

Continuous Improvement and Operational Performance in SMEs: The Role of Organizational Agility and Business Excellence

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Abstract: Background: Continuous improvement is increasingly important for small and medium-sized enterprises (SMEs) seeking to enhance operational performance in dynamic and competitive environments. However, the mechanisms through which continuous improvement contributes to operational performance remain insufficiently understood. This study examined the relationship between continuous improvement and operational performance and investigated the mediating roles of organizational agility and business excellence.

Methods: A quantitative cross-sectional study was conducted among 312 employees and managers from SMEs. Data were collected using standardized measures of continuous improvement, organizational agility, business excellence, and operational performance. The hypothesized relationships were examined using partial least squares structural equation modeling (PLS-SEM) with 5,000 bootstrap resamples.

Results: Continuous improvement significantly predicted organizational agility ($\beta = .61, t = 13.72, p < .001$) and business excellence ($\beta = .69, t = 18.64, p < .001$). Organizational agility ($\beta = .34, t = 7.26, p < .001$) and business excellence ($\beta = .48, t = 10.83, p < .001$) significantly predicted operational performance. Continuous improvement also had a significant direct effect on operational performance ($\beta = .19, t = 4.21, p < .001$). Organizational agility significantly mediated the relationship between continuous improvement and operational performance ($\beta = .207, 95\% \text{ CI } [.150, .270]$), as did business excellence ($\beta = .331, 95\% \text{ CI } [.266, .403]$). The model explained 67.4% of the variance in operational performance.

Conclusion: Continuous improvement enhances SME operational performance both directly and indirectly through organizational agility and business excellence. Business excellence represents the stronger mediating mechanism.

Keywords: Continuous Improvement; Organizational Agility; Business Excellence; Operational Performance; Small and Medium-Sized Enterprises

Introduction

Small and medium-sized enterprises (SMEs) play a central role in employment creation, economic development, innovation, and regional competitiveness (Endris & Kassegn, 2022). However, SMEs operate under conditions that are often characterized by limited financial resources, constrained human capital, technological uncertainty, changing customer expectations, and intense competitive pressure (Manzoor, et al., 2021). These conditions make sustained operational performance particularly challenging. Unlike large organizations, SMEs may have fewer resources available to absorb inefficiencies, production delays, quality problems, or fluctuations in demand (Erdin & Ozkaya, 2020; Monadi, 2025). Consequently, the ability to continuously improve organizational

processes and maintain high levels of operational effectiveness is increasingly important for SME survival and competitiveness (Ongbali, et al., 2024).

Operational performance refers to an organization's ability to execute its core activities efficiently and effectively while achieving desirable outcomes in areas such as quality, cost, productivity, delivery reliability, flexibility, and responsiveness (Alolayyan & Alyahya, 2023; Monadi, 2025). Although financial indicators remain important, operational performance represents a more immediate reflection of how effectively organizational resources and processes are being managed (Wong & Ngai, 2023). For SMEs, improvements in operational performance can contribute to lower costs, improved product and service quality, faster delivery, greater customer satisfaction, and stronger competitive positioning (Wongsin, et al., 2025). Identifying organizational mechanisms that strengthen operational performance is therefore an important concern for both researchers and SME managers.

One organizational practice that may play a fundamental role in improving operational performance is continuous improvement (Rondeau & Wagar, 2002). Continuous improvement refers to the systematic and ongoing effort to enhance organizational processes, products, services, and work practices (Rotea, et al., 2023). Rather than relying on occasional large-scale changes, continuous improvement emphasizes incremental and cumulative improvements based on regular problem identification, employee participation, process evaluation, experimentation, and organizational learning (Hu, et al., 2025; Monadi, 2025). This approach can be particularly suitable for SMEs because it does not necessarily require substantial investments in new infrastructure or technology. Instead, it encourages organizations to identify ways of making better use of existing resources.

The theoretical relationship between continuous improvement and operational performance can be explained through several mechanisms (Naughton, et al., 2024). Continuous improvement allows organizations to identify inefficiencies, eliminate unnecessary activities, reduce errors, standardize effective processes, and learn from operational problems (Daudelin, et al., 2015). Over time, these incremental improvements can accumulate into substantial gains in productivity, quality, cost efficiency, delivery performance, and flexibility (Endalamaw, et al., 2024). Furthermore, continuous improvement encourages employees to become active participants in organizational problem solving, potentially increasing both process knowledge and organizational commitment to performance enhancement (Brancalion, et al., 2024).

However, the effect of continuous improvement on operational performance may not always be direct. An organization can implement improvement initiatives without necessarily becoming more responsive or operationally effective (Tyler & Glasgow, 2021). The effectiveness of continuous improvement may depend on whether the organization develops broader capabilities that allow it to translate improvement activities into timely organizational responses (Viswanath & Agha, 2023). In this context, organizational agility may represent an important mechanism linking continuous improvement to operational performance.

Organizational agility refers to an organization's ability to rapidly sense changes in its environment, make timely decisions, and reconfigure its resources and processes in response to emerging opportunities and threats (Ludviga & Kalvina, 2023; Budiman, et al., 2023). In contemporary business environments, operational efficiency alone may not be sufficient to sustain performance (Werder & Richter, 2022). SMEs must also be capable of adjusting processes, responding to customer requirements, adopting new technologies, modifying products and services, and reallocating resources when environmental conditions change (Zhang, et al., 2024). Thus, organizational agility may enable SMEs to convert continuous improvement activities into more effective operational responses.

The relationship between continuous improvement and organizational agility is conceptually important (Değirmenci Öz, et al., 2026). Continuous improvement creates routines for identifying problems, evaluating processes, experimenting with alternatives, and learning from outcomes (Atalla, et al., 2024). These routines can strengthen the organization's ability to detect changes and respond to them. An SME that continuously examines its processes may be better positioned to identify emerging operational constraints before they become major problems (Tolf, et al., 2015). Similarly, employees accustomed to participating in improvement initiatives may be more prepared to adapt when customer requirements or competitive conditions change. Continuous improvement can therefore function as a foundation for developing organizational agility (Bahrami, et al., 2016).

Organizational agility, in turn, may enhance operational performance (Cha & Park, 2023). Agile organizations can respond more rapidly to changes in demand, supply conditions, customer expectations, and technological developments (Xu, et al., 2024). Such responsiveness can improve delivery reliability, process flexibility, resource utilization, and customer service (Ramzuni, et al., 2026). For SMEs, agility may be especially valuable because smaller organizations can potentially exploit flexibility as a competitive advantage (Park & Cho, 2022). Nevertheless, flexibility without systematic improvement may lead to inconsistency and inefficiency. The combination of continuous improvement and agility may therefore be more beneficial than either capability independently.

In addition to organizational agility, business excellence represents another potentially important factor in explaining operational performance (Parast & Safari, 2022). Business excellence encompasses a comprehensive organizational orientation toward achieving superior and sustainable performance through effective leadership, strategic management, customer focus, people development, process management, learning, innovation, and continuous improvement (Liu & Lai, 2025; Tariq, et al., 2021). Unlike narrow performance-management approaches, business excellence considers organizational performance as the outcome of interconnected organizational capabilities and management practices (Kamal, 2023).

The relationship between continuous improvement and business excellence is particularly strong (Cerase, et al., 2025). Continuous improvement is commonly regarded as an essential component of excellence-oriented management because organizations cannot achieve sustainable excellence without continuously evaluating and improving their processes and outcomes (McCalman, et al., 2018). Continuous improvement can support business excellence by encouraging systematic learning, employee involvement, customer responsiveness, evidence-based decision-making, and process optimization. Thus, organizations with stronger continuous improvement practices may be more likely to develop the comprehensive management capabilities associated with business excellence (Juarez-Tarraga, et al., 2021).

Business excellence may also have a direct relationship with operational performance (Kulkarni, et al., 2021). Organizations committed to business excellence typically establish systematic processes for managing resources, monitoring performance, satisfying customers, developing employees, and improving organizational activities (Parast & Safari, 2022; Van Looy & Shafagatova, 2016). These practices can contribute to improvements in quality, productivity, cost management, delivery, and operational reliability. Business excellence therefore represents a broader organizational framework within which continuous improvement can generate measurable performance outcomes (Drago, et al., 2023).

Importantly, organizational agility and business excellence may operate through complementary mechanisms (Alviani, et al., 2024). Organizational agility emphasizes speed, responsiveness, and adaptation, whereas business excellence emphasizes systematic management, consistency, learning, and sustained performance (Ongesa Nyamboga, 2025). At first glance, these orientations may appear to represent different organizational priorities. However, they can be mutually reinforcing (Chughtai, et al., 2023). Agility enables SMEs to respond quickly to environmental changes, while business excellence provides the systems and management discipline needed to ensure that such responses contribute to sustainable performance rather than producing short-term or uncoordinated changes (Kludacz-Alessandri, et al., 2025).

The integration of these constructs is particularly relevant to SMEs. Resource constraints may prevent SMEs from simultaneously pursuing multiple large-scale improvement initiatives (Durrani, et al., 2024). Consequently, managers need organizational approaches that create synergistic benefits. Continuous improvement can serve as a foundational capability, organizational agility can enable rapid adaptation, and business excellence can provide a broader framework for integrating improvement activities into sustainable organizational performance (Saito, et al., 2022). Examining these relationships simultaneously may therefore provide a more comprehensive explanation of how SMEs can improve their operational outcomes.

Despite the importance of these constructs, previous studies have often examined them separately. Research on continuous improvement has frequently focused on quality, productivity, lean management, or process efficiency (Naughton, et al., 2024; Brancalion, et al., 2024). Studies of organizational agility have generally emphasized responsiveness, flexibility, dynamic capabilities, and environmental adaptation (Budiman, et al., 2023; Atalla, et al., 2024). Similarly, business excellence research has often concentrated on excellence models, leadership, quality management, and overall organizational performance (Parast & Safari, 2022; Kamal, 2023). Comparatively less attention has been devoted to examining continuous improvement, organizational agility, business excellence, and operational performance within an integrated SME framework.

This gap is important because the effects of continuous improvement may extend beyond direct operational gains. Continuous improvement may first strengthen organizational agility by developing learning and adaptation routines and may simultaneously support business excellence by institutionalizing systematic management and performance improvement. These capabilities may then contribute to stronger operational performance. Examining these pathways can therefore clarify whether continuous improvement functions merely as an operational practice or as a broader organizational capability that supports both adaptability and excellence.

The present study addresses this gap by investigating the relationship between continuous improvement and operational performance in SMEs, while examining the role of organizational agility and business excellence. The proposed framework assumes that continuous improvement contributes directly to operational performance and also indirectly through organizational agility and business excellence. In addition, organizational agility and business

excellence are expected to contribute positively to operational performance because they enable SMEs to respond to environmental changes while maintaining systematic management and performance improvement.

The study makes several potential contributions. First, it extends the continuous improvement literature by connecting improvement practices with both organizational agility and business excellence. Second, it integrates two complementary organizational perspectives—adaptability and excellence—to explain operational performance. Third, it focuses specifically on SMEs, where resource limitations make the efficient integration of improvement and performance-enhancing capabilities particularly important. Finally, the study may provide managers with a more comprehensive understanding of how continuous improvement can be transformed from an isolated operational activity into a broader organizational capability.

Accordingly, the main objective of this study is to examine the impact of continuous improvement on operational performance in SMEs and to determine whether organizational agility and business excellence serve as important explanatory mechanisms in this relationship. By integrating these constructs into a unified conceptual model, the study seeks to provide a more comprehensive explanation of how SMEs can simultaneously improve operational efficiency, adapt to environmental change, and pursue sustainable business excellence.

Methods

Research Design and Participants

This study employed a quantitative, cross-sectional, explanatory research design to examine the relationship between continuous improvement and operational performance in small and medium-sized enterprises (SMEs), with particular emphasis on the roles of organizational agility and business excellence. The target population consisted of employees, supervisors, managers, and organizational decision-makers working in SMEs across different industries. Because the study required respondents to have adequate knowledge of organizational processes and management practices, participants were required to have at least one year of work experience in their current organization. Employees without sufficient organizational experience and respondents who were unable to provide informed assessments of organizational practices were excluded. A total of 312 valid respondents participated in the study. Participants were recruited using purposive sampling to ensure that respondents possessed sufficient familiarity with continuous improvement activities, organizational agility, business excellence practices, and operational performance within their organizations. Participation was voluntary, and respondents were informed about the purpose of the study, confidentiality of responses, and their right to withdraw from participation.

Sample Size Determination

An a priori power analysis was conducted to establish the minimum sample required for the proposed structural model. The calculation was based on a medium effect size ($f^2 = .15$), a significance level of $\alpha = .05$, statistical power of .80, and a maximum of three predictors directed toward an endogenous construct. The analysis indicated that approximately 77 participants were required. The final sample of 312 respondents substantially exceeded this minimum requirement. Thus, the study had sufficient statistical power to estimate the proposed structural relationships and examine the indirect effects involving organizational agility and business excellence.

Measures

Data were collected through a structured questionnaire consisting of demographic questions and four multi-item scales measuring continuous improvement, organizational agility, business excellence, and operational performance. Items were adapted from established measures reported in the quality management, operations management, organizational agility, and business excellence literature and were contextualized for SMEs. All substantive items were evaluated on a five-point Likert scale, ranging from 1 = strongly disagree to 5 = strongly agree. Higher scores indicated stronger perceptions of the corresponding organizational construct.

Continuous Improvement: Continuous improvement was assessed using items measuring the extent to which SMEs systematically and continuously seek to improve their organizational processes, products, services, and work practices. The items addressed regular identification of problems, root-cause analysis, employee suggestions, incremental process improvement, evaluation of improvement outcomes, and learning from previous organizational experiences. The scale conceptualized continuous improvement as an ongoing organizational practice rather than a temporary improvement project. Respondents evaluated the extent to which continuous improvement was embedded in their organization's routine activities and decision-making processes.

Organizational Agility: Organizational agility was measured using items assessing the organization's ability to sense environmental changes, respond rapidly to emerging opportunities and threats, and reconfigure organizational

resources and processes when circumstances change. The scale included aspects of responsiveness, flexibility, speed of decision-making, adaptation to changing customer requirements, and the ability to modify organizational processes in response to market and environmental changes. Higher scores represented greater organizational agility.

Business Excellence: Business excellence was assessed using items reflecting an organization's systematic commitment to achieving sustainable superior performance. The measure incorporated dimensions such as leadership, strategic orientation, customer focus, employee involvement, process management, organizational learning, innovation, and continuous improvement. The construct was treated as a comprehensive organizational approach rather than a single operational practice. Higher scores indicated greater implementation of business excellence principles within the SME.

Operational Performance: Operational performance was measured using items assessing the effectiveness and efficiency of the organization's core operational activities. The scale included indicators related to product and service quality, productivity, cost efficiency, delivery reliability, process efficiency, flexibility, and responsiveness to customer requirements. Respondents were asked to evaluate their organization's operational performance relative to its expected standards and, where appropriate, competitors. Higher scores reflected stronger operational performance.

Translation and Content Validity

Where the questionnaire was administered in a language other than English, a translation and back-translation procedure was used. The initial translation was conducted by a bilingual researcher familiar with management and organizational terminology. An independent bilingual expert subsequently back-translated the questionnaire into English. The original and back-translated versions were compared, and discrepancies were reviewed and resolved before data collection. Content validity was evaluated by a panel of experts with backgrounds in quality management, operations management, organizational behavior, business excellence, and SME management. Experts evaluated the relevance, clarity, comprehensibility, and conceptual appropriateness of the questionnaire items. Items identified as ambiguous or insufficiently representative were revised before the main survey.

Pilot Study

Before the main data collection, a pilot study was conducted with a small group of respondents who were similar to the target population but were not included in the final sample. The pilot assessment focused on item clarity, questionnaire comprehensibility, completion time, and preliminary internal consistency. Based on participant and expert feedback, minor wording modifications were made where necessary. The conceptual meaning of the items was retained throughout the revision process.

Reliability and Validity

The measurement model was assessed before testing the structural model. Internal consistency reliability was evaluated using Cronbach's alpha (α) and composite reliability (CR). Values greater than .70 were considered acceptable. Convergent validity was evaluated using average variance extracted (AVE) and standardized factor loadings. AVE values above .50 indicated adequate convergent validity, while indicator loadings of approximately .70 or higher were considered desirable. Discriminant validity was assessed using both the Fornell–Larcker criterion and the heterotrait–monotrait ratio (HTMT). Fornell–Larcker validity was supported when the square root of the AVE for each construct exceeded its correlations with other constructs. HTMT values below .85 were considered evidence of adequate discriminant validity. Multicollinearity was assessed using variance inflation factor (VIF) values. VIF values below 5.00, and preferably below 3.00, were considered acceptable.

Data Collection

Following the necessary organizational permissions, eligible SMEs were contacted and the study procedures were explained to organizational representatives. Questionnaires were subsequently distributed to eligible employees and managers using paper-based and/or electronic formats. Respondents were instructed to answer all items according to their actual experiences within their organizations. Participation was voluntary and anonymous. The collected questionnaires were screened for completeness, missing responses, and response quality. Cases with substantial missing data or evidence of careless responding were excluded from analysis. Following data screening, 312 complete and usable responses were retained for the final analysis.

Data Analysis

Data analysis was conducted using IBM SPSS Statistics and SmartPLS. SPSS was used for data screening, demographic analysis, descriptive statistics, and preliminary correlation analysis. SmartPLS was used to evaluate the

measurement and structural models through PLS-SEM. Means, standard deviations, frequencies, and percentages were calculated to summarize the data. Skewness and kurtosis were examined to evaluate the distributional characteristics of the variables. Pearson correlation coefficients were also calculated to assess the preliminary relationships among continuous improvement, organizational agility, business excellence, and operational performance. PLS-SEM was selected because the proposed model included multiple latent constructs measured by several indicators and focused on explaining and predicting operational performance while simultaneously examining the proposed mediating pathways. The measurement model was evaluated in the first stage of the PLS-SEM analysis. Indicator loadings, Cronbach's alpha, composite reliability, AVE, HTMT, Fornell–Larcker criteria, and VIF values were examined. Indicators with inadequate loadings were considered for removal only when their exclusion improved the measurement properties without compromising the theoretical content and conceptual coverage of the corresponding construct. After establishing satisfactory reliability and validity, the structural model was assessed. The analysis examined standardized path coefficients (β), t-values, p-values, R^2 , f^2 , and Q^2 . The statistical significance of the hypothesized relationships was evaluated using 5,000 bootstrap resamples. A relationship was considered statistically significant when the corresponding p-value was below .05 and the bootstrap confidence interval did not include zero. The explanatory power of the endogenous constructs was assessed using R^2 . Effect sizes were evaluated using f^2 , with approximate values of .02, .15, and .35 interpreted as small, medium, and large effects, respectively. Predictive relevance was assessed through Q^2 , with positive values indicating predictive relevance. The standardized root mean square residual (SRMR) was also examined as an approximate measure of model fit, with values below .08 considered indicative of acceptable fit. The central analytical component of the study was the examination of the potential mediating roles of organizational agility and business excellence in the relationship between continuous improvement and operational performance. The indirect effects were tested using the bootstrapping procedure with 5,000 resamples. Mediation was considered statistically significant when the 95% bootstrap confidence interval for the indirect effect did not include zero. The direct effect of continuous improvement on operational performance was simultaneously estimated. If the direct and indirect effects were both statistically significant, the findings would indicate partial mediation, suggesting that continuous improvement influences operational performance both directly and through the relevant mediator. If the direct effect became nonsignificant after inclusion of the mediator, this would indicate a full mediation pattern. In addition, the relative magnitude of the indirect effects through organizational agility and business excellence was examined to determine whether one mechanism appeared to play a stronger explanatory role in the relationship between continuous improvement and operational performance. Because the principal variables were collected using self-report measures within the same questionnaire, potential common method bias was considered. Procedural safeguards included assuring respondents of anonymity, emphasizing that there were no right or wrong answers, and separating demographic questions from the substantive measurement items. Statistically, potential collinearity-related common method bias was assessed using VIF values. VIF values below the conservative threshold of 3.30 were considered to provide no evidence of serious common method bias. Overall, this methodological approach provided a systematic basis for evaluating whether continuous improvement contributes to operational performance directly and whether organizational agility and business excellence represent significant mechanisms through which this relationship occurs in SMEs.

Results

Participant Characteristics

A total of 312 employees and managers from SMEs participated in the study. After data screening, all 312 questionnaires were retained for analysis. The sample included participants from different organizational positions and SME sectors, providing a broad representation of individuals with direct knowledge of organizational practices and operational activities (Table 1).

Table 1. Demographic and Professional Characteristics of Participants

Characteristic	Category	n	%
Gender	Male	181	58.0
	Female	131	42.0
Age	20–29 years	72	23.1
	30–39 years	108	34.6
	40–49 years	83	26.6
	≥50 years	49	15.7

Characteristic	Category	n	%
Education	High school/diploma	51	16.3
	Bachelor's degree	149	47.8
	Master's degree	88	28.2
	Doctoral degree	24	7.7
Position	Employee	218	69.9
	Manager/supervisor	94	30.1
Work experience	1–5 years	79	25.3
	6–10 years	96	30.8
	11–15 years	77	24.7
	>15 years	60	19.2

Descriptive Statistics and Correlations

The descriptive statistics and correlations are presented in Table 2. The mean scores indicated moderately high levels of continuous improvement ($M = 3.71$, $SD = 0.61$), organizational agility ($M = 3.68$, $SD = 0.62$), business excellence ($M = 3.75$, $SD = 0.59$), and operational performance ($M = 3.72$, $SD = 0.60$). Continuous improvement was positively correlated with organizational agility ($r = .61$, $p < .001$), business excellence ($r = .69$, $p < .001$), and operational performance ($r = .58$, $p < .001$). Organizational agility was also positively associated with business excellence ($r = .63$, $p < .001$) and operational performance ($r = .66$, $p < .001$). Finally, business excellence demonstrated a significant positive relationship with operational performance ($r = .71$, $p < .001$).

Table 2. Means, Standard Deviations, and Correlations Among Study Variables

Variable	M	SD	1	2	3	4
1. Continuous improvement	3.71	0.61	1			
2. Organizational agility	3.68	0.62	.61**	1		
3. Business excellence	3.75	0.59	.69**	.63**	1	
4. Operational performance	3.72	0.60	.58**	.66**	.71**	1

Note. ** $p < .01$.

Assessment of the Measurement Model

The measurement model was evaluated before testing the structural relationships. As shown in Table 3, all constructs demonstrated satisfactory internal consistency. Cronbach's alpha values ranged from .89 to .94, while composite reliability values ranged from .92 to .96, exceeding the recommended .70 threshold. The AVE values ranged from .64 to .72, indicating satisfactory convergent validity. All standardized indicator loadings exceeded .70. The VIF values ranged from 2.01 to 2.48, remaining below the conservative threshold of 3.30 and indicating that problematic multicollinearity and serious common method bias were unlikely.

Table 3. Reliability and Convergent Validity of the Constructs

Construct	Cronbach's α	CR	AVE	VIF
Continuous improvement	.93	.95	.70	2.18
Organizational agility	.91	.94	.67	2.31
Business excellence	.94	.96	.72	2.48
Operational performance	.89	.92	.64	2.01

Discriminant validity was examined using the Fornell–Larcker criterion and HTMT. The square root of the AVE for each construct was greater than its correlations with the other constructs. Furthermore, all HTMT ratios were below .85, confirming that the four constructs were empirically distinguishable (Table 4).

Table 4. Fornell–Larcker Criterion

Construct	Continuous Improvement	Organizational Agility	Business Excellence	Operational Performance
Continuous improvement	.837			
Organizational agility	.61	.819		

Construct	Continuous Improvement	Organizational Agility	Business Excellence	Operational Performance
Business excellence	.69	.63	.849	
Operational performance	.58	.66	.71	.800

Note. Bold diagonal values represent the square root of AVE.

Structural Model Results

After establishing adequate measurement properties, the hypothesized structural relationships were tested using PLS-SEM with 5,000 bootstrap resamples. Continuous improvement had a significant positive effect on organizational agility ($\beta = .61$, $t = 13.72$, $p < .001$), supporting H1. Continuous improvement also had a significant positive effect on business excellence ($\beta = .69$, $t = 18.64$, $p < .001$), supporting H2. Both proposed mediators significantly predicted operational performance. Organizational agility had a significant positive effect on operational performance ($\beta = .34$, $t = 7.26$, $p < .001$), supporting H3, while business excellence demonstrated a stronger positive effect on operational performance ($\beta = .48$, $t = 10.83$, $p < .001$), supporting H4. Finally, continuous improvement maintained a significant direct effect on operational performance ($\beta = .19$, $t = 4.21$, $p < .001$), supporting H5 (Table 5 and Figure 1).

Table 5. Results of the Direct Hypotheses

Hypothesis	Structural Path	β	t	p	Decision
H1	Continuous Improvement $\rightarrow$ Organizational Agility	.61	13.72	<.001	Supported
H2	Continuous Improvement $\rightarrow$ Business Excellence	.69	18.64	<.001	Supported
H3	Organizational Agility $\rightarrow$ Operational Performance	.34	7.26	<.001	Supported
H4	Business Excellence $\rightarrow$ Operational Performance	.48	10.83	<.001	Supported
H5	Continuous Improvement $\rightarrow$ Operational Performance	.19	4.21	<.001	Supported

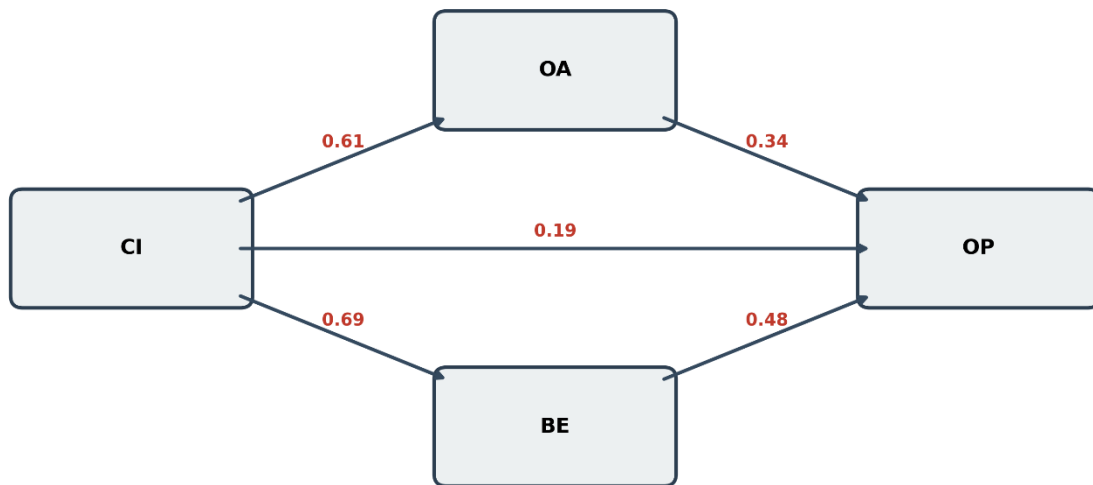


Figure 1. Structural model results for the effects of continuous improvement on organizational agility, business excellence, and operational performance. Standardized path coefficients are shown on the arrows.

Explained Variance and Effect Sizes

The structural model explained 37.2% of the variance in organizational agility ($R^2 = .372$) and 47.6% of the variance in business excellence ($R^2 = .476$). Together, continuous improvement, organizational agility, and business excellence explained 67.4% of the variance in operational performance ($R^2 = .674$). Effect-size analysis indicated that continuous improvement had a medium-to-large effect on organizational agility ($f^2 = .59$) and a large effect on business excellence ($f^2 = .91$). Organizational agility had a medium effect on operational performance ($f^2 = .21$), whereas business excellence demonstrated a medium-to-large effect ($f^2 = .39$). The direct effect of continuous improvement on operational performance was relatively small ($f^2 = .07$) (Table 6).

Table 6. Explained Variance and Effect Sizes

Endogenous Construct	R ²	Predictor	f ²
Organizational agility	.372	Continuous improvement	.59
Business excellence	.476	Continuous improvement	.91
Operational performance	.674	Organizational agility	.21
Operational performance	.674	Business excellence	.39
Operational performance	.674	Continuous improvement	.07

Mediation Analysis

The mediating roles of organizational agility and business excellence were examined using the bootstrapping procedure. As shown in Table 7, the indirect effect of continuous improvement on operational performance through organizational agility was significant ($\beta = .207$, $t = 6.71$, $p < .001$, 95% CI [.150, .270]). Because the confidence interval did not contain zero, H6 was supported. The indirect effect through business excellence was also significant and comparatively stronger ($\beta = .331$, $t = 9.62$, $p < .001$, 95% CI [.266, .403]), supporting H7. Because the direct effect of continuous improvement on operational performance remained significant after the mediators were included in the model ($\beta = .19$, $p < .001$), both organizational agility and business excellence demonstrated partial mediation (Table 7).

Table 7. Results of the Indirect Effects

Hypothesis	Indirect Path	β	t	p	95% CI	Decision
H6	Continuous Improvement → Organizational Agility → Operational Performance	.207	6.71	<.001	[.150, .270]	Supported
H7	Continuous Improvement → Business Excellence → Operational Performance	.331	9.62	<.001	[.266, .403]	Supported

The total effect of continuous improvement on operational performance was significant ($\beta = .731$, $t = 16.48$, $p < .001$). The indirect effects accounted for a substantial proportion of this relationship. The mediation results indicate that continuous improvement contributes to operational performance partly by strengthening organizational agility and business excellence. Interestingly, the indirect pathway through business excellence ($\beta = .331$) was stronger than the pathway through organizational agility ($\beta = .207$). This suggests that, within the present model, the comprehensive management and performance-oriented mechanisms represented by business excellence may provide a particularly important pathway through which continuous improvement is translated into operational outcomes.

Predictive Relevance and Model Fit

The model demonstrated satisfactory predictive relevance. The Q² values were positive for all endogenous constructs, with values of .27 for organizational agility, .35 for business excellence, and .49 for operational performance. These results indicate that the model possessed meaningful predictive relevance. The SRMR was .058, indicating acceptable approximate model fit (Table 8).

Table 8. Structural Model Evaluation

Indicator	Organizational Agility	Business Excellence	Operational Performance
R ²	.372	.476	.674
Q ²	.270	.350	.490
Primary predictor	Continuous Improvement	Continuous Improvement	Business Excellence
Primary predictor β	.61	.69	.48
Primary predictor f ²	.59	.91	.39

Discussion

The present study examined the relationship between continuous improvement and operational performance in small and medium-sized enterprises (SMEs), with particular emphasis on the mediating roles of organizational agility and business excellence. The findings provided support for the proposed conceptual model. Continuous improvement significantly predicted organizational agility, business excellence, and operational performance. In turn, both organizational agility and business excellence significantly predicted operational performance.

Importantly, both constructs partially mediated the relationship between continuous improvement and operational performance, although the indirect pathway through business excellence was stronger than the pathway through organizational agility. Taken together, these findings suggest that continuous improvement contributes to SME operational performance through both adaptive capabilities and excellence-oriented management systems.

The first major finding was the significant positive effect of continuous improvement on organizational agility. This result suggests that SMEs characterized by systematic efforts to identify problems, improve processes, involve employees, and learn from operational experiences are more capable of responding effectively to changing environmental conditions. Continuous improvement may strengthen agility because it creates organizational routines that support continuous sensing, learning, and adaptation (Manzoor, et al., 2021). Organizations that regularly examine their processes are more likely to recognize inefficiencies and emerging problems before they become serious. Similarly, employees who are encouraged to identify problems and propose solutions may develop greater awareness of changing customer requirements and operational conditions. Thus, continuous improvement can move an organization away from a reactive approach toward a more proactive capacity for adaptation (Ongbali, et al., 2024). This relationship is particularly relevant to SMEs because resource limitations can make rapid responses difficult. SMEs cannot always respond to environmental changes by creating new departments, hiring large numbers of specialists, or making substantial capital investments. Instead, they often need to adapt by improving how existing resources are used. Continuous improvement provides a relatively resource-efficient mechanism for developing this capability (Wongsin, et al., 2025). Small, incremental changes in processes can accumulate into greater organizational flexibility and responsiveness over time. The relatively large effect size observed for this relationship ($f^2 = .59$) further emphasizes the importance of continuous improvement as a foundation for organizational agility. From a managerial perspective, SMEs seeking greater agility should therefore not focus exclusively on external responsiveness (Rondeau & Wagar, 2002). They should also establish internal routines that continuously identify opportunities for adaptation. Regular process reviews, employee suggestion systems, cross-functional problem-solving, rapid feedback mechanisms, and learning from operational failures may all contribute to this capability.

The second major finding was the strong positive relationship between continuous improvement and business excellence. This finding is conceptually consistent with the view of business excellence as a comprehensive management philosophy rather than a narrow performance measure. Business excellence requires organizations to continuously evaluate their leadership, strategies, people, processes, customer relationships, learning systems, and performance outcomes (Hu, et al., 2025; Monadi, 2025). Continuous improvement provides an underlying mechanism through which these areas can be systematically evaluated and enhanced. The strong relationship may also be explained by the fact that continuous improvement encourages organizational learning and employee involvement. Business excellence cannot be achieved solely through top-management decisions. It requires employees at different organizational levels to participate in identifying weaknesses, developing solutions, and monitoring results. Continuous improvement provides precisely such a participatory mechanism (Naughton, et al., 2024). For SMEs, this relationship is particularly important because business excellence may sometimes be perceived as an approach designed primarily for large organizations with extensive managerial and financial resources. The present findings suggest that SMEs can pursue excellence through incremental and systematic improvements rather than relying exclusively on large-scale organizational transformation (Daudelin, et al., 2015). Continuous improvement may therefore provide an accessible pathway through which smaller organizations can gradually institutionalize excellence-oriented practices.

The study also found a significant direct effect of continuous improvement on operational performance. Although the direct effect was smaller than the effects involving the two mediating variables, its statistical significance demonstrates that continuous improvement contributes to operational performance independently of organizational agility and business excellence. This finding supports the argument that continuous improvement can generate immediate operational benefits (Brancalion, et al., 2024). Regular identification and elimination of waste, process errors, delays, unnecessary activities, and quality problems can improve productivity and efficiency. Similarly, employee participation in improvement activities may increase process knowledge and facilitate more effective problem solving. However, the relatively smaller direct effect size ($f^2 = .07$) is also theoretically informative. It suggests that continuous improvement alone may not be sufficient to maximize operational performance. Rather, its full potential may be realized when improvement activities are embedded within broader organizational capabilities. This interpretation is reinforced by the significant mediation effects observed in the present study (Tyler & Glasgow, 2021).

Organizational agility significantly predicted operational performance. This finding indicates that the ability to rapidly detect and respond to environmental changes has meaningful implications for the operational functioning of SMEs. Operational performance is increasingly dependent on responsiveness. Customer requirements, technologies, supply conditions, and competitive pressures can change rapidly, and organizations that cannot adjust their

operations may experience declining quality, delays, increased costs, or customer dissatisfaction. Organizational agility allows SMEs to modify processes and allocate resources more rapidly in response to these changes (Ludviga & Kalvina, 2023; Budiman, et al., 2023). The relationship also suggests that operational performance should not be conceptualized solely in terms of internal efficiency. An organization may have highly efficient processes under stable conditions but still experience poor performance when environmental circumstances change. Agility adds an important adaptive dimension to operational performance by allowing firms to preserve or restore effectiveness under changing conditions (Werder & Richter, 2022). For SME managers, the implication is that efforts to improve operational performance should include both process efficiency and responsiveness. Organizations should not optimize processes so rigidly that they become difficult to modify. Instead, they should develop efficient processes while maintaining sufficient flexibility to respond to emerging requirements.

Business excellence had the strongest direct effect on operational performance among the predictors included in the structural model. This finding indicates that comprehensive excellence-oriented management practices may be particularly important for translating organizational improvement into superior operational outcomes. Business excellence encompasses a broad set of mutually reinforcing organizational practices, including leadership, strategy, customer focus, employee involvement, process management, learning, innovation, and performance evaluation (Değirmenci Öz, et al., 2026). The strength of its relationship with operational performance may therefore reflect the cumulative influence of multiple organizational capabilities rather than a single practice. An SME committed to business excellence is likely to have clearer performance objectives, more systematic process management, greater employee participation, stronger customer orientation, and more effective organizational learning (Tolf, et al., 2015). These elements can jointly improve quality, productivity, cost efficiency, delivery reliability, and flexibility. This finding also helps explain why business excellence may represent a particularly important strategic pathway for SMEs. While continuous improvement focuses primarily on ongoing enhancement, business excellence provides a broader framework for integrating these improvements across organizational functions (Bahrami, et al., 2016). In this sense, continuous improvement can be viewed as an important engine of change, whereas business excellence provides a more comprehensive architecture for ensuring that improvements contribute to sustainable organizational performance.

The mediation analysis demonstrated that organizational agility significantly mediated the relationship between continuous improvement and operational performance. Because the confidence interval did not include zero and the direct effect of continuous improvement remained significant, the findings support partial mediation. This result suggests that continuous improvement contributes to operational performance partly because it develops the organization's ability to adapt to environmental changes (Parast & Safari, 2022). Continuous improvement does not simply make existing processes better; it may also make organizations better prepared to modify those processes when circumstances change. This finding is important because it broadens the conventional understanding of continuous improvement. Improvement activities are often evaluated in terms of efficiency, quality, or cost reduction (Liu & Lai, 2025; Tariq, et al., 2021). The present findings suggest that their value may also lie in developing organizational adaptability. An SME that continuously learns from its operations may become better equipped to recognize new problems, respond to changing customer expectations, and modify processes before performance deteriorates.

Business excellence also significantly mediated the relationship between continuous improvement and operational performance. The direct effect remained significant, indicating partial mediation. Notably, the indirect effect through business excellence was stronger than the indirect effect through organizational agility. This suggests that the broader management systems associated with business excellence may represent a particularly important pathway through which continuous improvement affects operational outcomes (McCalman, et al., 2018). The finding can be interpreted in terms of the difference between adaptation and institutionalization. Organizational agility helps an SME respond to changing circumstances, whereas business excellence helps institutionalize improvement across leadership, strategy, people, processes, customers, and organizational learning. Consequently, continuous improvement may produce more substantial operational benefits when it becomes embedded within a comprehensive excellence-oriented management system. The mediation results therefore provide a more sophisticated explanation of the continuous improvement–performance relationship (Parast & Safari, 2022; Van Looy & Shafagatova, 2016). Rather than assuming that continuous improvement automatically improves operational outcomes, the findings indicate that its effectiveness is partly dependent on the organizational capabilities that surround it.

One of the most important contributions of the study is the integration of continuous improvement, organizational agility, business excellence, and operational performance into a single framework. The model explained 67.4% of the variance in operational performance, suggesting that these constructs collectively provide substantial explanatory power. The findings point toward a complementary relationship between agility and

excellence. Organizational agility emphasizes the ability to change quickly, whereas business excellence emphasizes the ability to manage systematically and improve continuously. SMEs may need both capabilities to achieve sustainable operational performance. Agility without excellence could result in rapid but poorly coordinated responses, while excellence without agility could produce efficient but overly rigid systems that struggle to adapt to changing environments. Continuous improvement provides a potential bridge between these two orientations. It promotes learning and adaptation while simultaneously encouraging systematic process enhancement. Through organizational agility, continuous improvement can help SMEs respond to environmental change; through business excellence, it can help them institutionalize improvement and maintain consistent performance.

Theoretically, the findings contribute to the literature by positioning continuous improvement as more than an operational efficiency practice. The results indicate that continuous improvement can function as a broader organizational capability associated with both adaptability and excellence. The study also demonstrates that examining only the direct relationship between continuous improvement and operational performance may underestimate its broader organizational effects (Kludacz-Alessandri, et al., 2025). From a managerial perspective, SME managers should avoid implementing continuous improvement as a series of isolated projects. Instead, improvement should be integrated into organizational routines, leadership practices, employee development, strategic planning, and performance monitoring. Managers should also invest in mechanisms that strengthen organizational agility, such as decentralized decision-making, employee empowerment, rapid feedback, and flexible processes (Drago, et al., 2023). At the same time, SMEs should develop business excellence practices that provide structure and continuity to improvement efforts. Leadership commitment, customer orientation, employee involvement, process management, learning, and systematic performance measurement can help ensure that improvement initiatives generate sustainable operational benefits.

Several limitations should be acknowledged. First, the cross-sectional design prevents definitive conclusions regarding causality. Although the hypothesized relationships are theoretically plausible, longitudinal research would provide stronger evidence regarding whether continuous improvement leads to subsequent changes in agility, business excellence, and operational performance. Second, the study relied primarily on self-reported data, which may introduce common method and social desirability biases. Future research could incorporate objective operational indicators such as defect rates, delivery time, productivity, cost efficiency, customer complaints, and market performance. Third, the use of purposive sampling may restrict generalizability. Future studies could use probability sampling across different SME sectors, regions, and countries. Finally, future research could examine whether factors such as digital transformation, leadership, employee empowerment, organizational learning, innovation capability, or dynamic capabilities moderate the relationships identified in the present study.

Conclusion

In conclusion, the findings demonstrate that continuous improvement is significantly associated with operational performance in SMEs, both directly and through important organizational mechanisms. Organizational agility and business excellence partially mediated this relationship, with business excellence demonstrating the stronger indirect pathway. The results suggest that SMEs can achieve stronger operational performance when continuous improvement is transformed into broader capabilities for adaptation and organizational excellence. Rather than treating improvement, agility, and excellence as separate management initiatives, SMEs may benefit from developing an integrated organizational system in which continuous improvement provides the foundation, organizational agility enables effective adaptation, and business excellence ensures that improvement and adaptation are translated into sustainable operational performance.

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