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Article

Methodology for Assessing the Economic Sustainability of Family Enterprises in the Service Sector and its Practical Application

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Abstract: This article examines a comprehensive methodology for assessing the economic sustainability of family enterprises operating in the service sector and its empirical application in the Samarkand region. Economic sustainability is assessed through three interrelated components: financial stability, economic efficiency, and income stability. The methodology covers nine indicators, which are normalized using the min–max method and aggregated into a weighted composite index. Indicator weights are informed by expert assessments obtained through a three-round Delphi process. The empirical basis comprises 118 family service enterprises selected from 12 districts and cities, 23 in-depth interviews, and assessments by 15 experts. The calculations show that the average integrated sustainability index is 0.276, while 86.4 percent of the enterprises fall into the low-sustainability group. The findings indicate the need to improve liquidity management, financial reserves, management quality, and the management of income fluctuations.

Keywords: family enterprise, service sector, economic sustainability, composite index, financial stability, profitability, income stability, Delphi method, Samarkand region.

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1. Introduction

Family enterprises play an important role in the service sector by providing employment, meeting local demand, transferring entrepreneurial skills between generations, and strengthening regional economic activity. Such enterprises often rely on the labour, financial resources, experience, and social networks of family members. At the same time, the close interconnection between ownership, management, and family relationships makes the assessment of their economic sustainability more complex [1]. In particular, seasonal demand, intensifying competition, rapid changes in digital technologies, and limited access to financial resources directly affect the performance of service-sector enterprises.

Traditional financial analysis provides an important methodological basis for studying enterprise sustainability. The Altman Z-score model uses financial ratios to assess the probability of bankruptcy, while Beaver's approach examines the ability of financial indicators to predict business failure. Liquidity, financial independence, profitability, and cash-flow indicators describe an enterprise's current financial condition. However, these indicators alone do not fully capture the continuity of a family enterprise across

generations, the use of family resources, the professionalization of management, or its socio-emotional objectives [2].

Contemporary research on family business emphasizes the need to consider family influence and distinctive resources alongside financial performance. The familiness concept introduced by Habbershon and Williams explains the unique resources and capabilities associated with family involvement. Berrone and co-authors developed the socioemotional wealth perspective to analyze non-financial objectives such as family control, identity, social ties, and continuity across generations [3]. The F-PEC scale proposed by Astrachan and co-authors assesses family influence through the dimensions of power, experience, and culture.

Although these approaches contribute to a deeper understanding of family businesses, their direct application to service enterprises in the Samarkand region requires adaptation to local conditions. In many local family enterprises, formal financial reporting is incomplete, business and personal funds may be mixed, financial reserves are limited, and management is often concentrated in the hands of the head of the family. Therefore, the purpose of this article is to present a multi-criteria methodology for assessing the economic sustainability of family enterprises in the service sector and to test it using empirical data [4], [5].

2. Materials and Methods

The empirical basis of the study consists of 118 family service enterprises operating in 12 districts and cities of the Samarkand region. The sample was formed using a stratified random sampling approach based on service type and geographical location. Data were collected from enterprise financial statements, a structured questionnaire consisting of 38 questions, in-depth interviews, and expert assessments. The interviews involved 17 entrepreneurs, four successors, and two public-sector employees, making a total of 23 respondents.

The selection of indicators was based on international academic literature, the specific characteristics of family businesses, and local business practice. The initial list of indicators was reviewed through a three-round Delphi process involving 15 experts. The Kendall coefficient of concordance was used to assess the consistency of expert opinions: $W = 0.78$; $p < 0.01$. This result indicates a high level of agreement among the experts.

The methodology includes nine indicators grouped into three dimensions: financial stability, economic efficiency, and income stability. Each indicator describes a different aspect of an enterprise's economic condition. The min–max normalization method was used to convert the indicators to a common scale. The general formula is:

$$\mathbf{K_i(norm) = (K_i - Kmin) / (Kmax - Kmin)}$$

Here, K_i is the observed value of the i-th indicator, while Kmin and Kmax are the minimum and maximum values in the sample. The normalized value ranges from 0 to 1. For indicators where a lower value represents a more favourable outcome, such as the cost level or income volatility, the direction of normalization should be reversed. Clearly specifying the direction of each indicator is essential for the reproducibility of the methodology.

The integrated sustainability index is calculated as a weighted sum:

$$\mathbf{IS = \Sigma(W_i \times K_i(norm)),\ i = 1, \ldots, 9;\ \ \Sigma W_i = 1}$$

Here, W_i represents the weight coefficient determined on the basis of Delphi expert assessments. The sum of the weights equals 1. This article applies the thresholds presented in the practical classification table: $IS < 0.40$ – low sustainability; $0.40 \le IS \le 0.70$ – medium sustainability; and $IS > 0.70$ – high sustainability. Other parts of the source material also refer to thresholds of 0.33 and 0.66. Therefore, the practical table's thresholds were used

for reporting the empirical results, while the classification criteria should be made consistent before final publication.

System of Assessment Indicators **Table 1**

Dimension	Code	Indicator	Description
Financial stability	K1	Current liquidity	Ability to cover short-term liabilities with current assets
Financial stability	K2	Financial independence	Share of equity in the enterprise's assets
Financial stability	K3	Adequacy of working capital	Availability of working capital to finance current operations
Economic efficiency	K4	Return on assets	Efficiency of using enterprise assets
Economic efficiency	K5	Sales profitability	Profit in relation to sales revenue
Economic efficiency	K6	Cost level	Ratio of costs to revenue
Income stability	K7	Income volatility	Degree of fluctuation in income across periods
Income stability	K8	Stability of growth	Consistency of growth in revenue and business scale
Income stability	K9	Adequacy of financial reserves	Ability of reserves to cover operating expenses

The selected indicators make it possible to assess an enterprise not through a single financial ratio, but through liquidity, capital structure, profitability, cost discipline, and the stability of income over time. Indicators K1–K3 describe solvency and sources of financing; K4–K6 reflect the efficiency of resource use; and K7–K9 characterize the stability of income flows and the ability to withstand unexpected shocks.

3. Results

According to the survey, 81.4 percent (96 enterprises) are managed by the head of the family, 14.4 percent (17 enterprises) employ a professional manager, and in 4.2 percent (five enterprises) the children take the leading role. The average number of employees is 11.2, while the median is five. The average number of family members involved in the enterprise is 2.9. These figures indicate that management in family service businesses is largely concentrated within the family and that most enterprises operate on a relatively small scale.

The main constraints reported by entrepreneurs include insufficient financing, identified by 57.6 percent (68 respondents); lack of knowledge and skills, 36.4 percent (43); tax burden, 31.4 percent (37); competition, 30.5 percent (36); and lack of time, 28.0 percent (33) [6]. These findings show that economic sustainability is affected not only by internal financial indicators but also by the institutional environment, managerial capacity, and market conditions.

The survey results on financial reserves reveal considerable differences among enterprises. Some 42.4 percent have reserves sufficient for two to three months, while 28.8 percent have reserves covering more than six months. Reserves cover up to one month for 20.3 percent of enterprises, and 8.5 percent have no reserves at all. Seasonality is also a significant issue: 58.5 percent of respondents reported seasonal income fluctuations. Monthly income remains almost unchanged in 33.1 percent of enterprises, while 8.5 percent reported highly unstable income [7].

In the expert assessment, the external environment received the highest average score of 3.94. Service diversification and employee loyalty each received 3.90, management quality 3.89, digitalization 3.78, and family capital 3.39. Management quality was

identified as the most important factor by 56 enterprises. This suggests that, in addition to average expert scores, managerial capacity may play a decisive role at the level of individual enterprises.

2. Descriptive Statistics of Normalized Indicators

Indicator	Mean	Std. dev.	Min	Max	Median
K1 – Current liquidity	0.143	0.174	0.000	0.905	0.082
K2 – Financial independence	0.137	0.171	0.000	0.950	0.076
K3 – Working capital adequacy	0.156	0.193	0.000	0.929	0.085
K4 – Return on assets	0.158	0.190	0.000	0.918	0.089
K5 – Sales profitability	0.141	0.181	0.000	0.942	0.074
K6 – Cost level	0.139	0.166	0.000	0.887	0.081
K7 – Income volatility	0.136	0.169	0.000	0.911	0.070
K8 – Stability of growth	0.758	0.218	0.000	1.000	0.813
K9 – Financial reserves	0.712	0.234	0.000	1.000	0.776
Integrated sustainability (IS)	0.276	0.188	0.053	0.950	0.214

The descriptive statistics show that the average normalized values of the financial stability indicators are relatively low. K1, K2, and K3 stand at 0.143, 0.137, and 0.156, respectively. These results are consistent with the reported constraints related to limited financial resources, reliance on borrowed funds, and difficulties in working-capital management. The economic efficiency indicators K4–K6 also range from 0.139 to 0.158, indicating differences among enterprises in profitability and cost efficiency [8].

Within the income stability dimension, K8 – stability of growth (0.758) and K9 – financial reserves (0.712) have comparatively high average values. However, K7 – income volatility – has a value of 0.136. Interpretation of these results requires attention to indicator direction: a higher level of income volatility may reduce sustainability. Therefore, the methodology should explicitly state whether reverse normalization was applied to K7.

The mean integrated sustainability index is 0.276, with a standard deviation of 0.188, a minimum of 0.053, and a maximum of 0.950. This wide range indicates substantial variation in the economic sustainability of family service enterprises. While some enterprises have achieved high sustainability, weaknesses remain among the majority [9].

3. Classification of Enterprises by Sustainability Level

Sustainability level	IS range	Number	Share	Group mean IS
Low	IS < 0.40	102	86.4%	0.198
Medium	0.40 ≤ IS ≤ 0.70	7	5.9%	0.534
High	IS > 0.70	9	7.6%	0.847
Total	—	118	100.0%	0.276

According to the classification, 102 of the 118 enterprises, or 86.4 percent, belong to the low-sustainability group. The medium-sustainability group includes seven enterprises (5.9 percent), while nine enterprises (7.6 percent) belong to the high-sustainability group. The 0.1 percentage-point difference in the sum of the rounded shares is due to rounding [10]. Enterprises in the low group more frequently demonstrate weak financial management, insufficient reserves, limited use of digital tools, and problems related to financial literacy.

Enterprises in the medium group generally have an established customer base and a certain level of business experience. However, they face limitations in professionalizing management and formalizing succession plans. Enterprises in the high-sustainability group more often demonstrate professional management, financial reserves, service diversification, digital marketing, and preparation for succession.

3.3. Internal Consistency and Qualitative Evidence

The Cronbach's alpha coefficient for the internal consistency of the methodology is 0.913. This indicates a high level of internal consistency within the selected set of indicators. At the same time, the item-test correlations for K8 and K9 are lower than those of the other indicators: 0.261 for K8 and 0.123 for K9. When these indicators are removed, the alpha coefficient increases to 0.939 and 0.940, respectively. This suggests that their relationship with the overall scale is comparatively weak. Nevertheless, K8 and K9 were retained because they represent substantively important aspects of economic sustainability [11].

A high Cronbach's alpha indicates internal consistency, but it does not by itself prove construct validity or demonstrate that the methodology will be reproducible in all settings. Therefore, future research should additionally examine factor structure, criterion validity, and the theoretical relationships among the indicators.

Qualitative data helped explain the quantitative findings. Some entrepreneurs associated sustainability with the ability of an enterprise to operate over the long term and adapt to market changes. Others described it as maintaining profitability, retaining customer trust, or continuously improving service quality. Some respondents found it difficult to provide a precise definition of sustainability. This indicates a practical need for a simple, understandable, and regularly applicable assessment tool for family enterprises [12], [13], [14], [15].

4. Discussion

The findings confirm that the economic sustainability of family service enterprises is a multidimensional phenomenon. An assessment based solely on profit or revenue does not fully capture short-term solvency, sources of financing, resilience to seasonal fluctuations, or continuity across generations. The proposed methodology combines financial, efficiency, and income stability indicators into a single index, thereby providing a common basis for comparing enterprises [16].

The most significant issue identified by the study is the large share of enterprises in the low-sustainability group. This result is consistent with the fact that 57.6 percent of respondents identified insufficient financing as a major constraint, 8.5 percent of enterprises had no financial reserves, and 58.5 percent experienced seasonal income fluctuations. To reduce seasonal demand fluctuations in the service sector, enterprises may expand their service portfolios, introduce advance-booking systems and customer loyalty programmes, and use digital sales channels [17].

Interview examples illustrate the contribution of family resources and entrepreneurship. For example, an abaya brand that began with small orders through Instagram expanded to three branches and exports to six countries, demonstrating the potential of digital marketing and business expansion [18], [19], [20]. The growth of an adras brand from one employee to more than 30 employees within five years, accompanied by a three- to fourfold increase in revenue, highlights the importance of management, branding, and human-resource development. The example of an entrepreneur who expanded an inherited livestock business into three farms also illustrates the practical role of intergenerational transfer of knowledge and capital.

These examples are individual interview findings and should not be interpreted as universal patterns applicable to all family enterprises [21], [22]. They are used as

qualitative evidence to help interpret the index results. Another advantage of the methodology is the combined use of expert assessments, surveys, and interviews. This approach makes it possible to understand enterprise conditions more broadly where formal financial reporting is insufficient [23], [24].

Three issues should be addressed to further improve the methodology. First, the normalization rules for indicators with positive and negative directions should be clearly described. Second, the index thresholds should be standardized throughout all tables and sections. Third, the relatively low correlations of K8 and K9 with the overall scale indicate the need for additional construct-validity testing. Addressing these issues would strengthen the scientific reliability and practical applicability of the methodology.

5. Conclusion

The study empirically tested a comprehensive methodology for assessing the economic sustainability of family enterprises in the service sector, combining three dimensions and nine indicators. The financial stability dimension includes current liquidity, financial independence, and working capital adequacy. The economic efficiency dimension covers return on assets, sales profitability, and the cost level. The income stability dimension includes income volatility, stability of growth, and adequacy of financial reserves.

For the 118 enterprises, the average integrated sustainability index was 0.276. According to the applied classification criteria, 86.4 percent of enterprises were assigned to the low-sustainability group, 5.9 percent to the medium group, and 7.6 percent to the high group. These findings demonstrate the need for systematic measures to improve financial management, build reserves, control costs, and reduce income fluctuations in family service enterprises. In practical terms, family enterprises are advised to maintain separate financial records, build reserves sufficient to cover several months of operating expenses, diversify their service portfolios, manage customer databases using digital tools, and clearly distribute responsibilities and authority among family members. Studying and adapting the practices of enterprises with high sustainability is also an important practical direction. Future research should expand the sample, conduct comparative analyses across other regions, re-examine indicator weights, specify the reverse-normalization procedure for negatively oriented indicators, and assess the forecasting capacity of the integrated index. In addition, incorporating family governance, succession readiness, and socioemotional capital as a separate module may further enrich the methodology.

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