



The Effect of Open Innovation on Sustainable Innovation Performance with Knowledge Sharing as an Intervening Variable: Case study Batik MSMEs Surakarta

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Abstract: MSMEs are the business entities that contribute the most to employment in Indonesia. During the 1997 crisis, MSMEs were able to survive and become models in the case of economic crises. However, during the Covid-19 Pandemic, MSMEs are allegedly the most affected. The Indonesian government uses MSMEs to revive economic conditions that have been slumped during the Covid-19 Pandemic. In the midst of the boom, MSMEs in Indonesia, especially the invasion of imported products, need to find solutions in maintaining the sustainable performance of MSMEs. Innovation is needed by paying attention to open innovation and knowledge sharing so that MSMEs can rise again. This research is located in Surakarta, Indonesia with a saturated sample format of 50 Batik MSMEs. Data was obtained from Surakarta Batik MSMEs in the period of October to November 2024. Perception measurement in sustainable innovation performance, open innovation and knowledge sharing variable. The analysis tool uses path analysis equipped with t-test, F-test, determination coefficient, correlation test and Sobel test. The sobel test is used to determine the role of variable intervening. Before the analysis, the data is tested using data quality testing (validity and reliability). The findings shown that open innovation significant positive on knowledge sharing. Open innovation and knowledge sharing have a significant positive effect on sustainability innovation performance. Direct effect, more effective in improving the sustainable innovation performance. Another finding shows that although open innovation is directly more effective in influencing the sustainable innovation performance. Sobel test, show that knowledge sharing is more emphasized as an intervention although the influence is effective if it is carried out by choosing direct effect. The results of this study contribute to sustainable innovation performance in MSMEs Batik.

Keywords: Sustainable_innovation_performance; open_innovation, knowledge_sharing; MSMEs; Batik

1 INTRODUCTION

In Indonesian, MSMEs contribute 89 percent to employment (Prakasa & Putri, 2020). Although Indonesian MSMEs are relatively small on an international scale (Azzahra, B., & Wibawa, 2021) even below neighboring countries such as Thailand and Malaysia, MSMEs can contribute 60.3% of GDP and 97% of the workforce (Fina Hilyah Fa'iqoh; Nur Hidayati; M Tody Arsyianto, 2023; Saryadi et al., 2024). Indonesian MSMEs had fallen in the Covid-19 Pandemic situation (Suyatno, Saryadi, & Purnomo, 2024; Suyatno, Saryadi, Nabila, et al., 2024).

The government has determined in the recovery of the nation's economy after Covid-19, through the empowerment of MSMEs. For the empowerment of MSMEs, it uses the acceleration of the development of Business Model Innovation (IMB) as carried out on various companies in the Western Balkans, especially in Kosovo, Albania, and North Macedonia. IMB is considered to be a direction and guide in anticipating facing various business challenges that have a social impact. IMB has a significant direct impact on the company's sustainability. Business Model Innovation is an option in the development of Post-Covid-19 Batik MSMEs.

The literature that is developing, there is a study that connects the analogy of Sustainable Business Model Innovation with Business Model Innovation (Shakeel et al., 2020). Sustainable business model innovation in SLR is considered a guide in anticipating various challenges that have a social impact (Geissdoerfer et al., 2018).

In Jordan, business models and risks to the performance of MSMEs have a significant direct influence between resources and business model innovation. Research examining the impact of business model innovation on corporate sustainability in various companies was conducted in the Western Balkan countries, particularly in Kosovo, Albania, and North Macedonia. Research shows that Business Model Innovation, policies and employee empowerment have a direct impact on the sustainability of the company with the presence of leadership capabilities (Kajtazi et al., 2023). However, in a resource-based approach related to export market orientation, the marketing ability and export performance of SMEs in Turkey in emerging markets show that export market orientation and marketing ability have a direct positive effect on export performance (Acikdilli et al., 2022).

In the performance of sustainable innovation, support from the openness of the company's innovation is needed. Open innovation is an approach in the innovation process where organizations or companies not only rely on internal resources, but also utilize external resources to accelerate the development and implementation of new ideas. The openness of innovation allows collaboration between various parties, such as academics, customers, suppliers, governments, or even competitors to create new value. Open innovation has a positive relationship with the performance of sustainable innovation (Fadhilah & KS, 2018). The influence of open innovation on innovation performance was also conveyed in the research (Alfarobi & Hartono, 2022). Study (Ahn et al., 2015) openness of innovation is a new classification in improving the innovation performance of MSMEs. In the implementation of the company's innovation performance, open innovation also has a significant impact on innovation performance (Fadhilah & KS, 2018). Meanwhile, research related to innovation performance has been carried out a lot (Saryadi et al., 2023; Saryadi & Arini, 2023; Saryadi Saryadi & Liss Dyah Dewi Arini, 2023). Knowledge sharing can improve performance (Goo et al., 2022). Sharing this knowledge is able to strengthen innovation performance (Kurniawan & Pratiwi, 2021).

Knowledge sharing is the process by which an individual or organization distributes information, experiences, skills, or insights to others in order to increase collective capacity

within a community, organization, or group. Knowledge sharing has an influence on employee performance (Fikri, 2017).

2 METHOD

This research is located in Surakarta, Indonesia with a saturated sample format of 50 batik MSMEs. The independent variables, namely openness of innovation and knowledge sharing, are intervening variables and the performance of sustainable innovation as independent variables. The data were tested for validity and reliability and analyzed using path analysis to determine the direct and indirect influence, in order to understand the more effective influence.

The path analysis is made as follows:

Path regression 1

$$B_P = \alpha + \beta_1 K_I + \epsilon_1$$

Path regression 2:

$$KIK = \alpha + \beta_2 K_I + \beta_3 B_P + \epsilon_2$$

Description:

KIK = Sustainability Innovation Performance

K_I = Open innovation

B_P = Knowledge Sharing

α = Constants

$\beta_1, \beta_2, \beta_3$ = Regression Coefficient

ϵ_1, ϵ_2 = residual value

Conceptual framework

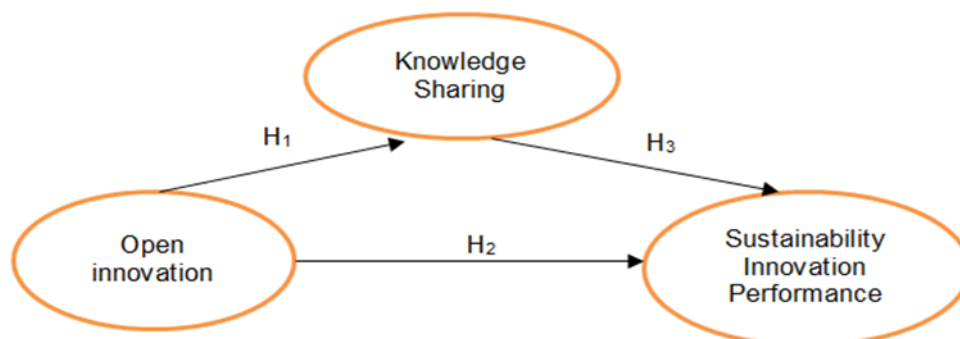


Figure 1. Path Analysis

3 RESULTS AND DISCUSSION

Results

a. Validity and reliability test

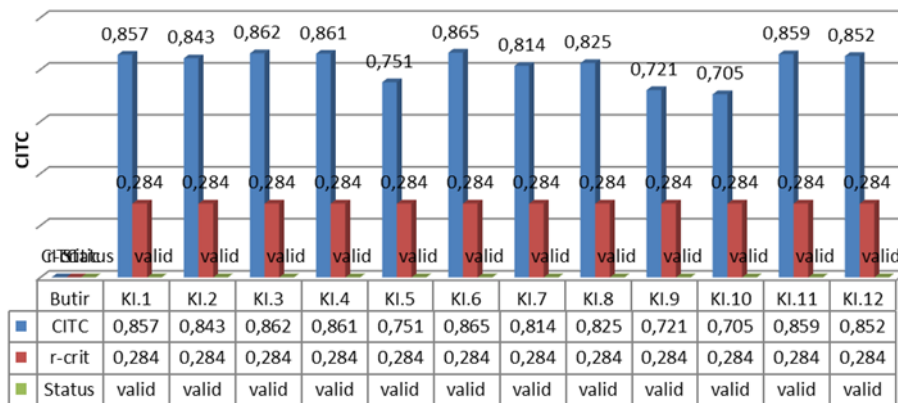


Figure 2. Validity of open innovation

The conclusion from the open innovation validity result image is that the open innovation variable statement item is valid with the r-count value of each item, namely KI.1=0,857; KI.2=0,843; KI.3=0,862; KI.4=0,861; KI.5=0,751; KI.6=0,865; KI.7=0,814; KI.8=0,825; KI.9=0,71; KI.10=0,705; KI.11=0,859; KI.12=0,852 is above r-critical = 0.284 with the 6th and 3rd and 4th items as the most dominant open innovation behavior.

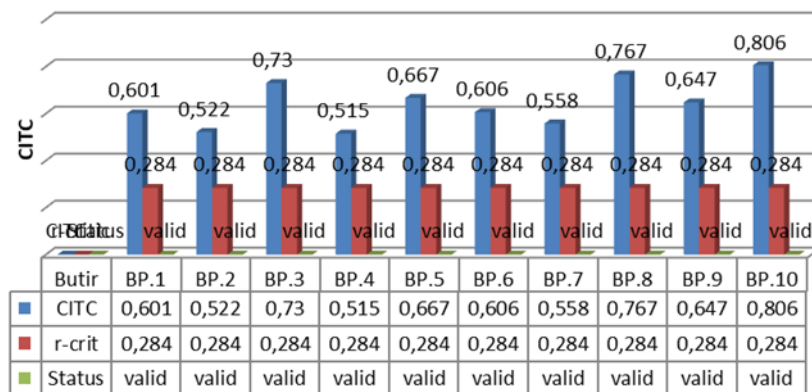


Figure 3. Validity of Knowledge Sharing

The conclusion from the knowledge sharing validity result image is that the knowledge sharing variable statement item is valid with the r-count value of each item, namely BP.1=0,601; BP.2=0,522; BP.3=0,73; BP.4=0,515; BP.5=0,667; BP.6=0,606; BP.7=0,558;

BP.8=**0,767**; BP.9=0,647; BP.10=**0,806** is above r-critical = 0.284 with the 10th and 8th and 3rd items as the most dominant shapers of knowledge-sharing behavior.

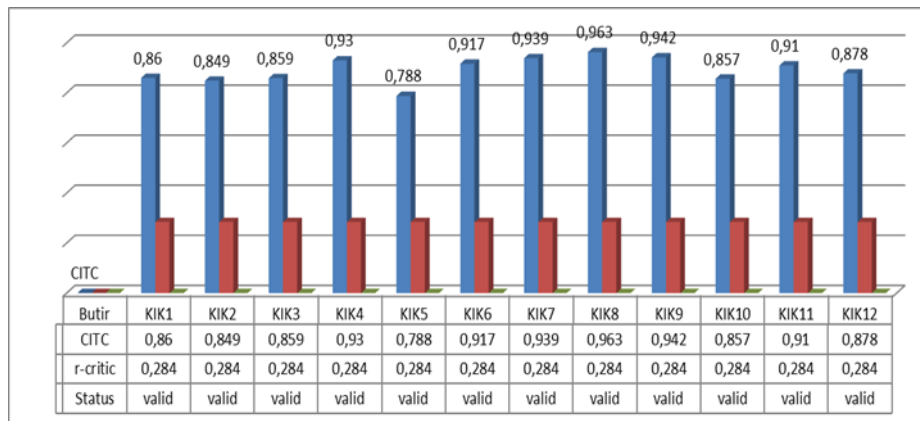


Figure Grafik 4. Validity of Sustainability Innovation Performance

The conclusion from Sustainability Innovation Performance validity result image is that the Sustainability Innovation Performance variable statement item is valid with the r-count value of each item, namely KIK.1=0,86; KIK.2=0,849; KIK.3=0,859; KIK.4=0,93; KIK.5=0,788; KIK.6=0,917; KIK.7=0,939; KIK.8=0,963; KIK.9=0,942; KIK.10=0,857; KIK.11=0,91; KIK.12= 0,878 is above r-critical = 0.284 with the 8th and 9rd and 7th items as the most dominant open innovation behavior.

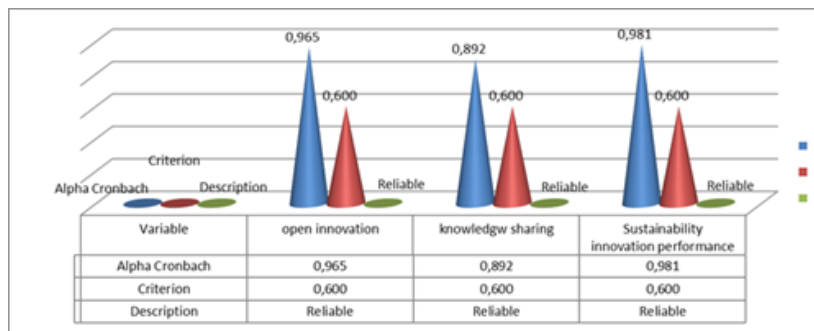


Figure 5. Reliability Test Results

a. Path regression 1

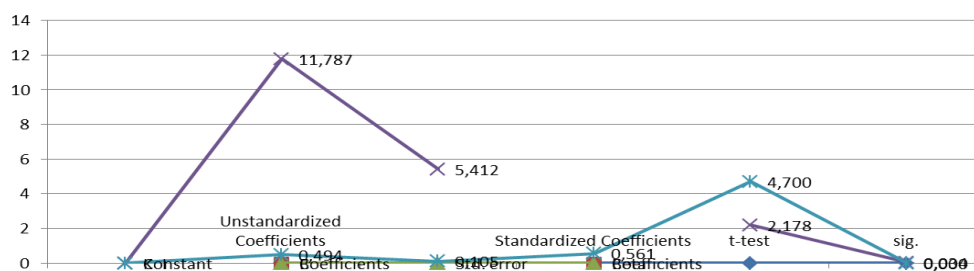


Figure 6. Path regression 1

Source : Data processed, 2024

b. Path regression 1:

$$B_P = 11,787 + 0,494 K_I + \epsilon_1$$

Innovation openness has a regression coefficient of 0.494 and a t-test of 4.700 with a significance value of 0.000. So the influence of the innovation openness variable on knowledge sharing is significantly positive.

Path regression 2

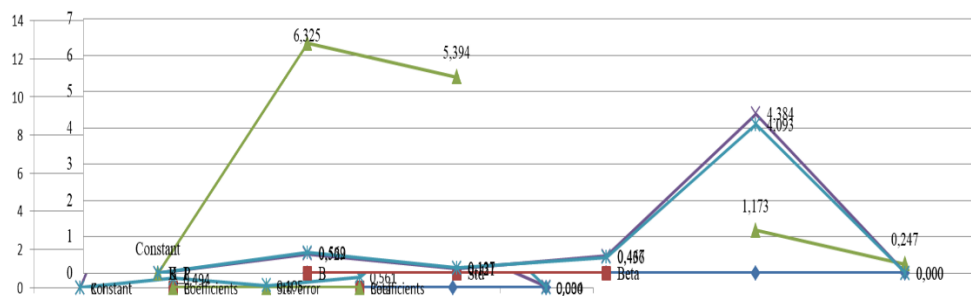


Figure 7. Path regression 2

Source : Data processed, 2024

Path regression 2:

$$KIK = 6,325 + 0,529 K_I + 0,562 B_P + \epsilon_2$$

The results of the analysis showed that each variable, both innovation openness and knowledge sharing, had a significance value of $0.000 < 0.05$. Thus, all variables, both innovation openness and knowledge sharing, positively significant to the sustainability innovation performance variables.

c. t-test

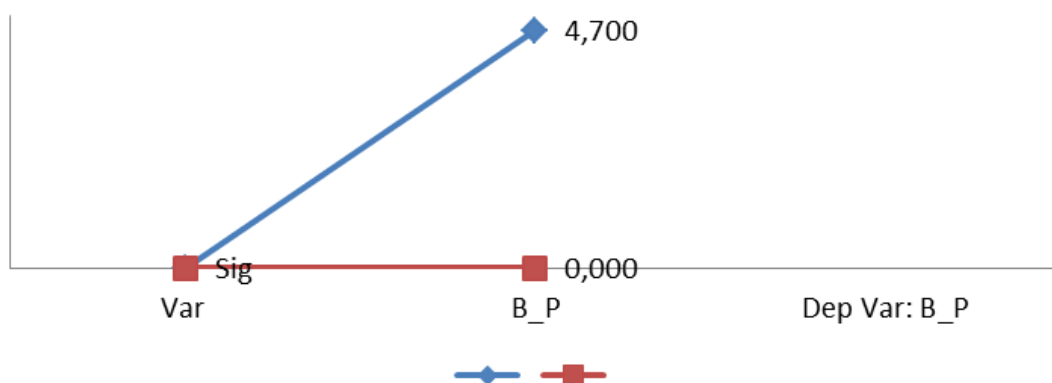


Figure 8. Result t-test path 1

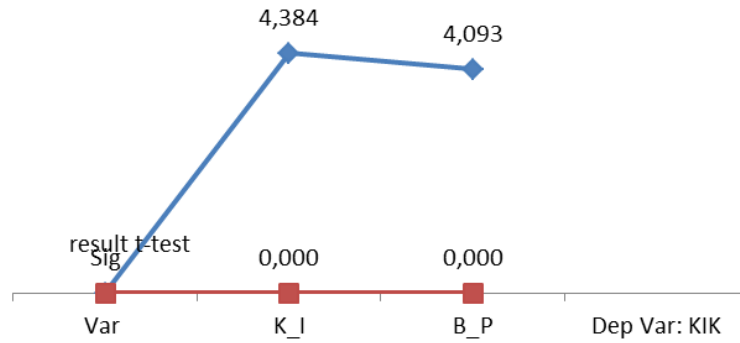


Figure 9. Result t-test path 2

From the data and figures above, it can be explained that the t-test values are 4.384 and 4.093 respectively with a significance value of $0.000 < 0.05$. In conclusion, both innovation openness and knowledge sharing have a significant positive impact on sustainability innovation performance.

d. F-test

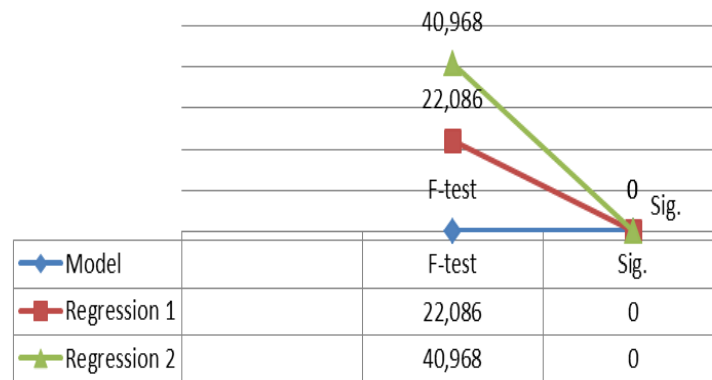


Figure 10. result F-test

The F test shows that the variables of innovation openness and knowledge sharing together have a significant positive effect on the performance of sustainability innovation.

e. Coefficient of determination (R^2) Total

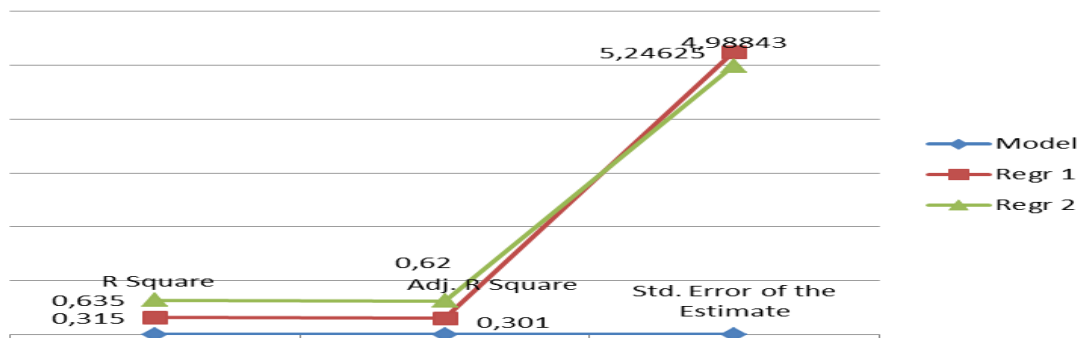


Figure 11. Coefficient of Determination

The figure above, shows the R-square value in line 1 of 0.315 and the R-square value in line 2 of 0.635.

R² Path equations 1 retrieved 0,315.

e₁ Path equations 1:

$$e_1^2 = 1 - R_1^2 = 1 - 0,315 = 0,685$$

$$e_1 = 0,828$$

R² Path equations 1 retrieved 0,635

e₂ path equations 2

$$e_2^2 = 1 - R_2^2 = 1 - 0,635 = 0,365$$

$$e_2 = 0,604$$

Coefficient of Determination total (R²total)

R-square total value of 0.750 means that the sustainable innovation performance of Surakarta City Batik MSMEs is explained by the openness of innovation by sharing knowledge as an intervention of 75.0% and the remaining 25.0% explained by variables outside the model, for example market dynamics, culture of innovation.

Results of Path analysis

Table 1: Results of Path Analysis

No.	Arrow	Unstandardized Regression				Correlation		ξ
		B	Std.Error	t-test	Sig.	R	Sig	
Path 1	K_I → B_P	0,494	0,105	4,700	0,000	0,561	0,000	0,828
Path 2	K_I → KIK	0,529	0,121	4,384	0,000	0,711	0,000	0,604
	B_P → KIK	0,562	0,137	4,093	0,000	0,697	0,000	

Table 2: Direct, Indirect and Total Influence

No	Relationship Variables	Between	Effect		Effect Total
			Direct	indirect	
1	K_I → KIK		0,529		
2	K_I → B_P → KIK			0,494 * 0,562 = 0,278	0,529 + 0,278 = 0,807

f. Sobel test

Test of effect open innovation on sustainable performance with knowledge sharing of Batik MSMEs as a mediating

$$\begin{aligned}
 Sab &= \sqrt{b^2 S_a^2 + a^2 S_b^2 + S_a^2 S_b^2} \\
 Sab &= \sqrt{(0,494)^2 (0,137)^2 + (0,562)^2 (0,105)^2 + (0,137)^2 (0,105)^2} \\
 Sab &= \sqrt{(0,2440) (0,0188) + (0,3158)(0,0110) + (0,0188)(0,0110)} \\
 Sab &= \sqrt{(0,004580) + (0,003482) + (0,000207)} \\
 Sab &= \sqrt{0,008269} \\
 Sab &= 0,090936
 \end{aligned}$$

$$t - \text{test} = \frac{ab}{Sab} = \frac{0,562 \times 0,494}{0,090936} = \frac{0,277628}{0,090936} = 3,053$$

Value t-test much $3,053 > t_{50(\text{table})}=2,021$. knowledge sharing as role mediating affect open innovation on sustainable performance MSMEs Batik Surakarta. Therefore, knowledge sharing was a partial mediating variable between open innovation on sustainable performance.

g. results of analysis

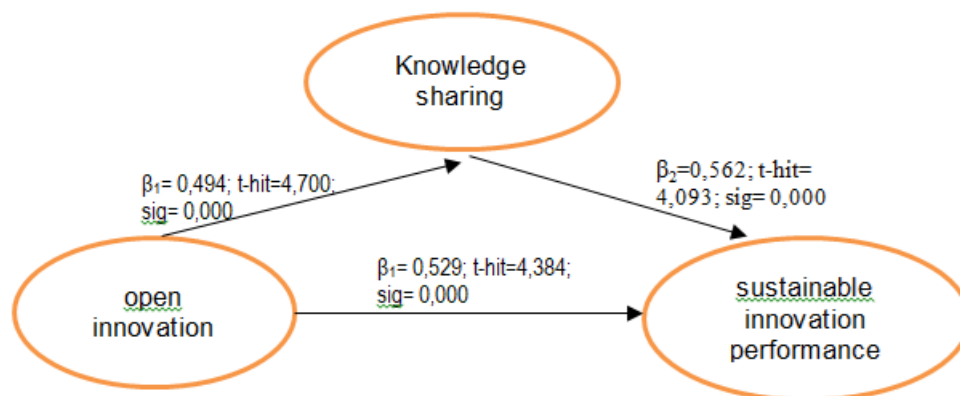


Figure 11. Path Analysis

4 CONCLUSION

Positive innovation openness was significant to knowledge sharing with a regression coefficient of 0.494 and significant at $0.000 < 0.05$. Innovation openness and knowledge sharing have a significant positive effect on the performance of sustainability innovation with regression coefficients of 0.529 and 0.562 with a significance of $0.000 < 0.05$ each. These findings are consistent with previous studies that show that open innovation has a positive relationship with sustainable innovation performance (Alfarobi & Hartono, 2022; Fadhilah &

KS, 2018) Some even state that open innovation is a new phenomenon that has an impact on innovation performance (Ahn et al., 2015). The findings in this study show that the performance of sustainable innovation is affected by the variable of open innovation. Another finding in this study shows that although open innovation has a significant effect on the performance of sustainable innovation, the existence of knowledge sharing is even more emphasized, as an intervening variable. This is shown through the Sobel test with a value $t\text{-test} = 3,053 > t_{50(\text{table})} = 2,021$. Knowledge sharing as role mediating affect open innovation on sustainable performance MSMEs Batik Surakarta, although the influence is more effective if it uses direct influence.

ACKNOWLEDGEMENTS

Thank you to all the respondents. Thank you also to LPPM UDB Surakarta for providing the mandate and opportunity for this research.

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