

Strategic Agility, Managerial Ties, and the Sustainable Performance of Small and Medium Enterprises in an Emerging Economy: Direct and Relational Pathways

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Research Article

Keywords: Strategic agility, Managerial ties, Social capital, Sustainable SME performance, Triple bottom line, Emerging economy, PLS-SEM

Posted Date: August 11th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-10412133/v1>

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Additional Declarations: No competing interests reported.

Version of Record: A version of this preprint was published at Discover Sustainability on September 23rd, 2026. See the published version at <https://doi.org/10.1007/s43621-026-04788-0>.

Abstract

Small and medium enterprises (SMEs) anchor employment and output in emerging economies, yet the mechanisms through which their adaptive capabilities translate into sustainable performance remain contested. Prior research frequently reports that the effect of strategic agility on performance is fully absorbed by relational mediators, but such findings are vulnerable to shared response formats and single-method designs. Drawing on the dynamic capabilities view, social capital theory, and the relational view, this study models strategic agility as influencing sustainable SME performance through two pathways: a direct capability pathway and an indirect relational pathway operating through managerial ties with buyers, suppliers, and government officials. Sustainable performance is conceptualised along triple-bottom-line dimensions covering economic, social, and environmental outcomes. Survey data were collected from SME owners and managers in the Greater Bandung region of Indonesia using an instrument designed to attenuate common method variance through differentiated scale anchors, embedded attention checks, and a theoretically unrelated marker variable; the final analysis sample comprised 179 responses. Partial least squares structural equation modelling with 5,000 bootstrap resamples shows that strategic agility exerts a strong direct effect on sustainable performance ($\beta = 0.493$) and a smaller but significant indirect effect through managerial ties ($\beta = 0.080$), a pattern of complementary partial mediation in which the relational channel accounts for approximately 14% of the total effect. Supplementary analysis indicates that strategic decision speed aligns positively with agility yet adds no incremental explanatory power. The findings suggest that agility is a proximate driver of SME sustainability that relational resources amplify rather than fully transmit, with implications for Sustainable Development Goals 8 and 9.

1. Introduction

Small and medium enterprises (SMEs) are widely recognised as the structural foundation of economic activity in emerging economies, where they generate the majority of employment and contribute substantially to national output [1, 2]. In Indonesia, SMEs account for the overwhelming share of business units and absorb the vast majority of the workforce, positioning them at the centre of the country's development agenda and its pursuit of the Sustainable Development Goals (SDGs), particularly SDG 8 on decent work and economic growth and SDG 9 on industry, innovation, and infrastructure. Because these enterprises operate at the intersection of livelihood creation and economic resilience, their capacity to survive and to grow sustainably is not merely a private concern but a matter of broad developmental significance.

The environment in which SMEs operate has become markedly more turbulent. Rapid digitalisation, volatile consumer demand, shifting supply chains, and intensifying resource pressures have compressed the time available for firms to sense change and respond to it. Under such conditions, scholars have increasingly turned to the concept of strategic agility, understood as a firm's capacity to continuously sense environmental shifts and reconfigure its resources to remain aligned with a changing market [3–5]. Grounded in the dynamic capabilities view [6, 7], strategic agility is theorised to be especially

consequential for smaller firms, whose limited slack requires them to adapt continuously rather than rely on accumulated market power.

Despite this theoretical prominence, three issues constrain current understanding. First, the empirical literature on strategic agility remains disproportionately concentrated on large firms and developed-market settings, leaving the mechanisms operating within resource-constrained SMEs in emerging economies comparatively underexamined [1, 8]. Second, the evidence on how agility reaches performance is unsettled: several studies report that the agility–performance relationship is heavily or even fully mediated by intervening capabilities such as business model innovation and market orientation [5, 9, 10], yet these designs typically rely on single-source surveys in which all constructs share a common response format, a condition known to inflate observed mediation through correlated measurement error. Whether the relational channel genuinely absorbs the effect of agility, or whether agility also operates directly, therefore remains an open empirical question that demands measurement designs capable of separating substance from method. Third, although relational resources are repeatedly identified as vital to SMEs in emerging economies, where managerial ties with buyers, suppliers, and government actors substitute for underdeveloped formal institutions [11], the joint modelling of agility, ties, and sustainability outcomes defined across economic, social, and environmental dimensions has rarely been undertaken [12, 13].

This study addresses these issues by asking two research questions. First, does strategic agility relate to the sustainable performance of SMEs directly, indirectly through managerial ties, or through both pathways? Second, how large is the relational pathway relative to the direct pathway once measurement precautions against common method variance are built into the research design? To answer these questions, the study integrates the dynamic capabilities view, social capital theory, and the relational view into a dual-pathway mediation model and tests it on survey data from 179 SME owners and managers in the Greater Bandung region of Indonesia using partial least squares structural equation modelling (PLS-SEM). Sustainable performance is operationalised along triple-bottom-line dimensions [14, 15], and the instrument incorporates differentiated scale anchors across construct blocks, two embedded attention checks, response-duration screening, and a theoretically unrelated marker variable.

The findings offer a mechanism-based account that qualifies the prevailing mediation narrative. Strategic agility exerts a strong and significant direct effect on sustainable SME performance, alongside a smaller but reliable indirect effect through managerial ties; the pattern corresponds to complementary partial mediation, with the relational channel carrying approximately 14% of the total effect. A supplementary analysis further shows that strategic decision speed correlates positively with agility and performance but contributes no incremental explanatory power once adaptive capability and relational ties are modelled, indicating that speed accompanies agility rather than substituting for it.

The study makes three contributions. First, it demonstrates that when common method variance is procedurally and statistically constrained, the influence of strategic agility on SME sustainability is predominantly direct, repositioning relational resources as an amplifying channel rather than the sole

conduit and thereby refining the conversion logic of the dynamic capabilities view. Second, it extends the sustainability outcome space for SMEs beyond financial growth by modelling economic, social, and environmental performance jointly within a triple-bottom-line construct, and it shows that the environmental dimension is the least responsive to agility and ties, a finding with direct policy relevance. Third, it advances measurement practice in agility research by illustrating how differentiated anchors, attention checks, and marker-variable tests alter the substantive conclusions that single-format designs would otherwise support. The remainder of the paper develops the theoretical framework and hypotheses, describes the methodology, reports the results, and discusses their implications for theory, practice, and the SDGs.

2. Theoretical foundation and hypotheses

2.1 The dynamic capabilities view as an organising lens

The dynamic capabilities view (DCV) extends the resource-based view [16] by shifting attention from the mere possession of valuable resources to a firm's capacity to sense opportunities, seize them, and reconfigure its resource base as conditions change [6, 7]. In turbulent environments, competitive advantage is understood to rest less on static resource endowments than on the higher-order routines through which firms renew those endowments over time [17]. This perspective is particularly germane to SMEs, whose modest resource stocks make continuous adaptation a condition of survival rather than a discretionary strategic choice.

Within this tradition, strategic agility has been articulated as a concrete manifestation of dynamic capability, resting on the interrelated pillars of strategic sensitivity, resource fluidity, and collective commitment [3, 18]. The present study foregrounds two of these facets that are directly observable in SME behaviour, namely the rapid sensing of and response to market change, and the fluid reallocation of resources across activities [19]. Positioning agility within the DCV clarifies why it should matter for sustainability, but it also invites a more precise question that the DCV leaves open: whether capabilities reach performance directly through superior adjustment, indirectly through the complementary assets they help to accumulate, or through both routes simultaneously [7, 17]. The present study models these routes explicitly rather than assuming either one away.

2.2 Strategic agility

Strategic agility is defined here as a firm's capacity to continuously detect shifts in its competitive environment and to redeploy its resources rapidly and repeatedly in response [3, 4]. This conceptualisation comprises two complementary dimensions. The first, market responsiveness, captures the speed and readiness with which a firm reacts to changing customer needs, market conditions, emerging opportunities and threats, and competitor moves. The second, resource fluidity, captures the ease with which the firm shifts funds, people, and equipment across activities, redeploys employees to new roles, reallocates budgets toward more promising uses, and flexes its operating structure as priorities change. Together these dimensions represent the sensing and reconfiguring

components of dynamic capability as they are enacted at the scale of a small enterprise, and they follow the second-order operationalisation of agility employed in prior empirical work [5]. Recent research has extended this capability-based account of agility to SMEs operating under the resource constraints and environmental uncertainty characteristic of emerging economies [1, 8, 20, 21].

This study treats strategic agility as conceptually related to, but analytically distinct from, the speed of strategic decision-making. Classic evidence associates fast strategic decisions with performance in high-velocity environments [22–24], and adaptive firms may well decide quickly. Nevertheless, decision speed describes the tempo of choice, whereas agility describes the capability to adapt repeatedly; the two need not carry identical performance implications, and this study examines their empirical relationship rather than presuming it.

2.3 Managerial ties as relational social capital

Social capital theory conceives of the relationships in which an actor is embedded as a resource that can be mobilised for productive ends [12, 13]. Economic action is, in this view, embedded in ongoing networks of social relations rather than conducted at arm's length [25], and the position a firm occupies within these networks conditions the information and opportunities available to it [26, 27]. In emerging economies, the most consequential expression of firm-level social capital is the set of managerial ties that owners and managers cultivate with business partners and government actors, because such ties substitute for underdeveloped market-supporting institutions and reduce the transaction hazards of exchange [11]. Following this tradition, the present study operationalises relational social capital as managerial ties along three facets: ties with buyers, reflecting closeness to and understanding of customers; ties with suppliers, reflecting investment in personal relationships with supplier managers; and ties with government officials, reflecting the maintenance of good relationships with influential public actors [11, 28].

For SMEs, such ties are not a peripheral asset but a functional substitute for the formal resources they lack. Constrained in finance, specialised personnel, and market power, small firms depend on their networks to access information, absorb shocks, and coordinate joint problem-solving [27, 29]. Trust-infused ties additionally lower the costs of monitoring and encourage the exchange of valuable, hard-to-codify knowledge [30]. Managerial ties are therefore theorised here as a relational channel through which internally generated capabilities can be converted into external advantage, while leaving open the possibility that capabilities also act on performance directly.

2.4 Sustainable SME performance as a triple-bottom-line construct

Sustainability is understood in this study as the enduring viability of the enterprise across economic, social, and environmental dimensions, consistent with the triple-bottom-line conception of organisational sustainability [14] and with the broad understanding of sustainable development articulated in the foundational literature [15]. Sustainable SME performance is accordingly

operationalised through three first-order dimensions. Economic performance captures sales growth, profitability, and the stability of financial performance relative to competitors. Social performance captures the provision of fair working conditions, contribution to the surrounding community, and the maintenance of long-term relationships with employees, customers, and partners, in line with SDG 8. Environmental performance captures the reduction of waste, the consideration of environmental impact in business activities, and the use of environmentally friendlier materials, packaging, and processes, in line with SDG 9 and the broader environmental agenda. Treating these dimensions jointly captures sustainability as the capacity of the firm to create durable value for its owners, its stakeholders, and its natural environment simultaneously, an integrative framing that recent syntheses identify as the direction of travel in sustainability research [31].

Because the performance indicators are self-reported and perceptual, they are interpreted as managerially assessed sustainability outcomes rather than as externally audited measures. The research design addresses the associated method risks through differentiated response anchors for the performance blocks and through the statistical checks described in the methodology.

2.5 Hypothesis development

The relational view of the firm provides the theoretical bridge that connects agility, managerial ties, and sustainability [32]. It holds that a firm's critical resources may extend beyond its own boundaries and become embedded in inter-firm relationships, generating relational rents that no firm could secure in isolation. Read through this lens, strategic agility is the internal capability that enables a firm to identify complementary partners and to reconfigure itself to engage them, while managerial ties are the relational infrastructure through which the resulting rents are jointly created and appropriated. Crucially, however, the relational view does not imply that relational rents are the only rents available to an agile firm; superior adjustment to demand shifts can yield performance advantages through entirely internal routes such as faster product turnover, better capacity utilisation, and avoided obsolescence. The theoretically appropriate model is therefore a dual-pathway model in which agility acts on sustainable performance both directly and through ties.

An agile firm continuously scans its environment and reconfigures its offerings, and in doing so it deepens and diversifies its external relationships. Frequent product, channel, and resource adjustments require ongoing engagement with customers, suppliers, and, in emerging economies, government actors whose programmes and regulations shape small-firm opportunity sets [1, 11, 27]. Strategic agility is therefore expected to strengthen managerial ties. Accordingly, the following hypothesis is proposed.

H1. Strategic agility is positively associated with managerial ties.

Managerial ties, once accumulated, are expected to enhance sustainable performance. Tie-rich firms enjoy privileged access to market intelligence, financing, and cooperative arrangements, and they face lower transaction and monitoring costs than their poorly connected rivals [11, 28–30, 32]. Beyond economic returns, embedded relationships with employees, communities, and public actors support the

social legitimacy on which small firms depend, and exposure to buyer requirements and government programmes can transmit environmental expectations into firm practice. This reasoning yields the second hypothesis.

H2. Managerial ties are positively associated with sustainable SME performance.

The direct pathway from agility to sustainable performance rests on the internal returns to superior adjustment. A firm that senses demand shifts early and moves resources quickly captures revenue that slower rivals forgo, avoids the write-offs associated with obsolete stock and misallocated capacity, and preserves the employment relationships and stakeholder commitments that turbulence would otherwise strain [5–7]. These returns do not require the intermediation of external ties, and they should be observable once the relational channel is modelled alongside the direct one. The third hypothesis therefore states a direct effect.

H3. Strategic agility is positively associated with sustainable SME performance.

Bringing these arguments together, managerial ties are expected to transmit part, but not all, of the influence of strategic agility on sustainability outcomes. Because theory supports both an internal capability route and an external relational route, the expected pattern is complementary partial mediation, in which the direct and indirect effects are both positive and jointly account for the total effect [33, 34]. The final hypothesis states this mediation expectation.

H4. Managerial ties partially mediate the positive relationship between strategic agility and sustainable SME performance.

Figure 1 summarises the hypothesised dual-pathway model, in which strategic agility influences sustainable SME performance directly (H3) and indirectly through managerial ties (H1, H2, and H4).

3. Methodology

3.1 Research design and context

The study adopts a quantitative, cross-sectional survey design to test the hypothesised dual-pathway model. The empirical context is the Greater Bandung region of West Java, Indonesia, one of the country's most active concentrations of SMEs across the culinary, fashion, services, textile, craft, and creative sectors. As an emerging-economy setting characterised by rapid digital adoption, intense competition, and constrained access to formal resources, the region offers a theoretically appropriate site for examining how adaptive capability and relational resources jointly shape SME sustainability.

3.2 Sample and data collection

Data were collected online from owners and managers of SMEs, who were selected as key informants because the constructs of interest concern firm-level strategy and external relationships rather than

isolated operational tasks. Respondents were recruited through five complementary channels in order to reduce dependence on any single sampling frame: SME communities (30.7% of the final sample), social media outreach (19.6%), the regional office for cooperatives and SMEs (19.0%), business associations (18.4%), and referral (12.3%). Participation was voluntary and anonymous, informed consent for participation and for the use of responses in analysis and publication was obtained at the start of the questionnaire, and a short response code was used solely to detect duplicate submissions.

A total of 194 questionnaires were received. Data quality was screened through a pre-registered protocol: twelve responses were excluded because they failed at least one of two embedded attention-check items or exhibited straight-line answering, and three further responses were excluded for incomplete construct blocks, yielding a final analysis sample of 179. Seven respondents completed the questionnaire in less than four minutes and were flagged; a sensitivity analysis excluding them produced substantively identical estimates, and they were therefore retained. The achieved sample size exceeds the minimum of approximately 155 implied by the inverse square root method for detecting a path coefficient of 0.20 at 5% significance and 80% power [35–37], and it is consistent with the prediction-oriented use of PLS-SEM.

An initial data-collection wave conducted with an earlier version of the instrument was not pooled with the present data, because that version employed different item stems and response anchors for the focal constructs and its responses are therefore not psychometrically comparable; the present study reports exclusively on the refined instrument described below.

3.3 Measures

All focal constructs were measured with multi-item scales adapted from prior research and contextualised for SMEs, and the questionnaire was administered in Indonesian following standard translation and review procedures; the full English wording of every measurement item, together with the response anchors of each block, is reported in Appendix A. Strategic agility was modelled as a reflective–reflective second-order construct comprising two first-order dimensions adapted from the strategic agility literature [3, 5, 18]: market responsiveness, measured by four items capturing the speed of response to customer needs, market change, emerging opportunities and threats, and competitor moves; and resource fluidity, measured by four items capturing the mobility of funds, people, and equipment across activities, the redeployability of employees, the speed of budget reallocation, and the flexibility of the operating structure. Managerial ties were modelled as a second-order construct with three first-order facets adapted from the managerial ties literature [11]: buyer ties (three items), supplier ties (three items), and government ties (three items). Sustainable SME performance was modelled as a second-order construct with three first-order dimensions reflecting the triple bottom line [14]: economic performance (three items anchored from 1 = much worse than competitors to 5 = much better than competitors), social performance (three items), and environmental performance (three items), the latter two anchored from 1 = never practised to 5 = always practised consistently. All remaining Likert blocks used agreement anchors from 1 = strongly disagree to 5 = strongly agree. Strategic decision speed was measured with five agreement-anchored items adapted from the decision-speed literature [24] and

analysed in a supplementary model. Firm and respondent characteristics, including industry, firm age, invested capital, and the number of business lines, were recorded as controls.

Three design features were incorporated specifically to attenuate common method variance at the source [38]. First, the response anchors of the outcome blocks were deliberately differentiated from those of the predictor blocks, breaking the shared scale format that inflates correlations among self-reported constructs. Second, two attention-check items with prescribed answers were embedded at different points in the questionnaire, and completion duration was recorded. Third, a three-item marker variable that is theoretically unrelated to the substantive constructs was included to permit a marker-variable test [39].

3.4 Analytical approach

The hypotheses were tested using PLS-SEM, which is well suited to prediction-oriented models, higher-order composite constructs, and ordinal indicators [35, 36]. A two-stage procedure was followed: the first-order dimension scores were estimated and then used as indicators of the second-order constructs in the structural model [40]. The measurement model was evaluated for internal consistency reliability, convergent validity [41], and discriminant validity using both the Fornell–Larcker criterion and the heterotrait–monotrait (HTMT) ratio with bootstrap confidence bounds [41, 42]. The structural model was assessed through path coefficients, coefficients of determination, and effect sizes, and the significance of the direct and indirect effects was established through percentile bootstrapping with 5,000 resamples [43]. All analyses were conducted in SmartPLS 4. In line with current reporting guidance [35], the out-of-sample predictive relevance of the model was assessed with the PLSpredict procedure, using ten-fold cross-validation with ten repetitions and a naïve linear-regression benchmark [50], and overall model fit was inspected through the standardised root mean square residual (SRMR) [34]. The mediation pattern was classified using the typology of Zhao and colleagues, which distinguishes complementary, competitive, and indirect-only mediation on the basis of the joint signs and significance of the direct and indirect effects [33, 34].

3.5 Common method bias

Because the data are drawn from single informants at one point in time, common method bias was addressed procedurally through the design features described above and evaluated statistically through three complementary checks [38, 39, 44]. First, Harman’s single-factor test showed that the first unrotated factor accounted for 24.5% of the variance, well below the 50% threshold. Second, the marker-variable test showed that the marker construct exhibited satisfactory psychometric properties ($\alpha = 0.795$; CR = 0.880; AVE = 0.709) yet correlated only weakly with the substantive constructs, with a maximum absolute correlation of 0.218 with strategic agility and correlations of 0.070 and 0.108 with managerial ties and sustainable performance, respectively [39]. Third, a full-collinearity assessment returned variance inflation factors between 1.54 and 1.61 across all constructs, below the conservative threshold of 3.3 [45]. Taken together, these results indicate that common method variance is unlikely to account for the findings, although the single-source design is acknowledged as a limitation.

4. Results

4.1 Respondent and firm profile

The final sample comprised 179 SMEs distributed across the Greater Bandung region, with the largest shares located in Bandung Regency (30.7%) and Bandung City (30.2%). Respondents were evenly split by gender (50.3% male), and a majority were between 25 and 44 years of age. The culinary sector was the most represented (37.4%), followed by fashion (26.3%), services (13.4%), textiles (8.9%), crafts (7.8%), photography (4.5%), and chemicals (1.7%), yielding a more sectorally balanced sample than is typical of regional SME surveys. Most enterprises operated more than one business line, invested capital was concentrated in the small-to-medium range, and firm ages spanned nascent to established ventures. Table 1 summarises the profile of the sample.

Table 1
Profile of the sample (n = 179)

Characteristic	Category	%	Characteristic	Category	%
Industry	Culinary	37.4	Firm age	< 1 year	15.6
	Fashion	26.3		1–3 years	27.4
	Services	13.4		3–5 years	30.7
	Textiles	8.9		> 5 years	26.3
	Crafts	7.8	Invested capital	< IDR 50m	20.7
	Photography	4.5		IDR 50–500m	57.5
	Chemicals	1.7		IDR 500m–10bn	18.4
Location	Bandung Regency	30.7	Business lines	> IDR 10bn	3.4
	Bandung City	30.2		One	25.1
	West Bandung Reg.	15.6		Two	27.9
	Other cities	12.8		Three	27.4
	Cimahi City	10.6		Four or more	19.6
Source: Authors' own data					

The descriptive statistics of the second-order constructs indicated moderately positive assessments with adequate dispersion: strategic agility (M = 3.36, SD = 0.91), managerial ties (M = 3.56, SD = 0.64), decision speed (M = 3.43, SD = 0.79), and sustainable performance (M = 3.32, SD = 0.66). Among the performance dimensions, social performance was rated highest (M = 3.58) and environmental performance lowest (M = 3.03), foreshadowing the differentiated results reported below.

4.2 Measurement model assessment

The measurement model was evaluated in two stages. At the first-order level, all items loaded on their intended constructs with standardised loadings of at least 0.71, and every construct satisfied the conventional criteria for internal consistency and convergent validity, with Cronbach's alpha ranging from 0.739 to 0.840, composite reliability from 0.853 to 0.894, and average variance extracted (AVE) from 0.582 to 0.717 [35, 41]. Table 2 reports these results.

Table 2
First-order measurement model

First-order construct	Items	α	CR	AVE	Loading range
Market responsiveness	4	0.824	0.884	0.656	0.79–0.83
Resource fluidity	4	0.840	0.894	0.677	0.79–0.84
Buyer ties	3	0.745	0.855	0.663	0.79–0.83
Supplier ties	3	0.780	0.874	0.698	0.78–0.88
Government ties	3	0.801	0.884	0.717	0.82–0.87
Economic performance	3	0.781	0.873	0.696	0.82–0.85
Social performance	3	0.777	0.871	0.692	0.83–0.83
Environmental performance	3	0.739	0.853	0.659	0.80–0.84
Decision speed	5	0.820	0.874	0.582	0.71–0.79
Marker variable	3	0.795	0.880	0.709	0.82–0.86

Source: Authors' own findings (based on PLS-SEM analysis)

At the second-order level, both dimensions loaded strongly and symmetrically on strategic agility (0.945 and 0.945; CR = 0.944; AVE = 0.893). The three ties facets loaded satisfactorily on managerial ties (0.800, 0.805, and 0.704; CR = 0.814; AVE = 0.594). The three performance dimensions loaded acceptably on sustainable performance (economic 0.703, social 0.772, environmental 0.636; CR = 0.747), although the AVE of the second-order performance construct was 0.498, marginally at the 0.50 benchmark; this reflects the deliberate breadth of a triple-bottom-line construct whose dimensions are conceptually distinct, and the dimension-level analysis reported in Section 4.5 addresses it directly. As an additional robustness check, the higher-order performance construct was re-estimated under a formative (Mode B) specification following established guidance on higher-order constructs [40]; the structural conclusions were unchanged (agility $\rightarrow$ performance $\beta \approx 0.49$; ties $\rightarrow$ performance $\beta \approx 0.30$; indirect effect ≈ 0.09), indicating that the marginal AVE reflects the deliberate breadth of the triple-bottom-line construct rather than model misspecification. Table 3 reports the higher-order results together with the Fornell–Larcker matrix, in which the square root of each construct's AVE exceeds its correlations with the other constructs [41].

Table 3
Higher-order construct validity and the Fornell–Larcker criterion

Construct	CR	AVE	AGI	TIES	PER
Strategic agility (AGI)	0.944	0.893	0.945		
Managerial ties (TIES)	0.814	0.594	0.271	0.771	
Sustainable performance (PER)	0.747	0.498	0.551	0.398	0.706
<i>Note: Diagonal values are the square root of AVE; off-diagonal values are inter-construct correlations. Source: Authors' own findings (based on PLS-SEM analysis)</i>					

Discriminant validity was further examined using the HTMT ratio computed on the full item pools of the second-order constructs, with bootstrap confidence bounds based on 2,000 resamples [42]. As reported in Table 4, all HTMT values lay comfortably below the conservative 0.85 threshold. In particular, the HTMT ratio between strategic agility and managerial ties was 0.324, with a 90% bootstrap upper bound of 0.452, providing clear evidence that the capability construct and the relational construct are empirically distinct. The highest ratio in the matrix, between agility and performance, was 0.667, still well within the acceptable range.

Table 4
Discriminant validity (HTMT ratio)

Strategic agility (AGI)	AGI	TIES	SPD	PER
	—			
Managerial ties (TIES)	0.324	—		
Decision speed (SPD)	0.465	0.636	—	
Sustainable performance (PER)	0.667	0.522	0.343	—
<i>Note: The HTMT ratio between AGI and TIES has a 90% bootstrap upper bound of 0.452. Source: Authors' own findings (based on PLS-SEM analysis)</i>				

4.3 Structural model and hypothesis testing

Before interpreting the structural paths, collinearity between the predictors of sustainable performance was assessed; the variance inflation factor was 1.08, far below the common threshold of 5.0, indicating that collinearity does not distort the estimates [35]. The standardised root mean square residual of the estimated higher-order model was 0.092, below the 0.10 threshold recommended for composite models [34], and the PLSpredict procedure indicated positive out-of-sample predictive relevance for all three performance dimensions ($Q^2_{\text{predict}} = 0.21, 0.18, \text{ and } 0.04$ for economic, social, and environmental performance, respectively). Prediction errors of the PLS model were comparable to those of the linear-regression benchmark for the economic and social dimensions and smaller for the environmental dimension, a pattern indicating modest but genuine predictive power [50] that is consistent with the

dimension-level results reported in Section 4.5. The structural model explained 40.5% of the variance in sustainable performance ($R^2 = 0.405$) and 7.6% of the variance in managerial ties ($R^2 = 0.076$).

The results of the hypothesis tests are reported in Table 5. Strategic agility was positively and significantly associated with managerial ties ($\beta = 0.276$; $t = 3.97$; 95% CI [0.140, 0.415]; $f^2 = 0.079$), supporting H1 with a small effect size. Managerial ties were positively and significantly associated with sustainable performance ($\beta = 0.289$; $t = 4.43$; 95% CI [0.160, 0.419]; $f^2 = 0.106$), supporting H2 with a small-to-medium effect size. The direct effect of strategic agility on sustainable performance was positive, significant, and the strongest path in the model ($\beta = 0.493$; $t = 7.88$; 95% CI [0.366, 0.610]; $f^2 = 0.337$), supporting H3 with a medium-to-large effect size.

Table 5
Structural model results and hypothesis tests

H	Path	β	t	95% CI	f^2	Decision
H1	Agility → Managerial ties	0.276	3.97	[0.140, 0.415]	0.079	Supported
H2	Managerial ties → Performance	0.289	4.43	[0.160, 0.419]	0.106	Supported
H3	Agility → Performance (direct)	0.493	7.88	[0.366, 0.610]	0.337	Supported
Note: $R^2 = 0.076$ (managerial ties), 0.405 (performance); percentile bootstrapping with 5,000 resamples. Source: Authors' own findings (based on PLS-SEM analysis)						

4.4 Mediation analysis

The mediation hypothesis was tested by examining the indirect effect of strategic agility on sustainable performance through managerial ties [33, 43]. As reported in Table 6, the indirect effect was positive and significant ($\beta = 0.080$; $t = 2.83$; 95% CI [0.034, 0.144]), and the direct effect remained positive and significant, so the pattern corresponds to complementary partial mediation in the typology of Zhao and colleagues [33, 34]. The total effect of agility on sustainable performance was 0.573, of which the relational channel accounted for approximately 14%. H4 is therefore supported in its partial form: managerial ties transmit a reliable but minor share of the influence of agility, while the majority of that influence operates directly.

Table 6
Mediation analysis (agility → managerial ties → performance)

Effect	β	t	95% CI	Result
Direct (agility → performance)	0.493	7.88	[0.366, 0.610]	Significant
Indirect (via managerial ties)	0.080	2.83	[0.034, 0.144]	Significant
Total effect	0.573	10.21	[0.458, 0.678]	Significant
Proportion mediated (indirect / total)	≈ 14%	—	—	Complementary partial mediation

Source: Authors' own findings (based on PLS-SEM analysis)

4.5 Supplementary analyses: performance dimensions and decision speed

Two supplementary analyses probe the robustness and texture of the main results. First, because the triple-bottom-line construct aggregates conceptually distinct dimensions, the structural model was re-estimated with economic, social, and environmental performance as separate outcomes. Agility and ties predicted economic performance ($\beta = 0.409$ and 0.232) and social performance ($\beta = 0.379$ and 0.245) with comparable strength, whereas their effects on environmental performance were markedly weaker ($\beta = 0.219$ and 0.092 , the latter not significant). Environmental performance also recorded the lowest mean among the three dimensions. Adaptive capability and relational ties thus translate readily into economic and social sustainability but only faintly into environmental practice, a pattern taken up in the discussion. Second, the estimates were robust to the inclusion of industry, invested capital, and firm age as controls, with the direct effect of agility on performance changing only marginally ($\beta = 0.471$).

A further supplementary analysis examined strategic decision speed. Decision speed correlated positively with strategic agility ($r = 0.40$), with managerial ties ($r = 0.52$), and with overall sustainable performance ($r = 0.27$), and its association was strongest with the economic dimension ($r = 0.28$) and weakest with the environmental dimension ($r = 0.09$). When decision speed was entered into the structural model alongside agility and ties, however, its incremental path to performance was small and not significant ($\beta = -0.10$), while the effects of agility and ties were preserved. Decision speed therefore accompanies agility rather than substituting for it: fast-deciding firms tend to be agile and well connected, but speed itself adds no explanatory power for sustainability once adaptive capability and relational resources are taken into account.

5. Discussion

5.1 Summary of findings

This study set out to determine whether strategic agility reaches the sustainable performance of emerging-economy SMEs directly, indirectly through managerial ties, or through both pathways. The evidence yields a clear answer in favour of the dual-pathway account. Strategic agility exerts a strong direct effect on sustainable performance and, at the same time, cultivates managerial ties that carry a smaller, complementary share of its influence. The relational channel is real but minor, accounting for approximately one seventh of the total effect, and the pattern is robust to controls, to sensitivity screening, and to a battery of common-method safeguards built into the research design.

5.2 Agility as a proximate driver: reappraising the mediation narrative

The central contribution of this study is a reappraisal of the mediation narrative that has come to dominate the agility literature. A growing body of work reports that the effect of agility on performance is heavily or fully absorbed by intervening variables, including business model innovation, innovation capability, and market orientation [5, 9, 10], and a parallel expectation might have been formed for the relational channel examined here. The present findings do not support that expectation. Once the outcome construct was anchored differently from the predictor constructs, once inattentive responding was screened out, and once discriminant validity between the capability and the relational construct was demonstrably established, the direct effect of agility emerged as the dominant path and the indirect effect, while significant, was modest.

Two readings of this result are possible, and they are complementary rather than competing. Substantively, the result is consistent with the internal logic of the dynamic capabilities view: sensing and reconfiguring create value in the first instance inside the firm, through faster alignment of offerings with demand, better utilisation of scarce resources, and avoided losses from obsolescence [6, 7, 17], and relational rents arise as an additional layer on top of these internal returns [32]. For a small enterprise, being able to redeploy people, funds, and equipment quickly is itself performance-relevant, whether or not the firm is richly connected. Methodologically, the result suggests that some of the very large mediated effects reported in single-format survey designs may be inflated by shared method variance, which is known to strengthen observed associations among perceptual constructs measured on identical scales [38, 44]. The design of the present study cannot adjudicate every prior finding, but it demonstrates that the balance between direct and indirect pathways is sensitive to measurement rigour, and it cautions against concluding that agility is inert without relational intermediation.

This reframing preserves an important role for social capital while resizing it. Managerial ties significantly improve sustainable performance and significantly grow with agility, so the relational view retains explanatory force [11, 32]; what changes is the architectural claim. Ties are best understood as an amplifier that extends the reach of an agile firm into resources it cannot generate alone, rather than as the sole conduit through which agility becomes valuable. The practical corollary is that capability building and relationship building are complements, not sequential stages.

5.3 Decision speed: alignment without substitution

The second contribution concerns the role of strategic decision speed. Classic evidence associates fast strategic decision-making with performance in dynamic environments [22–24], and in the present sample speed indeed travels together with agility, with ties, and with economic performance. Yet when speed is modelled alongside adaptive capability and relational resources, it contributes no incremental explanation of sustainability. This pattern refines rather than contradicts the classic account: the performance value that appears to attach to fast decisions is carried by the broader adaptive capability of which speed is one expression. The finding is also consistent with the long-standing argument that decision comprehensiveness and tempo must be matched to the environment [46], and it cautions managers and policymakers against treating acceleration programmes as a substitute for building genuine sensing and reconfiguration capability.

5.4 Contribution to the sustainability and SDG agenda

Interpreted through the lens of sustainable development, the findings clarify how intangible capabilities support the developmental role of SMEs. Because the performance construct spans economic, social, and environmental dimensions, the results speak directly to SDG 8 on decent work and economic growth and to SDG 9 on industry, innovation, and infrastructure. Agility and ties translate strongly into economic viability and into the social outcomes of fair employment, community contribution, and durable stakeholder relationships, which suggests that capability-building and network-building programmes are effective levers for the employment-related goals. The environmental dimension, by contrast, responds only weakly to both agility and ties and records the lowest practice levels in the sample. Environmental sustainability among small firms therefore appears unlikely to emerge as a by-product of general adaptive capability or connectedness; it requires dedicated instruments such as green skills programmes, targeted financing, and buyer-driven environmental requirements transmitted through supply chains.

This differentiated reading aligns with the broader trajectory of sustainability research. Recent syntheses document a shift from narrowly environmental and efficiency-oriented conceptions of sustainability toward capability- and mechanism-based accounts in which organisational resources, leadership, and knowledge assets are treated as the levers through which firms contribute to the SDGs [31, 47]. The present findings extend this trajectory to the smallest class of firms by showing that the levers operate unevenly across the triple bottom line, and that the environmental pillar demands policy attention that the economic and social pillars do not.

5.5 Relation to prior evidence

The findings both extend and refine prior research. They are consistent with studies in emerging economies that document positive associations between agility, relational resources, and SME outcomes [1, 2, 8], and with the managerial ties literature showing that connections to buyers, suppliers, and government actors improve firm performance where formal institutions are thin [11, 28, 29]. The mediated structure documented here also connects with emerging evidence from other developing-country settings showing that organisational capabilities improve sustainability-related outcomes partly

through intervening mechanisms. In Vietnamese firms, for example, digital transformation has been found to shape environmental, social, and governance outcomes through the quality of the internal information environment [48], and evidence from the banking sector likewise indicates that the financial payoff of sustainability practices is conditional rather than automatic [49]. The present study contributes to this conversation a calibrated estimate of how much of the capability effect the relational channel actually carries for SMEs, and a demonstration that this share is far smaller than single-format designs would suggest. In doing so, it supplies a more precise, mechanism-based understanding of how agility matters for the sustainability of small firms in resource-constrained settings.

6. Implications

6.1 Theoretical implications

The study offers three theoretical implications. First, by integrating the dynamic capabilities view, social capital theory, and the relational view within a single dual-pathway model, it demonstrates that these perspectives are complementary and that their joint specification changes the conclusions each would support alone: internal capability generates performance directly, and relational resources add a distinct, smaller increment [7, 12, 32]. Second, by establishing complementary partial mediation with a calibrated proportion mediated, it replaces the binary question of whether relational resources mediate the agility–performance link with the more productive question of how much they mediate, a specification that future capability research can adopt and compare across contexts [33]. Third, by showing that decision speed aligns with agility yet adds no incremental explanation, it sharpens the conceptual boundary between the tempo of choice and the capability to adapt, contributing precision to the agility construct [4].

6.2 Practical and policy implications

For SME owners and managers, the findings recommend investing first in the firm’s own adaptive machinery, namely the routines through which customer needs are sensed quickly and people, funds, and equipment are redeployed without friction, because this capability carries the largest and most direct sustainability payoff. Relationship building with buyers, suppliers, and government actors remains worthwhile as an amplifier of that capability and as an independent source of advantage, and it is best pursued alongside, rather than instead of, capability building. For policymakers and business-support institutions, the results imply that programmes which strengthen SME adaptive capability, such as digital adoption support, managerial training in resource reallocation, and flexible micro-financing, address the primary channel of sustainability, while network-oriented instruments such as SME associations, mentoring platforms, and partnership facilitation address a genuine but secondary channel [1]. Finally, because environmental performance responds only weakly to both channels, advancing the environmental pillar of the SDGs among SMEs will require dedicated instruments, including green skills development, targeted green financing, and environmental requirements transmitted through public procurement and buyer standards, rather than reliance on general capability or network programmes.

7. Conclusion, limitations, and future research

This study examined how strategic agility relates to the sustainable performance of SMEs in an emerging economy and quantified the relational mechanism that partially carries this relationship. Drawing on an integrative dual-pathway framework and survey evidence from 179 Indonesian SMEs collected with a measurement design built to constrain common method variance, it found that strategic agility improves triple-bottom-line performance primarily through a direct capability pathway, that managerial ties with buyers, suppliers, and government actors add a significant complementary pathway carrying roughly 14% of the total effect, and that decision speed accompanies agility without substituting for it. Agility, in short, matters for SME sustainability chiefly because of what it lets the firm do, and additionally because of whom it helps the firm know.

Several limitations qualify these conclusions and delineate an agenda for future research. The cross-sectional design precludes strong causal inference, and the possibility of reverse causation between agility, ties, and performance cannot be excluded [33]. The outcome measures are self-reported and perceptual rather than externally audited, and although the differentiated anchors, attention checks, marker-variable test, and full-collinearity assessment jointly indicate that method variance is well controlled, a single-informant design can never eliminate it entirely [38, 44]. The AVE of the second-order performance construct sat at the 0.50 boundary, reflecting the breadth of the triple-bottom-line conception, and the dimension-level analysis should therefore be read alongside the aggregate results. The sample is geographically bounded to the Greater Bandung region and recruited through non-probability channels, which limits generalisability despite the deliberate use of five complementary recruitment routes. Future studies could employ longitudinal or multi-informant designs, incorporate objective and audited performance data, examine moderators such as environmental dynamism and institutional support, test the model across regions and sectors, and investigate which dedicated instruments most effectively activate the environmental dimension that general capability and network channels leave behind. Addressing these questions would further consolidate a calibrated, mechanism-based understanding of how adaptive capability and relational resources jointly sustain small enterprises.

Declarations

Ethics approval and consent to participate. The study was performed in accordance with the ethical standards of the institutional research committee and with the 1964 Declaration of Helsinki and its later amendments. The study protocol was reviewed and approved by the Research Ethics Committee of Institut Teknologi Bandung (Komisi Etik Penelitian ITB; ethical clearance No. KEP/II/2025/X/M070825HW-DCRT, issued 19 November 2025 and valid until 19 November 2026). All respondents were adults who participated voluntarily and anonymously, and informed consent for participation and for the use of responses in analysis and publication was obtained electronically from all respondents before the questionnaire began.

Clinical trial number. Not applicable.

Conflict of interest. The authors declare that they have no competing interests.

Data availability. The datasets analysed during the current study are available from the corresponding author on reasonable request.

Funding. The authors declare that no funds, grants, or other support were received during the preparation of this manuscript.

Author contributions. Harimukti Wandebori: conceptualisation, methodology, formal analysis, investigation, data curation, writing—original draft. Anak Agung Ngurah Tata Pinandhika: methodology, validation, writing—review and editing, supervision. Bernadetta Nadya Amarani Sitompul: resources, writing—review and editing, project administration. All authors read and approved the final manuscript.

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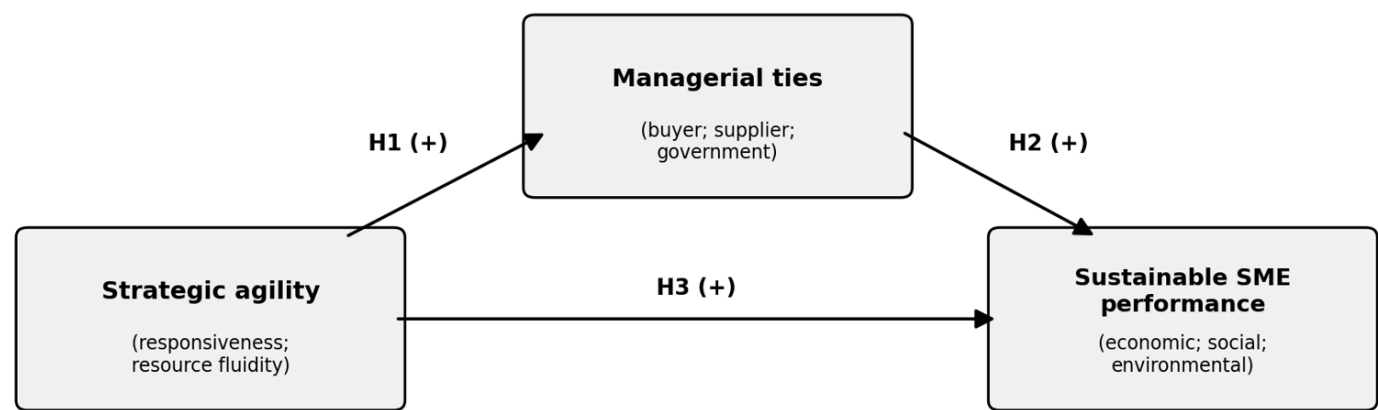
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Figures



H4: Managerial ties partially mediate the agility-performance relationship

Figure 1

The hypothesised dual-pathway model linking strategic agility, managerial ties, and sustainable SME performance

Supplementary Files

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