Jurnal Ekonomi Kreatif dan Manajemen Bisnis Digital
Volume 3 (4), 2025: 611 - 629
E-ISSN: 2961-8428

THE ROLE OF BEYOND CONNECTIVITY IN TRANSACTION COSTS ON THE SUCCESS OF MSME BUSINESS INCUBATION

Ni Komang Septia Noriska
Universitas Sebelas Maret, Surakarta, Indonesia
E-mail: nikomangseptian20@staff.uns.ac.id

Abstract

Ministry of Cooperatives and MSMEs data shows that Micro, Small, and Medium Enterprises (MSMEs) contribute significantly to Indonesia's economy, contributing approximately 61% of the total Gross Domestic Product (GDP) in 2022 and absorbing up to 97% of the workforce across various sectors. Along with the rapid development of information and communication technology (ICT), the concept of Beyond Connectivity emerges as a potential solution to overcome the challenge of high transaction costs in MSMEs. This concept not only connects businesses with consumers digitally but also key in improving operational efficiency and significantly reducing transaction costs. This research uses a quantitative approach with a true experimental method and 2x2x2 factorial design, involving 30 MSME participants working in technology and non-technology fields. The main focus is to explore the role of technology as a moderating variable that influences the relationship between transaction costs and MSME business success. The research results are expected to provide new empirical contributions that expand understanding of technology's strategic function in the MSME context, going beyond previous studies that mostly highlighted technology's direct impact on MSME operations without considering the interaction between technology and transaction costs. These findings open opportunities for developing more effective policies and business strategies to support MSME growth and competitiveness in the digital era. The originality of this research lies in the technology moderation approach to transaction costs in the MSME context and the use of strong factorial experimental design, providing new empirical contributions and practical implications for MSME development in the digital era.

Keywords: *Beyond Connectivity, Transaction Costs, Business Incubator, MSMEs Development*

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) play a strategic role in Indonesia's national economy, particularly in creating employment opportunities, driving innovation, and enhancing economic inclusion. Based on data from the Ministry of Cooperatives and Small and Medium Enterprises (2022), MSMEs contribute 61% to the national Gross Domestic Product (GDP) and absorb approximately 97% of the workforce across various sectors. This contribution positions MSMEs as the main pillar in maintaining economic stability, especially during volatile and uncertain conditions (Harahap & Tambunan, 2022). As stipulated in Law Number 20 of 2008, micro enterprises have maximum assets of IDR 50 million with maximum annual turnover of IDR 300 million, while small enterprises have assets between

Universitas Sebelas Maret, Surakarta, Indonesia
Ni Komang Septia Noriska
*E-mail: nikomangseptian20@staff.uns.ac.id

IDR 50 million to IDR 500 million with annual turnover reaching IDR 2.5 billion. Medium enterprises have assets between IDR 500 million to IDR 10 billion with annual turnover up to IDR 50 billion.

MSMEs provide significant contribution to Gross Domestic Product (GDP) and absorb more than 90% of the workforce in Indonesia. Additionally, this sector also plays an important role in promoting economic equality by supporting economic activities in regions with minimal large investments. The Ministry of Cooperatives and SMEs report (2022) states that MSMEs contribute around 60% to GDP and absorb more than 120 million workers. MSMEs also stimulate innovation, particularly in the creative sector and agribusiness, thus accelerating local-based economic transformation.

Besides being an employment absorber, MSMEs also play an important role in producing innovative products and services that meet local community needs (Warni, 2023). Entrepreneurial activities distributed across various regions contribute to financial inclusion and more equitable economic growth (Tambunan, 2019). Still, the great potential of MSMEs is often hindered by various structural and non-structural constraints. One of the main challenges is high transaction costs, which reduce efficiency and lower business success rates.

Transaction costs include various components, including information search costs, negotiation, contract drafting, as well as monitoring and agreement enforcement. For MSME actors, these costs become serious obstacles, especially amid market uncertainty and information asymmetry between business actors and business partners (Harahap & Tambunan, 2022). Limited access to market information, weak business networks, and complexity in contractual relationships often force MSMEs to allocate resources inefficiently. This is exacerbated by uneven digital and logistics infrastructure, especially in remote areas, thus limiting MSMEs' ability to optimize business opportunities.

In this context, the concept of Beyond Connectivity emerges as a promising alternative solution. Beyond Connectivity refers to the utilization of information and communication technology (ICT) that not only connects business actors with markets, but also strengthens internal efficiency and reduces transaction costs through business process digitalization. The use of e-commerce platforms, cloud-based financial management systems, and other automation software enables MSME actors to manage business activities more efficiently and in real-time (Bessant & Tidd, 2013). This digital technology opens access to broader markets, both domestic and global, without having to rely on physical expansion that requires large costs.

Moreover, Beyond Connectivity has the potential to become a moderating factor that weakens the negative impact of transaction costs on MSME performance. Digital technology not only acts as operational support tools, but also as strategic elements that can enhance competitiveness and support business sustainability (Senne, 2021). Nevertheless, empirical studies that specifically examine the role of technology as a moderator variable in the relationship between transaction costs and MSME success remain limited. Most research focuses more on the direct influence of technology on business performance, without exploring deeper the complex interactions between transaction costs, technology, and business success.

Although digital technology adoption by Small and Medium Enterprises (SMEs) in Indonesia experienced significant acceleration due to the COVID-19 pandemic, the role of technology as a moderator variable in reducing transaction costs has not been deeply researched, particularly in the context of digital SMEs post-pandemic. Previous studies show that digitalization in the early stages of the pandemic actually created challenges and less favorable results for SMEs, indicating that digital transformation has not been fully internalized effectively (Oikawa et al., 2025). However, in the long term, these negative impacts begin to diminish as digital strategies mature, contributing to the resilience and adaptability of small businesses.

Furthermore, technology adoption has been identified as an important factor that can moderate business resilience, especially when combined with government policy support and reduced compliance costs (Lestari et al., 2024). In the e-commerce context, technology and organizational elements have been proven to positively influence SME performance improvement through digital channel optimization (Maslichah & Diana, 2022). Nevertheless, the relationship between technology adoption and transaction cost efficiency remains complex and contextual. Many SMEs, particularly in non-urban areas, still face obstacles in the form of low digital literacy, infrastructure limitations, and resource constraints to implement technology optimally.

Thus, there is an important gap in the literature that needs to be bridged, namely the lack of empirical understanding about how digital technology can function as a moderator in reducing the negative impact of transaction costs on SME success. Further research is needed to comprehensively describe this dynamic, so it can become the basis for formulating evidence-based policy interventions and SME empowerment strategies. Therefore, more comprehensive research is needed to understand the extent to which technology within the

https://transpublika.co.id/ojs/index.php/JEKOMBITAL
E-ISSN: 2961-8428

Beyond Connectivity framework that can mitigate the negative impact of transaction costs and promote MSME success and sustainability in the digital era. Such research is not only academically relevant, but also has significant practical implications for formulating technology-based MSME empowerment policies.

LITERATURE REVIEW

Beyond Connectivity

The concept of Beyond Connectivity refers to the utilization of digital technology that not only functions as a connecting medium between business entities and consumers, but also as a catalyst in improving operational efficiency, product and service innovation, and cross-stakeholder collaboration. Unlike mere internet connectivity or social media presence, Beyond Connectivity emphasizes the importance of optimizing information and communication technology (ICT) such as cloud computing, big data analytics, and artificial intelligence (AI) in driving sustainable digital transformation, particularly for micro, small, and medium enterprises (MSMEs) (Bharadwaj et al., 2013).

Strategic ICT implementation enables MSMEs to overcome geographical barriers, reduce operational costs, improve customer service quality, and expand access to global markets. In this context, digitalization becomes a significant leverage factor in building business competitiveness in the digital economy era. As revealed by Schwab (2016), digitalization has broad and deep impacts on industry structure, including the MSME sector, through mechanisms of efficiency, disintermediation, and creation of new technology-based value.

The concept of Beyond Connectivity refers to the development of digital connectivity services that are not only limited to providing internet access, but also include the utilization of advanced technologies such as Internet of Things (IoT), artificial intelligence (AI), and cloud computing. This approach aims to produce integrated digital solutions capable of increasing business added value, strengthening operational efficiency, and driving customer engagement more optimally. This becomes increasingly relevant, particularly for Micro, Small, and Medium Enterprise (MSME) actors, who are required to compete in increasingly digitalized and dynamic markets (Hoontrakul, 2017).

Referring to Hoontrakul (2017), Beyond Connectivity includes various forms of digital services and technologies that play strategic roles in business capacity development, including:

https://transpublika.co.id/ojs/index.php/JEKOMBITAL
E-ISSN: 2961-8428

1. Internet of Things (IoT) Integration: Implementation of smart devices that enable remote operational monitoring and control, such as sensor-based energy management and security systems.
2. Artificial Intelligence (AI)-Based Automation: Use of AI technology in business automation processes, such as chatbots for customer service and predictive systems for equipment maintenance.
3. Cloud Computing Services: Data storage facilities and cloud-based collaborative platforms that support operational flexibility and efficiency, particularly at MSME scale.
4. Integrated Communication Systems: Unification of various communication channels such as voice, video, and messages in one efficient and easily accessible platform.
5. Cybersecurity Solutions: Development of adaptive and proactive digital security systems against cyber threats, including monitoring systems and automatic response to security incidents.

The implementation of the above elements enables deeper and more strategic digital transformation, making connectivity not just basic infrastructure, but as a foundation for innovation and business growth acceleration in the digital era.

Networked Readiness Index (NRI)

The Networked Readiness Index (NRI) was developed as an instrument to measure the level of readiness of a country or organization in utilizing digital technology to enhance competitiveness and drive innovation. NRI examines several strategic dimensions that become key indicators in digital transformation, including:

a) Policy and Regulatory Dimension: Policy environment that supports information and communication technology (ICT) becomes an important prerequisite in supporting the success of digital technology implementation. This includes digital rights protection regulations, cybersecurity policies, and legal frameworks that promote inclusive and sustainable e-commerce development.

b) Digital Infrastructure Dimension: Access to internet services, presence of 5G networks, and affordability and reliability of digital services significantly contribute to productivity improvement and operational efficiency. Adequate ICT infrastructure is the main foundation in accelerating technology adoption, particularly for small and medium enterprise (SME/MSME) actors.

https://transpublika.co.id/ojs/index.php/JEKOMBITAL
E-ISSN: 2961-8428

c) Technology Utilization Dimension: This aspect refers to the intensity level of ICT use in business, government, and society sectors. High levels of technology adoption positively correlate with innovation acceleration, cross-sector collaboration, and public service efficiency.

d) Social and Economic Impact Dimension: Digital technology utilization has broad impacts on improving social and financial inclusion, creating new jobs, and improving community quality of life. Specifically, digital technology implementation makes real contributions to service quality improvement in strategic sectors such as education, health, and social welfare.

Beyond Connectivity for MSME

For MSMEs, operational challenges such as limited capital and high transaction costs often become obstacles in business development. Beyond Connectivity helps MSMEs overcome these challenges through the implementation of internet and cloud-based technology, which can reduce transaction costs and accelerate business processes. For example, e-commerce and digital payment platforms enable small-scale businesses to operate more efficiently, expanding their market reach to international levels (Tidd & Bessant, 2020). Additionally, adoption of ICT technologies such as Customer Relationship Management (CRM) and Enterprise Resource Planning (ERP) helps MSMEs improve customer experience and manage resources more effectively. In the era of Industrial Revolution 4.0, technologies such as big data and AI also enable MSMEs to predict market trends and make faster and more accurate decisions.

Although Beyond Connectivity offers various strategic opportunities in driving digital transformation, its implementation still faces several significant challenges, especially among Micro, Small, and Medium Enterprises (MSMEs) located in areas with digital infrastructure limitations. Main constraints include limited internet access, high costs of implementing new technology, and low digital literacy among MSME actors. This condition causes most MSMEs to be unable to optimize technology utilization to expand business networks or improve their operational performance. This problem is exacerbated by minimal access to relevant and sustainable digital training and education (Kergroach & Bianchini, 2021).

Furthermore, technical challenges such as interoperability issues between devices and systems that are not always compatible also hinder efficient technology integration. Data security and privacy aspects also become critical concerns, given the increasingly complex cyber risks that are not easily managed by MSMEs with limitations in technical and financial

https://transpublika.co.id/ojs/index.php/JEKOMBITAL
E-ISSN: 2961-8428

resources. Other obstacles come from regulatory aspects, particularly those related to compliance with personal data protection policies that vary across regions (Hoontrakul, 2017).

Overcoming these gaps requires strategic collaboration between technology providers, regulators, and MSME actors in designing inclusive, affordable, and secure solutions. Several telecommunications service providers have initiated bundling service approaches, such as providing Internet of Things (IoT) platforms equipped with technical support and user training, to simplify technology implementation complexity and accelerate MSME adoption (Green & Sandbrook, 2021). The Beyond Connectivity concept not only aims to create new revenue sources, but also demands strategic and long-term oriented business planning.

Therefore, both service providers and MSME actors need to conduct capacity gap mapping and systematically develop digitalization roadmaps. The complexity of integrating cutting-edge technologies such as artificial intelligence (AI) and big data becomes a particular challenge, especially due to limited workforce with competencies in these fields. To bridge this gap, synergy between government, private sector, and educational institutions is needed in providing training programs, incentives, and financial support to MSMEs committed to digital transformation. Several countries have even adopted affirmative policies in the form of subsidies and digital literacy programs to encourage accelerated technology adoption in the MSME sector.

Transaction Cost Economics (TCE)

Transaction Cost Economics is a theoretical framework developed by Ronald Coase and subsequently refined by Oliver Williamson, which aims to explain how transaction costs affect economic decision-making processes and organizational structure. In his essay titled "The Nature of the Firm", Coase (1993) argued that besides production costs, economic interactions also generate other costs such as information search costs, contract negotiation, and monitoring and agreement enforcement.

Williamson (1998) expanded this concept by dividing transaction costs into two main categories: ex-ante costs, which include costs before transactions such as partner search and contract formulation; and ex-post costs, namely costs arising after transactions occur, such as contract implementation monitoring and dispute resolution. Organizational efficiency, according to the TCE perspective, can be achieved through mechanisms capable of reducing both types of costs.

https://transpublika.co.id/ojs/index.php/JEKOMBITAL
E-ISSN: 2961-8428

In the context of Micro, Small, and Medium Enterprises (MSMEs), transaction costs often appear in the form of efforts to search for and select suppliers, conduct price negotiations with clients, and ensure product and service quality remain maintained. Therefore, effective transaction cost management becomes crucial in improving MSME competitiveness and business sustainability.

Several strategies that MSMEs can apply to minimize transaction costs include: (1) utilizing digital technology to accelerate information search and transaction processes; (2) using standard contracts to simplify negotiation processes; and (3) establishing strategic partnerships with supporting institutions such as business incubators and industry associations. Thus, MSMEs can not only improve operational efficiency, but also strengthen adaptive capacity in facing market dynamics and business environment uncertainty.

Role of Business Incubators in Reducing MSME Transaction Costs

Business incubators have a crucial role in helping MSMEs reduce transaction costs, especially in the early stages of business development. Incubators provide access to business networks, market information, and resources such as relevant mentors and training. With support from incubators, MSMEs can reduce information search costs and accelerate negotiation processes with potential partners. Additionally, incubators also provide standard contract frameworks that help reduce monitoring and contract enforcement costs for business actors.

Challenges Faced by MSMEs and Business Incubation Efforts

Despite playing a major role in the economy, MSMEs face various challenges, such as limited access to information, markets, and technology. Information access often becomes a constraint due to limited networks and knowledge related to market trends or latest regulations. Additionally, difficult market access also hinders MSME development, especially for business actors in remote areas with limited physical and digital connectivity. Technology access becomes another challenge because many MSMEs have not been able to fully utilize digital platforms and e-commerce effectively to expand their business reach.

Business incubation is one effective solution to overcome these challenges. Incubators provide mentoring, training, and access to business networks, which can help MSMEs improve their capacity and competitiveness. Tambunan (2012) shows that business incubation can increase MSME success opportunities by up to 40%, especially with access to experienced mentors and assistance in technology utilization. Additionally, incubators also

https://transpublika.co.id/ojs/index.php/JEKOMBITAL
E-ISSN: 2961-8428

help build stronger business structures through mature business plan development and administrative process simplification.

Business incubation not only supports MSMEs in early development stages but also helps them adapt to market dynamics. Incubation programs focus on improving management skills and developing product innovations relevant to consumer needs. By utilizing business networks and investors provided by incubators, MSMEs can expand markets and increase financing opportunities. Furthermore, incubators also provide access to latest technology and e-commerce platforms, which greatly help MSMEs face the era of business digitalization.

Research Framework

Research on transaction costs in the context of micro, small, and medium enterprises (MSMEs) is rooted in Transaction Cost Economics (TCE) developed by Williamson (1985). This theory emphasizes that transaction costs, including information search costs, negotiation, and contract monitoring which significantly influence organizational decisions and operational efficiency.

In the MSME context, high transaction costs often become obstacles in conducting business activities optimally. When MSMEs face large transaction costs, whether due to complex bureaucracy, institutional voids, or limited information access, their operational efficiency and flexibility will be disrupted. This impacts decreased business performance, including profit, productivity, and asset returns (Fidow et al., 2022).

Furthermore, high transaction costs can hinder long-term MSME growth. Limitations in establishing partnerships, expanding distribution networks, and penetrating new markets will increase when coordination and monitoring costs rise. Masroor et al. (2023) state that good transaction governance structure has the potential to reduce this burden, enabling MSMEs to grow despite being in unsupportive environments.

Conversely, effective transaction cost management through digitalization strategies and good governance has been proven to improve performance and drive MSME growth. Technologies such as e-commerce and CRM can reduce information costs and accelerate transactions, ultimately improving efficiency and market expansion (Rahayu & Day, 2017).

https://transpublika.co.id/ojs/index.php/JEKOMBITAL
E-ISSN: 2961-8428

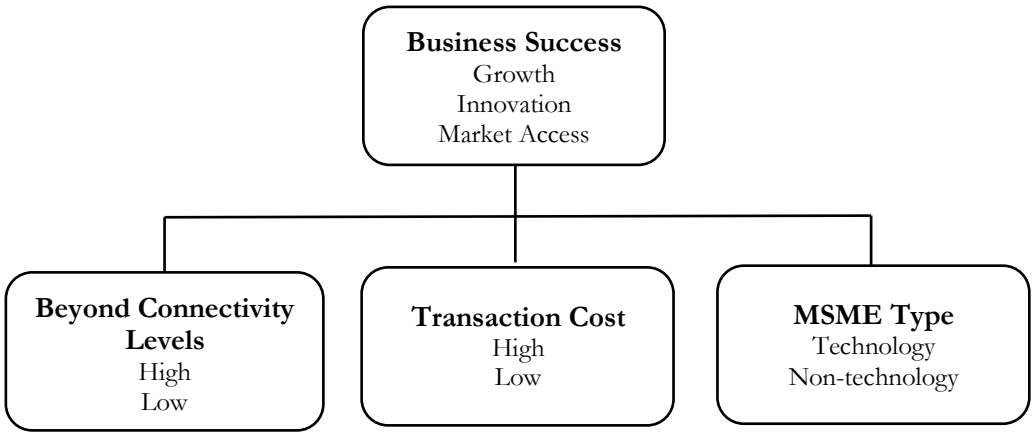

Figure 1. Research Framework

Hypothesis

1. Low transaction costs enable MSMEs to allocate their resources more efficiently, thus focusing on innovation and product development. Research shows that transaction cost reduction through incubation support can increase MSME success opportunities (Tambunan, 2012; Williamson, 1998).

H1: Low transaction costs will increase MSME business incubation success.

2. High levels of Beyond Connectivity provide fast information access and efficient business interactions, thus reducing transaction costs that usually burden MSMEs. By utilizing digital technology, MSMEs can improve their operational efficiency and market competitiveness (Schwab, 2016).

H2: High levels of Beyond Connectivity will reduce the negative impact of transaction costs on incubation success

3. Technology MSMEs tend to be more adaptive and innovative, utilizing technology to accelerate growth and broader market access. Research shows that technology-based MSMEs have greater success potential in incubation compared to non-technology MSMEs (Schwab, 2016).

H3: There are differences in incubation success between technology and non-technology MSMEs, where technology MSMEs show higher success

RESEARCH METHODS

Research Approach and Type

This research uses a quantitative quasi-experimental approach with a 2x2x2 factorial design to test the influence of three independent variables on one dependent variable. This research is classified as factorial experiment as it involves combinations of three factors:

https://transpublika.co.id/ojs/index.php/JEKOMBITAL
E-ISSN: 2961-8428

Beyond Connectivity Level (high/low), Transaction Costs (high/low), and MSME Type (technology/non-technology).

Population and Sample

The population in this research consists of all MSME actors in Surakarta City area. The sampling technique used is probability sampling with random sampling method, considering variations in business sectors and technology adoption levels. The sample size is determined as 30 MSMEs, proportionally divided into 8 experimental groups (cells) according to the 2x2x2 design. Each group will consist of approximately 3–4 MSMEs to maintain balance between cells.

Research Variables and Operationalization

The variables in this research are as follows:

Table 1. Operational Definitions

Variable	Definition	Indicators	Scale	Category
Independent Variables				
Beyond Connectivity	The role of information and communication technology in supporting MSME operations. Measured in two levels (High/Low) to see its impact on efficiency and market expansion	- Use of digital platforms - Access to real-time data and communication	Ordinal	High / Low
Transaction Costs	Involves costs such as information search, negotiation, and monitoring. These costs are differentiated into two categories (High/Low) and tested to see their influence on MSMEs' ability to operate effectively	- Information search costs - Negotiation costs - Monitoring costs	Ordinal	High / Low
MSME Type	MSME types are divided into two categories: technology-based (technology MSMEs) and non-technology (non-technology MSMEs), to understand whether technological innovation provides more significant advantages	MSMEs based on digital products or application-based services vs conventional MSMEs	Nominal	Technology / Non-Technology
Dependent Variable				
MSME Incubation Success	The level of achievement of micro, small, and medium enterprise (MSME) performance that has participated in business incubation processes, characterized by significant progress in business growth aspects, innovation capability, and market access expansion. This success reflects the effectiveness of incubation support in strengthening MSME competitiveness and business sustainability.	- Revenue and customer growth - New product/service innovation - Market access and network expansion	Likert 1–5	Total Score per Dimension

https://transpublika.co.id/ojs/index.php/JEKOMBITAL
E-ISSN: 2961-8428

Table 2. 2x2x2 Experimental Design for Research

Beyond Connectivity	Transaction Costs	MSME Type	Incubation Success (Growth, Innovation, Market Access)
High	High	Technology	Cell 1
High	High	Non-Technology	Cell 2
High	Low	Technology	Cell 3
High	Low	Non-Technology	Cell 4
Low	High	Technology	Cell 5
Low	High	Non-Technology	Cell 6
Low	Low	Technology	Cell 7
Low	Low	Non-Technology	Cell 8

Research Instruments

The instrument used is a closed questionnaire based on Likert scale (1–5). Content validity is tested through expert judgment, while instrument reliability is tested using Cronbach's Alpha.

The experimental design in this research uses a 2x2x2 model to test combinations of three independent variables: Beyond Connectivity level, transaction costs, and MSME type. Each cell in the above table represents a specific experimental condition combination. This research aims to measure the combined impact of each independent variable on MSME incubation success. Each condition combination will be tested to determine the extent to which these factors influence MSME success.

1. Cell 1 and Cell 3: Technology MSMEs with high Beyond Connectivity levels may show more significant growth and innovation compared to MSMEs in other cells, especially if transaction costs are low.
2. Cell 2 and Cell 4: Non-technology MSMEs may experience limitations in market access, despite being in an ecosystem with high connectivity.
3. Cell 5 and Cell 7: Low Beyond Connectivity levels will hinder MSME success, especially if transaction costs are high and business types are less innovative.

Data Collection Techniques

Data collection in this research will be conducted through surveys using questionnaires systematically designed to measure MSME perceptions related to Beyond Connectivity, transaction costs, and incubation success. This research aims to involve 30 MSMEs randomly selected from various sectors in Surakarta City area, ensuring representativeness of the resulting data.

https://transpublika.co.id/ojs/index.php/JEKOMBITAL
E-ISSN: 2961-8428

RESULTS AND DISCUSSION

Research Results

Normality Test

Based on the normality test results conducted on variables in the dataset, it can be concluded that the data meets normal distribution assumptions. This normality testing was conducted using two statistical approaches, namely Kolmogorov-Smirnov and Shapiro-Wilk tests. The Kolmogorov-Smirnov test results show a significance value of 0.200, while the Shapiro-Wilk test produces a significance value of 0.790. Both values exceed the significance level $\alpha = 0.05$, so there is insufficient evidence to reject the null hypothesis that data is normally distributed. The Shapiro-Wilk test, known to be more sensitive to small sample sizes, provides reinforcement to the Kolmogorov-Smirnov test results.

Table 3. Normality Test Results

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
Standardized Residual for KB	0.115	30	0.200*	0.979	30	0.790

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

With the fulfillment of this normality assumption, parametric statistical analyses such as linear regression, ANOVA, or t-tests can be conducted validly and reliably. This is important considering the validity of statistical inference in parametric methods heavily depends on normal distribution of the analyzed data.

Homogeneity Test

Based on homogeneity of variance test results using Levene's Test, it can be concluded that the homogeneity of variance assumption for MSME Business Incubation Success variable has been fulfilled. Levene's Test is a statistical procedure aimed at testing the null hypothesis (H_0) that variance between groups is the same, so there are no significant differences in data distribution of each group. In this testing, four approaches were used: based on mean, median, median with degree of freedom adjustment, and trimmed mean. These four approaches produce significance values of 0.359, 0.506, 0.510, and 0.387 respectively. All these values exceed the established significance level of 0.05. Therefore, there is insufficient evidence to reject the null hypothesis, indicating that variance between groups can be considered homogeneous.

https://transpublika.co.id/ojs/index.php/JEKOMBITAL
E-ISSN: 2961-8428

Table 4. Homogeneity Test Results

Levene's Test of Equality of Error Variances[a,b]					
		Levene Statistic	**df1**	**df2**	**Sig.**
Success	Based on Mean	1.162	5	22	0.359
	Based on Median	0.887	5	22	0.506
	Based on Median and with adjusted df	0.887	5	18.266	0.510
	Based on trimmed mean	1.103	5	22	0.387

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.
a. Dependent variable: Success
b. Design: Intercept + TBc + BT + JU + TBc * BT + TBc * JU + BT * JU + TBc * BT * JU

The fulfillment of this assumption is an important prerequisite in using parametric statistical analysis techniques, such as analysis of variance (ANOVA) or linear regression, so that obtained results are valid, unbiased, and can be interpreted reliably. Thus, further analyses dependent on this assumption can be done with high confidence in result accuracy.

Hypothesis Testing

Analysis results using Tests of Between-Subjects Effects statistical approach show that the constructed model can explain approximately 29.7% of variation in Business Incubation Success (R Squared = 0.297). However, after adjustment for the number of predictors in the model, the Adjusted R Squared value drops significantly to 0.074, indicating that the actual contribution of variables in the model to incubation success is still limited. This reflects that most variability in success is likely influenced by other factors outside the studied model.

Table 5. Hypothesis Test Results

Tests of Between-Subjects Effects					
Dependent Variable: Success					
Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Corrected Model	373.269[a]	7	53.324	1.329	0.284
Intercept	37378.352	1	37378.352	931.709	0.000
TBc	261.394	1	261.394	6.516	0.018
BT	34.762	1	34.762	0.866	0.362
JU	1.717	1	1.717	0.043	0.838
TBc * BT	2.819	1	2.819	0.070	0.793
TBc * JU	106.740	1	106.740	2.661	0.117
BT * JU	66.805	1	66.805	1.665	0.210
TBc * BT * JU	5.055	1	5.055	0.126	0.726
Error	882.598	22	40.118		
Total	62186.000	30			
Corrected Total	1255.867	29			
a. R Squared = 0.297 (Adjusted R Squared = 0.074)					

The very high F value at Intercept of 931.709 with significance 0.000 indicates that the basic average of Business Incubation Success is statistically significant. The only variable

https://transpublika.co.id/ojs/index.php/JEKOMBITAL
E-ISSN: 2961-8428

showing meaningful influence is Beyond Connectivity Level, with F value of 6.516 and significance level 0.018 ($p < 0.05$). This finding confirms that connectivity aspects beyond basic digital technology functions have an important role in driving incubation process success. Conversely, other variables such as Transaction Costs and MSME Type do not show statistically significant influence. Relatively low F values and significance levels exceeding 0.05 indicate that cost differences or micro, small, and medium enterprise categories do not become primary determinants in incubation success in the studied context.

Analysis of combinations or interactions between variables also does not show significant results. Interactions between Beyond Connectivity Level with Transaction Costs, Beyond Connectivity Level with MSME Type, or three-variable interactions simultaneously, all have significance values above conventional thresholds. This means there are no significant synergistic effects between variables in explaining incubation success. Thus, it can be concluded that incubation program success is more influenced by how far business entities can utilize connectivity strategically, not merely by cost aspects or business categories. The low total model contribution to success variability also indicates the need for further exploration of other more relevant variables, whether structural, managerial, or contextual in the incubation ecosystem.

Discussion

Based on hypothesis testing results using Tests of Between-Subjects Effects for the dependent variable MSME Business Incubation Success, several important points can be concluded regarding the influence of independent variables Beyond Connectivity Level (TBc), Transaction Costs (BT), and MSME Type (JU) on MSME Business Incubation Success. This testing also involves interactions between these variables. From the obtained results, R Squared value of 0.297 shows that the model can explain approximately 29.7% of variability in MSME Business Incubation Success. Meanwhile, Adjusted R Squared value of only 0.074 indicates that the actual contribution of predictor variables, after adjustment for the number of predictors used, is relatively low. In other words, although this model has the ability to explain variability, many other factors not accommodated in the model also influence MSME Business Incubation Success (Prasasti & Triyanto, 2023)

Furthermore, analysis results show that Intercept is highly significant with F value of 931.709 and significance 0.000. This indicates that generally, the average MSME Business Incubation Success already shows significant value even without influence from independent variables. The independent variable Beyond Connectivity Level (TBc) has significant

https://transpublika.co.id/ojs/index.php/JEKOMBITAL
E-ISSN: 2961-8428

influence on the dependent variable MSME Business Incubation Success, with F value of 6.516 and significance value 0.018 which is smaller than 0.05. This shows that there is a significant relationship between TBc and Success, where increased Beyond Connectivity Level has positive contribution to success. Beyond Connectivity Level describes how far a business or MSME has exceeded basic connectivity limits in utilizing technology or information, which apparently has real influence on business success achievement (Nurwani & Safitri, 2019).

Conversely, Transaction Costs (BT) and MSME Type (JU) variables do not show statistical significance in influencing MSME Business Incubation Success individually. BT variable has F value of 0.866 with significance 0.362, while JU variable has F value of 0.043 with significance 0.838. Both significance values are larger than the 0.05 threshold, meaning both variables are not strong enough to predict or explain changes in MSME Business Incubation Success independently. Transaction Costs, despite being important in business operational context, may not have significant impact due to external factors such as market variations or policies that can balance the influence of these costs. Similarly, MSME type (whether small, micro, or medium enterprise category) apparently does not become the main factor determining success level in this context (Fauzi, 2020).

Besides individual influence analysis, interactions between independent variables were also examined to see whether combinations of these variables can produce significant influence on MSME Business Incubation Success. However, results show that no interaction between variables has significant influence. For example, interaction between TBc * BT has F value of 0.070 with significance 0.793, showing that interaction between Beyond Connectivity Level and Transaction Costs has no meaningful effect on Success. Similarly with interactions TBc * JU (F = 2.661, Sig. = 0.117), BT * JU (F = 1.665, Sig. = 0.210), and TBc * BT * JU (F = 0.126, Sig. = 0.726), all show significance values greater than 0.05, meaning there are no interactions among combinations of these variables that can significantly influence success (Prasetya et al., 2021)

These results show that although Beyond Connectivity Level plays an important role in determining success, other variables such as Transaction Costs and MSME Type do not provide significant influence, either individually or through interactions. With low Adjusted R Squared value, this indicates that the used model is not yet good enough in explaining MSME Business Incubation Success variability, and there are other more dominant factors not yet included in this model. These factors could include aspects such as product quality,

marketing strategy, customer relationships, or even external factors such as economic conditions and government support. Therefore, further exploration is needed to identify additional factors that can contribute to MSME success. Deeper research may need to include other variables more related to operational, marketing, or managerial aspects of MSMEs to obtain a more comprehensive picture of factors influencing success.

Thus, these results emphasize the importance of a more holistic approach in understanding MSME success. Although technology and connectivity (Beyond Connectivity Level) are proven significant, success is not only determined by these aspects. Conversely, approaches that include various dimensions, both internal and external, are needed to obtain more complete understanding and to design more effective interventions in improving MSME success in the future.

CONCLUSION

Based on the findings of this research, there are several important implications both practically and theoretically. Practically, the integration of Beyond Connectivity technology becomes a crucial strategy that needs to be optimized by business incubation actors and MSME managers in Surakarta City. The implementation of technology that goes beyond basic connectivity can improve operational efficiency, expand market reach, and minimize barriers caused by high transaction costs. Therefore, business incubators and local governments are advised to facilitate training, provision of technological infrastructure, and comprehensive digitalization support for MSMEs so that the potential of Beyond Connectivity can be utilized optimally.

Theoretically, this research enriches the literature regarding factors that influence the success of MSME business incubation, particularly affirming the importance of Beyond Connectivity as a key variable that has significant impact. These findings encourage the development of more holistic future research models by incorporating other variables such as product quality, marketing strategies, and external environmental factors. This also opens opportunities for follow-up studies to test the effectiveness of Beyond Connectivity in various geographical contexts and different MSME business sectors.

Furthermore, the research results show that transaction cost factors and types of MSMEs are not always dominant variables in the context of business incubation success, so policy makers and business practitioners need to reassess intervention priorities that have been focused on these aspects. Thus, a deeper understanding of the role of Beyond Connectivity can serve as the foundation for developing more effective policies and

https://transpublika.co.id/ojs/index.php/JEKOMBITAL
E-ISSN: 2961-8428

incubation programs, which in turn can accelerate the digital transformation process and improve MSME competitiveness in the current digital economy era.

REFERENCES

Bessant, J., & Tidd, J. (2013). *Managing innovation: integrating technological, market and organizational change*. Wiley.

Bharadwaj, A., El Sawy, O. A., Pavlou, P. A., & Venkatraman, N. v. (2013). Digital business strategy: toward a next generation of insights. *MIS Quarterly*, *37*(2), 471–482.

Coase, R. H. (1993). The nature of the firm (1937). *Economica*, *4*, 396–405.

Fauzi, N. A. (2020). Pengaruh Karakteristik Wirausaha, Modal Usaha dan Penggunaan Informasi Akuntansi terhadap Keberhasilan UMKM Industri Shuttlecock di Desa Lawatan Kecamatan Dukuhturi Kabupaten Tegal. *Skripsi, Universitas Pancasakti Tegal*, 1–114.

Fidow, A. N., Odoyo, S., & Wambalaba, F. W. (2022). The Effect of Transaction Cost on the Performance of SMEs in Kenya. *International Journal of Accounting, Finance and Risk Management*, *7*(1), 11.

Green, A., & Sandbrook, C. (2021). Beyond connectivity: An exploration of expert perspectives on conservation corridors. *Geoforum*, *127*, 257–268.

Harahap, I., & Tambunan, K. (2022). The Effect of SBI and SBIS as Monetary Instruments on the Indonesian Economy. *Share: Jurnal Ekonomi Dan Keuangan Islam*, *11*(1), 1–19.

Hoontrakul, P. (2017). *Economic transformation and business opportunities in Asia*. Springer.

Kergroach, S., & Bianchini, M. M. (2021). *The digital transformation of SMEs*. OECD Publishing.

Lestari, E. D., Abd Hamid, N., Shamsuddin, R., Kurniasari, F., & Yaacob, Z. (2024). Investigating the factors of SMEs' business resilience in the post-pandemic crisis of COVID-19 with technology adoption as a quasi-moderator: a multigroup analysis of Indonesian and Malaysian SMEs. *Cogent Business & Management*, *11*(1), 2301135.

Maslichah, M., & Diana, N. (2022). Connecting the dots: Linking technological, individual, organizational and environmental factors towards SMEs performance with the mediation role of e-commerce adoption. *JEMA: Jurnal Ilmiah Bidang Akuntansi Dan Manajemen*, *19*(2), 175–198.

Masroor, I., Tasneem, S., Alam, M. N., Hossen, S. S., Nabi, M. N. U., & Ghosh, A. (2023). Transaction governance structure, institutional voids and transaction efficiency: An analysis of small and medium-sized enterprises in emerging markets. *Business Strategy &*

Development, *6*(4), 724–738.

Nurwani, N., & Safitri, A. (2019). Pengaruh PIA Terhadap Keberhasilan Usaha Kecil Menengah (Studi Pada Sentra Dodol di Kec. Tanjung Pura). *Liabilities (Jurnal Pendidikan Akuntansi)*, *2*(1), 37–52.

Oikawa, K., Iwasaki, F., Sawada, Y., & Shinozaki, S. (2025). Unintended Consequences of Business Digitalization Among MSMEs During the COVID-19 Pandemic: The Case of Indonesia. *Asian Economic Papers*, *24*(1), 98–122.

Prasasti, A. D., & Triyanto, E. (2023). The influence of understanding, application and utilization of accounting information system on the performance of smes in Surakarta city (Case Study on Convection SMEs). *Kewirausahaan Dan Bisnis*, *51*(1), 31–41.

Prasetya, A. Y., Sugiharti, S., & Fadhila, Z. R. (2021). Pemanfaatan Media Sosial Dalam Upaya Meningkatkan Penjualan Produk UMKM Desa Boja. *Budimas : Jurnal Pengabdian Masyarakat*, *3*(1), 102–108. https://doi.org/10.29040/budimas.v3i1.1628

Rahayu, R., & Day, J. (2017). E-commerce adoption by SMEs in developing countries: evidence from Indonesia. *Eurasian Business Review*, *7*, 25–41.

Schwab, K. (2016). *The Fourth Industrial Revolution*. World Economic Forum.

Senne, F. (2021). Para além da conectividade: Internet para todas as pessoas. *Panorama Setorial Da Internet, São Paulo*, *13*(2), 1–10.

Tambunan, T. (2012). UMKM Indonesia. *Buku Dosen-2014*.

Tambunan, T. (2019). Women entrepreneurship in Asian developing countries: Their development and main constraints. *African Journal of Gender and Women Studies*, *4*(5), 1. https://www.internationalscholarsjournals.com/articles/women-entrepreneurship-in-asian-developing-countries-their-development-and-main-constraints.pdf

Tidd, J., & Bessant, J. R. (2020). *Managing innovation: integrating technological, market and organizational change*. John Wiley & Sons.

Warni, A. R. (2023). Analysis of The Utilization of Shopeefood Features on The Revenue of Micro, Small, and Medium-Sized Culinary Businesses in South Jakarta. *JURNAL EKONOMI KREATIF DAN MANAJEMEN BISNIS DIGITAL*, *1*(3). https://doi.org/10.55047/jekombital.v1i3.451

Williamson, O. E. (1998). Transaction cost economics: how it works; where it is headed. *De Economist*, *146*, 23–58.