



**Research Article**

# **Psychometric Measure of Economic Sustainability of Small and Medium Enterprises: An Empirical Validation**

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## **Abstract**

*Empirical validation of a good psychometric measure to assess Economic Sustainability (ES) felt utmost critical in the domain of sustainable development. In the quantitative deductive tradition, this paper attempted to make available the empirical evidence for the ES measure developed by Matinaro et al. (2019) in the SME context of a developing country: Sri Lanka. 361 SMEs of three main categories were surveyed twice within one year, with their owners and managers directly involved in the surveyed SMEs' strategic, managerial, and operational functions. Eight dimensions of the sustainable economic performance of SMEs were evaluated based on the 24-item measure with a seven-point response scale. The confirmatory factor analysis was equipped to evaluate the instrument's measurement properties. The results empirically proved the soundness of some measures in terms of validity and reliability.*

**Keywords:** confirmatory factor analysis, financial management, reliability, structural equation modeling, sustainability, validity

**JEL Classification Codes:** O10, O30, L10, L20, M10

## Introduction

The economic pursuit of the sustainability dimensions is known as Economic Sustainability (ES). Psychometrics involves creating scientifically valid and reliable instruments (such as questionnaires and tests) to collect data and provide a quantitative measure (American Psychological Association (APA), 2023). Hence, a measure's psychometric properties usually denote its validity and reliability, which is acceptable for further scientific investigation.

SMEs, in general, are experiencing a high mortality ratio worldwide (The World Bank, 2022). This is specular for developing countries whose economies are supported mainly by SMEs in national production and employment. SMEs' inability to maintain ES is a root cause for many of SMEs' weaknesses and constraints (Goerner et al., 2009; Tennakoon & Janadari, 2022). Nevertheless, SMEs rarely assess and report their ES, which instinctively leads to ignorance of the principal dimension of sustainability. The irregularities in SMEs' sustainability reporting are found due to a lack of technical knowledge and awareness, unavailability of good measurement tools and inadequate pressure from external stakeholders (Hillary, 2000; Spence & Rutherford, 2001; Tennakoon & Janadari, 2022).

Measuring ES is still controversial due to its aligning nature with financial performance (Goerner et al., 2009; Tennakoon & Janadari, 2022). Growing wealth without compromising the successors' ability to grow their wealth is often contradicted by the financial interests of the stakeholders. Hence, businesses' financial interests and performance should be explicitly demarcated from sustainable practices and performances, enabling quantifying such performance for confirmation and further improvement. However, the scarcity of sound psychometric measures to assess the ES is a far-felt need in corporate sustainability (Spangenberg, 2005).

Further, the available limited measures for measuring ES are loosely supported with sound empirical evidence. It is undoubtful that SMEs' ES measures should not be the ones we are adopting for large-scale businesses that enjoy a distinctive business profile than SMEs. Provided the multifaceted contribution by SMEs toward the national economies (Aris, 2007; Harvie, 2004; Robu, 2013), SMEs should be placed top of any sustainability agenda. Thus, developing new measures and empirical validation of existing measures for assessing the ES is considered imperative to further developing the existing depth and breadth of the construct.

Matinaro et al. in 2019, attempted to develop a business model that helps SMEs operate more sustainably and environmentally

friendly. They looked at sustainable development and innovations in 233 Taiwanese SMEs and found that a sustainable business model is performed with colleagues' agreement, which requires comprehensive strategic efforts. They have extracted factors for evaluating the sustainable performance of three pillars of sustainability: economic, social, and environmental (Elkington, 1994). They have adapted the case study method and questionnaires to collect empirical evidence, which was then interpreted using Grey Relational Analysis (GRA) to detect critical sustainable development factors. Resultantly, three sets of factors were extracted those explain the sustainable development of SMEs concerning TBLs. However, Matinaro et al. (2019) acknowledged that the Key Success Factors (KSFs) developed lack generalizability as they have been tested in a narrowed context; within the Taiwanese SME sector only. The review of existing contributions clearly shows a vacuum of empirically validated sound psychometric measures to assess ES. To address the scarcity of the empirically validated psychometric measure that assesses ES, the present study aimed at empirically validating the KSFs of the economic dimension of sustainable performance in a distinctive set-up: the SME sector of Sri Lanka. Specifically, it aimed at assessing the validity and reliability of the ES measure proposed by Matinaro et al. (2019) in the SME sector of a developing

country: Sri Lanka. The study findings would generate empirical evidence for the proposed measurement of ES, enabling SMEs to better focus and assess their ES with a comprehensive evaluation of their economic viability.

The remainder of this article is structured in a way that the second section reviews the theoretical background of the study domain and the third section presents the materials and methods used in achieving the research objectives. The fourth section then summarizes the results of confirmatory factor analysis, and the last sections present the discussion followed by the conclusion.

## **Theoretical Background**

Economic Sustainability, as a principal element of sustainability, has been defined by several scholars from varied perspectives. Nevertheless, a consensus over a universal definition has yet to be reached. Hungover et al. (2017), while attempting to develop a uniform measure for economic and environmental aspects of sustainability, defined ES as the long-term competitiveness, profitability, and meeting the demands of shareholders. From a financial standpoint, an economic unit must be capable enough to satisfy the long-term demands of the shareholders. Competitiveness and profitability go hand in hand with the need for satisfaction. However, generalising these themes to the macro level, for instance, to a

government or a country, may be controversial. Societal demands usually deserve first place on top of pure economic measures. Thus, the reality reflects a socio-economic rather than a unified financial setting.

This mutually inclusive nature of sustainability's societal, ecological, and economic dimensions was well recognised in Morelli's interpretation of ES. Morelli (2011) stated, "Economic sustainability should involve analysis to minimise the social costs of meeting standards for protecting environmental assets but not for determining what those standards should be" (p. 2). Morelli (2011) demarcated the role of ES from the other two pillars, whereas ES is supposed to minimise the social cost of preserving the environment. This definition, however, neither specifies the time dimension nor the target group, thus reasonably encountering the larger community.

Sachs (1999) defined ES as the efficiency of economic systems (institutions, policies, and rules of functioning) to ensure continuous socially equitable, quantitative and qualitative progress. Nevertheless, Sachs (1999) recognised the merger between social and economic dimensions, but no environmental elements were incorporated. However, it specialises in addressing both quantitative and qualitative aspects of economic progress.

In a more general way, Harris and Goodwin (2001) defined ES as a system able to produce goods and services continuously. It is an open expression of the ultimate aim of an economic system. Other than that, they emphasise the continuous nature of the supply while no added sustainable elements are presented.

In its sustainability policy, the University of Mary Washington (2009) refers to ES as the practices that support long-term economic growth without negatively impacting the community's social, environmental, and cultural aspects. Meanwhile, the university emphasises that sustainable practices should be long-lasting and harmonise with the social, environmental, and cultural aspects.

While interpreting sustainability in economic terms, Stavins et al. (2002) justified why economists focus on efficiency in their journey towards sustainability, leaving equity considerations to the political process. Stavins et al. (2002) argued that dynamic efficiency's insufficiency reflects sustainability. Intergenerational equity is proposed to merge with dynamic efficiency to balance the level of need satisfaction across generations, meeting the needs of both present and future generations. As Stavins et al. (2002) view it, a sustainable growth path is dynamically efficient and non-decreasing over time.

Definitions discussed reflected a mix of socio, economic and ecological aspects rather than a purely economic measure. In a way, this acknowledges the desired harmonious evolution of the three spheres. The strong sustainability model claims environmental sustainability as the core of economic and social sustainability. Weak sustainability models hint at a mutual existence of three spheres. However, the two models posit that only pure individual dimensions can be optimised by acknowledging the progress of the rest of the dimensions. Following this generalisation, many, if not all, theoretical frameworks presented so far have attempted to incorporate more or less social and environmental elements in assessing ES.

Husgafvel et al. (2017) identified, tested, and finalised nine dimensions of economic sustainability (ES). These dimensions include vital financial statistics, investments, raw materials & energy, risks, supply chain, social aspects, cross effects, cost based on legislation and legal aspects. Christen et al. (2013) figured out four dimensions: cost efficiency, food production, energy production, and investments. Sachs (1999) proposed a practical yet representative measure combining environmental and economic indices, which includes fixed & variable cost components and environmental cost elements. This model fits well in balancing quantitative and qualitative progress for many industries.

The macro-level assessment of economic sustainability involves evaluating the economic viability of governing systems. Harris & Goodwin (2001) incorporated government debt, external debts and sectoral imbalances as determinants of economic sustainability. The sustainability principle of the University of Mary Washington (2009) identified four aspects as predictors of environmental, cultural, social, and economic aspects. Goerner et al. (2009) argued that resilience and efficiency are the most essential yet complementary factors that ensure economic viability. Rigamonti et al. (2016) viewed cost as the principal dimension of the economic arms of sustainability.

The suggested composite indicator has three elements: two for environmental assessment (MRI and ERI) and one for economic assessment (Cost Indicator). Rigamonti et al. (2016) tailored it into the municipal waste management system, with the cost of collection, treatment, and final disposal being the major but not the only indicator of all financial substances. Stavins et al. (2002) counted this principle in assessing ES and claimed that intergenerational equity is one of two dimensions of ES. They proposed linking efficiency and equity from a normative interpretation of ES. Stavins et al. were the first to count equity as the social dimension within an assessment of ES. Industry/sector-specific indicators are widely

used in environmental management (ES). Hanegraaf et al. (1998) adopted a tri-dimensional model for assessing the ecological and ES of energy crop production. This model involved the cost of energy produced, the cost of abated CO<sub>2</sub> emission and employment creation per hectare. Pieper (1999) interpreted labour productivity and productivity growth as the dimensions of ES. Labour is the most critical factor of production, but more is needed to represent the overall economic well-being of the entire community. Productivity growth would indicate the macroeconomic gain but not the social dimension of sustainability.

The existing literature demonstrates the both merits and demits. Empirical evidence for the conceptual framework Matinaro et al. (2018) to analyse sustainability is scary, and more empirical research is needed.

## **Materials and Methods**

### **Study Design**

The empirical validation of research instruments can be achieved using various research designs depending on the study's specific goals and requirements. Two widely used research designs for questionnaire validation are cross-sectional and longitudinal. Among them, longitudinal designs facilitate generalizability (Creswell, 2009). Accordingly, the present study followed a longitudinal design. The data was

gathered through a longitudinal study of Sri Lankan SMEs. The questionnaire was administered twice within a year (August 2021 and February 2022), with a six-month gap in between. Participation was entirely voluntary. They completed the questionnaire independently, with the assistance of a research team member if necessary. The questionnaire took an average of 30 to 45 minutes to complete. We ensured confidentiality by assigning each participant a unique code that only the research team could access.

### **Participants**

The Department of Census and Statistics (DCS) of Sri Lanka conducted the last Economic Census in 2013/14, providing a solid base for scientifically defining SMEs. Although the department has identified turnover, the value of assets and the number of people engaged as key variables in defining SMEs, the number of people engaged was selected as the most reliable and consistent variable in defining SMEs in Sri Lanka. Further, the Economic Census in 2013/14 classified the significant economic activities into three categories: the industry and construction sector, the trade sector, the and services sector. DCS has used several people to define micro, small, medium, and large establishments (See Table 1).

**Table 1: Definition of SMEs – Department of Census and Statistics of Sri Lanka**

Size	Number of people engaged		
	Industry and Construction	Trade	Services
Micro	1 to 4	1 to 3	1 to 4
Small	5 to 24	4 to 14	5 to 15
Medium	25 to 199	15 to 34	16 to 74
Large	200 and above	35 and above	75 and above

*Note:* Department of Census and Statistics (2015)

Considering the labor-intensive nature of SMEs, we drew the participating SMEs of our study based on the classification of SMEs by the Sri Lankan DCS in 2015. Accordingly, establishments with 5-24 people (Small enterprises) and establishments with 25-199 people (Medium enterprises) were considered in defining the sample of the study (DCS, 2015). The unit of analysis was individual SMEs where owners/managers with direct involvement with the managerial and operational functioning filled the questionnaires representing the organizations. The owner/manager was regarded as the primary source of assessment; the unit of analysis is the organization. Usually, the SME’s business owner and the business share a mutual existence (Lopez-Perez & Rodriguez-Ariza, 2013) as he/she is the founder of many SMEs who starts and manages the enterprise (Adla & Gallego-Roquelaure, 2019). Furthermore, the business performance of the SMEs is vested mainly in the performance of the owners in many cases

(Adla & Gallego-Roquelaure, 2019; Chirkos, 2019; Lopez-Perez & Rodriguez-Ariza, 2013; Robleh, 2017). Hence, the present study's unit of analysis is regarded as SMEs.

The generalizability of research findings is vested in the sample's representativeness. On the other hand, the representativeness of a sample primarily resides in the sample size (Krejcie & Morgan, 1970). When validating a measure, these criteria become even more critical. Neither too small nor too large samples will meet the purpose of accuracy and cost-effectiveness, respectively. Thus, determining the appropriate sample size is a critical task. No common rule of thumb to determine the sample size is available. Some method-specific and statistical tool-specific rules of thumb are used, while most quantitative researchers adapt the statistical formula to calculate the sample size. These formulas vary by the parameters they use in the calculation process. Social scientists heavily adopt Krejcie and Morgan's (1970) formula in the surveys. We also calculated the

sample size based on Krejcie and Morgan's (1970) recommendation (Sekaran & Bougie, 2019). For the population of 81 531 SMEs, (DCS, 2021) 383 is identified as the sample size with a 95 percent confidence level and a five percent margin of error. Roscoe (1975) proposed that sample sizes (n),  $n > 30$ , and  $n < 500$  are appropriate for most research (Hashim, 2010). Stevens (1996) explained that a rigorous statistical analysis should have data from a sample of more than 300 respondents. Loehlin (2004) used confirmatory factor analysis and suggested that at least 200 cases and 300 observations would be better for the confirmatory factor analysis. Kline (2011) recommended sample sizes of at least 200 or 5-10 cases per parameter for structural equation modeling. Accordingly, 383 is regarded as a representative sample.

The proportionate sampling technique is used to maintain a fair representation of all the identified sectors of SMEs. Accordingly, the patriating SMEs were drawn from three categories of SMEs namely, industry& construction, trade, and service (DCS, 2021). The sampling process started with selecting two out of nine country provinces. The Western and North Western provinces hold the highest number of SMEs in Sri Lanka (DCS, 2021). The SMEs of these provinces cover a wide range of industrial activities, too (DCS, 2021). In addition, these two

provinces have been identified as housing the districts with higher disaster vulnerability: Kalutara, Gampaha, Colombo, and Kurunegala (UNDRR, 2019), where business continuity is often challenged.

Moreover, the Western province inherits the country's commercial hub, while Western and North Western provinces are among the three provinces with higher contributions to GDP (Central Bank of Sri Lanka, 2021). As the study aimed at testing KSFs of SMEs leading to ES, the selection of two provinces is believed to be administrative-critical. The lists of registered business establishments obtained from the Small Enterprise Development Divisions of each province's Office of the District Secretariat were refined based on the definition of SMEs adopted by the study to ensure the inclusion of the correct sample units in the SMEs category. The lottery method identified individual sample units from the sampling frame based on their business registration number. Questionnaires were hand-delivered via the field officers of the Provincial Small Enterprise Development Divisions. Actual participation in the first round was 412. It was 361 in the second round. Only the participants who participated in the first phase were invited to participate in the second round of data collection. The distribution of actual sample items who took part in both rounds is shown in Table 2.



**Table 2: Distribution of Sample Items**

Province		Scale		Sector		
Western	North Western	Small	Medium	Industry & Construction	Trade	Service
229	132	318	043	145	127	089
63	37	88	12	40	35	25

*Note:* Developed by the Authors (2022)

We ensured that the questionnaire was filled by the person directly involved with the overall planning and operational aspect of the SMEs, thus resembling the long-term vision

for the organization’s financial viability. Table 3 shows the sociodemographic profiles of participants.

**Table 3: The Sociodemographic Profiles of the Sample - SME Owners/Managers**

	Characteristic	Range of Birth Years	Age Range	N	%
<b>Age Generation</b>	Baby Boomers	1946–1964	76 - 58	036	10
	Generation X	1965–1980	57 - 42	178	49
	Millennials (Generation Y)	1981–1995	41 - 27	126	35
	Generation Z	1996–2010	26 - 12	021	06
<b>Gender</b>	Male			111	31
	Female			250	69
<b>Civil Status</b>	Unmarried			062	17
	Married			299	83
<b>Level of Education</b>	O/L			136	38
	A/L			150	41
	Diploma			057	16
	Degree/Postgraduate			018	05
<b>Total</b>				361	100

*Note:* Survey Data (2021/2022)

The characteristics of SME owners show that the majority of the respondents represent generation X (49 percent), are female entrepreneurs (69 percent), are married (83 percent), and have reached the advanced level of formal education (41 percent). Despite these dominant characteristics, the

participants showed a significant diversity in their business profiles. Business profiles of the surveyed SMEs are represented in Table 4. Diversities in demographics are expected to swell the broader representativeness of the sample.

**Table 4: The Business Profiles of the Sample - SMEs**

	Characteristic	N	%
<b>Lifespan Business (Years)</b>	05 - 10	047	13
	11 - 25	144	40
	26 - 50	113	31
	51 +	057	16
<b>Total Assets (Million)</b>	> 1	115	32
	01 - 20	116	32
	20 - 50	091	25
	50 <	039	11
<b>Market</b>	Only Local	292	81
	Only International	021	06
	Both	048	13
<b>Total</b>		361	100

*Note:* Survey Data (2021/2022)

Most businesses have a lifespan between 11 and 25 (40 percent). Man of SMEs' total assets is less than 20 million (64 percent). Eighty-one percent of them cater to the local market, and only very few targets international and local markets (13 percent). The diversities of the business profiles of the sample are regarded as uplifting the sample's representativeness.

### **Instruments**

The study questionnaire is arranged in two parts (Part A & B). Additionally, the title and background details for the research were stated at the beginning to increase transparency and better communicate the purpose of the study. Part A consists of sociodemographic variables about the owner/manager of the SMEs (Age, Gender, Marital status, and level of education) and the

attributes of the SMEs (Nature of the business, Number of years in the business, Total assets, Market, and Products and Services). Part B consisted of statements about ES (Financial management, Resource allocation, Decision-making, Added value, Brand value, Competitiveness, Cost reduction, and Profit). Apart from items questioning the sociodemographic information, 24 items focused on ES's KSFs. The items of these measures took the closed-ended structured form in which the response scale was set as a continuum of 0 to 7 (1 – Strongly Disagree, 7 – Strongly Agree). The Seven-point Likert scale was used instead of the five-point Likert scale to improve the expression range of the responses, thus approaching a broader continuum to approach the interval scale. Revilla et al. (2014) suggested that 7 points are better for

bi-polar scales (i.e., Dissatisfied to Satisfied) while 5 points are better for uni-polar scales. The response scale of the present study is bi-

polar. Hence, Seven-point was regraded most appropriately. The structure of the questionnaire is summarized in Table 5.

**Table 5: Structure of the Survey Questionnaire**

Section	Construct/ Variable	Scale of Measurement	Response Scale	Item
Part A	Demographic Variables	Nominal, Ordinal, Ratio	Dichotomous, Multiple Choice, Open-ended	1 - 10
Part B	Economic Sustainability	Continuous	7-Point Likert Scale	PR1 - FM24

*Note:* Developed by the Authors (2022)

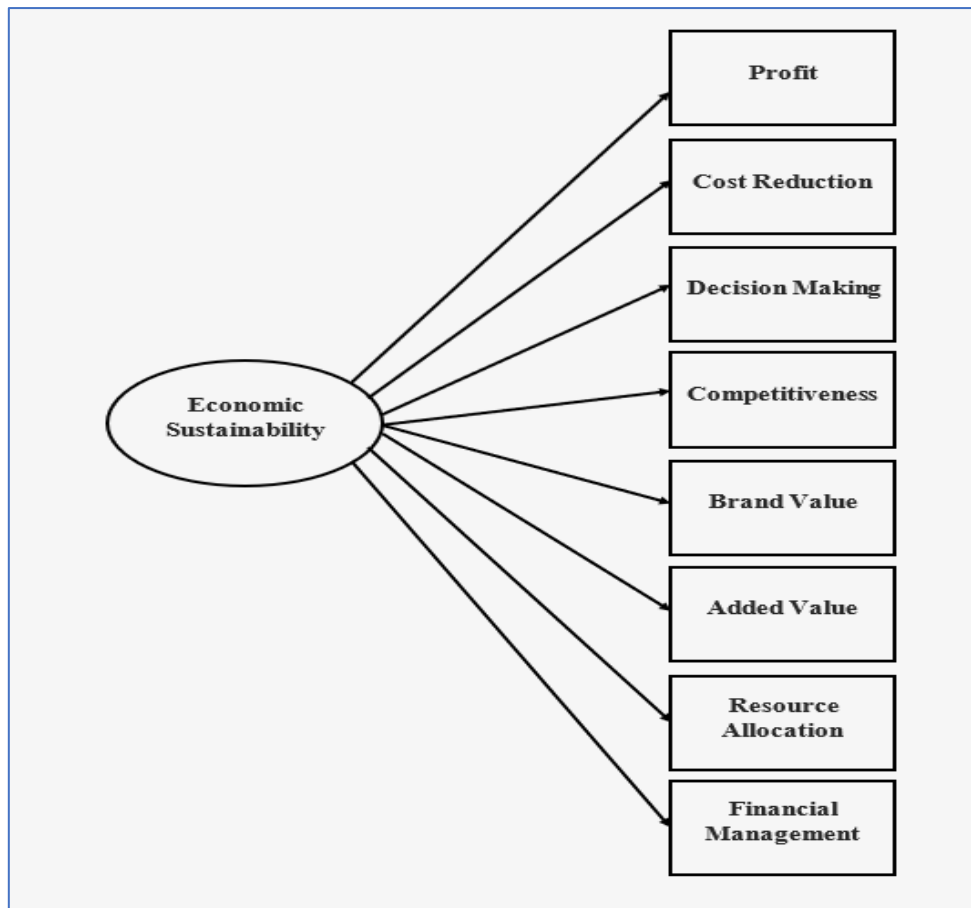
The instrument is based on eight major latent categories of interconnected organizational outcomes of SMEs linked to ES, as depicted in Figure 1.

*Profit* is the fundamental economic concept used to measure any economic unit's financial performance. It is defined as the net of implicit returns to "entrepreneur" inputs (Zafiris, 1975, p.145). Gross profit is calculated by deducting the Cost of Goods Sold (COGS) from total sales. Operating profit is the residual value of total sales after all costs are paid, thus carrying greater representativeness of the economic aspect of an organisation.

*Cost reduction* is an actual and permanent reduction in the unit cost of goods created or services supplied. As the costs are reduced, profit margins improve significantly.

Consumers can also benefit from cost savings through lower prices or more supply for the same price. The effect of cost reduction is usually evident as lower spending while maintaining the same output volume.

*Decision-making* is the next dimension. Profits are generated by effective decisions (i.e., *decision-making*), whereas ineffective decisions generate losses. Due to the criticality of their business survival, this operates similarly for SMEs (Salles, 2006; Sahin, 2017). A decision is taken to solve an issue or take action to capitalize on an opportunity (Kotter, 2012). It refers to a procedure including identification, information collecting, alternative identification, alternative solution evaluation, alternative solution selection, execution, and review.



**Figure 1: Economic Sustainability and its Subconstructs**

*Note:* Developed by the Authors (2022) based on Matinaro et al. (2019)

*Competitiveness* refers to the capacity to produce and provide high-quality goods and services at lower costs than competitors. The greater the competitiveness, the higher the economic returns will thus possess potential in affecting the ES of SMEs. Because of their enormous significance in the state's economy, SMEs' competitiveness is regarded as critical.

*Brand* of a company is an intangible asset, and Matinaro et al. (2019) suggest adopting it as a subcontract of ES. It aids in distinguishing between a company's book and market value. The quantification of brand value helps estimate a company's value accurately.

Various organisations employ a variety of metrics to quantify brand value. Many SMEs emphasise increasing brand value/equity, considering they operate in a narrower niche.

*Added value* is the difference in price between the finished product/service and the cost of the inputs used to create it. Organisations use a range of ways to offer value in order to meet their marketing and financial goals. Purchases and repeat purchases will increase due to the additional value provided to customers, which is essential in securing future economic value generation.

Businesses that create value find it easier to achieve profitability.

*Resource allocation* is how a corporation chooses where to allocate scarce resources to produce goods and services. Efficient resource allocation frequently results in effective goal achievement, whereas inefficient resource allocation results in increased costs and losses. Several reasons contribute to the complexity of resource allocation, including shortage of resources, financial limits, organisational politics, lack of know-how and other information, imprecise objectives, a proclivity for risk, and organisational inertia, among others. However, regarding the breadth of their operation, resource allocation decisions for SMEs may not be that hard. Nevertheless, a smooth resource allocation function would provide an uninterrupted manufacturing process, which is critical for meeting client needs.

*Financial management* is the last dimensions. SMEs are frequently characterized by poor *financial management*, which leads to poor business performance and, in extreme cases, bankruptcy (Jindrichovska, 2013; Jindrichovska et al., 2013). Financial management is a critical component of any firm, regardless of size. It is the planning, organizing, directing, and controlling of an organization’s financial activities. Any financial management, in general, will estimate capital requirements, determine the capital composition, select funding sources, invest funds, dispose of cash, and control finance (Karadag, 2015). Thus, SMEs' business sustainability requires strong financial management as it eventually becomes a part of their ES. So, we operationalize the ES construct, incorporating financial management as a subconstruct.

Matinaro et al. (2019) extracted items from various studies for which the literature support is provided in table six.

**Table 6: The Subconstructs and their Indicators/Items**

Subconstruct/ Indicator		Source
<b>Profit</b>		
PR1	My organization’s business model is business-driven. (For example, the business model is established based on corporate objectives).	(Schaltegger et al., 2012) (Dyllick & Rost, 2017)
PR2	My organization usually generates profits for stakeholders.	(Chen et al., 2005) (Singh et al., 2007) (Samy et al., 2010) (Schaltegger et al., 2012)
PR3	My organization is profit-oriented.	(Bocken et al., 2014) (Jamali & Rasti-Barzoki, 2018)

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**Cost reduction**

CR4	My organization reduces business spending gradually.	(Dyllick & Rost, 2017) (De Medeiros & Ribeiro, 2017)
CR5	My organization improves cost-effectiveness day by day.	(Singh et al., 007) (Global Reporting Initiative, 2014) (Luqmani et al., 2017)
CR6	My organization's business model is committed to reducing costs.	(Li et al., 2010) (Bocken et al., 2014)

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**Decision-making**

DM7	The non-economic aspects of my organization's corporate decision-making are sustainable.	(Singh et al., 2007) (Hallstedt, 2017)
DM8	The economic aspects of my organization's corporate decision-making are sustainable.	(Singh et al., 2007) (Hallstedt, 2017)
DM9	My organization's business model improves corporate decision-making in general.	(Singh et al., 2007) (Hallstedt, 2017)

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**Competitiveness**

CO10	The key factor for my business's success is its sustainable business model.	(Piscicelli et al., 2018) (Long et al., 2018)
CO11	My organization's business model establishes competitive advantages.	(Bocken et al., 2014) (Saeidi et al., 2015) (Zhu & Sarkis, 2016)
CO12	My organization's business model promotes its competitive position.	(Pujari et al., 2003) (Saeidi et al., 2015) (Jamali & Rasti-Barzoki, 2018)

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**Brand value**

BV13	My organization's business model positively enhances the relationship between enterprises and its stakeholders.	(Steurer et al., 2005) (Williams & Dair, 2007)
BV14	My organization's business model improves corporate reputation.	(Fombrun, 2005) (Sethi et al., 2016)
BV15	My organization's business model promotes its image in the market.	(McAdam & Leonard, 2003) (Dangelico & Vocalelli, 2017)

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**Added value**

AV16	My organization positively contributes to my/our other businesses (if any).	(Hart & Milstein, 2003) (Figge & Hahn, 2004) (Porter & Kramer, 2011)
AV17	My organization brings unexpected benefits to my/our other businesses (if any).	(Samy et al., 2010) (Piscicelli et al., 2018)
AV18	My organization brings unexpected opportunities for my/our other businesses (if any).	(Cohen & Winn, 2007) (Cooperrider, 2008)

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**Resource allocation**

RA19	My organization conducts economic trade-off selections.	(Beckmann et al., 2014) (Jamali & Rasti-Barzoki, 2018)
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RA20	My organization performs reallocation of resources.	(Martínez-Ferrero & Frías-Aceituno, 2015)
RA21	My organization allocates resources effectively.	(Ortiz-de-Mandojana & Bansal, 2015)

**Financial Management**

FM22	My organization is improving its financial performance day by day.	(Ortiz-de-Mandojana & Bansal, 2015)
FM23	My organization’s business model brings financial benefits to my/our other businesses (if any).	(Martínez-Ferrero & Frías-Aceituno, 2015)
FM24	My organization is improving the use of working capital.	(De Medeiros & Ribeiro, 2017)

*Note:* Developed by the Authors (2022) based on Matinaro et al. (2019)

The ESQ was created by a team of experts from Aalto University in Finland, Linköping University in Sweden, Vaasa University in Finland, and National Chung Hsing University in Taiwan. Items in English were translated into Sinhala and Tamil for data collection by a professional translator under the supervision of the research team. We made a few minor changes in this phase to the wording to make the ES theme more explicit, improve the language, and ensure that the items' correct meaning was represented.

The instrument was constructed of three items that were built around 24 items in total

**Analytical Approach**

Confirmatory Factor Analysis (CFA) is the frequent first step in scale validation (Hine et al., 2016). The CFA examines how well data fits a theoretical model. We used structural equation modelling (SEM) to do CFA

(Table six) for the eight subconstructs of ESQ (Figure 1). We carefully eliminated individual-level ES assessments and solely incorporated organizational-level ES features when constructing the items. Nevertheless, to improve the explanatory power, we broadened the number of items for the decision-making subconstruct (Hair et al., 2017). Moreover, to determine the respondent's appropriateness to represent the SME, we included a few questions on individual demographic factors in addition to questions about the business profiles of SMEs (See table five).

because we primarily wanted to validate the subconstructs and their respective indicators. The ESQ's components were placed into the two-order model (See Figure 2), thus generating the second-order latent construct ES, which is made up of eight first-order latent constructs identical to the

subconstructs of the model. The reliability of the sub-scales was assessed in the first step of a validation study by calculating internal consistency (Janadari et al., 2016). Then the validity criteria are tested.

In the following stage, we calculated descriptive statistics for each item to understand the distribution of the answers. The subsequent assessment of the reflective

### Results and Data Analysis

The results are provided per the analytical approach previously indicated. As a result, we present the CFA results first, followed by the reliability measures, validity measures, and descriptive statistics for the ESQ questions.

*Confirmatory Factor Analysis* results are shown in table seven (7).

The first-order measurements of ES are in the form of reflective measures. Thus, the following section presents the extent to which the measurement properties of these constructs can support the reliability and validity of their instruments.

*Reliability- First-order constructs:* Observing factor loadings is the first step in evaluating the indicator reliability of reflective measurement devices. Hair and Alamer (2022) suggested maintaining indicators with loadings greater than 0.708 since they can explain more than half of the variance in the construct. All of the first-order latent variables of the ES construct (i.e., Profit, Cost Reduction, Decision-making, Competitiveness, Brand Value, Added Value,

measurement model was carried out using SmartPLS version 3. The ESQ assesses ES features, in particular those that prevail in SMEs. It lacks the ability to incorporate quantitative financial metrics. However, it should be a valuable instrument for examining the economic dimension of sustainable SMEs.

Resource Allocation, and Financial Management) had factor loading ranges ranging from 0.891 to 0.960 in the first-order measurement model. As a result, the indication dependability of all of ES's subconstructs is established (Table seven).

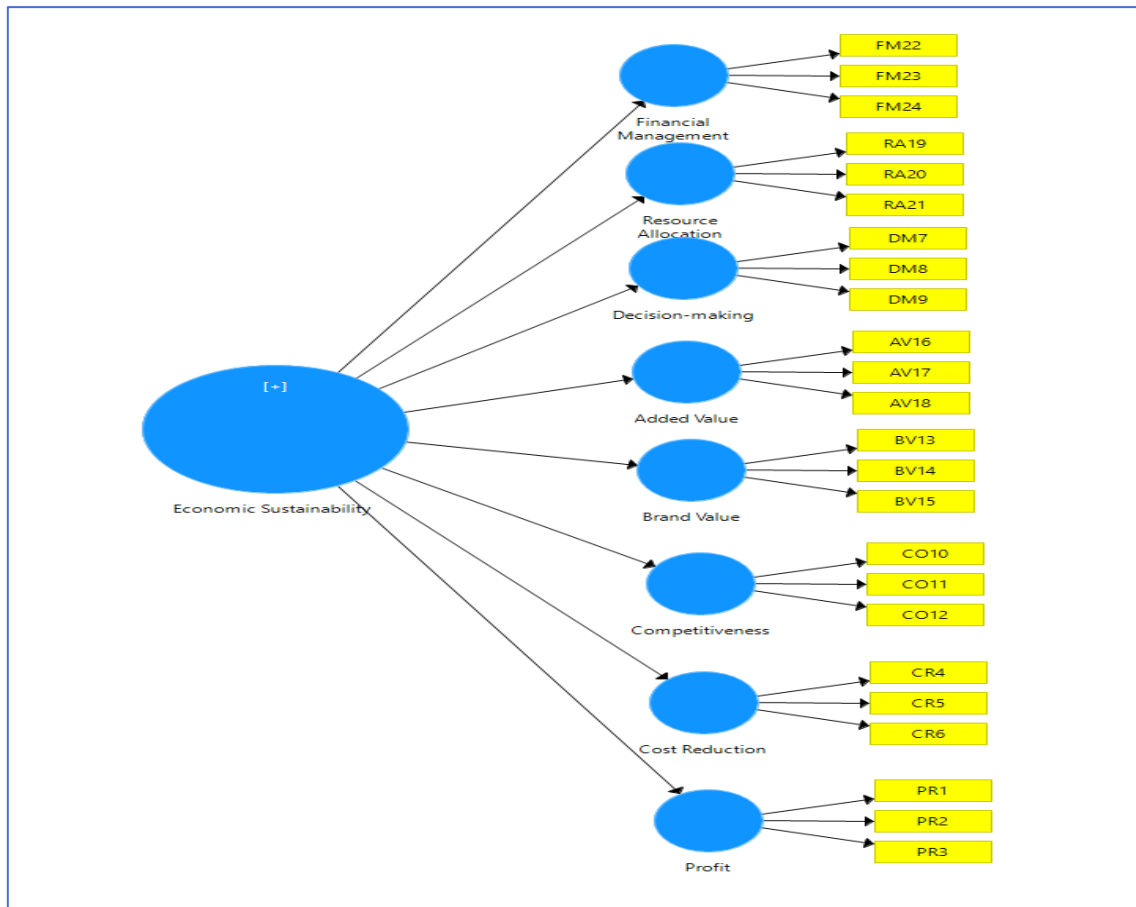
Internal consistency reliability was assessed using three criteria; Jöreskog's Composite Reliability (CR), Cronbach's Alpha, and Henseler's rho are the three (Hair et al., 2017, Hair & Alamer, 2022). Subconstructs with CR values above 0.7 are considered "acceptable to good" (Hari et al., 2017). The CR values of the eight first-order latent variables of the ES construct range from 0.938 to 0.955. As a result, all the latent variables satisfy the requirement, demonstrating the internal consistency of ES's first-order latent variables (Table seven).

Cronbach's Alpha was the second internal consistency reliability measure. It is based on the same assumptions as the CR (Hair et al., 2017). Cronbach Alpha scores for the ES construct's first-order latent variables range



from 0.901 to 0.929. The Cronbach Alpha coefficient values for all latent variables exceed the threshold ( $> 0.7$ ). As a result,

internal consistency reliability is increased (Table seven).



**Figure 2: Measurement Model of Economic Sustainability**

*Note:* Developed by the Authors (2022)

We also use Henseler's rho as an internal consistency reliability measure. The criterion and interpretation are the same as for Cronbach Alpha, where values greater than 0.7 are considered credible (Dijkstra & Henseler, 2015). The rho values of the ES construct's first-order latent variables range from 0.902 to 0.946. As a result, the instrument meets the internal consistency reliability criteria. Similarly, the items and latent constructions of ES were found to be internally trustworthy (Table seven).

To be meaningful, the indices of a dependable instrument should have had reasonably high stability over time. To evaluate the above assumption, test-retest reliabilities were determined using data obtained throughout two rounds of the study. Within the six-month time interval, the test-retest correlations of all eight subconstructs ( $r_1, r_2$ ) were satisfactory and greater than 0.60. This finding suggests that subconstructs were assessed with minimal random error (Table eight)

Table 7: Properties of First-Order Reflective Measurement Model

	Construct Dimension/ Indicator	Loadings	t-Statistics	CR	AVE	Cronbach's $\alpha$	rho_A
Economic Sustainability (ES)	<b>Profit</b>						
	PR1	0.933	106.986				
	PR2	0.939	78.828	0.951	0.866	0.923	0.923
	PR3	0.921	77.383				
	<b>Cost Reduction</b>						
	CR4	0.936	122.506				
	CR5	0.927	72.171	0.945	0.851	0.912	0.913
	CR6	0.904	59.763				
	<b>Decision-making</b>						
	DM7	0.903	74.034				
	DM8	0.929	110.233	0.938	0.835	0.901	0.902
	DM9	0.909	92.569				
	<b>Competitiveness</b>						
	CO10	0.953	155.661				
	CO11	0.924	103.605	0.955	0.876	0.929	0.941
	CO12	0.930	177.221				
	<b>Brand Value</b>						
	BV13	0.903	63.993				
	BV14	0.960	226.03	0.955	0.875	0.929	0.946
	BV15	0.943	210.353				
	<b>Added Value</b>						
	AV16	0.922	99.651				
	AV17	0.934	85.524	0.949	0.861	0.920	0.920
	AV18	0.928	89.608				
<b>Resource Allocation</b>							
RA19	0.931	108.839					
RA20	0.891	50.851	0.940	0.840	0.905	0.908	
RA21	0.928	117.735					
<b>Financial Management</b>							
FM22	0.921	91.508					
FM23	0.936	112.741	0.947	0.857	0.916	0.917	
FM24	0.920	107.291					

Note: Developed by the Authors (2022)

*Validity - First-order constructs:* The validity of a research instrument is an assessment of how well the instrument measures what it is supposed to measure (Robson, 2011; Blumberg et al., 2005). It is the degree to

which the outcomes are accurate. As a result, a research instrument is required to accurately measure the concepts under inquiry (Pallant, 2011).

**Table 8: Test-Retest Correlation between Two Rounds**

	r1*	r2*
Profit	0.603	0.619
Cost Reduction	0.626	0.633
Decision-making	0.743	0.738
Competitiveness	0.694	0.701
Brand Value	0.611	0.609
Added Value	0.748	0.750
Resource Allocation	0.723	0.744
Financial Management	0.674	0.682

*Note:* Developed by the Authors (2022). \* Correlations are significant (P < 0.05)

The validity of the reflective measurement instruments is assessed through convergent and discriminant validity (Janadari et al., 2016; Hair et al., 2017). The latent constructs' convergent validity is usually measured against the Average Variance Extracted (AVE) and factor loadings (Hair et al., 2017). The AVE for all indicators on each construct was calculated with a threshold of 0.50. An AVE score of 0.50 or higher suggests that the construct explains 50% or more of the variance of the construct's indicators (Hair et al., 2017). The AVE values for ES's first-order latent variables are more than 0.50. In addition, the factor loadings of all indicators are sufficiently measuring the respective subconstruct (> 0.708), as suggested by Hair et al. (2017). As a result, the ES's second-order instruments are recognized as convergently valid (Table seven).

The next step in validating an instrument, as advised by Hari et al. (2022), is to analyze its

discriminant validity. The Fornell and Larcker (1981) criterion and the Heterotrait-Monotrait ratio (HTMT) of correlations are used in this investigation (Henseler et al., 2015). The Fornell and Larcker criterion requires that the AVE of a latent variable be greater than the squared correlations between the latent variable and all other variables (Chin, 2010; Fornell & Larcker, 1981). The matrix of construct AVE and squared inter-construct correlations of various latent variables is shown in Table nine.

All dimensions of all first-order latent variables fulfill the Fornell & Larcker criterion, implying that both instruments have discriminant validity (Table nine). Henseler et al. (2015) advocate the HTMT ratio to assure discriminant validity. High HTMT scores (> 0.90) indicate that discriminant validity is a problem (Hair et al., 2017). The HTMT ratios of the ES's first-order constructs are shown in Table 10.

**Table 9: Discriminant Validity - Fornell & Larcker Criterion**

Dimensions of ES	1	2	3	4	5	6	7	8
1 Added Value	<b>0.928</b>							
2 Brand Value	0.599	<b>0.936</b>						
3 Competitiveness	0.582	0.911	<b>0.936</b>					
4 Cost Reduction	0.769	0.628	0.654	<b>0.922</b>				
5 Decision Making	0.842	0.601	0.597	0.804	<b>0.914</b>			
6 Financial Management	0.771	0.584	0.558	0.798	0.815	<b>0.926</b>		
7 Profit	0.747	0.561	0.566	0.882	0.772	0.761	<b>0.931</b>	
8 Resource Allocation	0.793	0.625	0.596	0.827	0.877	0.86	0.815	<b>0.917</b>

*Note:* Developed by the Authors (2022)

**Table 10: Discriminant Validity – HTMT Ratio**

Dimensions of ES	1	2	3	4	5	6	7	8
1 Added Value	-							
2 Brand Value	0.639	-						
3 Competitiveness	0.621	0.784	-					
4 Cost Reduction	0.839	0.672	0.698	-				
5 Decision Making	0.824	0.646	0.642	0.885	-			
6 Financial Management	0.838	0.621	0.596	0.872	0.796	-		
7 Profit	0.810	0.597	0.602	0.762	0.845	0.827	-	
8 Resource Allocation	0.868	0.671	0.639	0.808	0.771	0.743	0.789	-

*Note:* Developed by the Authors (2022)

None of the dimensions' HTMT ratios is more significant than 0.9. As a result, the discriminant validity of the instruments can be guaranteed.

The items of the instruments were well-fitted in measuring the respective latent constructs, according to reflective measures of the first-order measurement models. As a result, the evaluation of first-order latent constructs is verified to be reliable and valid.

We next present the reliability and validity measures of the second-order construct.

*Reliability- Second-order constructs*

The indicator reliability of second-order reflective measurement instruments begins with monitoring factor loadings, identical to the technique used to analyze the reliability and validity of first-order measurement models. All subconstructs are retained as the factor loading of all of them is greater than 0.708 as recommended by Hair et al. (2017).

The three criteria used in evaluating the internal consistency reliability of the first-order measurement model were adopted to evaluate the subconstruct’s reliability of the

second-order measurement model. The reliability statistics of the three criteria are shown in Table 11.

**Table 11: Properties of Second-Order Reflective Measurement Models**

	Construct Dimension/ Indicator	Loadings	t-Statistics	CR	AVE	Cronbach's $\alpha$	rho_A
Economic Sustainability (ES)	Profit	0.882	56.326	0.962	0.759	0.954	0.957
	Cost Reduction	0.918	94.681				
	Decision-making	0.912	94.051				
	Competitiveness	0.771	29.246				
	Brand Value	0.778	31.859				
	Added Value	0.881	55.624				
	Resource Allocation	0.924	98.363				
	Financial Management	0.889	58.403				

*Note:* Developed by the Authors (2022)

The statistics of all measures satisfy the boundary values suggested by the previous scholars that were presented during the first-order measurement model assessment. Thus, the internal consistency reliability of the subconstructs is rectified.

*Validity - Second-order constructs:* As suggested by Hari et al. (2017), discriminant validity is assessed as the final step of assessing the reflective measurement models. The same criteria that assessed the first-order construct’s discriminant validity apply here as well [(i.e., Fornell and Larcker criterion (1981) and the HTMT ratio by Henseler et al. (2015)]. However, assessment of both criteria required to have values of some other related constructs to compare with (e.g., instrument

of social or ecological sustainability). Having realised the necessity to have another instrument during the research design, we collected data for social sustainability from the same respondents using the instrument developed by the same authors, Matinaro et al. (2019). The squared correlations of this instrument were adapted in assessing the Fornell & Larcker criterion (Chin, 2010; Fornell & Larcker, 1981) and the results confirm the ES instrument adequately discriminates from the social sustainability construct. Table 12 demonstrates the matrix of the ES construct’s AVE and squared inter-construct correlation of the social sustainability construct.

The ES construct satisfies the HTMT ratio as well so that no construct's HTMT ratio exceeds 0.9 (Table 13). Hence, the discriminant validity of the ES instrument can be ensured.

Both second-order and first-order model assessments ensured that the items and their respective latent variables sufficiently address

the measurement model's reliability and validity requirements. Hence, it is confirmed that the ES instrument developed by Martinaro et al. (2019) is confirmed to be possessing sound measurement properties for it to be regarded as a reliable and valid instrument.

**Table 12: Discriminant Validity of Second-Order Reflective Measurement Models - Fornell & Larcker Criterion**

Constructs		1	2
1	Economic Sustainability	<b>0.871</b>	
2	Social Sustainability	0.834	<b>0.878</b>

*Note:* Developed by the Authors (2022)

**Table 13: Discriminant Validity of Second-Order Reflective Measurement Models – HTMT Ratio**

Constructs		1	2
1	Economic Sustainability	-	
2	Social Sustainability	0.808	-

*Note:* Developed by the Authors (2022)

## Discussion

The results showed good measurement properties of the eight-dimension ES measure proposed by Martinaro et al. (2019). All items demonstrated acceptable reliability and validity measures, as presented in the previous section. Profit as a dimension of financial stability has been previously identified by many studies (Zafiris, 1975; Fundera, 2022; Arbelo et al., 2018). They have identified that profit is the most realistic

measure of the financial strength of any organisation. Hence, including profit as an ES's subconstruct is further ensured. Cost reduction has been long identified as an operational practice to preserve the monetary resources of any organisation. It can secure proven results in the short term as well as in the long term. Long-term cost reduction benefits ultimately instil an economic measure of sustainability (Arbelo et al., 2018; Martinaro et al., 2019). The liquidity of a firm is rooted in its competitiveness. It has

implications for an organisation's competitive advantage that fuel it to keep moving while maintaining favourable financial indices. The present study's findings prove the suitability of competitiveness to reflect ES. The brand is also found as a valid and reliable subconstruct of ES. It is associated with competitiveness as well. A brand is a way of expressing the value of an organisation. The financial stability of any organisation is usually derived from its actual value (Kotter, 2012). Sustainable businesses must keep adding value to their existing value portfolio to ensure their future presence in the market (United Nations, 2017). Next, ES's subconstruct assesses whether a firm is adding value to help it become economically sustainable. Decision-making is a part of a sustained business model. It will decide on suitable investments at the right time to ensure financial viability in the near and far future. Many previous authors developed consistent arguments (Iversky et al., 1988; Sahin, 2017; Kotter, 2012). Another linked subconstruct is resource allocation. Resource allocation results in ES by discovering the optimum resource allocation to ensure maximum return. It ensures an uninterrupted supply of resources for generating future cash flows that will, in turn, establish sustainability. On top of all that, managing the organisation's financial assets is vital to ensure long-term financial viability (Mazzarol, 2014). The eighth subconstruct, financial management, is thus regarded as

reflecting the ES. Based on the previous knowledge of each subconstruct, we confirmed their appropriateness as the dimensions of ES. Few authors specifically (Martinario et al., 2019) and many authors in general has reported consistent findings. The generalisability of these dimensions across diverse industrial setups is deemed appropriate, provided that the sample represents all the industrial sectors of SMEs falling into three main categories: industrial, service, and trade. Furthermore, to improve generalisability, we included SMEs with a broader range of owner profiles (Table three) and business profiles (Table four). Moreover, the selection of SMEs with more than five years of experience is presumed to distinguish sustainable performance from general business performance. Few authors specifically (Martinario et al., 2019) and many authors in general (Arbelo et al., 2018; Zafiris, 1975; Fundera, 2022; Arbelo et al., 2018; Sahin, 2017) have reported consistent findings.

## **Conclusion**

Even though sustainability is a well-developed construct with more significant theoretical and practical applications in the present organisational context, the ES construct remains less formalised in terms of its definitions and dimensions. Likewise, the review of ES literature shows critical gaps in its theoretical evolution. The present study tried to validate an existing measurement for

ES in the context of Sri Lankan SMEs. The study generated empirical evidence for eight dimensions of ES (profit, cost reduction, decision-making, competitiveness, brand value, added value, resource allocation, and financial management) as defined by Matinaro et al. (2019). The validity and reliability statistics proved their potential for accounting for the SMEs' ES. Thus, we conclude that ESQ is a sound psychometric measurement of ES with a particular focus on the SME sector. The study's implications rest on the applications of ESQ in assessing ES in the domain of sustainable development. Specifically, SMEs can effectively adopt the scale in assessing the ES of them. Further studies may extend these dimensions' theoretical and empirical refining, tailoring them to macro and large-scale enterprises.

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