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Determinants Affecting the Sustainable Development of Small and Medium-Sized Enterprises in a Developing Economy: A Cognitive Modeling Case Study of Cameroon

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ABSTRACT

The recent revolutionary shifts in the global economy have generated new prospects for the growth and development of national economies through technological innovation while also exacerbating issues of macroeconomic instability, social inequality, and poverty. At present, small and medium-sized enterprises (SMEs) have catalyzed the advancement of the majority of national economies. **The subject** of the study is the conditions and determinants affecting the sustainable development of SMEs in Cameroon. **The purpose** of this research is to identify the key factors of development and suggest a comprehensive model of the sustainable development of the SME sector in Cameroon, taking into account the structural features of the national economy. **The relevance** is determined by modern trends of globalization and technological innovations affecting national economies, especially developing countries such as Cameroon, along with its vital economic and social problems. **The scientific novelty** involves developing a cognitive model that examines the cross-impact of factors influencing the development of SMEs, based on the theory of fuzzy sets, and substantiating practical mechanisms to enhance the effectiveness of government policies supporting SMEs. The authors used **methods** of systems approach, expert assessment method, fuzzy set theory, cognitive modeling, comparative analysis, and statistical methods of data verification. **The authors concluded** that there is structural dualism in Cameroon's economy in the disproportion between the high-tech financial sector and archaic forms of entrepreneurship. A fuzzy cognitive map has been developed, indicating seven important influential factors with maximum centrality, including the level of production infrastructure development and the success of anti-corruption strategy, among others. The necessity for a program-targeted strategy has been substantiated, focusing on the establishment of a sustainable investment climate, the development of public-private partnerships, and the enhancement of the financial culture within the business environment. The existence of systemic contradictions has been proven, namely regarding the exclusion of SMEs from investment growth in infrastructure.

Keywords: small and medium-sized enterprises; SME; Republic of Cameroon; factor analysis; fuzzy set theory; cognitive modeling; government economic policy

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ОРИГИНАЛЬНАЯ СТАТЬЯ

Факторы, влияющие на устойчивое развитие малых и средних предприятий в развивающейся экономике: когнитивное моделирование на примере Камеруна

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АННОТАЦИЯ

Революционные преобразования мировой экономики последних лет открыли новые перспективы для роста и развития национальных экономик благодаря технологическим инновациям, одновременно усугубив проблемы макроэкономической нестабильности, социального неравенства и бедности. В настоящее время малые и средние предприятия (МСП) являются катализатором развития большинства национальных экономик. **Предметом** исследования являются условия и факторы, влияющие на устойчивое развитие МСП в Республике Камерун. **Цель** данного исследования — выявить ключевые факторы развития и предложить комплексную модель устойчивого развития сектора МСП в Камеруне, учитывающую структурные особенности национальной экономики. **Актуальность** определяется современными тенденциями глобализации и технологическими инновациями, влияющими на национальные экономики, особенно развивающиеся страны, такие как Камерун, где наблюдаются серьезные экономические и социальные проблемы. **Научная новизна** состоит в разработке когнитивной модели взаимовлияния факторов развития МСП, основанной на теории нечетких множеств, а также предложенных практических механизмах улучшения государственной политики поддержки малых предприятий. Авторы использовали **метод** системного подхода, метод экспертной оценки, теорию нечетких множеств, когнитивное моделирование, сравнительный анализ и статистические методы верификации данных. Авторы пришли к **выводу** о наличии структурного дуализма в экономике Камеруна, проявляющегося в диспропорции между высокотехнологичным финансовым сектором и архаичными формами предпринимательства. Была разработана нечеткая когнитивная карта, указывающая на семь важных факторов влияния с максимальной центральностью, включая уровень развития производственной инфраструктуры и эффективность антикоррупционной стратегии. Обоснована необходимость программно ориентированной стратегии, направленной на создание устойчивого инвестиционного климата, развитие государственно-частного партнерства и повышение финансовой культуры в деловой среде. Доказано наличие системных противоречий, в частности, в отношении исключения МСП из инвестиционного роста в инфраструктуру.

Ключевые слова: малые и средние предприятия; МСП; Республика Камерун; факторный анализ; теория нечетких множеств; когнитивное моделирование; государственная экономическая политика

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Introduction

The increased scientific interest in the small and medium-sized enterprises (SMEs) sector, both globally and specifically in Cameroon, is driven by their significant contribution to addressing key socio-economic issues, such as generating employment for the population and promoting income growth at both the regional and national levels.

Cameroon's economy has one of the most dynamic development paths among Central African countries, demonstrating robust gross domestic product (GDP) growth rates that significantly outpace the regional average. According to the World Bank, Cameroon's average annual GDP growth rate was 3.8% in 2021, 3.74% in 2022 and 3.25% in 2023, exceeding the Central African average rates by 2.7%, 3.54%, and 2.38%, respectively.[1]

[1] World Bank. Countries and Economies. URL: https://data.worldbank.org/country (accessed on 07.18.2024).

The structural analysis of Cameroon's economy reveals the dominance of the services sector (50.2% of GDP), where primarily large corporations operate, including transnational ones (telecommunication, finance, logistics companies), while the industry sector (mining industries) accounts for 25.5% and the agricultural sector, with the SMEs' predominance, comprises 17.3%.[2]

In the context of the social organization of the economy, SMEs play a system-forming role, providing employment for over 50% of the population and accounting for over 90% of the business sector.[3] However, in terms of GDP and added value, the large, predominantly foreign capital, concentrated in the raw materials and financial sectors, plays a dominant role. It creates a dualistic economic model in which the SMEs with their critical social function demonstrate a limited contribution to the macroeconomic value indicators due to low productivity and concentration in low-margin activities.

This structural imbalance greatly explains the low rate of GDP per capita growth and the persistent low living standards of the population as a consequence. According to the analytical estimates, the Quality of Life Index in Cameroon over a period of 2021–2023 was recorded at 3.6 points out of 10,[4] corresponding to 78th place in the global ranking.

Insufficient infrastructure advancement significantly restricts the development of entrepreneurship. By the end of 2023 approximately 30% of the country's population lacked access to the electricity grid, and by 2024 approximately 60% of the residents lacked reliable Internet access. These infrastructure deficiencies cause the systemic problems at all stages of the value-added creation limiting the inflow and effective use of investment resources, which is reflected in Cameroon's low ranking (123rd out of 141) in the 2024 Global Competitiveness Index.[5]

Despite Cameroon's rich natural resource base (oil, bauxite, timber, iron ore, gold, diamonds and coffee), its investment structure lacks a clear national focus. The capital from China, India and France dominates the primary industries and banking sector. Gaps in the legal regulation of entrepreneurship foster the spread of unauthorized and illegal business practices accompanied by high levels of corruption (140th place in the 2023 Transparency International Corruption Perceptions Index).[6]

The established duty rates at 10, 20, and 30% provide great opportunities for subjective decisions and corruption development, which further hinders the formation of a nationally oriented business community and the legalization of economic activity, including the SME sector.

Thus, despite the implementation of economic reforms, the adoption of Cameroon's Vision 2030, and the intensification of scientific and technical cooperation with industrialized countries, there remains an urgent need to foster conditions for enhancing the real competitiveness of small and medium-sized businesses. The purpose of this study is to identify the key factors for the SME's growth that best correspond to the current state and strategic development objectives of this sector.[7]

Literature review

The theoretical basis for studying the key trends in SME development is provided by the works of the leading economic scholars, who interpret the role and importance of SMEs in the economy in different ways. Thus, within the framework of the neoclassical paradigm, SMEs are an essential element of the competitive environment, which facilitates the efficient use of resources and is highly adaptable to market conditions [1]. The institutional school (T. Veblen, J.K. Galbraith, R. Coase, and others) emphasizes the dependence of SME development on the quality of institutions, including informal ones, the availability of infrastructure and government support tools [2]. In the countries of the European Union, for

[2] Economic and political overview in Cameroon. Montrouge: Groupe Credit Agricole. 2019. URL: https://international.groupecreditagricole.com/en/international-support/cameroon/economic-overview

[3] Institut National de la Statistique du Cameroun. INS Cameroon. Yaoundé-Cameroun: Institut National de la Statistique. 2025. URL: https://ins-cameroun.cm/en/

[4] USnews.com. URL: https://www.usnews.com/ (accessed on 02.12.2025).

[5] Global Competitiveness Index. URL: https://gtmarket.ru/ratings/global-competitiveness-index?ysclid=m5i9pk9fj0693230570 (accessed on 15.02.2025).

[6] To AmerunplaceVratingcorruption. URL: https://cbonds.ru/indexes /29333/?ysclid=m5i8 siuo7302607084 (accessed on 12.08.2024).

[7] Cameroon Country Strategic Plan 2021–2030. URL: https://www.effectivecooperation.org/content/cameroon-national-development-strategy-2020-2030 (accessed on 19.10.2024).

example, a developed infrastructure supporting SMEs (business incubators, guarantee funds) advances their growth [3].

Keynesian economists argue for the need for active government support for the SMEs through subsidies and public procurement, the fact of which is justified with the experience of small businesses in Russia under the sanctions in 2022, when the Bank of Russia's credit holiday measures[8] helped preserve businesses and jobs [3]. Thus, scientific literature acknowledges the significant potential impact of government support measures for SMEs as a key tool for economic stabilization, particularly during times of crisis.

Complex econometric models have been employed in several studies to analyze the growth determinants of SMEs, including the classical study by Akinboade O.A. [4], which identified key factors such as access to financing, personnel qualifications, and infrastructure quality. However, this study analyzes the factors without considering their systemic interactions and synergistic effects. The implemented linear model does not reveal nonlinear relationships, which results in its methodological limitation.

The key trends of the SMEs' development in Cameroon are determined by the state economic policy, resource potential and degree of integration into the regional and global markets. SMEs are essential to Cameroon's economy, playing a key role in reducing unemployment and ensuring social stabilization [5]. The research on identifying the SMEs' growth factors [6], assessing the effectiveness of the government support[9] [7], forecasting structural shifts in the economy,[10] barriers and risks analysis, as well as identifying the growth opportunities, emphasizes the need for a systematic study of the SMEs' development trends for their effective management.[11]

The analysis of the SMEs' development trends in Cameroon allows the assessment of potential opportunities and risks in various industries and identification of patterns for predicting crises, growth, or market transformation. For example, modeling the impact of tax imposition tools on Cameroon's economic development allows us to predict[12]: 1) acceleration of the GDP growth to 4.5% on average over 2025–2027 in case of the reforms in the energy sector and government funding [7]; 2) reduction of the inflation to 3% by 2027 due to the stabilization of the budget deficit (~1% of the GDP)[13] [8]; 3) a social effect in the form of increasing the coverage of education and healthcare services in rural areas through budget funds redistribution [8].

The representatives of the evolutionary school (the innovative approach) emphasize the nonlinear nature of development and the importance of knowledge and institutions in shaping the long-term competitiveness of the SMEs as well as their role in the generation and diffusion of innovations through the network interactions [9]. The digital transformation of business and the implementation of technological innovations receive significant attention. There has been a study of the integration of digital platforms into the SMEs' supply chains: it has been proved that the use of blockchain tracking can reduce the carbon dioxide emission by 15–20% (using the example of the water footprint in agriculture monitored by Vestigia), which increases the investment attractiveness of the business.[14]

The digital transformation of the SMEs in Cameroon faces a number of challenges that slow down the adoption of modern technologies. The key obstacles include: insufficient digital infra-

[8] Analytical Center for the Government of the Russian Federation. Small and medium-sized businesses under sanctions.

[9] World Bank. Cameroon Economic Update: Private Sector Growth and AfCFTA Integration. Washington, DC: World Bank Group; 2024. URL: https://www.worldbank.org (accessed on 02.02.2025).

[10] INS Cameroon. 2024. Agro-Industrial Potential of Cameroon: 2024 Statistical Review. Yaoundé: Institut National de la Statistique. URL: https://www.ins-cameroun.org UNCTAD. Green Energy Adoption in African SMEs: Case Studies from Cameroon. Geneva: United Nations; 2025.

[11] GICAM. Digital Transformation in Cameroonian SMEs: Trends and Barriers. Douala: Groupement Interpatronal du Cameroun; 2024. URL: https://www.gicam.org (accessed on 02.02.2025); African Development Bank. FinTech Solutions for SMEs in CEMAC Region. Abidjan: AfDB; 2025.

[12] World Bank. Cameroon's Fiscal Policy Scenarios: 2025–2035. World Development Report. 2024;12(4):33–50. DOI: 10.1596/978-1-4648-2024-1

[13] International Monetary Fund. African Dept. Central African Economic and Monetary Community (CEMAC): Press Release; Staff Report; and Statement by the Executive Director. IMF Staff Country Reports. 2025;064:1–87. DOI: 10.5089/9798229003711.002; International Monetary Fund. African Dept. Central African Economic and Monetary Community: Common Policies in Support of Member Countries Reform Programs. IMF Staff Country Reports. 2024;193:1–59. DOI: 10.5089/9798400280054.002

[14] European Commission. Blockchain for SME Supply Chains: EU Pilot Projects. Sustainability. 2025;17(3):112–130. DOI: 10.3390/su17030112.

structure (low internet penetration, especially in rural areas, high costs of the Internet connection, unstable communications, shortage of the adapted IT solutions) [10]; financial restrictions (lack of investment in digital technologies, limited access to crediting, insufficient government support) [11]; digital skills deficit (low digital literacy of entrepreneurs and employees, shortage of qualified IT specialists) [12, 13]; cultural and organizational barriers (conservative business models, resistance to change, insufficient awareness of the benefits of digital tools) [13, 14]; legal and regulation challenges (underdeveloped regulation framework for the digital economy, cyber security issues) [15].

The Cameroonian SMEs identify the conflict between traditional management models and digital transformation requirements as a key barrier [16]. The traditional hierarchical structures and cultural stereotypes hinder the implementation of agile approaches. The level of SMEs' digitalization in Cameroon is 23% lower than in Kenya and Nigeria, with less dominant traditional structures. To overcome these barriers, it is proposed to use the adapted training for managers, pilot projects and digital platforms (e.g., electronic data interchange systems for supply chains), the effectiveness of which has been proven within the framework of the EU Horizon 2020 INNOSUP and BlockStart programs.[15] An additional barrier is the digital gender gap mentioned in the World Bank reports.

Targeted government funding stimulates the "green transition" and sustainable development of SMEs. The research shows that the long-term effects of government support for "green innovation" continue to positively impact the financial performance of SMEs even after funding is cancelled, with a lag effect of 3–5 years [17]. The subsidies are proposed to be stratified. There is "green start-ups" grant support for microenterprises and R&D tax credits for medium-sized enterprises. Such programs as the UN's "Green To Compete" program help the SMEs implement "green" technologies, reducing costs and increasing competitiveness, which confirms the effectiveness of a growth model based on the triad of "digitizing, cooperation, and government support" [18, 19].

The cluster model is considered to be a long-range management technology for the SMEs' growth based on the geographic concentration of interconnected enterprises, organizations and institutions. Interaction within clusters facilitates the exchange of knowledge and resources, accelerating the development and implementation of innovations. The collaboration allows the SMEs to experiment, analyze successful practices and reduce barriers to accessing information and technologies [19–21].

The sustainable development paradigm views SMEs as the key agents of change, particularly in developing countries. Cameroon collaborates with such international organizations[16] as the Climate and Clean Air Coalition (CCAC)[17] to develop methodologies for assessing the SMEs' impact on the environment. There are implemented projects that are aimed at reducing emissions in the livestock industry (use of feed additives that reduce methane emissions by 15–20%). The share of «green» enterprises is forecasted to increase to 25% by 2030.

The scientific studies of the SMEs' contribution to the economy rest on qualitative and quantitative analytical methods [22–26]. However, there remains a relevant trend to study cause-effect relationships between the development of the SMEs as an institution and socioeconomic development indicators, as well as the consideration of associated effects [27]. Such an approach allows us to predict risks and opportunities as well as develop appropriate management decisions.

Materials and methods

A system approach was chosen as the main research method due to the need for providing the sustainable development of the SMEs based on the principles of economic, environmental and social justice [28].

Based on a review of articles on the problems of the SMEs' sustainable development management in the digital economy, external determinants were grouped into the key perspectives in accordance with the UN Sustainable Development Framework: economic, social, and environmental. There was also an institutional perspective, as the creation of a highly effective business requires the corresponding institution's performance.

[15] European DIGITAL SME Alliance. Blockchain. 2024, May 7. URL: https://www.digitalsme.eu/blockchain/

[16] UNDP. Cameroon Country Report 2024. URL: https://www.unfpa.org

[17] CCAC. Agriculture Sector Report. URL: https://www.ccacoalition.org

The analysis of the current conditions of the SMEs in Cameroon over the past five years and revealing institutional and infrastructural challenges and weaknesses were carried out using quantitative and qualitative analytical methods.

The qualitative analysis served as a methodological approach to identify the specific features of doing business by the SMEs in foreign countries. A number of authors indicate such issues as the company's age, industry, size, level of innovative activity, growth potential, etc., as the key indicators of sustainable and regular growth. According to international practices, the achievement of the sustainable and regular growth key indicators relies on the national support of the SMEs, including systematic, holistic, and functional (thematic) approaches to selecting the SMEs subjects whose government support can create a synergistic effect both for an individual economic entity and for society as a whole [29]. The most common programs within the holistic approach are aimed at searching for (often on an application basis) companies with high competitive potential in the international market in order to create a relatively small pool of high-growth companies (HGCs) deserving government support [30, 31].

An expert assessment method was used to identify and rank challenges and prioritize the SMEs development in Cameroon. We used data from the World Bank, the Strategy Document for Growth and Employment (DSCE), the Vision 2035 Development Strategy, and the General Plan for Industrialization (PDI). Statistical analysis was used to verify the expert assessments.

Market and industry analyses were used to assess the SMEs' business activity through the processes of concentration and deconcentration: 1) market concentration according to the "grow or go" principle leads to the consolidation of business structures and the displacement of less efficient SMEs [32]; 2) deconcentration causes an increase in the number of companies in high-income segments, increasing competition and distributing growth potential, which can lead to a decrease in the number of SMEs. Industry analysis emphasizes that different business areas are at different stages of the life cycle [33] and have different growth potentials.

The forms and mechanisms of the SMEs' state subsidies were studied, taking into account the theoretical principles of market models of subsidies, problems of information asymmetry and appropriate mechanisms (E. Gurvits, E. Maskin, R. Myerson, B. Goodwin, G. Kramer, and others) [34].

To identify and systematize the problems of the SMEs, the materials from the International Organization of Standardization (ISO) and the World Economic Forum (WEF) were used, as well as the empirical observations in the regions of Cameroon over the past five years. The targets of Cameroon's Vision 2030 have set a focus on researching the SMEs' growth issues as well as developing the tools for providing their sustainable growth.

The identification of numerous problems in the functioning of the SMEs in Cameroon, which increase their impact on the effectiveness and sustainability of the SMEs, made it essential to assess the degree of their importance in key areas for developing the unified organizational and methodological tools of the SMEs' sustainable growth — modeling the conditions for the SME development, based on the theory of fuzzy sets.

Using fuzzy set theory as a mathematical tool and the construction of a fuzzy economic model

Table 1

Diagnostic map of SME problems in Cameroon

Prospects	Key operational issues and development of SMEs
Economic	High financial isolation of SMEs; poorly diversified industry structure of SMEs; low investment activity limited access to energy and Internet resources for SMEs
Social	low literacy rate of the population, including financial literacy of SMEs insufficient supply of qualified personnel
Ecological	failure to adhere to environmental standards of SMEs limited implementation of state environmental monitoring measures
Institutional	high differentiation in the development of Cameroon's regions lack of institutions of territorial development poor infrastructure provision in the districts

Source: Compiled by the authors.

Table 2
Cameroon SME development matrix

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
									3												
3				3		2											–1				
	3		2																		
				3		2															
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1				3																	
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	3																				
		2							–2												
			2								–3			3		3					3
	1								–3						1						–3
								2				3								1	
				3	2												–2				

Source: Compiled by the authors.

for the SMEs' development in Cameroon stems from the fact that observational data on the SMEs' activity in the country is not homogeneous and lacks a clearly defined statistical nature. The experts have also noted the lack of clearly structured databases characterizing the SMEs in Cameroon and the unsystematic record of statistical data. The demand to account for nonlinear relationships between the factors also influenced the choice of this mathematical tool. It limits the application of the traditional econometric models.

Using the expert assessment method with the involvement of 47 experts that represent the SME entities, selected according to the criteria of expertise and experience in the SME sector (at least 5 years) and knowledge of national specifics, the problems have been ranked and the influence strength between them assessed, using the scale from — (maximum negative impact) to +1 (maximum positive impact).

The results of the expert assessment made it possible to group the identified problems into 4 prospects and draw a diagnostic map of the SMEs problems: (*Table 1*). The diagnostic map of the SMEs problems in Cameroon has showed that assessing the problems requires the coordinated processing of both quantitative and qualitative indicators to obtain reliable research results. To improve the reliability and validity of the study results, the Cameroon National Institute of Statistics database for 2020–2024 was used.[18]

The experts have identified the most significant indicators (concepts) characterizing the presence or absence of the problems in the development of the SMEs, which were assessed by the experts in quartiles: "1" — low level, "2" — average level, "3" — high level: 1. Density of transport routes; 2. Level of the e-commerce development; 3. Density of the banking network in the country's regions; 4. Availability of banking products; 5. Adherence to environmental standards by SMEs; 6. Number of the Internet users; 7. Volumes of real investment; 8. Level of industrial infrastructure development; 9. Budget expenditures for the SMEs support; 10. Wage rate of the population; 11. Literacy rate of the

[18] National Institute of Statistics of Cameroon. URL: https://ins-cameroun.cm/en/ (accessed on 01.11.2025).

population; 12. Level of financial literacy of SMEs; 13. Level of the business social responsibility; 14. Tax burden on business; 15. Level of corporate culture development; 16. Development of local self-government: 17. Effectiveness of anti-corruption policy; 18. Negative impact of business on the environment; 19 Level of public-private partnerships development; 20. Density of SMEs; 21. Administration simplicity; 22. Contribution of SMEs to GDP.

At the stage of modeling the conditions for the SMEs development, the level of codified relationships between the indicators (concepts) was assessed with the use of the scale: 1.0; 0.75; 0.5; 0.25; 0; –0.25; –0.5; –0.75; –1.0, (in quartiles: 4, 3, 2, 1, 0, –1, –2, –3, –4).

As a result, a matrix (cognitive map) of the SME development in Cameroon was drawn (*Table 2*).

To verify the expert assessments and minimize the bias, we conducted the statistical analysis of the opinion consistency. The calculated dissonance index showed an average level of 26%, indicating acceptable consistency. The largest discrepancies were recorded for the indicators "negative impact of business on the environment" (65%) and "contribution of SMEs to GDP" (62%), reflecting the ambiguity of their perceptions.

The quality and acceptable confidence level in the indicators selected for the analysis is confirmed by a consonance level of over 90%.

Based on Cameroon's SME development matrix, the most important indicators that demonstrate a high level of trust and intensity of influence on SMEs have been established, including the volume of real investment, the level of industrial infrastructure development, budget expenditures on SME support, the level of financial literacy of SMEs, the level of corporate culture development, the level of public-private partnerships development, and the effectiveness of anti-corruption policies.

The above-mentioned indicators can be grouped according to the trends that have developed in Cameroonian SMEs:

1) formation of a sustainable investment climate:

- volumes of real investment;
- level of industrial infrastructure development;

2) interaction between the state and business, promotion of the GR management technologies:

- budget expenditures on the SMEs support;
- level of corporate culture development;
- level of public-private partnerships development;

3) formation of financial culture in the business environment and the society as a whole:

- level of financial literacy of the SMEs;
- effectiveness of anti-corruption policy.

The research, based on the fuzzy cognitive mapping (FCM) method, emphasizes modeling the factors' systemic interactions and synergies rather than examining the role of each factor in isolation. For example, this model demonstrates that even a significant improvement of one factor ("availability of banking products"), coupled with a low level of another ("financial literacy"), may not produce the expected positive effect on "actual investment volumes" (see *Table 2* of the impact matrix). Thus, the suggested method complements existing quantitative research methods by offering a qualitative systemic perspective.

The performed calculations have revealed the structure-forming factors and outlined the direction of further research in order to develop relevant organizational and methodological tools for providing the sustainable growth of the SMEs.

Results

The modeling performed enabled us to identify seven critical elements with the highest potential impact on the development of SMEs in Cameroon and categorize them into strategic clusters:

1. Formation of a sustainable investment climate

A foresight analysis of Cameroon's SMEs' economic activity revealed that the key factor in achieving socioeconomic benefits is the adoption of innovative technologies, which is impossible without significant investment. In recent years, Cameroon has experienced active digitization of its agricultural and banking sectors, the development of which is recognized as strategically important in the context of the global trends.

The agricultural sector, which includes crop production, livestock farming, forestry, and related activities (processing, marketing, and distribution), has a systemic impact on all aspects of Cameroon's population. This sector plays a key role in the country's economy, serving as a potential growth area as it provides employment for a significant part of the population (over 40% in 2023). It also facilitates the development of the related indus-

tries and provides a means of living for most small businesses. Its contribution to Cameroon's GDP remains significant, amounting to 16.7% in 2023.

The effectiveness of modern agribusiness models, which include not only production but also logistics (setting up logistics hubs and industrial parks mainly oriented to SMEs), processing, and marketing, directly depends on the development of road, transport, and digital infrastructure. In a developing economy, government institutions play a key role in shaping the national investment market, while achieving economic sovereignty is difficult without their active participation.

The pace of modernization of Cameroon's agricultural sector depends directly on the volume of investment attracted. The banking sector, which is the main source of financing for the SMEs, is primarily represented by the subsidiaries of foreign financial groups (e.g., Societe Generale Cameroun, UBA Cameroon, AccessBank). Although the presence of international capital provides access to a wide range of banking products, the task of strategic development, within the framework of the stated course to build a digital economy by 2035, requires intensified investment activity and technology transfer from research centers to the real sector. Thus, increased financial integration creates preconditions for economic and social development, stimulates savings and capital accumulation, and helps optimize the distribution and availability of financial resources for businesses [35].

The model demonstrated a strong positive correlation between the volume of real investment and the level of industrial infrastructure development. However, a contradiction has been revealed: increased investment in infrastructure can indirectly contribute to the market monopolization and displacement of SMEs by attracting large amounts of foreign capital. This underscores the need for the state to specifically invest in infrastructure that caters to the needs of SMEs, such as logistics hubs and industrial parks.

2. Limited access to investment resources for SMEs in Cameroon

The availability of investment resources for SMEs in Cameroon remains a limiting factor in their progressive development. This problem is fundamentally structural in nature, exacerbated by the dominance of agricultural and rural microenterprises (over 80%) in the SME sector, which are characterized by chronic financial exclusion. In this context, differentiating both investment types (based on the target function) and institutional funding sources is methodologically justified.

A large number of the SMEs, being an indicator of significant entrepreneurial potential, correlates with the prevalence of micro-entrepreneurship, which is largely capitalized on through the reinvestment of personal savings or family pools. However, such financial injections are characterized as compensatory "subsistence investments," rather than strategic "growth investments," which objectively limits the potential for scaling business models and their transition to sustainable development.

There arises a systemic paradox: despite the nominal presence of formal credit products in the financial market (produced primarily by the subsidiaries of international banking groups), their actual accessibility for the vast majority of SMEs remains minimal. This imbalance is determined by the financial institutions' excessive requirements for collateral, credit history and the level of business formalization. Thus, there is a fundamental gap between the institutional supply of financial services and the practical approval of these services by the SMEs, caused by the dissonance between the standardized credit products and the specific risk profile of local enterprises.

This combination of factors highlights the need for government institutions to develop and implement comprehensive investment programs aimed at reducing the identified gap through the creation of specialized financial mechanisms adapted to the structural characteristics of the SME sector.

These circumstances make it necessary to develop and implement comprehensive government investment programs aimed at reducing this gap.

3. Interaction between the government and business: institutional aspect and implementation of the government relations (GR) management technologies

The institutional framework of Cameroon's state support system for small and medium-sized enterprises demonstrates formal structural integrity. The key actors in this system are:

- The Ministry of Small and Medium Enterprises, Social Economy and Handicrafts (MINP-

MEESA), which performs a coordinating and regulatory function.

• Agency of the SMEs Promotion (APME) that is responsible for the operational implementation of the support programs.

• Specialized development financial institutions: National Credit Council for Agriculture (CNCA CreditAgricole) and Bank of Small and Medium Enterprises (Banquedes PME).

The effectiveness of these institutions is ambivalent. The effectiveness of these institutions is significantly limited by administrative barriers, persistent underfunding, and weak interdepartmental coordination, in addition to certain incentive measures, such as reducing the corporate tax rate for SMEs from 28% to 25% in 2023. This creates an institutional trap whereby program initiatives fail to reach a significant portion of target groups, particularly SMEs in the informal sector and remote regions.

In the paradigm of the modern economic theory, consolidated interaction between the state and business is considered to be a key determinant of the formation of sustainable synergies aimed at socioeconomic development. The state acts as a system-forming stakeholder interested in the diversified development of the business sector. Legal and effective economic activity by the SMEs is possible only in an environment of institutionalized public-private dialogue within a clear legal framework, which is a prerequisite for building a competitive economy.

In Cameroon, elements of such collaboration are partially incorporated into the Kribi, Douala and Limbe free economic zones (FEZs), where the SMEs receive comprehensive support (administrative, fiscal, and advisory). However, this model is characterized by spatial and sectoral fragmentation: for example, the agricultural processing cluster is concentrated in the Douala zone, while most FEZs are located on the coast, limiting access for businesses in inland regions. Thus, the process of establishing public-private collaboration institutions for sustainable development is fragmented and requires further optimization.

To harmonize interests and test new forms of cooperation within the framework of government relations (GR) partnerships, a Sector Development Center under the Ministry of Economic Planning and Territorial Development was established. Its mandate focuses on stimulating public-private partnership (PPP) projects in infrastructure development (transport corridors in Chad, Gabon, and Congo; highways; and energy facilities such as the Nachtigal Dam and the Grand Eweng hydroelectric power station).

Alongside the context of GR partnerships, the Center initiates support for accelerators and incubators (MEST, Techstars, FI Cameroon Startup Accelerator, United Nations Development Program (UNDP) Cameroon Accelerator Lab) based on a system of key performance indicators (KPIs), providing mentoring, educational programs, and financial support [36]. This facilitates the integration of SMEs into a digital ecosystem. These structures focus on promoting economic reforms and industrial diversification of the economy.

Dissemination of the GR management practices has also catalyzed the emergence of the national initiatives aimed at increasing transparency and accountability in both the government and business sector. Institutionalized collaboration with the civil society organizations (the Cameroon Consortium of English-Speaking Civil Society, Campos, and others) is implemented through public hearings on budgetary and regional projects.

Monitoring committees have become an important control tool since 2013. Together with the civil society groups (the Cameroon Union of Industrialists and Entrepreneurs, the Association of Cameroonian Banks, etc.), they monitor and verify budget execution at the national, regional, and municipal levels.

The conducted analysis proves the existence of a developed institutional basis for supporting the SMEs in Cameroon; however, its effectiveness requires significant optimization by overcoming departmental disunity and expanding the geographical coverage of the support programs.

4. Improving financial culture in the business environment and society as a determinant of structural transformation of the Cameroonian economy

Achieving sustainable rates of economic growth and deep structural transformation of the Cameroonian economy are determined not only by measures of direct regulatory and fiscal impact (export support, tax incentives), but also by the need for implementing a comprehensive policy aimed at forming a relevant financial culture in

the business environment and public consciousness [36].

Financial culture is a complex, multicomponent socioeconomic construct, influenced by the level of financial literacy, individual and collective experience in making financial decisions, and the degree of institutional development of the financial market [37]. The key aspect of its development is the elimination of cognitive distortions and emotional barriers that determine irrational financial behavioral patterns. Consequently, improving financial culture should incorporate not only traditional financial education but also the development of decision-making skills under the conditions of uncertainty, taking into account behavioral economic models.

In Cameroon, this process is in its incubation phase and is being implemented piecemeal through targeted initiatives, such as the national entrepreneurship training program Kiro'o and the ActivSpaces incubator. These measures represent the initial stage of developing a public policy of building human capacities for priority economic sectors.

To intensify this process, it is necessary to implement a number of practical measures aimed at developing entrepreneurial initiative:

1) stimulating the formation of informal networks and business associations as the institutions of collective action that provide mutual support, knowledge transfer and access to resources;

2) development of business incubators and accelerators (based on the ActivSpaces model) focused not only on the GR interactions but also on the in-depth testing of practical business skills and financial management methods;

3) promoting successful local business cases to foster positive behavioral patterns and increase entrepreneurial motivation.

The effectiveness of integrating financial and cultural aspects is subject to quantitative assessment through a system of specialized indicators, including the sub-indices of "responsibility," "trust," and "long-term planning" [38]. These indicators establish a new standard for the requirements of business community competence.

Higher education institutions are expected to play a special role in this process. The researchers point out that it is crucial to develop graduates' soft skills, focused on social responsibility, risk management, and effective communication. However, the low level of engagement of the Cameroonian universities in financial and digital literacy programs highlights the need to overcome the heterogeneity of the educational environment and develop individual professional pathways that integrate these components.

Thus, developing a financial culture in Cameroon is a complex task that requires synergy between the efforts of the state, educational institutions, and the business community to achieve long-term socio-economic development goals.

5. State programs as a tool for implementing national priorities: a program-targeted approach in the context of structural heterogeneity of the Cameroonian economy

The study reveals a deep structural duality as a systemic characteristic of Cameroon's economy, reflected in significant intersectoral heterogeneity. This phenomenon manifests itself in a paradoxical combination of high-tech segments, represented by a modern banking sector with developed financial technologies, and archaic forms of economic activity, determined by a persistent deficit in energy and transport infrastructure.

Leveling this imbalance and strengthening the country's economic sovereignty objectively requires the state's regulatory and coordinating functions to be intensified. Reducing the severity of structural contradictions and harmonizing the economic space appear achievable only through the implementation of a system of comprehensive state programs focused on addressing specific development challenges.

The implementation of this approach involves the formation of a clear system of performance indicators that ensure monitoring the target indicators' achievement and allow for timely adjustment of the program activities depending on variable external and internal conditions (see *Figure*).

Such initiatives should be inter-institutional rather than departmental, ensuring the synchronization of efforts to modernize infrastructure, stimulate the SME sector, build human capital, and digitally transform the economy. A program-based approach creates the institutional preconditions for consolidating the resources to achieve the strategic national priorities, generating synergies and overcoming the fragmentation inherent in the current economic policy.

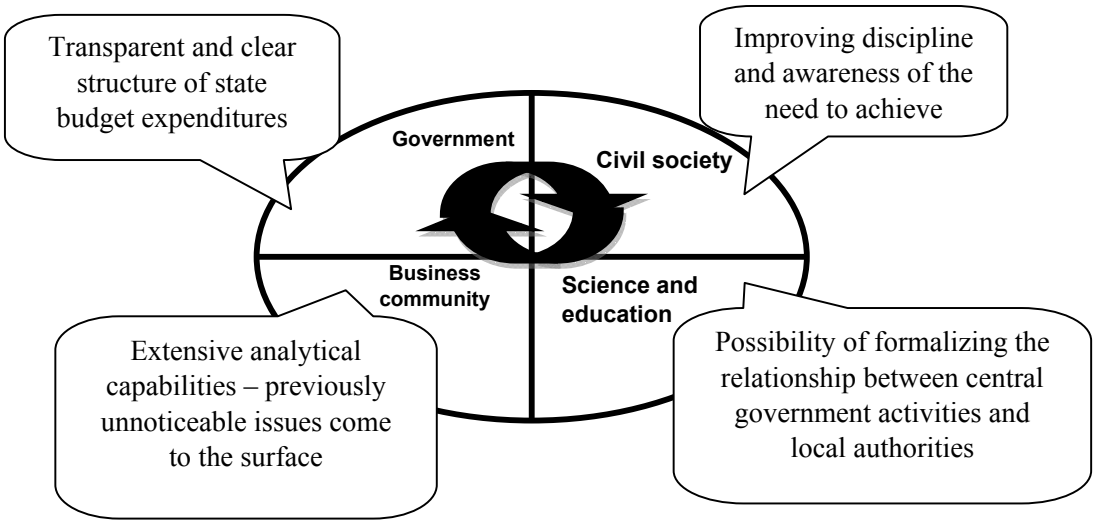

Fig. **The main advantages of using a project approach in the development and implementation of state programs in budget planning**

Source: Compiled by the authors.

6. Experience of state planning and methodological substantiation of the project approach in Cameroon

The analysis of Cameroon's public administration system reveals relevant experience in strategic planning, institutionalized in several key documents, such as the General Plan for Industrialization (Plan Directeur d'Industrialisation, PDI) and the national development strategy, Vision 2035. However, there is a significant methodological drawback in the current line-item budgeting model, which dominates at the national level. While focusing on the principles of targeted use of budget appropriations, it does not provide for a comprehensive mechanism for assessing the effectiveness and efficiency of funding across individual national projects. This circumstance leads to a systemic gap between the volume of allocated budgetary resources and the socioeconomic indicators actually achieved.

Improving the effectiveness of the government program implementation objectively requires transforming the existing budget management system toward a project-based approach. The methodological nature of this approach consists in the implementation of the following principles:

1) detailed integration of program activities with the priority course of the state policy;

2) application of a system of key performance indicators (KPI);

3) institutionalization of personal responsibility and transparent accountability mechanisms for achieving the planned results.

Testing a project-based approach to managing the SMEs sector development will significantly improve the validity of selecting and funding most relevant programs, providing a transition from cost-based management to results-based management.

Further optimization of the strategic planning system requires improving the methodology for identifying and prioritizing current development issues. To address this challenge, it is methodologically sound to use the fuzzy set theory, which provides formal tools for quantifying and analyzing semi-structured qualitative information. This approach can provide a more objective selection of the program targets and optimization of a range of measures to achieve the required socioeconomic results.

Discussion

The study allows us to conceptualize Cameroon's SME sector as a complex, semi-structured system characterized by a close relationship with the country's overall level of socioeconomic development. The key properties of this system are:

- directions diversity of ongoing processes;
- nonlinearity of cause-and-effect relationships between the system elements;
- high dynamism and instability of parameters;
- the necessity of applying a combined approach for a comprehensive analysis.

The research employed a systems approach aimed at identifying the most relevant areas with-

in the system for subsequent prioritization of the management impact. The applied fuzzy cognitive map revealed that concepts such as "level of industrial infrastructure development" and "effectiveness of anti-corruption policies" have the greatest strategic importance and influence on other factors.

The outcomes achieved have important practical implications. In terms of the institutional constraints, direct implementation of the advanced technological solutions appears ultimate. Priority efforts should be focused on creating fundamental conditions: providing a stable energy supply, developing logistics infrastructure, and expanding access to funding. The introduction of some technological innovations should not be considered as a starting point but as a natural consequence of improving these basic conditions.

The research has also revealed some potential systemic contradictions. For example, the increased infrastructure investment makes it possible to create positive externalities for the SMEs, on the one hand, and can also lead to the displacement of small businesses by larger players, on the other. Identically, the undifferentiated liberalization of government support measures at low levels of financial literacy can foster dependency attitudes and reduce the competitiveness of SMEs.

The use of cognitive modeling methods has demonstrated its heuristic value in analyzing complex socioeconomic systems, enabling the integration of both quantitative and qualitative factors. It is important to emphasize that the indicators used in the model and the identified priorities are relevant to the current timeframe. The model can be further verified with due regard for changing socioeconomic conditions.

The qualitative assessment was based on the expertise obtained using a stratified sampling method. To enhance the validity and reliability of the results in the long-range studies, it is advisable to apply more rigorous criteria for expert pool formation (level of competence, sectoral representativeness, and substantiated work experience).

The implemented methodology for constructing a cognitive model included a data triangulation stage — reconciling the results obtained from expert and statistical methods. This procedure ensures increased validity and reliability of the model. The reliability of a model constructed using the proposed algorithm is a prerequisite for developing effective management decisions based on it.

Prospects for further research lie in the development of dynamic versions of the model, allowing for time lags and nonlinear interaction effects. Despite the variability of external conditions, the proposed methodological approach retains its value as a tool for substantiating public policy priorities and ranking projects based on their potential impact on the system.

This study contributes to the development of methodology for analyzing complex economic systems and offers practical tools for developing balanced policies to support SMEs in emerging market economies.

Conclusion

The conducted research allows us to propose a system of conclusions that are theoretically and practically significant for solving the problems of sustainable development of the small and medium-sized business sector in the Republic of Cameroon:

1. The investment climate as an institutional foundation of development. Creating a favorable investment climate is an integral part of effective public economic policy. The development of such a climate in African countries is significantly hampered by the limited access of SMEs to financial resources, the spread of corrupt practices, and the lack of a systematic registry of long-range investment projects. There is a great need for a fundamentally new paradigm of attracting investment, focused on stakeholders and aimed not only at economic returns but also at creating positive social externalities.

2. Public-private partnership as a coordination mechanism. In terms of increasing external uncertainty, it is impossible to build a competitive economic system without the institutionalized interaction between the state and business. Harmonization of the interests of the society, business, and the state must be achieved with the coordinating role of public institutions. Regulatory measures provide the foundation of digital transformation and should be focused on achieving measurable socioeconomic results.

3. GR management as a tool for reducing transaction costs. Institutionalizing GR management technologies helps minimize risks and foster sustainable relationships between the SMEs and the government through the mechanisms of incorporating them into public organizations, con-

sultative commissions, and industry committees. The application of these technologies increases transparency in the business environment and creates the conditions for establishing an equitable dialogue with government agencies.

4. Financial culture as a factor in behavioral economics. The development of financial culture in the business community and public consciousness correlates with the improvement of educational programs and the rise of digital financial literacy. It creates a basis not only for effective business communications but also for a responsible approach to social and environmental obligations.

5. Financial system stability as a macroeconomic priority. Low levels of financial literacy hinder productivity growth, innovation, and the development of crisis resilience. Improving this level will strengthen the stability of the banking sector, providing SMEs financing and optimizing implementation of the international risk management standards.

6. Government programs as a strategic planning tool. The use of program-targeted methods in implementing national priorities allows for the consolidation of financial resources from various sources in order to launch large-scale projects. This tool enhances the synergetic effect of approving the interests of the state and business, improves the quality of the SMEs' development management, and contributes to sorting out the current socioeconomic problems.

7. Project-based approach as a budget management paradigm. The introduction of a project-based approach into the development and implementation of government programs creates a methodological basis for improving the quality of budget planning and generates positive externalities for all stakeholders. The government receives results-oriented budget expenditures. Businesses receive new opportunities for growth, while the civil society receives transparency of budget expenditures and clear interaction between the various government levels.

These findings highlight the need for a comprehensive approach to the SME sector development that combines institutional reforms, improved management practices and human capital investments.

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