Factors Influencing Sustainability of Batik SMEs Entrepreneurs

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Abstract. Amid the COVID-19 pandemic, sustainable entrepreneurship (SE) has become crucial for the survival of small and medium enterprises (SMEs). The pandemic has significantly impacted SMEs by decreasing product demand and productivity. This study aims to identify factors influencing sustainable entrepreneurship among Batik SME entrepreneurs by examining four latent variables: social, cultural, environmental, and economic. The SE model includes three manifest variables: business size, managerial skills, and the industrial sector, along with the business model. The model was validated using data from Batik SME entrepreneurs on Madura Island, Indonesia. The proposed SE model was tested using the Partial Least Square (PLS) method. The findings indicate that environmental and economic variables significantly influence SE, whereas social and cultural variables do not have a substantial impact. The practical implications of this research include providing Batik SME managers with insights into the key variables that can help sustain their businesses. The government can utilize the SE model to develop strategies for SME recovery. Additionally, the SE model serves as a reference for academics studying SE, particularly for SMEs in the Batik industry and similar sectors.

1 Introduction

The COVID-19 pandemic has significantly impacted both human health and the sustainability of small and medium enterprises (SMEs). SMEs have faced a severe decline in income due to the COVID-19 pandemic [1]. Due to weak assets and management processes, many SMEs have temporarily closed or reduced their workforce [2]. The implementation of Large-Scale Physical Distancing and Social Restrictions has led to the cessation of operations for many companies. This situation has led to the accumulation of raw materials, which are at risk of damage if not promptly used. SMEs' productivity and sustainability must be stimulated during and after the COVID-19 pandemic so that SMEs can quickly return to their everyday business processes. Thus, research identifying factors influencing sustainable entrepreneurship in SMEs is essential to inform them about internal and external challenges. The tourism industry's decline due to social restrictions has further exacerbated the challenges for craft SMEs, leading to decreased demand from souvenir sellers. These conditions negatively affect the sustainability of people whose primary income is from the sales of craft products. Those rationales have triggered the researchers to study the influence of latent variables that integrate technical and social manifest variables, including spiritual intelligence, in craft SMEs. This research contributes to providing information and recommendations to craft SME managers so they can sustain and develop their businesses. The government and academicians also get information about several significant latent variables in developing sustainable entrepreneurship strategies for SMEs impacted by COVID-19.

Batik, a traditional handicraft and cultural heritage in countries like Indonesia[3], Malaysia [4], and China [5] that is challenged by the tight competition with garment products that are designed and produced with modern technology. This challenge has become increasingly complex because during the COVID-19 pandemic, batik, which is not a primary product, experienced a decline in sales turnover. Nearly 80% of Batik SMEs ceased production during the COVID-19 outbreak due to the significant drop in demand. Madura is one of Indonesia's islands famous for its SMEs that develop their business in batik fabrics with unique designs of Indonesian cultural heritage. Madura consists of four regencies with a total population of nearly four million people. About 60% of the Madurese population work as batik artisans. The impact of the COVID-19 outbreak worsens people's lives whose basic income is from production and batik business. For this reason, the respondents of this research are owners of batik SMEs in Madura Island, Indonesia.

Sustainable entrepreneurship (SE) is the positive impact of a product, service, or value that can be used for an extended period by maintaining the sustainability of resources for future generations and developing distinctive solutions for an extended period [6]. The

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implementation of SE in SMEs has not received much attention from SME owners. Thus, more efforts are required to apply the concept of sustainability in economic, social, and environmental aspects [7]. Studies on SE in SMEs have been carried out in Malaysia [7], [8], Iran [9], Pakistan [10], and South Africa [11]. Studies on SE have discussed important latent variables, comprising social, environmental, and economic variables, contributing to SE performance in SMEs. The cultural variable is included as a factor in SE [12][6], [13],[14], [10], [9].

SE concepts link sustainability development and entrepreneurship. It is a process in which entrepreneurs exploit opportunities to innovate to gain economic benefits and social equity, maintain environmental quality, and preserve culture in a balanced way [7]. Some researchers have proposed several SE models, including the SE orientation model developed from entrepreneurial and sustainability orientations [15]. Majid and Koe [12] have suggested the SE model, which covers four latent variables, including cultural, economic, social, and ecological variables. In 2017, a model was developed for entrepreneurial behavior with four latent variables: sustainability value, attitude, social norm, and governmental legislation [13]. Previously, Koe et al. [16] advocated the SE model with four latent variables in the aspects of behavior: sustainability attitude, social norm, perceived desirability, and perceived feasibility. Vuorio also recommended an SE model focusing on behavior [17]. Unlike previous research, the study by Wahga [10] has developed the SE model with religion as one of the variables.

This study investigates factors influencing the sustainable entrepreneurship of SMEs, adopting latent variables from the triple bottom line [12], [15], [18]–[23] including culture, religious value, spiritual intelligence, and local wisdom. The multivariate Partial Least Square (PLS) was used to analyze the influence of manifest and latent variables. This paper provides new information for SME entrepreneurs to obtain their sustainability business. The rest of this paper is organized into four parts as follows. Part one contains an introduction, part two includes research methods, and part three contains results, discussion, and conclusions.

2 Theoretical framework and hypothesis development

Limited studies on SE have focused on different latent variables conducted in the context of cultural heritage. Alani (Alani Lawal, Worlu and Ayoade (2016)) and [24] used latent variables that include networking with stakeholders, environment, ethical entrepreneurship, and corporate social responsibility, as well as manifest variables, such as firm size and sector. The manifest variable is included in the present study by considering that businesses are categorized into three, including micro, small, and medium enterprises, based on total sales turnover and total net worth of the company [25]. The second manifest variable is managerial skills and knowledge in carrying out sustainable entrepreneurship [8], [17], [26], [27], [28]. The third manifest variable is the SMEs sectors and business models, which cover traditional, technological, and hybrid models [8], [29], [30]. The cultural heritage, a unique climate, and abundant natural resources are all the strengths that can sustain the craft SME business. For these reasons, the SE model proposed in this study combines the social latent variable that centers on the characteristics of entrepreneurs. This cultural latent variable is mainly implemented with the local wisdom aspect, the environmental latent variable that pays attention to natural resources and tropical climate, and the economic latent variable that concerns collaboration with stakeholders to maintain the SME businesses' sustainability jointly. This study proposes the SE model with social, cultural, environmental, and economic variables. The following are the details about each variable (See Figure 1).

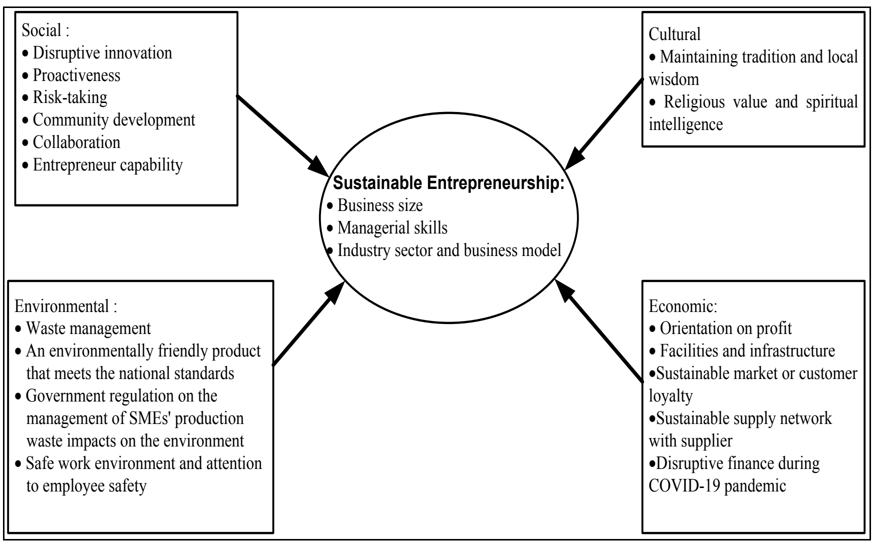

Fig. 1. The proposed sustainable entrepreneurship model for Batik SMEs.

2.1 Social latent variable

SMEs that were innovative and struggling to explore opportunities to get benefits during the pandemic [31]. Thus, Disruptive innovation or innovation change in the product development process [6], [32], [33], [34], [15] serves as the first manifest variable of the latent social variable. An entrepreneur with a proactiveness or a strong interest in implementing sustainable entrepreneurship in their business [15], [32], [16], [8], [10], [17], [35], [27], [28]). Risk-taking or the courage to face risks [15], [6], [32], [36] is a characteristic that must be possessed by entrepreneurs, A broader variable, namely an active role in community development, one of which is realized by providing jobs for people who live around the SMEs locations [37], [9], [38], [33], [12]. External support is essential for SMEs because it gives them the knowledge to develop and implement innovations. Collaboration between SME members is highly effective during the pandemic, which can be implemented in solving problems and accessing capital [39], [8], [40]. To overcome the current COVID-19 crisis and sustain the business in the long run, entrepreneurial action and the capability of entrepreneurs in performing sustainable entrepreneurship is required [16], [8], [17], [28], [36], businesses need to innovate and apply creativity to turn challenges into opportunities [41]. Therefore, the first hypothesis proposed in this study is:
H1: Social latent variable influences the sustainable entrepreneurship of SMEs.

2.2 Cultural latent variable

Entrepreneurs' effort to maintain local traditions and wisdom in running their business processes [12][6], [13],[14], [10], [9], religious value [10] and spiritual intelligence that motivate entrepreneurs in Indonesia to maintain their businesses [27]. Thus, the second hypothesis proposed in this study is:
H2: Cultural latent variable affects the sustainable entrepreneurship of SMEs

2.3 Environmental latent variable

Natural resources are also utilized by most of the craft SMEs, particularly by making crafts from natural raw materials. However, craft production waste has not been appropriately managed or paid attention to its environmental impact. Hence, waste management and responsibility in using natural resources [21], [33]. SMEs are expected to produce environmentally friendly products following international standards and adhere to government regulations on waste management [21], [10], [9]. [32], [13], [10], [38], Moreover, a safe work environment and attention to employee safety are required [9], [42]. For those rationales, the third hypothesis proposed in this study is:
H3: Environmental latent variable contributes to the sustainable entrepreneurship of SMEs.

2.4 Economic latent variable

The key motivation for establishing an SME is to gain profit or value [12][21], [13], [10]. Facilities and infrastructures are necessary to support the sustainability of the business operation process [8]. Application of new digital technologies within business models during and after the pandemic disruption is essential for business over the long term. The SMEs will survive and emerge over this disruption by adopting new technologies [43]. Establishing a sustainable market or consumer loyalty [20], [38], [42] and developing a sustainable supply network with suppliers [33], [42], [44] are the main forces that help SMEs to survive during the COVID-19 pandemic. Another problem during the COVID-19 pandemic is disruptive finance, including a decrease in sales turnover or difficulty in accessing capital [45], [46], [40], [47], [48], [49], [44]. SMEs must adopt mobile payment services [50] and accept flexible payment methods from consumers to simplify the payment process and avoid missing sales opportunities. The fourth hypothesis suggested in this study is:
H4: Economic latent variable influences the sustainable entrepreneurship of SMEs.

3 Method, data, and analysis

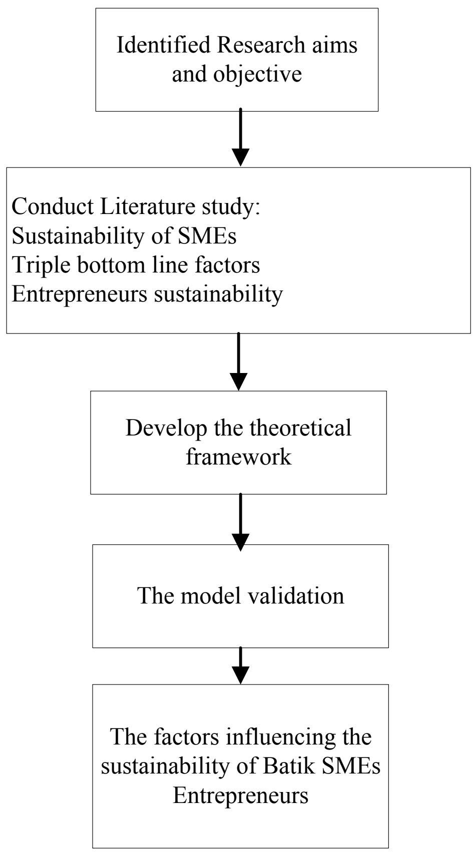

Fig. 2 Research flow diagram.

Figure 2 describes the research flow diagram. The research starts with identifying aims and objectives, and then the researchers study the literature on the sustainability of SMEs, the triple bottom line, and entrepreneurs' sustainability. The framework was developed to investigate the factors influencing the sustainability of the entrepreneurs. The model is then validated with responses from the SME owner and managers.

3.1 Preparation of questionnaires

This study utilized two types of questionnaires. The first questionnaire aimed to test the validity of latent and manifest variables, with responses from experts in Batik SMEs across four regencies in Madura. The first questionnaire comprised 20 Yes/No questions, where 'Yes' indicated 'suitable' and 'No' indicated 'unsuitable'. Respondents were also allowed to provide additional information on other manifest variables used in this study. The second questionnaire assessed the validity and reliability of the SE model, with Batik SME managers as respondents. A Likert scale ranging from 1 to 5 was used, where 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree. The second questionnaire incorporated 31 questions, 11 of which were about the profiles of SMEs and the remaining 20 questions about the influences of manifest variables on SMEs. A pilot study involving 15 SME managers was conducted to test the validity of the questionnaires before distribution to all respondents.

3.2 Samples and data collecting

This research was conducted among Batik SMEs in four regencies in Madura. Although there are over a thousand Batik SMEs in Madura, only 88 remained operational during the COVID-19 pandemic. However, during the COVID-19 pandemic, only 88 SMEs still survive their business process. For this reason, the number of respondents in this research was taken from the total population of batik SMEs that still survive. The number of respondents was estimated using the stratified random sampling method with an alpha level of 0.61[51]. The alpha level of 0.61 was chosen due to the temporary closure of most Batik SMEs during the COVID-19 pandemic, which made data collection challenging. The sample size was calculated using the Slovin formula, resulting in a requirement of 69 respondents to validate the SE model. The respondents stated that they were willing to participate and respond to all questions in this research before filling out the questionnaire.

3.3 Data analysis

The data obtained from questionnaires were analyzed with multivariate Partial Least Square (PLS) applied with the software smartPLS 3.0 [52]. The analysis focused on four latent variables, covering social, cultural, environmental, and economic. The social variable contained several manifest variables of innovation changes in the product development process, a strong interest in implementing SE in their business, the courage to face risks, an active role in community development, collaboration among members of SMEs, and an entrepreneur's capability to implement SE. The cultural variable covered two manifest variables, including entrepreneurs' efforts in maintaining local traditions and wisdom in carrying out their business processes, as well as religious values and spiritual intelligence. The environmental variable comprised four manifest variables: waste management and responsibility in using natural resources, creation of environmentally friendly products and compliance with national standards, adherence to government regulations on waste management, a safe work environment, and attention to employee safety. The economic variable included five manifest variables: profit or value, facilities and infrastructures, sustainable market or consumer loyalty, and a sustainable supply network with suppliers. The validity and reliability of disruptive finance during the COVID-19 pandemic were examined, and the effects on latent variables of SE, centering on the business size, such as managerial ability and industrial sector and business model, were thoroughly investigated.

4 Result and discussion

4.1 Data analysis

The majority of Batik SME managers are male (58%), aged between 20 to 60 years (94%), and have an education level of senior high school or below (61%). Most batik SMEs registered in the Office of Cooperatives and SMEs in Madura already have business licenses (88%) and have been established for over five years (80%). Although batik is an ancestral cultural heritage, most batik SMEs were established independently (59%), and some were inherited from their parents (41%).

Table 1. Distribution profiles of respondents.

Description	Variable	Total	Percentage
Gender	Male	40*	58%
	Female	29	42%
Age	20 – 50 Year	38*	55%
	41 – 60 Year	27	39%
	61 – 80 Year	4	6%
Education	Elementary	6	9%
	Secondary school	42*	61%
	High degree	21	30%
Business License	Have a permit	61*	88%
	Don't have a permit yet	8	12%
Long established business	01 – 10 Year	35*	51%
	11 – 20 Year	23	33%
	21 – 50 Year	11	14%
The origin of the business	Independent	41	59%
	Hereditary	28	41%

4.2 Data analysis

The outer model evaluation assessed the validity and reliability of the SE model using convergent and discriminant validity methods. Convergent and discriminant validity methods were used to determine the extent of manifest variables' influence on the SE model's latent variables. The loading factor value for each manifest variable must be > 0.7 [53]. If the loading factor does not meet the standard, the manifest variable is removed and then recalculated to obtain the loading factor that meets the standard. The result of the convergent validity test, in which the loading factor value of the manifest variable is <0.7, is written in bold (See Figure 3). If the value of the loading factor is <0.7 or does not reach the limit, the manifest variable is omitted.

Social latent variables (X1) contain manifest variables of innovation changes (X11) and proactiveness (X12) that do not affect the SE model. One of the manifest variables in the cultural latent variable (X2), which is maintaining traditions and local wisdom (X21), does not affect the SE model. A safe work environment and attention to employee safety (X31) are the manifest variables in the environmental latent variable (X3) that do not influence the SE model. Moreover, profit (X41) and disruptive finance during the COVID-19 pandemic (X45) contained in economic latent variables (X4) do not have any effect on the SE model. The manifest variables without any contribution to the SE model were removed, and the SE model was then recalculated to ensure whether the loading factor value was <0.7. Figure 3 demonstrates the model validated in the second calculation.

The results of the second run using SmartPLS 3.0 software show that all loading factor values were> 0.7, which exemplifies that the manifest variables in the research model have met the requirements and have a substantial effect on latent variables, so the manifest variables do not have to be reduced as seen in Figure 4.

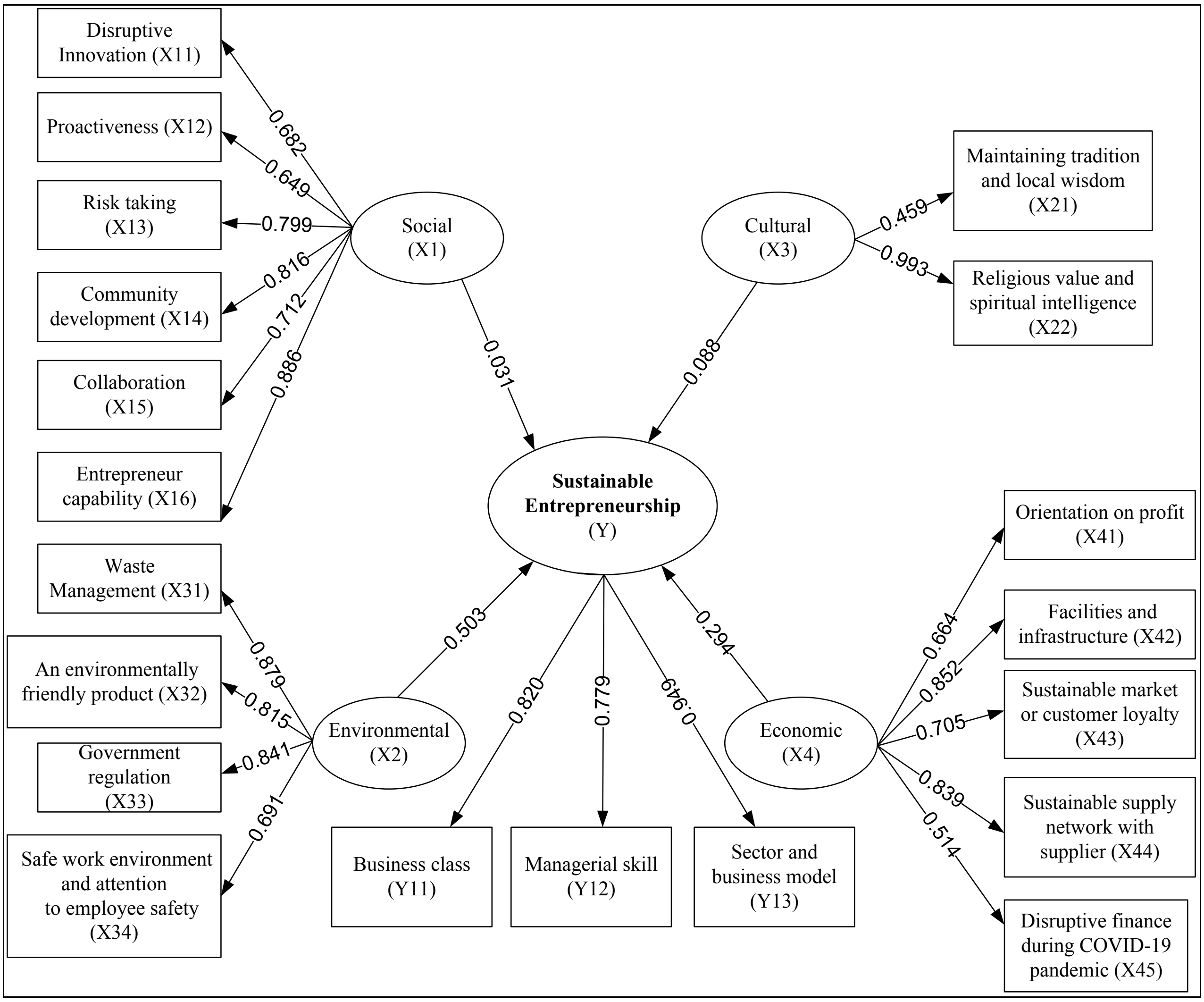

Fig. 3. The results of the validity test of the proposed sustainable entrepreneurship model for SMEs.

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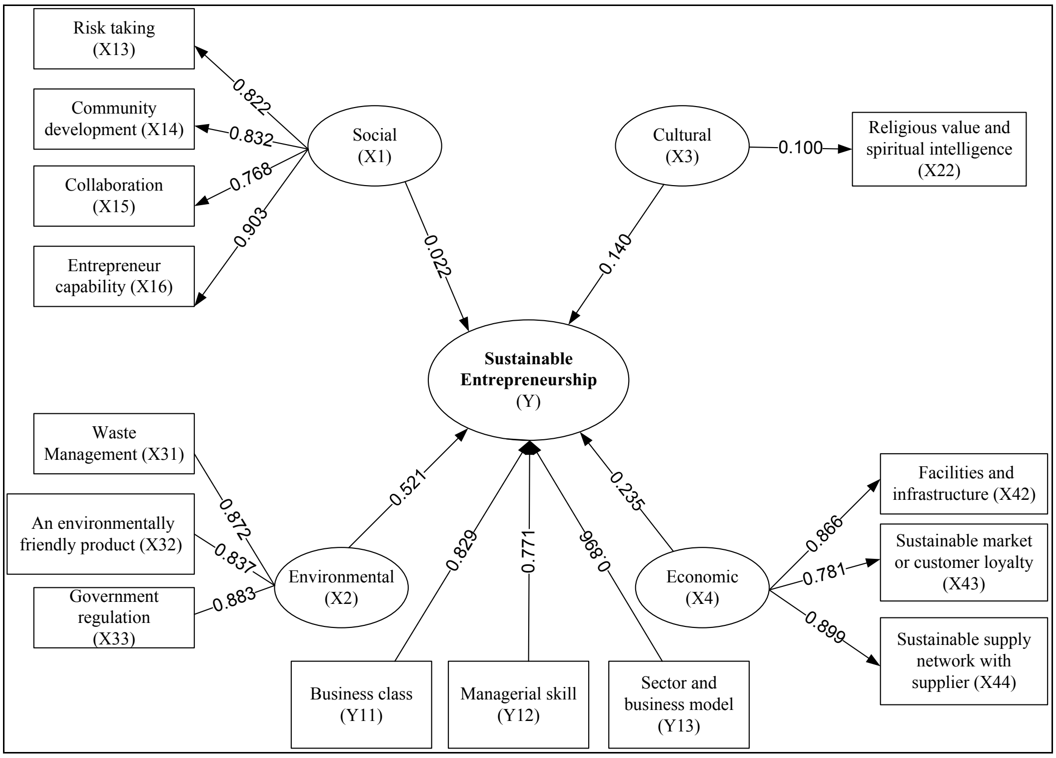

Fig. 4. The framework for SE in SMEs.

The next step was to test whether the Average Variance Extracted (AVE) value of each latent variable met the requirements with a value of > 0.5. This value illustrates adequate convergent validity, which signifies that one latent variable can explain more than half of the variances of its manifest variables on average. The result practically denotes that the variables are satisfactory or approved by most SME managers. The AVE values of all latent variables have met the requirements, or all latent variables have a valid manifest variable, as described in Table 2.

Table 2. The results of the validity and reliability tests of the variables.

Variable	Cronbach's Alpha	Rho A	Composite	AVE	Decision
Social (X1)	0.854	0.889	0.900	0.693	Valid Reliable
Cultural (X2)	1.000	1.000	1.000	1.000	Valid Reliable
Environmental (X3)	0.831	0.840	0.898	0.747	Valid Reliable
Economic (X4)	0.787	0.808	0.875	0.700	Valid Reliable
Sustainable Entrepreneurship (Y)	0.780	0.794	0.872	0.695	Valid Reliable

The reliability of latent and manifest variables was measured based on two criteria, namely composite reliability and Cronbach's alpha. All latent variables have fulfilled the requirements, with Cronbach's alpha value> 0.7, thus, the variables are considered reliable in Table 2. However, the resulting Cronbach's alpha value was slightly under the estimation, so it was suggested that a composite reliability value was used. The composite reliability values on all latent variables have met the requirements, with the combined reliability value> 0.7, therefore, the latent variable is reliable. It is also evident that the composite reliability values of all variables were much higher than Cronbach's alpha values.

The output of the Fornell Larcker criterion, which is the value of intercorrelation between latent variables, indicates that all latent variables are valid, as described in Table 3. For example, the cultural latent variable correlates with the cultural latent variable (1,000). This value was more significant than the correlation between the cultural latent variable and another latent variable, so it can be concluded that the generated SE model is valid.

Table 3. The results of the intercorrelation test between variables.

Latent Variables	Cultural (X2)	Economic (X4)	Environment (X3)	Social (X1)	Sustainable Entrepreneurship (Y)
Social (X1)	**1.000**				
Cultural (X2)	0.587	**0.836**			
Environmental (X3)	0.578	0.750	**0.864**		
Economic (X4)	0.502	0.680	0.725	**0.833**	
Sustainable Entrepreneurship (Y)	0.590	0.723	0.794	0.630	**0.834**

Cross loading value is the correlation value between a latent variable and its manifest variable, which can be seen from the correlation value higher than the correlation value between a latent variable and the manifest variable of the other latent variable, as seen in Table 4. For example, the correlation value between risk-taking (X13) and social latent variable (X1) reached 0.822. This value was more significant than the correlation value between risk-taking (X13) and culture (X2), environment (X3), and economy (X4), which reached 0.461, 0.676, and 0.647, respectively. The correlation values of all manifest variables are in accordance with the criterion, so the latent variables and manifest variables are declared valid.

Table 4. The cross leading value of the latent variable and manifest variable.

Manifest Variables	Cultural (X2)	Economic (X4)	Environment (X3)	Social (X1)	SE (Y)
Risk-taking (X13)	**0.822**	0.461	0.676	0.674	0.577
Community development (X14)	**0.832**	0.396	0.552	0.501	0.415
Collaboration (X15)	**0.768**	0.346	0.443	0.485	0.389
Entrepreneur capability (X16)	**0.903**	0.448	0.686	0.576	0.644
Religious value and spiritual intelligence (X22)	0.502	**1.000**	0.578	0.587	0.590
Waste management (X31)	0.716	0.602	**0.872**	0.738	0.727

4.3 Evaluation of structural (inner) model

The evaluation of the structural model or inner model in this study was to predict the relationship between latent variables. The result of data analysis on the R^2 value of the SE model was 0.680, meaning that the model is included in the moderate category. In other words, the effect of social (X1), economic (X2), environmental (X3), and cultural (X4) variables on SE (Y) was 68% as seen in Figure 5. While other latent variables outside the research model influenced the remaining 32%. The predictive relevance values of the SE model of 0.441 and the Fit model of 72% have proven that the SE model developed in this study has a good and reliable observation value. Hence, it is feasible to be used as a model for SE development in SMEs.

The results of validity and reliability tests of the SE model for batik SMEs affected by the COVID-19 pandemic portray the relationship between the latent SE variables and the four exogenous latent variables. Based on the outcomes of examinations using SmartPLS, the latent economic variables show an effect on SE (p-value = 0.044). This proves that the economy is a determining latent variable to run a sustainable business. The batik SME managers believe that SE for SMEs can be realized by establishing a sustainable market or maintaining consumer loyalty so that they keep reordering products despite the threat of the COVID-19 pandemic, ensuring the availability of facilities and infrastructure, providing access to information or internet that can support e-commerce, and maintaining network with stakeholders and suppliers. These results support Liguori's points of view [42].

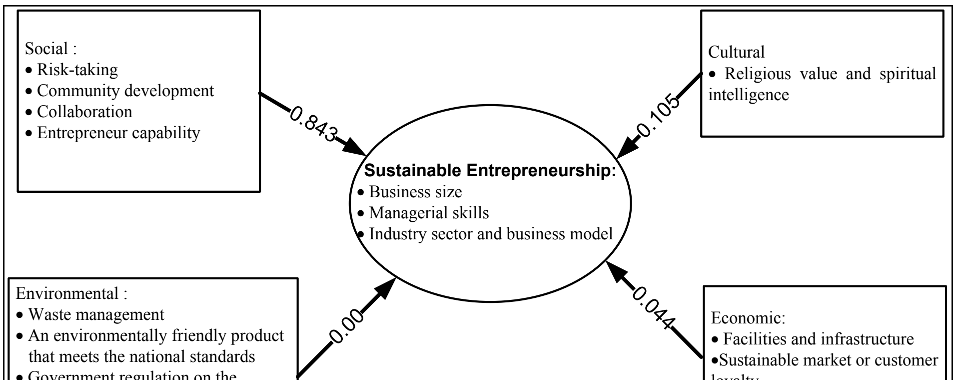

Fig. 5. The proposed sustainable entrepreneurship model for SMEs with reduced manifest variables.

The environmental latent variable also significantly affects SE, with a p-value = 0.00. This suggests that SME managers are optimistic that SE can be achieved through sound waste management. SMEs are also encouraged to generate environmentally friendly products that meet national standards. The government's role is also vital by issuing regulations regarding waste management procedures to reduce the negative impact of waste on the surrounding community. This also stimulates SMEs to make a significant contribution to environmental sustainability. The results of this hypothesis support the previous research [32] and Acosta [37].

The social latent variable does not significantly impact SE (p-value = 0.843), suggesting that social factors may not be as critical in this context and warrant further investigation, thus, it does not belong to the determining variable in running a sustainable business.

Correspondingly, indicated by *p*-value = 0.105, the cultural variable does not demonstrate considerable influence on SE. Therefore, a more in-depth and specific further study of social and cultural factors is necessary to be carried out, for example, by paying attention to geographical, demographic, and educational aspects [54].

5 Conclusion

This research aims to investigate factors influencing the sustainability of entrepreneurship in SMEs so that they can survive during and after the COVID-19 pandemic. The four aspects of sustainable entrepreneurship, which include social, economic, environmental, and cultural variables, are translated into 20 manifest variables. It is evident from the results of the model validation and reliability tests using the PLS approach that environmental and economic latent variables, but not social and cultural variables, have a substantial impact on SE. The predictive relevance values of the SE model and the Fit model confirm that the SE model constructed in this study has a good and reliable observation value that makes it suitable as an SE construction model for SMEs.

This research can provide information and help batik SME managers identify variables that support their businesses to survive the COVID-19 pandemic and sustain their business processes. The SE model introduced to SMEs is expected to supplement the knowledge and improve awareness of SME managers on the importance of paying attention to the surrounding environment to provide long-term benefits for the sustainability of the life chain. The government can also use the SE model developed in this study to formulate the recovery strategies for SMEs' operational activities. This SE model can also serve as a key performance indicator (KPI) in the assessment process of SE for SMEs. Therefore, the government can map the SMEs' size based on the SE levels, which can later be used to determine the types of assistance, mentoring, and guidance for SMEs. For academics, the SE model is expected to provide a reference regarding SE, particularly for SMEs with batik and other relevant products.

The objects of SMEs in this study are limited to batik SMEs in Madura. However, the results of this modeling can be developed by applying the model to SMEs in a broader area, such as Indonesia, where the same product sector is present. This development can also be accomplished by using the model for SMEs in other industries, like food or agriculture, and adopting a number of manifest variables specific to the SMEs' operations. Identifying the impact of social and cultural elements in terms of geographic locations can also be used to do additional studies.

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