Demirgil, (2009) [21]. Hassan and Hart, (2016) [22].
Innovation	Karaöz and Demirgil, (2009) [21]. Dugan and Tosunoğlu, (2020) [1]. Dragnić, (2014)[18]. O'Regan, et al, (2006) [23]. Brown, (2005)[14]. Hassan and Hart, (2016)[22]. Jovanovski, et al, (2015)[15].
Ownership Structure	[1] Dugan and Tosunoglu, (2020)[1]. Fadahunsi, (2012) [13.]
Environmental Factors	Dugan and Tosunoğlu, (2020)[1]. [23].O'Regan, et al., (2006) [23]. Sarwoko and Frisdiantara, (2016). [24]. Fadahunsi, (2012) [13].

the quantity of fast-growing businesses from 2016 to 2022. Figure 1 also presents this information.

I reviewed publications in the literature to identify factors affecting the rapid growth of SMEs. The study encompassed factors such as current issues related to innovation and access to finance, along with the criterion of partnership structure, which influences business continuity. Exports play a crucial role in enhancing companies' balance sheets, facilitating access to foreign markets, and securing a foothold within those markets. Environmental factors can influence companies both positively and negatively. The sector's conditions influence competition among companies. The study incorporates these factors due to their impact on the growth of SMEs. Table 3 outlines the factors that affect the growth of SMEs.

3. LITERATURE RESEARCH

Propose an innovative multi-criteria decision-making model that synthesizes DEMATEL, ANP, and VIKOR techniques for examining portfolio selection through the framework of CAPM. The statistics reveal that the macroeconomic criterion is the most critical factor affecting investment decisions, with the foremost companies in the wafer foundry sector appearing as the optimal investment portfolio over the analyzed time [25]. His study seeks to discover and examine the Critical Success Factors (CSFs) within the electronic design automation (EDA) industry by examining the problems encountered in this sector. The findings indicate that, with the DEMATEL technique, the crucial local demand situation and government influence are significant determinants for the EDA business to achieve a

competitive advantage, and both elements considerably impact its responsiveness [26].

The evaluation of SME growth through innovation was conducted utilizing the Analytic Hierarchy Process (AHP). The findings indicate that the most effective criterion was the Innovative Business Environment, with Organizational Capacity following closely at 3787.7. The most suitable solution identified was INNV2 [27]. A survey was carried out among SME managers in the provinces of Erzurum, Erzincan, and Bayburt, with the data being assessed through statistical analysis. The findings indicated that the growth objectives of SMEs include competitive advantage, an increase in market share, and the creation of employment. Additionally, it was determined that most of these enterprises implement various strategies to achieve growth [28].

This study seeks to identify optimal practices that will facilitate sustainable development through the assessment of the performance of 12 manufacturing industries in Taiwan. The methodologies employed include DEA and VIKOR prioritization analysis, with findings indicating that Taiwan's manufacturing sector is progressing towards high value-added branding and design innovation [29]. Construct a model that combines the TOE framework with MCDM methods to predict the performance of Industry 4.0 technology implementation in small and medium-sized enterprises. Technology is recognized as the leading element in the adoption of

SMEs are adopting Industry 4.0 [30]. An analysis was conducted on the management and organizational challenges faced by SMEs in the flour industry in Nevşehir as they navigate their growth process. The study uncovered insights related to management approaches, staff recruitment and training, organizational frameworks, planning capabilities, delegation practices, decision-making processes, institutionalization, quality consciousness, and growth patterns of the companies [31]. The study seeks to examine the impact of a company's inclusion or exclusion from the Borsa Istanbul 100 Index on its financial performance within the sustainability index. As a result, it was determined that the companies listed in the sustainability index did not exhibit a significant difference in financial performance compared to those not included in the index and did not demonstrate superior financial performance. We have identified the growth strategies of the 12 largest companies in Denizli. In pursuit of this objective, the Fuzzy Analytic Hierarchy Process (FAHP) method was employed to compare four fundamental strategies, revealing that market development is the most favored growth strategy among companies [33].

Their research identified the business factors influencing the success of health promotion through the application of the DEMATEL and M-DEMATEL methodologies. The key factors identified as promoting healthy diets include effective leadership, established communication channels, and adequate budgeting. The research assesses the combined impact of both methods, contributing to the identification of essential success factors for effective health promotion strategies. The research evaluates the financial performance of companies operating in the BIST energy sector by utilizing the TOPSIS and EDAS methodologies. In 2019 and 2020, periodic variations in the financial performance rankings of the firms were identified, along with minor discrepancies in the rankings produced by the two methods employed. The study effectively integrates ratio analysis with multi-criteria decision-making techniques for financial performance evaluations [35]. The socio-economic significance of SMEs and the key challenges they encounter have been analyzed based on recent research conducted in Türkiye and globally; notably, it has been identified that shortcomings in financial management represent a significant barrier to the sustainability of these enterprises. Furthermore, research assessing the impact of strategic financial management (SFM) practices, which emerged in the literature in 2005, on the growth, performance, and competitiveness of SMEs has been incorporated, illustrating the tactical importance of this subject within the management domain [36]. Sixteen significant challenges encountered by footwear SMEs in Bangladesh during their growth process have been identified; cash flow issues, intense market competition, difficulties in accessing finance, unfavorable bank credit policies, and weak supply chain management emerge as the five most critical challenges. The research offers significant insights. Sector-specific insights to the existing literature and presents policymakers and practitioners with effective solutions to address these challenges. [37]. The macroeconomic performance of G20 countries during the year 2022 was assessed using TOPSIS and SAW methods. In the TOPSIS method, Italy achieved the highest performance ranking, while the People's Republic of China secured the top position in the SAW method. In contrast, the TOPSIS analysis ranked Türkiye last, while the SAW method ranked South Africa last [38]. This study assesses the firms' financial performance using the CRM method. He presented a decision-making methodology for determining criterion weights and ranking alternatives. The analysis revealed that the profitability criterion holds the greatest significance, while the market valuation criterion is deemed the least significant [39].

The literature review encompassed research on the growth process of SMEs and the DEMATEL method. The literature review section encompasses studies pertinent to the performance of the manufacturing sector, highlighting the correlation between satisfactory business performance and growth. The research conducted did not identify any studies that assessed the factors influencing the rapid growth of SMEs utilizing the MDCM. This research utilizes the DEMATEL and AHP methodologies to assess the significance of factors contributing to the swift expansion of SMEs. This study, which assesses the significance of various factors affecting the rapid growth of SMEs through the

application of DEMATEL and AHP methods, is expected to make a valuable contribution to the existing literature.

4. METHODOLOGY

The matrix utilized in the study was developed based on expert opinion, with the DEMATEL and AHP methods of multi-criteria decision-making being favored due to their appropriateness for analyzing expert insights. The outcomes of the two methods were utilized for the final ranking through the average ranking technique, which serves as an integration method.

4.1. The DEMATEL Method

DEMATEL (Decision Making Trial and Evaluation Laboratory) is utilized to examine the relationships between the causes and effects of system components [40]. This method integrates value assessments to evaluate options for tackling genuine challenges [41]. This tool is employed to analyze and examine the interactions of criteria in the ranking of alternatives throughout the evaluation process. One can identify the interconnected impacts of criteria on each other. This approach employs diagrams and matrices to outline the connections between components and aims to clarify the strength of these relationships through quantitative definitions [42]. As a result, I preferred the DEMATEL approach in our research.

Procedures of the DEMATEL methodology [42], [43].

Step 1. Obtaining the direct and average relationship matrix

In this step, for n criteria, the degree of direct influence of each criterion on the other criteria is determined. For this purpose, each expert is asked about the degree to which criterion i influences criterion j scale of 0-4 is used for pairwise comparison.

When insights are gathered from various experts, the average initial matrix is derived by calculating the mean of the nxn matrices provided by each expert. Formula (1) is shown.

$$A = \begin{matrix} a_{11} & a_{1j} & \dots & a_{1n} \\ a_{i1} & a_{if} & \dots & a_{im} \\ \dots & \dots & \dots & \dots \\ \dots & \dots & \dots & \dots \\ \dots & \dots & \dots & \dots \\ a_{n1} & a_{nj} & \dots & a_{nn} \end{matrix} \quad i,j = 1,2,\dots\dots,n \qquad (1)$$

Step 2. Development of the normalized direct relationship matrix.

Matrix normalizing the average direct relationship matrix using Equation (2) and Equation (3).

$$M = kxA \qquad (2)$$

$$k = min\left[\frac{1}{\max_i \sum_{j=1}^{n} |d_{ij}|}, \frac{1}{\max_i \sum_{j=1}^{n} |d_{ij}|}\right], i,j = 1,2,,n \qquad (3)$$

Step 3. Obtaining a comprehensive matrix

The comprehensive relationship matrix T is derived from Equation (4).

$$T = M(I - M)^{-1} \qquad (4)$$

Step 4 involves calculating the sender and recipient groups.

The transmitter and receiver groups are determined using Equations (5), (6), and (7).

$$T = [t_{ij}]_{nxn} \quad i,j = 1,2 \dots\dots, n \qquad (5)$$

$$D = (r_i)_{nx1} = [\sum_{j=1}^{n} t_{ij}]_{nx1} \qquad (6)$$

$$R = (c_j)_{nx1} = (c_j)'_{nx1} = [\ \sum_{i}^{n} t_{ij}] \qquad (7)$$

Step 5. Establishing the threshold value

Step 6. Calculation of criteria weights

$$w_i = \sqrt{(D_i + R_i)^2 + (D_i - R_i)^2} \qquad (8)$$

$$W_i = \frac{w_1}{\sum_{i=1}^{n} w_i} \qquad (9)$$

Criteria weights are calculated using Equations (8) and (9)

4.2. AHP Method

The Analytic Hierarchy Process (AHP) is a systematic approach utilized for assessing the relative merits of two criteria. This approach systematically arranges criteria within a hierarchical framework and facilitates pairwise comparisons among them. This method is straightforward and effective for addressing complex multi-criteria decision-making challenges. This method effectively determines priorities and assists decision-makers in the process.makers in evaluating complex issues more thoroughly. The objective is to convert the issue into a hierarchical framework. The system conducts evaluations among hierarchical criteria. The system conducts evaluations based on hierarchical criteria. The eigenvector method is employed to determine rankings, and consistency is verified to ensure reliability. The consistency ratio serves as a tool to evaluate the accuracy of the solution [44], [45].

The AHS (Analytical Hierarchy Process) method consists of a structured series of steps designed to address a frequently encountered issue. This document outlines the procedure utilized to address multi-criteria decision-making challenges methodically [46].

1- The problem is defined and the objective is set.

2- The hierarchy of the defined problems is established.

3- Pairwise comparison matrices are arranged for each level below.

4- The consistency ratios of the matrices are checked. The consistency index is calculated using Equation (10).

$$CI = \frac{\lambda_{max} - n}{n-1} \qquad (10)$$

To determine the consistency ratio, the RI value corresponding to the number of decision alternatives is found, and the consistency ratio is calculated using equation (11).

$$CR = CI/RI \qquad (11)$$

5- A synthesis is performed to compile the eigenvector weights of each element of the problem.

6- The consistency of the hierarchy is evaluated; if the value is greater than 0.1, then there is an inconsistency and the data quality must be improved.

4.3. Average Sorting Technique

The mean ranking technique serves as a valuable approach in decision-making processes. This approach takes into account the prioritized preferences of a collective of individuals or experts and establishes the average ranking of these preferences. This method aggregates the rankings of individuals within the group and calculates the arithmetic mean of these rankings. The objective is to establish a ranking that accurately reflects the preferences of all individuals within the group [47].

Procedures for the Mean Ranking Technique:1. Gathering of Preferences: Each individual or expert organizes the candidates or options in a designated sequence. 2. Aggregation of Rankings: The rankings of all individuals are compiled, resulting in a total ranking score for each candidate or option. 3. Calculating the Average Ranking: The arithmetic mean of the total ranking scores for each candidate or option is computed. 4. Determination of the Winner: The candidate or option that achieves the lowest average ranking score is regarded as the most representative ranking within the group [48].

5. RESULTS

The findings obtained from the analysis performed using the DEMATEL and AHP methods are presented below.

The symbols of the factors affecting the growth of firms are represented by symbols between K1 and K6. They are given in Table 4.

Table 4. Symbols

FA1	Innovation
FA2	Sector
FA3	Ownership Structure
FA4	Financial Access
FA5	Environmental Factors
FA6	Export

When obtaining expert opinion, a pairwise comparison scale using a value between 0 and 4 was used. It is presented in Table 5.

Table 5. Binary Comparison Scale

Numerical	Definition
0	Unproductive
1	Minimal impact
2	Moderate Impact
3	Significant
4	Extremely Significant Impact

The initial decision matrix was developed to evaluate the effect of one direction on another, the mutual relationship between them, and the factors affecting the growth of SMEs. The degree of relationship between the sector and innovation and the degree of relationship between the ownership structure of the enterprise and innovation were rated on a scale of 0-4 by the author of this study. The paired comparison relationship matrix was created according to the DEMATEL method and is presented in Table 6.

Table 6. Direct Relationship Matrix

Criteria	FA1	FA2	FA3	FA4	FA5	FA6
FA1	0	3	2	2	3	4
FA2	2	0	3	2	2	3
FA3	3	0	0	4	2	3
FA4	3	3	4	0	3	3
FA5	1	3	1	2	0	3
FA6	3	3	2	3	3	0

The criteria in this matrix were determined based on the literature. The author has been working at the Small and Medium-Sized Enterprise Development and Support Administration (KOSGEB) for over twenty-six years. He has served as an SME expert and has been a director for many years. He has participated in hundreds of programs related to R&D, technology investment, entrepreneurship, and foreign market research support, as well as project evaluation committees.

Table 7. Normalized Direct Relationship Matrix

Criteria	FA1	FA2	FA3	FA4	FA5	FA6
FA1	0.000	0.188	0.125	0.125	0.188	0.250
FA2	0.125	0.000	0.188	0.125	0.125	0.188
FA3	0.188	0.000	0.000	0.250	0.125	0.188
FA4	0.188	0.188	0.250	0.000	0.188	0.188
FA5	0.063	0.188	0.063	0.125	0.000	0.188
FA6	0.188	0.188	0.125	0.188	0.188	0.000

The direct relationship matrix is normalized by dividing each value by the sum of the values in its row and column. Table 7 is presented.

Table 8. Total Relationship Matrix

Criteria	FA1	FA2	FA3	FA4	FA5	FA6
FA1	0.607	0.779	0.710	0.760	0.813	0.976
FA2	0.650	0.537	0.689	0.689	0.686	0.838
FA3	0.721	0.582	0.553	0.803	0.715	0.865
FA4	0.845	0.844	0.882	0.736	0.892	1.027
FA5	0.517	0.625	0.516	0.595	0.489	0.734
FA6	0.769	0.782	0.718	0.809	0.817	0.779

The total relationship matrix is obtained by multiplying the matrix and its inverse. It is used to obtain the D and R values.

Table 9. Sender And Receiver Group Calculation

Criteria	D	R	D+R	D-R	W_i
FA1	4.645	4.109	8.754	0.536	8.771
FA2	4.090	4.150	8.239	-0.060	8.240
FA3	4.238	4.068	8.306	0.171	8.308
FA4	5.226	4.392	9.618	0.834	9.654
FA5	3.477	4.412	7.889	-0.936	7.944
FA6	4.674	5.219	9.893	-0.545	9.908

The values within the columns and rows of this matrix are summed to derive the D and R values. D and R are combined and separated. The table for sender and recipient groups is utilized to determine the criteria weights. The D and R values serve as the basis for calculating the criteria weights. The operations for D and R values are presented in Table 9.

Table 10. Criteria Weights

Criteria	W_i(Criteria	Ranking
FA1	0.166	3
FA2	0.156	5
FA3	0.157	4
FA4	0.183	2
FA5	0.150	6
FA6	0.188	1

The DEMATEL method was utilized to ascertain the weights of the factors influencing the growth of SMEs. The significance of ranking growth factors was established. The weight ratios are presented in Table 10. The primary driver of firm growth is exports, followed by financial access, innovation, ownership structure, sector, and finally, environmental factors. Assessment of the outcomes derived from the DEMATEL method in conjunction with the AHP method to ascertain the consistency of the results obtained through the DEMATEL approach.

Table 11. Pairwise Comparison Matrix According to AHP Method

Criteria	FA1	FA2	FA3	FA4	FA5	FA6
FA1	1	2	3	1/3	4	½
FA2	1/2	1	1/2	1/4	2	1/3
FA3	1/3	2	1	1/2	3	¼
FA4	3	4	2	1	5	1
FA5	1/4	½	1/3	1/5	1	1/6
FA6	2	3	4	1	6	1

Two comparison matrices were created by the author of this study using the AHP method. The criterion weights obtained from the matrix calculations are listed in Table 11.

Table 12. Ranking of Weights According to AHP Method

Criteria	Weight	Ranking
FA1	0.17	2
FA2	0.08	4
FA3	0.11	3
FA4	0.30	1
FA5	0.04	5
FA6	0.30	1

The AHP method established the significance of the factors influencing the growth of SMEs. The significance of ranking growth factors has been established. The weight ratios are detailed in Table 12. Access to finance and exports are critical factors that facilitate business expansion. Innovation ranks second, followed by ownership structure in third place, sector in fourth, and environmental considerations in last. Alongside the AHP method, the average ranking technique was employed as a means of aggregation.

Table 13. Calculation According to Average Ranking Technique

Criteria	DEMATEL	AHP	Average Row	Ranking
FA6	1	1	(1 + 1) / 2 = 1	1
FA4	2	1	(2 + 1) / 2 = 1,5	2
FA1	3	2	(3 + 2) / 2 = 2,5	3
FA3	4	3	(4 + 3) / 2 = 3.5	4
FA2	5	4	(5 + 4) / 2 = 4,5	5
FA5	6	5	(6 + 5) / 2 = 5.5	6

The arithmetic mean of the rankings for each criterion across the two methods is presented in Table 13. The ranking of DEMATEL, based on the AHP method, is as follows: FA6, FA4, FA1, FA3, FA2, and FA5. The ranking was determined using the average sorting technique, and no discrepancies were observed in the results. Both methods yielded comparable results, along with the average ranking technique. The conclusive ranking is presented in Table 13.

6. CONCLUSION AND DISCUSSION

Small and medium-sized enterprises represent 73% of employment in Türkiye, and their role in production and exports underscores their significance. The rapid growth of SMEs is anticipated to further enhance their contribution to the nation's economy. It is essential to comprehend the growth factors to guarantee the ongoing contribution of SMEs to the national economy.

This study identifies criteria from the literature that influence the rapid growth of SMEs. The evaluation criteria included export, financial access, sector, ownership structure, innovation, and environmental factors. The order of importance of these factors was established through analysis using the DEMATEL and AHP methods. The final ranking was derived through the application of the averaging technique within the

framework of integration methods. The factors affecting the swift expansion of SMEs were ranked utilizing the DEMATEL method and arranged from the highest to the lowest value according to criterion weights. The primary criterion is exports, with financial access ranking second, followed by innovation in third, ownership structure in fourth, the sector of operation in fifth, and environmental factors in the final position. The calculations conducted using the AHP method yielded largely comparable results. Consequently, when the average technique was employed for integration, the results were consistent across both methods. The ranking established through the DEMATEL, AHP methods, and average technique is as follows: FA6 > FA4 > FA1 > FA3 > FA2 > FA5. The calculations conducted through both methods and the average technique demonstrated consistency.

The growth factors of SMEs can have an interdependent influence on one another. Expanding into foreign markets can enhance customer acquisition and drive sales, while introducing innovative products can open up new markets and boost exports. Cutting-edge products enable entry into new markets, whereas financial accessibility promotes fresh investments in this industry. At times, the sector may present opportunities for entrepreneurs as a result of prevailing economic conditions. The multi-partner structure of organizations can complicate decision-making processes and potentially adversely affect the company. Environmental factors, including intense competition, uncertainties, and rapid changes, can result in challenging situations. This situation has the potential to adversely impact the company's operational sector. The ownership structure and environmental factors may positively influence the company.

To sustain a stable growth rate, fast-growing SMEs must actively participate in innovation activities to enhance their competitiveness, alongside pursuing export growth, which ranks among the top three critical factors. Furthermore, prioritizing access to finance is essential for the swift expansion of businesses. Institutions that cater to SMEs ought to provide support programs aimed at assisting companies that have experienced a growth rate of 10% or more over the past three years in sustaining their performance. The support program for overseas market research assists companies in entering international markets, identifying new opportunities, acquiring new customers, and enhancing exports to current clients. Providing R&D and innovation support programs is essential to foster activities that enhance innovation, thereby increasing the market share and competitiveness of SMEs through the expansion of their product range and the reduction of product costs. Access to finance evidently plays a crucial role in the swift expansion of SMEs. Through the provision of straightforward and cost-effective financing options, we can enhance the financial frameworks for export, investment, and various other requirements.

Trade and industry chambers, business associations, and other organizations associated with SMEs have the capacity to organize training programs focused on partnership culture, family constitution, institutionalization, and business sustainability, which will effectively enhance awareness among companies. It is advisable for family businesses and companies with multiple partners to consider consulting services to promote a culture of collaboration. Chambers of Commerce and Industry have the potential to significantly enhance the growth of SMEs through the preparation of sectoral reports.

The prioritization of factors influencing the growth of SMEs could serve as a valuable resource for policymakers and institutions that provide support programs for SMEs in their initiatives. Seminars can be arranged to promote export initiatives among companies. The credit guarantee fund has the potential to enhance collateral opportunities for financing in sectors that significantly contribute to the nation's economy, particularly where high-tech companies are concentrated. Subsequent to this study, an additional investigation may be undertaken to evaluate the obstacles to SME growth utilizing the SME Competitiveness Assessment Methodology (SME-CAM).

DECLARATION OF ETHICAL STANDARDS

The author of this article declare that the materials and methods used in this study do not require ethical committee permission and/or legal-special permission.

AUTHORS' CONTRIBUTIONS

Ali SEVİNÇ: The comprehensive study was executed by

CONFLICT OF INTEREST

There is no conflict of interest in this study

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