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ANALYZING THE DRIVERS OF SUSTAINABLE VALUE CREATION, PARTNERSHIP STRATEGIES, AND THEIR IMPACT ON BUSINESS COMPETITIVE ADVANTAGES OF SMALL & MEDIUM ENTERPRISES: A PLS-MODEL

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Sustainable manufacturing is a critical phenomenon in the process of creating sustainable value. This is a way to increase innovation and resource quality. On the other hand, the partnership strategy is an important factor in efforts to improve company performance. The involvement of the partnership strategy is one of the factors that strengthen the achievement of sustainable values. Furthermore, this affects the sustainability of a manufacturing company's competitiveness, including Small and Medium Enterprises (SMEs). In this study, we focus on creating sustainable value and the role of partnership strategies in improving the business performance of SMEs engaged in the metal manufacturing industry. The Partial Least Squares (PLS) approach to Structural Equation Modeling (SEM) is used to evaluate relationships and effects based on survey data from small and medium industries. The results show that the creation of sustainable value, including products, processes, production, equipment, organization, and human values, has a significant impact (β=0.522; ρ<0.001) on increasing the competitiveness of small and medium enterprises. The effect of sustainable value creation on sustainable competitiveness is fully moderated by the partnership strategy (β=0.179; ρ=0.03), especially in the technology & equipment, and human resources. Apart from being a moderating variable, the partnership strategy has also been shown to significantly act as a partial mediating variable (β=0.135; ρ<0.05) for sustainable value creation in enhancing competitiveness. The partnership strategy`s simultaneous involvement proves that the partnership strategy plays an important role in value creation to increase the competitiveness of sustainable manufacturing SMEs

Keywords: sustainable, value creation, partnership strategy, competitiveness, small and medium enterprises

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1. Introduction

In the last decade, the issue of sustainability has emerged and has been realized and developed in various fields, including the manufacturing field. The growing numbers of sustainable manufacturing practices are mostly based on several drivers, including global climate and ecological scarcity, environmental impacts, production efficiency and productivity improvement, social welfare improvement for employees and consumers. To achieve better profits [1], EPA (Environmental Protection Agency) defined sustainable manufacturing as a "creation of manufactured products through economically sound processes that minimize negative environmental impacts while conserving energy and natural resources." According to [2], economic, environmental, and social aspects are the three main reasons for sustainable manufacturing.

Companies often see sustainable manufacturing as a competitive advantage for their business [3–5]. The research [6] has stated that there is no actual definite meaning for competitive advantage in both practices and marketing literature. However, competitive advantage can be referred to as company's strategies and ability to operate efficiently and responsively in order to be able to compete in the global market and be a market leader [7]. Competitive advantages are important for companies, especially the ones engaged in a highly competitive market. Either large, medium, small, or even micro-scaled enterprises need competitive advantages to be able to compete and sustain in the market. However, many models and theories regarding formulation and achievement of competitive advantages are only applied to larger firms, they are not wholly appropriate for smaller firms. Smaller firms such as Small and Medium Enterprises (SMEs) differ from the large-scaled firms in terms of particular operating circumstances surrounding the enterprise [8] and the non-existence of scale economies, which is applied in the larger firms [9, 10]. For developing countries, such as Indonesia, the national economy not only depends on the large-scaled manufacturing sectors but also on the SME sectors. For that, we need a methodology that specifically formulates the competitive advantages of SMEs business based on the concept of sustainability [10].

For manufacturing companies, the ability to create value and provide products according to customer needs at low costs are the key factors in achieving competitive advantages. Many have said that value creation is important for companies in order to increase competitive advantages. Value creation is part of the integration of the overall competitiveness factors that exist in the company. Value creation activities are achieved through changes in the ratio of input to output in the manufacturing process. According to [11], the transformation of value creation depends largely on the interaction between stakeholders at various levels. Interactions between producers, suppliers, customers, and stakeholders affect the process of creating sustainable value. Sustainable value is a major factor in improving and achieving sustainable competitiveness for the manufacturing industry. The value of sustainable manufacturing is created and converted into the product value, production process, technology, organizational management, and human resources [12].

In addition to sustainable manufacturing, partnership strategy becomes another factor to increase company's performance [13, 14]. This plays a role in strengthening the effect of sustainable value achievement [15]. However, partnership strategy, which supports company's long-term performance, is not widely discussed in the process of sustainable value creation. Also, scientific reports on the involvement of sustainable value creation by a partnership strategy are limited, especially in SMEs. In fact, implementing sustainable manufacturing for the creation of sustainable value requires the involvement of all business partners and is expected faster through such partnerships. Therefore, in this study, we try to evaluate the partnership strategy and sustainable value creation that is carried out to achieve the company's competitive advantage and how each variable's role in influencing the achievement of competitiveness is discussed in depth in this study. Our study focuses on SMEs, where a case study was conducted on metal SMEs in Indonesia. The main problem faced by these small and medium metal industries is that they are still facing big challenges to increase their competitiveness. The rapidly changing business environment and intense business competition threaten SMEs if they do not adapt immediately. The existence of competition, globalization, technological advances, limited resources, and fluctuating consumer demand encourage SMEs to be more flexible, adaptive, responsive, and innovative to change. Creating manufacturing value and implementing collaborative strategies among industries are alternative solutions to achieve competitiveness. Therefore, this research is important to produce a model of the relationship between the competitiveness-forming variables used as a reference for SMEs in improving manufacturing performance. This research contributes to practical industries by providing SMEs' directions in the decision-making process to increase business performance and competitive advantages through sustainable value creation. This study's results are expected to be used as managerial directions in strategy formulation and enhancing the sustainable competitiveness of SMEs.

2. Literature review and problem statement

This study was developed based on a conceptual framework to become a structural model capable of assessing the relationship between research variables' increasing competitiveness. The research variable is focused on sustainable manufacturing that can produce sustainable value creation factors and partnership strategies, with a theoretical background prepared based on literature reviews. This study only focuses on the SMEs metal manufacturing industry. The weak performance of SMEs in increasing competitiveness is an important reason for this research to be conducted. In facing market competition, small and medium industries still need support and guidance for strategic design frameworks to increase competitiveness.

The research [16] states that the implementation of sustainable manufacturing, particularly in Small and Medium Enterprises (SMEs), still needs to be improved as an effort to improve the standard of living and social welfare. This is confirmed by [17], who stated SMEs have a vital and strategic role in the development and economic growth of a country, especially developing countries like Indonesia. SMEs are the national economic movement's backbone that encourages industrial development through job opportunities and its supports for larger industries.

Literature review shows that there are many studies in the area of sustainable manufacturing practices [1, 18, 19], its relation to the green life cycle [20–22], and its integration in supply chain networks [13, 23]. Overall research supports that sustainable manufacturing can improve the manufacturing industry's performance in creating sustainable product value. However, overall research is still limited to discussing improving manufacturing performance by the developed field. Sustainable manufacturing practices are limited to the scope of the triple bottom line aspects of improving manufacturing performance. Likewise with the green life cycle, which analyzes the impact of manufacturing only on environmental aspects. Meanwhile, the sustainability of the supply chain network is more of an economic aspect. There is still a need for simultaneous and comprehensive research regarding manufacturing to create sustainable value as a basis for improving manufacturing performance.

Another study [15] concluded that the sustainability of manufacturing value has a positive impact on industrial competitiveness. This is in line with the research [24], which emphasizes sustainable value creation based on the driving factors to improve manufacturing performance. The whole study underlines the importance of value creation for sustainable manufacturing in enhancing competitiveness.

According to [25], dynamic market changes require companies to immediately create value to achieve sustainability and corporate competitive advantage. Also, the limited resources owned by SMEs encourage them to carry out a partnership strategy. This is reinforced in [26], who concluded that resource-based sharing could be carried out through cooperation and collaboration so that the existing partnerships become a solution to create a sustainable innovation process. According to [13], a collaborative strategy can help SMEs and their business partners solve problems to create mutually beneficial competitive advantage values.

The role of the partnership strategy in the SVC still needs further investigation. Previous studies related to SVC and the Partnership Strategy were still limited, both of which were still discussed separately regarding the achievement of manufacturing competitiveness. Therefore, based on existing research gaps, this study investigates and examines the extent to which partnership strategies and sustainable value creation simultaneously both directly and indirectly affect the improvement of SMEs' competitiveness performance.

PLS-SEM is an alternative method for structural equation modeling (SEM) that simultaneously tests the relationship between latent constructs in a linear or non-linear relationship with many indicators [27]. The advantage of this method compared to other SEM methods is that PLS-SEM aims to test the predictive relationship between constructs that can be carried out without a strong theoretical basis, and ignores statistical (non-parametric) assumptions required in the prediction model [28].

The PLS-SEM method has been used by researchers in testing the hypothesis of the predictive relationship or model. The research [15] found that a firm's dynamic capabilities have a significant impact on achieving sustainable competitive advantage. In addition, the partnership strategy is able to partially and fully mediate the company's dynamic capabilities in achieving a sustainable competitive advantage. Other studies have shown that competitiveness, corporate culture and public awareness have a positive and significant impact on the implementation of sustainable manufacturing [1]. Likewise, the research [18] showed that all drivers of sustainable manufacturing practice (SMP) simultaneously have a significant effect on the company's competitive performance. The research [29] developed an alternative model of product design innovation, which shows that historical and cultural aspects, as well as design effectiveness, are the most important and significant influences on consumer perceptions of design. The research proved that the PLS-SEM method is a quite powerful method and helps researchers strengthen the analysis in the decision-making process.

3. The aim and objectives of the study

The aim of this study is to obtain a structural model that can investigate and examine the extent to which the link between the driving factors for sustainable value creation and the partnership strategy simultaneously influences the improvement of SME competitiveness performance.

To achieve this aim, the following objectives are accomplished:

– to investigate the relationship between variables in increasing competitiveness;

– to test every relationship that occurs in the structural model based on the PLS-SEM method;

– to develop an assessment of alternative solutions to increase competitiveness based on the relationship between the resulting variables.

4. Materials and methods

4. 1. Research variable

Research variables are objects that become the center of attention in research. The research variables underlie a conceptual framework developed to assess the relationship between variables in the structural model. The development of research instruments and variables is based on literature studies to summarize the research's overall attributes. To ensure that these variables are valid, the research instrument is standardized through a pretest involving experts in developing small and medium enterprises in Indonesia. This includes experts in the industry, government, and related educational institutions. The valid research instrument is then used to collect data in the form of a questionnaire.

The questionnaire data were obtained from a survey conducted by distributing research questionnaires to small and medium metal manufacturing industry players in East Java, Indonesia. The survey involves distributing questionnaires in the form of mixed questions both openly and privately. Types of closed questions in the assessment process using a Linkert scale ranging from 1 ("very not important"); up to 5 ("significant"). Meanwhile, open questions are used to identify the characteristics of the respondent.

4. 2. Research methodology

The research method follows three stages. The first stage is designing the research instrument through a cross-sectional survey and re-validating it with a literature review. Then at the next stage, the research instrument is distributed to a random sample, in this case, the owner of the manufacturing SMEs. In the end, the response given can be validated using statistical tests both for the adequacy of the number and further analysis process.

5. Research results of structural models

Based on the results of brainstorming with small and medium metal industry entrepreneurs and conducting a literature study process on the research variables, each variable's constituent indicators can be summarized as in Tables 1, 2.

All indicators of research variables are used as the basis for the preparation and development of research instruments to obtain observational data.

Table 1

Variables and Item Measurements of Sustainable Value Creation (SVC)

Construct/latent variables	Dimensions/factors	Indicator	Symbol	References
Sustainable Value Creation (SVC) *X*	Product value (*X*1)	Function and Physical Product	*X*11	[2, 18, 30–32]
		Product Quality	*X*12	
		Transparency of product use	*X*13	
		National product standardization	*X*14	
	Human resources value (*X*2)	Employee responsiveness to problems	*X*21	[2, 24, 30, 31, 33]
		Employee health, safety, and education insurance	*X*22	
		Increase the quality of employee recruitment	*X*23	
		Cooperation between stakeholders to increase the quality of human resources	*X*24	
		The role and employees' participation	*X*25	
	Technological equipment value (*X*3)	Stabilization of product innovation	*X*31	[2, 24, 30, 32, 34, 35]
		Automation of industrial technology	*X*32	
		Flexibility and integration of equipment production	*X*33	
		Application of the 6R cycle in minimizing waste	*X*34	
		Minimization of accidents	*X*35	
	Process value (*X*4)	Stabilization of production process	*X*41	[2, 30, 32, 34, 36]
		Standardization of production process	*X*42	
		Efficiency of production time	*X*43	
		Efficiency of production costs	*X*44	
		Ecofriendly production	*X*45	
	Organizational management value (*X*5)	Simple organizational structure and transparency of working procedures	*X*51	[2, 18, 30, 31, 37]
		Responsiveness and responsive management services	*X*52	
		Guarantee of services	*X*53	
		Stakeholder participation in problematic decisions	*X*54	

Table 2

Variables and Item Measurements for Partnership Strategy and Competitiveness

Construct/latent variables	Indicator	Symbol	References
Exogenous variables: Partnership strategy (PS) *M*	Development of marketing area	*M*1	[13, 15, 24, 38–40]
	HR development	*M*2	
	Easy access to capital and information	*M*3	
	Fostering organizational management	*M*4	
	Innovation and technology transfer	*M*5	
Endogenous variables: Sustainable competitiveness advantages (SCA) *Y*	Minimization of company costs	*Y*1	[7, 18, 24, 41–43]
	Guarantee of product quality	*Y*2	
	Speed of product delivery	*Y*3	
	Company flexibility	*Y*4	

5. 1. Formation of structural model

As explained in Table 1, the sustainable value creation (SVC) variable includes product, human, equipment and technology, production process, and organization. Along with partnership strategy, SVC is expected to give a direct effect on sustainable competitive advantages of manufacturing SMEs. As discussed earlier, not only expected to give direct effects, partnership strategy is also expected to give indirect effects as a moderated mediation of sustainable competitive advantage in manufacturing SMEs. The conceptual framework of this research can be shown in Fig. 1.

The PLS-SEM is used to perform hypotheses testing and construct multivariate relationships. Here, we use WarpPLS 6.0 software. The PLS-SEM method was chosen as it is appropriate for theoretical development even with limited information [15]. It is designed to analyze the predictive relationship between constructs [44]. In addition, the PLS-SEM method is useful for a relatively small number of samples [28].

Since the conceptual model in this study is based on a constructive relationship with a higher order dimension, here we use Hierarchical Component Model (HCM) with the Reflective-Formative type. HCM is applied to simplify complex models as suggested in [45]. The Reflective-Formative HCM-type model calculation uses a two-stage iterative approach to estimate hierarchical latent variables. At the initial stage, repeated indicators are used to obtain latent variable scores from the lower order construct (LOC) and the score is then used as an indicator for latent variables at the higher order construct (HOC).

Fig. 2, 3 show the model used to evaluate HCM. Here, the SVC variable is measured based on a higher order hierarchy. In the first stage (Fig. 2), the construct value of the SVC variable is estimated based on the value of its forming indicators, which include product value, human resources, equipment technology, production and organization. The resulting construct value is then converted into an indicator called the latent score for the latent construct on the second stage (Fig. 3). The conceptual model was then translated into the WarpPLS6.0 model for further analysis.

The conceptual model design, which is the basis for forming the PLS-SEM structural model, is shown in Fig. 4.

Fig. 4 describes the relationship between variables that form the research hypothesis. In this case, SVC is an exogenous variable (variable X), which is expected to influence the achievement of competitiveness in the manufacturing industry (variable Y). In this conceptual model, partnership strategy is known as an intermediary variable (variable M), which is expected to have a role as a mediator for the SVC in achieving competitiveness. In addition, the partnership strategy also acts as a moderating variable, which is believed to strengthen or weaken the influence of the SVC in achieving competitiveness. The overall relationship between variables is clearly depicted through the direction of the arrows formed in the conceptual model presented.

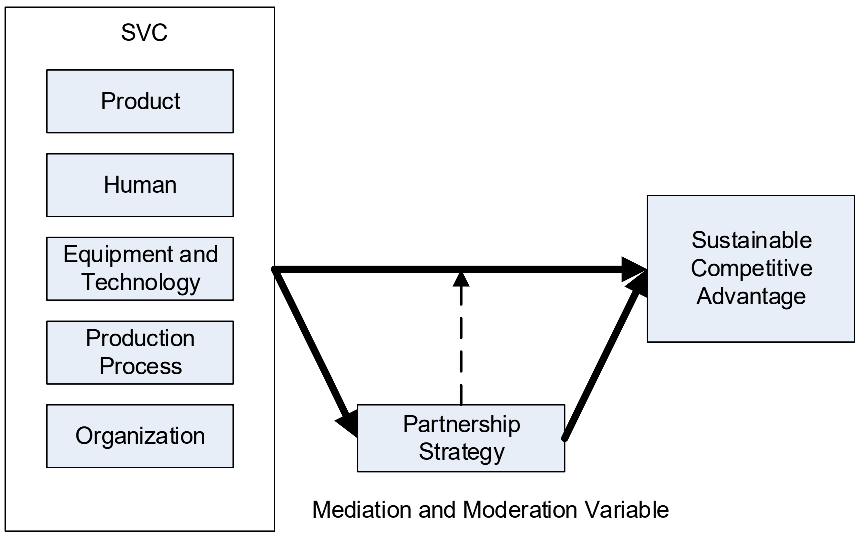

Fig. 1. Conceptual framework

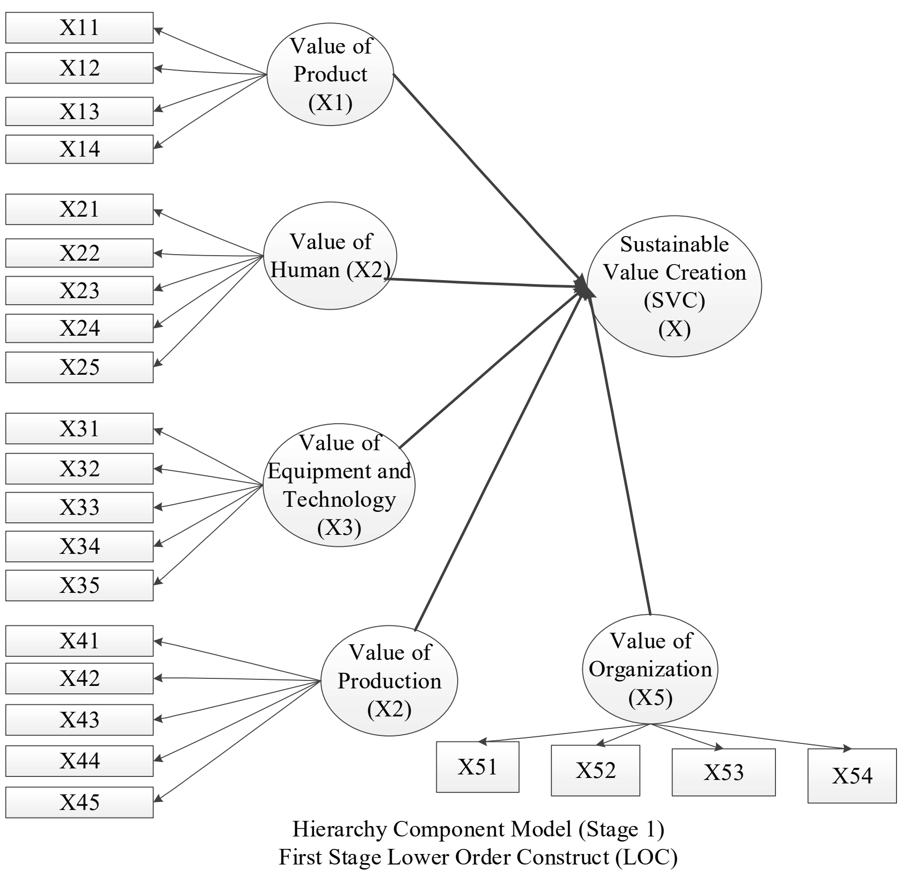

Fig. 2. Hierarchical Component Model (HCM): first stage lower order construct (LOC)

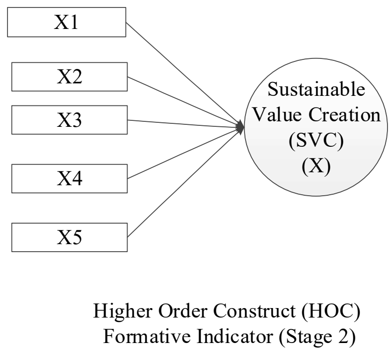

Fig. 3. Hierarchical Component Model (HCM): second stage higher order construct (HOC)

There are four hypotheses tested in the structural model to analyze further the relationship's effect arising from each variable. The entire research hypothesis includes:

– *H*1: sustainable value creation has a significant positive effect on increasing sustainable competitiveness for SME industries;

– *H*2: the partnership strategy has a significant positive effect on sustainable competitiveness for SME industries;

– *H*3: there is a positive relationship between SVC and sustainable competitiveness mediated by partnership strategy in the SME industry;

– *H*4: there is a positive relationship between SVC and sustainable competitiveness moderated by partnership strategy in the SME industry.

5. 2. PLS-SEM Structural Model Testing

Stage 1: Measurement Model Test (Outer Model).

Factor analysis involves a second-order construct through two stages of analyses. The first analysis is performed to analyze the latent construct. The second analysis is performed to evaluate hypothesis research, whether it can be accepted or rejected.

The sustainable manufacturing value is constructed of several dimensions including product value, human resources value, equipment and technology value, production process value, and the organizational process value. As explained earlier, the purpose of this study is to evaluate the relationship between SVC and competitive advantage in the manufacturing SMEs. It involves a partnership strategy as mediating and moderating variables.

Fig. 5 shows the outer model of construct variables. Here the indicators for each constructs are reflective [28]. The indicators are useful to evaluate the feasibility of each latent constructs. All latent constructs are valid and reliable if they meet a predetermined cut-off value [44].

Evaluation of the outer model begins by performing the reliability test of each construct. Reliability test is done by calculating the loading factor value of each indicator. For exploratory research, if the value meets the cut-off between 0.6–0.7 then the indicator is reliable [44]. The loading factor value for each indicator must be greater than the specified value and the *P* value must meet the maximum significant requirement of 5 %. Table 4 summarized the result of reliability testing of the outer model. From Table 4, it is known that loading factor values of each indicator are 0.6 with *P*-value<0.001. This reveals that all indicators are reliable and can be categorized as latent variables.

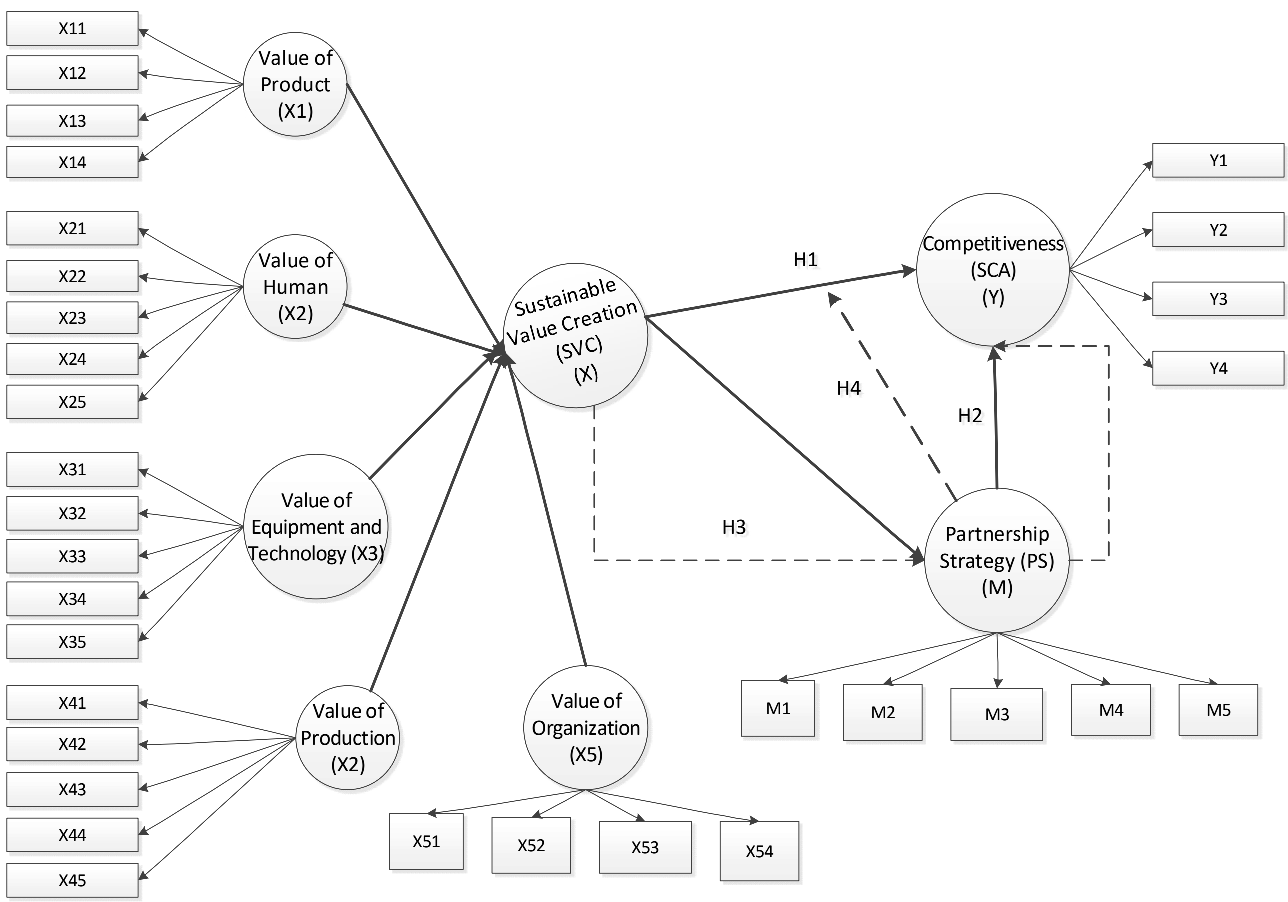

Fig. 4. Conceptual PLS-SEM model

Table 5 shows the validity and reliability testing result based on the Cronbach's Alpha Coefficient (CAC), composite reliability (CR), and average variance extracted (AVE) values of each construct. The CAC and CR values are greater than 0.6, while the AVE value is greater than 0.5. In addition, the square root AVE value is greater than all correlations between constructs. This shows that the outer model meets the validity and reliability test requirements of a construct with PLS analysis. Therefore, it can be concluded that the measurement model is reliable so that it is able to explain the variance that occurs from each of the research variable items [46].

The first-order measurement model shows that the measurement value is in accordance with the specified conditions. Therefore, the second-order structural model can be performed. The concept of the initial research model is the HCM for the variable of SVC. Therefore, all values in the first-order outer model will be standardized again into a single latent score based on the algorithm procedure in WarpPLS 6.0. Thus, it can be used as an input indicator for the second-order inner model testing process.

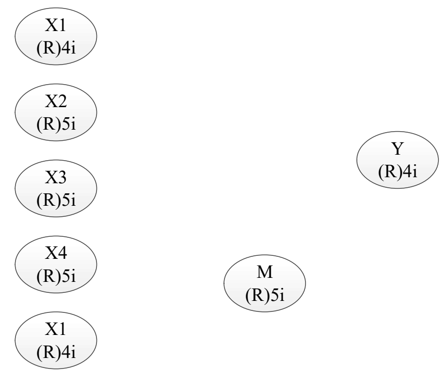

Fig. 5. Outer model with each construct variable

Table 4

Reliability Test Result of the Outer Model

Indicator	*X*1	*X*2	*X*3	*X*4	*X*5	PS	SCA	Type (a)	SE	*P*-value
*X*11	0.710	−0.246	−0.220	0.134	0.029	−0.133	0.186	Reflect	0.136	<0.001
*X*12	0.779	−0.325	0.080	0.159	0.003	0.087	−0.083	Reflect	0.120	<0.001
*X*13	0.846	0.226	0.079	−0.154	−0.171	0.155	−0.093	Reflect	0.090	<0.001
*X*14	0.759	0.312	0.036	−0.117	0.161	−0.139	0.015	Reflect	0.102	<0.001
*X*21	0.080	0.668	−0.376	−0.331	−0.023	−0.151	0.078	Reflect	0.109	<0.001
*X*22	−0.368	0.757	0.158	−0.084	0.060	0.006	−0.021	Reflect	0.117	<0.001
*X*23	0.370	0.738	−0.035	0.070	0.021	0.178	0.123	Reflect	0.107	<0.001
*X*24	−0.006	0.778	−0.179	0.134	0.037	0.103	−0.116	Reflect	0.085	<0.001
*X*25	−0.054	0.797	0.373	0.162	−0.094	−0.144	−0.047	Reflect	0.103	<0.001
*X*31	−0.039	0.121	0.831	−0.110	−0.009	−0.077	−0.020	Reflect	0.105	<0.001
*X*32	0.061	0.072	0.855	0.079	0.016	−0.215	−0.041	Reflect	0.084	<0.001
*X*33	−0.017	0.084	0.817	0.275	0.128	0.075	−0.056	Reflect	0.095	<0.001
*X*34	−0.013	−0.202	0.857	0.070	0.007	0.139	0.057	Reflect	0.097	<0.001
*X*35	0.007	−0.078	0.740	−0.352	−0.158	0.093	0.066	Reflect	0.114	<0.001
*X*41	0.139	−0.144	−0.060	0.824	0.118	−0.042	−0.145	Reflect	0.101	<0.001
*X*42	0.023	0.006	0.133	0.834	0.080	0.064	−0.179	Reflect	0.095	<0.001
*X*43	−0.012	0.207	−0.188	0.772	−0.078	−0.143	0.186	Reflect	0.106	<0.001
*X*44	−0.004	−0.227	−0.026	0.824	0.036	0.081	0.016	Reflect	0.091	<0.001
*X*45	−0.144	0.168	0.126	0.842	−0.158	0.029	0.133	Reflect	0.083	<0.001
*X*51	0.102	−0.135	0.092	0.080	0.785	0.071	−0.307	Reflect	0.096	<0.001
*X*52	−0.302	0.063	0.199	−0.307	0.699	0.016	0.262	Reflect	0.114	<0.001
*X*53	0.107	−0.066	−0.226	0.232	0.811	0.046	0.125	Reflect	0.082	<0.001
*X*54	0.054	0.143	−0.035	−0.045	0.807	−0.129	−0.054	Reflect	0.095	<0.001
*M*1	0.073	0.156	−0.109	−0.014	0.115	0.758	0.066	Reflect	0.087	<0.001
*M*2	−0.248	0.259	0.463	−0.484	−0.291	0.700	0.239	Reflect	0.103	<0.001
*M*3	−0.240	−0.016	−0.048	0.115	0.185	0.664	0.202	Reflect	0.115	<0.001
*M*4	0.030	−0.080	−0.305	0.251	−0.095	0.604	−0.209	Reflect	0.120	<0.001
*M*5	0.616	−0.401	−0.042	0.203	0.084	0.600	−0.376	Reflect	0.125	<0.001
*Y*1	0.323	−0.434	−0.229	0.447	0.410	0.051	0.721	Reflect	0.096	<0.001
*Y*2	−0.212	0.164	−0.234	0.164	−0.356	−0.057	0.668	Reflect	0.116	<0.001
*Y*3	−0.060	0.001	0.493	−0.379	−0.063	−0.031	0.749	Reflect	0.104	<0.001
*Y*4	−0.064	0.284	−0.067	−0.208	−0.015	0.035	0.714	Reflect	0.109	<0.001

Notes: Loadings are unrotated and cross-loadings are oblique-rotated. SEs and P-values are for loadings. P-values<0.05 are desirable for reflective indicators

Table 5

AVE, CR, Cronbach's alpha, and correlations among the constructs

Variable	AVE	CR	CAC	*X*1	*X*2	*X*3	*X*4	*X*5	PS	SCA
*X*1	0.600	0.857	0.776	0.775	–	–	–	–	–	–
*X*2	0.561	0.864	0.803	0.669***	0.749	–	–	–	–	–
*X*3	0.674	0.912	0.878	0.648***	0.756***	0.821	–	–	–	–
*X*4	0.672	0.911	0.877	0.560***	0.766***	0.807***	0.819	–	–	–
*X*5	0.603	0.858	0.780	0.332***	0.305**	0.397***	0.276***	0.777	–	–
M	0.446	0.800	0.686	0.308**	0.338***	0.409***	0.314***	0.454***	0.668	–
Y	0.509	0.806	0.678	0.615***	0.444***	0.552***	0.360***	0.475***	0.495***	0.714

*Note: Square roots of average variances extracted (AVEs) are shown on the diagonal; ** – significant with the P-value<0.05 (5 %); *** – strongly significant with the P-value<0.01 (1 %)*

Stage 2: Structural Model Test (Inner Model).

The structural model test shows the causal relationships between constructs. The test estimates the values of R2 and the path coefficient (β). We used the HCM to reduce the model complexity. The second-order analysis was conducted in the validation and reliability measurements.

Table 6 shows that sustainable value creation (SVC), with its five formative dimensions, is all significant with a *P*-value <0.001; WLS=1 and VIF<5, which have met the cut-off value required in the second order construction [44]. The loading value, *P* value and AVE value of all the reflective indicator constructs also show a significant level. This is reassured by the other reliability parameters in Table 7.

The overall value of the table's indicators shows that the latent variable's coefficient meets the predetermined requirements. Thus, it can be concluded that all research variables are valid and reliable to be further processed at the hypothesis analysis stage.

Table 6

Calculation Results of Indicator Weights, Combined Loadings and Cross-Loadings

Variable	SVC	PS	SCA	PS*SVC	Type *a*	SE	*P*-value	VIF	WLS	ES
*X*1	0.244	0.000	0.000	0.000	Formative	0.041	<0.001	2.012	1	0.196
*X*2	0.271	0.000	0.000	0.000	Formative	0.037	<0.001	3.190	1	0.242
*X*3	0.278	0.000	0.000	0.000	Formative	0.041	<0.001	3.812	1	0.254
*X*4	0.266	0.000	0.000	0.000	Formative	0.038	<0.001	3.469	1	0.233
*X*5	0.151	0.000	0.000	0.000	Formative	0.036	<0.001	1.211	1	0.075
M	0.000	1.000	–0.000	0.000	Reflect	0.071	<0.001	–	–	–
Y	–0.000	0.000	1.000	0.000	Reflect	0.063	<0.001	–	–	–
*M***X*1	0.135	–0.005	–0.047	0.822	Reflect	0.262	0.001	–	–	–
*M***X*2	–0.006	0.006	–0.001	0.948	Reflect	0.250	<0.001	–	–	–
*M***X*3	–0.092	0.015	0.089	0.939	Reflect	0.182	<0.001	–	–	–
*M***X*4	–0.193	0.033	0.148	0.899	Reflect	0.213	<0.001	–	–	–
*M***X*5	0.208	–0.059	–0.238	0.746	Reflect	0.222	<0.001	–	–	–

Notes: SVC: sustainable value creation; PS: partnership strategy; SCA: sustainable competitiveness advantage; VIF: indicator variance inflation factor; WLS=indicator weight-loading sign (–1=Simpson's paradox in l.v.); ES=indicator effect size

Table 7

Coefficients of latent variables

Parameter	SVC	PS	SCA	PS*SVC	Rule of thumb
R-squared coefficients	–	0.187	0.447	–	–
Adjusted R-squared coefficients	–	0.179	0.430	–	–
CR coefficients	0.903	1.000	1.000	0.941	>0.6–0.7
Cronbach's alpha coefficients	0.860	1.000	1.000	0.920	>0.6–0.7
AVE	0.659	1.000	1.000	0.764	>0.5
Full collinearity VIFs	1.849	1.420	1.809	1.230	<5
Q-squared coefficients	–	0.186	0.446	–	>0

5. 3. Assessment of hypothesis decisions

The PLS-SEM analysis of the structural model test is presented in Table 8. The results show that all path coefficients (β) and *P*-value are met, and the hypothesis is accepted by the bootstrapping test method and the linear inner model. The structural model of the overall value of the relationship between the research variables is shown in Fig. 6.

The results of the software output indicate that sustainable value creation/SVC (β=0.522; ρ<0.001) and partnership strategy /PS (β=0.313; ρ<0.001) have a significant positive effect on sustainable competitive advantage (SCA). Likewise with indirect relationships that involve partnership as a mediating and moderating variable. Both of them end in the result that there is a significant positive effect on competitive advantage. Thus, this research hypothesis can be accepted.

Table 8

Path Analysis of Coefficient Values Based on the Second-Order Model

Hypothesis	Effect	Coefficient	Effect size	Standard error	Result
*H*1	SVC→SCA	0.522***	0.309	0.087	Accepted
*H*2	PS→SCA	0.313***	0.155	0.076	Accepted
*H*3	SVC→PS	0.433***	0.187	0.091	Accepted
	SVC→PS→SCA	0.135** (indirect effect)	0.080	0.045	
*H*4	SVC→PS*SVC→SCA	0.179**	0.016	0.093	Accepted

*Note: ** – significant at a P-value<0.05 (5 %); *** – significant at a P-value<0.01 (1 %)*

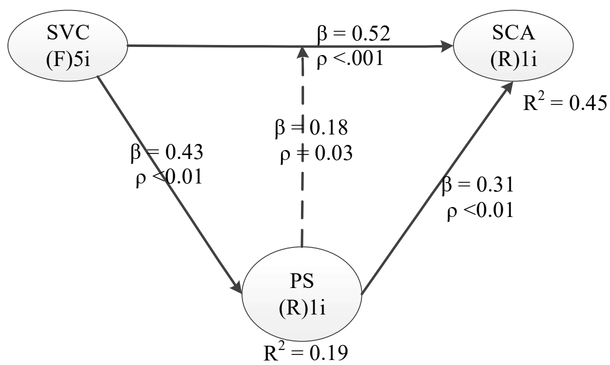

Fig. 6. Structural second-order model

6. Discussion of the research result models testing

The results of the structural model show that Sustainable Value Creation (SVC) and Partnership Strategy (PS) are drivers that positively affect the sustainable competitive advantage (SCA) of manufacturing SMEs. SVC is proven to be the most crucial variable, with β=0.522. These findings support previous research by [47], which stated that industrial competitiveness requires a company to create manufacturing value. In addition, the PS also provides a significant effect on competitive advantages, with β=0.313. The proposed model was moderate to substantially explain the creation of industrial competitive advantage with R^2=0.45. The R^2 value indicates that exogenous latent variables in the model influence endogenous latent variables. Public policy and economic factors are external factors that affect sustainable competitive advantages in manufacturing SMEs [7].

Based on the loading value of the Indicator Weights in Table 6, it is known that equipment and technology (*X*3) and human resources (*X*2) give the highest values of 0.278 and 0.271, respectively. Both are critical factors that need to be considered by SMEs in creating sustainable value. SMEs need to improve their technology & equipment capabilities as well as human resources, this becomes the main driver for them to carry out a partnership strategy in order to increase competitiveness. The results of the analysis also strengthen these findings. The PS variable is proven to be a mediating variable (as evidenced by the significant positive indirect effect relationship of β=0.135**) for the sustainable value creation process through cooperation in the fields of technology and human resources.

In addition, the mediation effect can also be seen from the change in the effect value between the SVC variable on SCA after the involvement of the PS as a mediating variable (Fig. 7). The results show, there is a decrease in the effect value from β=0.59 to β=0.52, yet with an increase in the *R*2 value. Other results show that the SVC variable has a significant positive effect on PS (β=0.43) and the partnership strategy itself has a significant direct effect on the competitiveness variable. Therefore, it can be concluded that the effect of the mediating variable that occurs is partial mediation. Here, apart from being a predictive variable for SCA, the PS variable also acts as a mediator for the SVC in an effort to increase the competitiveness of manufacturing SMEs. This shows that in its application, the partnership strategy policy makes it very possible for both parties to collaborate to support and complement each other in terms of resource sharing, improving the quality of human resources through training and internships, and increasing production capacity.

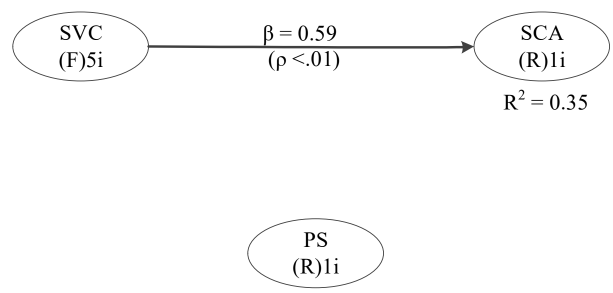

Fig. 7. Direct relationship of the SCV model toward competitiveness (SCA) without mediating and moderating effects

In addition to mediating variable, we also evaluate the effect of PS as a moderating variable. The results show that by implementing a partnership strategy, there is a positive moderating effect, which is proven to increase the effect of SVC on SCA, with an effect value of β=0.179 **. This provides sufficient evidence for *H*4 to be accepted. These results are in line with research by [48], where they show that a partnership strategy with all stakeholders will strengthen the company's strategy in expanding markets and distribution and improve performance through developing company resources. Given the latent variable PS is also a predictive variable for SCA, the moderating effect that occurs can be categorized as Quasi Moderation.

Further analysis shows that the size of the effect that occurs shows that the effect of moderation is very weak (0.016), even smaller than the specified lower limit value of 0.02 [49]. Therefore, the moderation effect that occurs can actually be neglected given the insignificant effect. In addition, the PS variable also acts as a mediating variable, which gives an effect size of 0.187, which is included in the moderate category. This becomes an interesting finding that a latent variable, which involves two direct influences in one structural model, cannot contribute to its maximum effect. This could be due to the indirect influence of the mediating variable. The effect of the more dominant mediation model is able to negate the effect of moderation, although in fact there is an influence that occurs from this relationship. Therefore, further research is still needed to deepen the effect of the relationship that occurs. So far, several previous research sources only discuss the function of one single variable. There have not been many studies involving the two effects of one variable directly in the structural relationship model. However, broadly speaking, this study is able to prove that one variable, namely the partnership strategy, can play a dual role both as a mediating variable and a moderating variable.

The findings of this study are a valuable topic for Indonesia, especially in an effort to increase the role of SMEs as the foundation of the country's economy. Findings that show the involvement of partnership strategies in sustainable value creation provide opportunities for further research in formulating optimal formulations for enhancing SME competitiveness. However, one limitation of this study is that the case study was only conducted in East Java, Indonesia. Further research should evaluate the metal industry on a vast scale, such as across the nation or even global. Another limitation is that the data are only specific to Indonesian characteristics. Further research should compare some countries to provide general implications and contributions in the process of creating sustainable values and competitive advantages.

7. Conclusions

1. Based on the results of literature studies and opinion polls with metal industry SMEs and practitioners, the overall indicators that make up the research variables can be used to create a research conceptual model that underlies the relationship of influence generated in the structural model. Four research hypotheses were formed from the resulting structural model design that describes the influence relationship between variables.

2. The PLS-SEM test results show that all variables are valid and reliable to form a research model indicated by the value of $P<0.001$; WLS=1, and VIF<5, which meet the required cut-off values. The predictive relationship of each path between constructs indicates that there are effects that occur. This is evidenced by the significant relationship between the sustainable value creation variable ($\beta=0.522$) and the partnership strategy ($\beta=0.313$) on increasing manufacturing competitiveness. All research hypotheses are accepted and stated to have a significant positive effect. This reveals that sustainable value creation and partnership strategy play an important role in increasing SMEs' competitiveness.

3. The study results provide recommendations and directions for SMEs in designing frameworks, strategies, and managerial perspectives to improve industrial competitiveness. The involvement of a partnership strategy in every chain of manufacturing activities provides positive benefits and solutions for SME performance sustainability. Therefore, increasing managerial awareness to create sustainable value and establishing link and match cooperation with stakeholders are very important to increase SMEs' competitive advantages in the future. Also, government support is significant for the sustainability of MSMEs, increasing capacity and creating more strategic value for national economic growth.

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