

Preferential purchasing policies and SME participation in public procurement markets: do technological capabilities matter?

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Abstract

This article examines how preferential purchasing policies influence small and medium-sized enterprise (SME) participation in public procurement markets, with particular attention to the moderating role of technological capabilities. The study adopted a cross-sectional research design and utilised a structured questionnaire to collect data from 283 randomly selected SMEs in Tanzania. The collected data was subsequently analysed using the Hayes PROCESS macro to test the proposed hypotheses. The findings revealed significant direct effects of preferential purchasing policies and technological capabilities on SME participation in public procurement markets. Surprisingly, technological capabilities exhibited insignificant positive moderating effect on the relationship between preferential purchasing policies and SME participation in public procurement markets. The study concludes that preferential purchasing policies can autonomously legitimise SME participation in public procurement markets, irrespective of technological capabilities. However, its positive coefficient signifies the potential of technological capabilities in strengthening the effect of preferential purchasing policies on SME participation in public procurement markets. The study recommends that policymakers, oversight authorities and support institutions streamline preferential purchasing policies within the public e-procurement system and provide training and mentorship programmes aimed at strengthening SMEs' technological capabilities and engagement in procurement markets. For SME managers, the study suggests investing in basic digital infrastructure (e.g. standard ICT tools and internet access), developing e-procurement-related skills and system integration. The study makes novel contribution to literature on SME-supporting policies and competitiveness in public procurement markets. It integrates insights from regulatory frameworks and firm-level technological capabilities to explain SMEs' participation in public procurement markets, an interplay which has been underexplored in existing literature.

Received

06 March 2026

Received in revised form

01 June 2026

Accepted

17 June 2026

Keywords:

Preferential purchasing

SMEs

Public procurement

Technological capabilities

Inclusive participation

1. Introduction

The inclusion of the small and medium-sized enterprises (SMEs) in the public procurement markets (PPM) has been stressed across governments and regions. This is attributed to substantial roles that SME plays in economies, as well as the sheer size of PPM. SMEs are commonly known to be drivers of economic growth, innovation, job creation and major contributors to gross domestic products (GDP). Also, SMEs represent the largest proportion (90%) of all businesses worldwide, generate up to 50% of the global employment, and contribute approximately 40% of the GDP (Flynn, 2026; World Bank, 2023). PPM, on the other side, constitutes a significant percentage of government expenditure, estimated at 70% in emerging economies and 30% in developed countries (Open Contracting Partnership, 2020; Taoufik & Azmani, 2025). With these regards, the inclusion of SMEs in PPM gives governments a distinct policy tool to facilitate broader socio-economic development, entrepreneurship, revenue generation and market expansions for SMEs (Changalima et al., 2023; Israel & Kazungu, 2019; Kinyua et al., 2025; Zabala-Iturriagagoitia, 2022). Ideally, the participation of SMEs in PPM symbolises how SMEs can access public procurement opportunities, compete against them, win tenders and successfully carry out contracts to supply goods, works and services (Flynn, 2026; Flynn & Davis, 2017; Hoekman & Taş, 2022). Irrespective of their significance, SMEs grapples with challenges to capitalize on their prospects and succeed in PPM. The market, especially is dominated by large-experienced enterprises (Akenroye et al., 2024; Kibari & Muturi, 2020). The statistics provided in 2023 revealed that the global average rate of SMEs involvement in PPM was 18% (World Bank, 2023).

In Tanzania specifically, where this study was conducted, the overall participation rate of SMEs in PPM was 4%, with an estimated range of 3% among the small enterprises, and 6% among the medium-sized enterprises (World Bank, 2023). This rate is considerably less compared to 18% of participation rate of large firms (World Bank, 2023). Several structural and individual obstacles have been reported to inhibit the ability of SMEs to exploit the potential of PPM. Among these obstacles are the bureaucratic nature of the PPM process, limited managerial and technical capacity among SMEs, stringent qualification and certification requirements, and intense competition from large companies (Mahuwi & Israel, 2023; Mutangili, 2024). The other obstacles are limited access to information on procurement, insufficient financial capacity and lack of experience in handling large government contracts (Ismail & Changalima, 2022; Israel et al., 2026; Mahuwi & Israel, 2023). To counter these issues, the Government of Tanzania has endorsed a set of preferential purchasing policies (PPPs) as a significant tool to help overcome the obstacles and low rates of participation of SMEs in PPM. The policies are grounded in the institutional theory (IT) and are aimed to level the playing field and engage SMEs in PPM by offering them preferential treatment and advantages in the tender evaluation and award of contracts (Ibrahim & Kyara, 2023; Kim et al., 2023). Viewed in the theoretical lens of IT, PPPs provide legislative frameworks (coercive and normative), which compel public organisations to implement and legitimize practices that involve SMEs in the procurement ecosystem (Kemboi & Thogori, 2025). Moreover, SMEs themselves are embedded in the same institutional context and are required to align their behaviour with the prevailing rules and norms of PPPs to gain legitimacy for engaging in PPM.

One of the PPPs in countries such as Kenya, South Africa, and Tanzania requires that 30% of procurement contracts be exclusively reserved for disadvantaged small businesses [The United Republic of Tanzania, (URT, 2023)]. Other policies focus on prioritising procurement from local SMEs and separating contracts into smaller lots (Ibrahim & Kyara, 2023; URT, 2023). Moreover, SMEs are also exempted of performance and tender security assurances, bidding charges and access to advance payments (Kenya Literature Bureau, 2021; URT, 2023). In certain contexts, bid price preferences are applied by discounting SMEs' tenders by a designated percentage. If a particular SME's tender emerges as the lowest-evaluated bid, it is then awarded the contract (Glas & Eßig, 2018; Patil, 2017). When properly enforced, PPPs have the potential to offset the structural and individual barriers associated with SME engagement in PPM. The rationale behind this is that PPPs enable SMEs to lower the barriers to entry in PPM, ease compliance requirements, provide preferential evaluation criteria and targeted capacity-building assistance (Di Mauro et al., 2020; Matveev, 2024). However, studies on the importance of PPPs in SME involvement in PPM suggests a contradictory view. In South Korea and New Zealand, studies by Kim et al. (2023) and Malcolm et al. (2024) indicate that PPPs facilitate SME involvement in PPM. However, in the United Kingdom, Glas and Eßig (2018) found no significant relationship between PPPs and SME involvement in PPM. These discrepancies underscore the necessity of getting further insights into when PPPs translate into greater involvement of SMEs in PPM.

According to Hayes (2022), the "when" question in business and social research is addressed through moderation analysis. This method describes how a moderating variable reinforces or undermines the effect of a predictor variable on the outcome variable. Considering the fact that PPPs are embedded in e-procurement system (Siwandeti et al., 2021; URT, 2023), therefore, this study proposes technological capabilities (TEC) as a key moderator of the relationship between PPPs and the participation of SMEs in PPM. This proposition is anchored in the theoretical framework of technology acceptance model (TAM), which explains firm's acceptance, adoption and use of new technologies (Davis, 1989). TAM proposes that firms adopt new technology depending on their perceptions of its usefulness and ease of use (Aburbeian et al., 2022). In this regard, TEC, especially digital skills, information and communication technology (ICT) infrastructure and system integration are important contributors to the perceived usefulness and ease of use that facilitates SMEs access to PPPs and overcome the complexity of e-procurement systems. Robust TEC ensure that SMEs can respond adequately to the digital aspect of PPM. More importantly, robust TEC helps SMEs design innovative products and services that meet the demand of buying organisations (Israel & Mwenda, 2024; Kemboi & Thogori, 2025).

Therefore, the interaction between PPPs and TEC establishes a sophisticated environment where the involvement of SMEs in PPM is determined. Although PPPs can reduce barriers to entry in PPM (Flynn, 2018), firms with strong TEC are better placed at successfully exploiting digitally integrated procurement opportunities (Kemboi & Thogori, 2025). However, evidence-based studies examining the interplay between PPPs, TEC and participation of SME suppliers in PPM, particularly in emerging economies like Tanzania remain scarce. Prior empirical studies in this domain are centred on assessing the direct effect of PPPs (Kim et al., 2023; Malcolm et al., 2024; Matveev, 2024) and TEC (Israel & Mwenda, 2024; Nakabuye, et al., 2023) on SME participation in PPM. Other studies address the barriers and factors for SME engagement in PPM (Akenroye et al., 2024; Dobrotă et al., 2022; Jama & Muloosi, 2025; Mutangili, 2024). The present study offers novel insight, examining the moderating role of TEC on the relationship between PPPs and participation of SME suppliers in PPM using the theoretical lenses of IT and TAM. In addition, the study examines whether PPPs and

TEC contribute individually to SME participation in PPM. The study is motivated by prior mixed findings, low rate SME participation in PPM and the enabling role of TEC in harnessing preferential e-procurement-based opportunities. The study is timely, given the growing focus on inclusive economic growth and sustainable development of SMEs in the global and national policy agendas (URT, 2023; World Bank, 2021). It is against this background that this study addresses the following three research questions:

RQ1. What is the effect of PPPs on SME participation in PPM?

RQ2. Does TEC have a significant direct effect on SME participation in PPM?

RQ3. How does TEC moderate the effect of PPPs on SME participation in PPM?

The implications of the interaction between PPPs, TEC and SME participation in PPM is both theoretical and practical in nature. Theoretically, the study advances the use of the TAM and IT to examine how institutional interventions such as PPPs interact with the firm-level capabilities like TEC to foster SME engagement in PPM. It contributes to existing literature on SME dynamic capabilities, regulatory environments and inclusive participation by offering new insight on the direct and moderating role of TEC in the link between PPPs and SME involvement in PPM. In practice, the research provides evidence-based recommendations to policymakers, support institutions and managers of SMEs interested in promoting inclusive participation in PPM. It reiterates the importance of both PPPs and TEC in enhancing the participation outcomes in the PPM.

2. Literature review

2.1 Theoretical underpinnings

This study is framed within IT and TAM, similar to prior studies (Akenroye et al., 2024; Brandon-Jones & Kauppi, 2018; Liu et al., 2024; Nassir et al., 2025), to explore how public sector employees respond to external institutional pressures for greater SME participation in PPM based on their TEC. In particular, IT identifies three types of pressures, namely coercive, normative and mimetic that shape organisational behaviour and performance (Meyer & Rowan, 1977; Scott, 2004). However, this study focuses on coercive posture of IT because the emphasis is on how PPPs act as external legal policy directives that facilitate and mandate SME engagement in PPM. PPPs, particularly set-asides, bid lot sizing, bid price preferences and procurement from local SMEs emanates from coercive posture of IT that compel PEs to include SMEs in public procurement processes. Empirical evidence in this context suggests that, when effectively enforced, PPPs can serve as key drivers of SME participation in PPM (Hoekman & Tas, 2022; Matveev, 2024). This is because PPPs create an enabling regulatory environment and supporting instruments that reduce structural barriers and legitimise SME involvement in PPM. The normative and mimetic pressures are not featured because the study does not account for professional norms, industry standards and imitation behaviour among SMEs.

However, IT is criticised for placing more emphasis on external pressures and providing limited insight into firm-level internal capabilities such as TEC (Aksom & Tymchenko, 2020). Given these limitations and the digital nature of PPM (Kim et al., 2023; Liu et al., 2024), IT can benefit from being complemented by the TAM in examining how TEC strengthen the effect of PPPs on SME participation in PPM. Yet, TAM is criticised for overlooking broader institutional factors that influence technology adoption (Rahimi & Oh, 2025). The theory primarily focusses on the perceived usefulness and ease of use as critical determinants that shape users' attitudes towards the acceptance and effective use of technology and systems (Aburbeian et al., 2022; Davis, 1989). In this way, TEC can serve a critical factor that influence SMEs' perceptions of e-procurement systems and, consequently, their willingness to utilise PPPs integrated within (Israel & Mwenda, 2024; Kemboi & Thogori, 2025). Well-developed ICT infrastructure, adequate digital skills and system integration capabilities instil users' confidence and competence in navigating e-procurement applications, as articulated by TAM. Prior studies in this domain have paid limited attention to the complementary role of IT and TAM. Accordingly, these theories are jointly employed in this study to explain how PPPs and TEC interact to influence SME engagement in PPM. While IT provides the institutional incentives and legitimacy for SME participation in PPM, TAM explains how TEC enables SMEs to operationalise PPPs through e-procurement system.

2.2 Preferential purchasing policies and SME participation in PPM

Typically, PPPs represent a form of coercive institutional pressure imposed by governments through formal rules and regulations that require public entities to include SMEs in public procurement activities. However, the literature in this domain provides contradictory findings on the relationship between PPPs and SME engagement in PPM. In Canada, a study by Di Mauro et al. (2020) reveal a significant positive impact of PPPs on SME engagement in PPM. These studies argue that PPPs, such as bid lot sizing, price preferences and the removal of bid security requirements, reduce entry barriers and enhance SMEs' eligibility and visibility within PPM. Such schemes, as also cited by Matveev (2024) reduce

financial constraints and ease compliance burdens that disproportionately limit SMEs' participation in PPM. Moreover, studies by Hawkins et al. (2018) and Hoekman and Taş (2022) in the United States and Egypt suggest that PPPs, particularly reserved contracts, reduce the intensity of competition and guarantee SMEs access to a defined share of government tenders that might otherwise be dominated by large firms. On the contrary, Glas and Eßig (2018), in the UK, found that bid lot sizing does not guarantee SME success in PPM. These inconsistencies may be attributed to differences in the rules and regulations governing PPM across countries (Di Mauro et al., 2020; Lu et al., 2021). Such differences provide an opportunity to examine how PPPs influence SME participation in PPM in emerging economies like Tanzania, where SMEs face unique disadvantages (Mahuwi & Israel, 2023; Mutangili, 2024). This relationship is operationalised within the coercive dimension of IT (Scott, 2004) and prior empirical evidence (Flynn, 2018; Hoekman & Taş, 2022), presenting PPPs as external policy instruments that level the playing field and help overcome disadvantages faced by SMEs in engaging in PPM. Given these insights, it is reasonable to hypothesise that:

H1. PPPs have a positive influence on the participation of SMEs in PPM

2.3 The moderating role of technological capabilities

Although PPPs create structural opportunities through coercive pressure that support SME engagement in PPM (Kemboi & Thogori, 2025; Matveev, 2024), their existence does not automatically guarantee effective SME participation. This is because firms differ in their ability to respond to digitalised PPM systems (Akenroye et al., 2020; Israel & Mwenda, 2024). In this regard, TEC, conceptualised in TAM, plays a critical enabling role. TEC reflects the theoretical stance of TAM regarding SMEs' ability to effectively and easily use digital procurement systems, which is nurtured by the availability of standard ICT infrastructure, digital skills, and system integration capabilities (Liao et al., 2020). Such capabilities, as documented by Nakabuye et al. (2023) and Bag et al. (2025) in South Korea and Spain, enable SMEs to respond to tenders efficiently, submit compliant bids, and track PPPs embedded within e-procurement platforms in real time. This, in turn, enhances the usability of PPPs integrated into e-procurement systems, thereby translating policy support intentions into actual SME participation in PPM. Conversely, limited TEC can weaken the impact of PPPs, as SMEs may continue to face exclusion due to difficulties in navigating digital procurement processes (Bag et al., 2025; Kemboi & Thogori, 2025). Although public procurement has increasingly digitalised in emerging economies, empirical evidence on how TEC interacts with PPPs to influence SME participation remains largely unexplored (Bag et al., 2025). This has prompted the necessity to test the following hypotheses in the Tanzanian context using the theoretical lenses of IT and TAM. In this case, TEC is grounded in TAM as an antecedent and enabling condition that reflects SMEs' perceptions of the usefulness and ease of use of institutionalised PPPs rooted in public e-procurement systems.

H2. TEC has a positive influence on the participation of SMEs in PPM

H3. TEC moderates the relationship between PPPs and SME participation in PPM

2.4 The conceptual framework

Figure 1 presents the conceptual model for this study, illustrating the hypothesised relationships between PPPs, TEC and SME participation in PPM. The model was developed based on the literature review and the research hypotheses formulated in the previous section. It proposes that PPPs serves as the drivers for SMEs participation in PPM. Moreover, the model hypothesizes that TEC is positively related to SMEs' participation in PPM. Additionally, the model posits that TEC moderates the effect of PPPs on SME participation in PPM. Firm size and age were also featured in the model as the control variables because they could have a substantial effect on the involvement of SMEs in PPM.

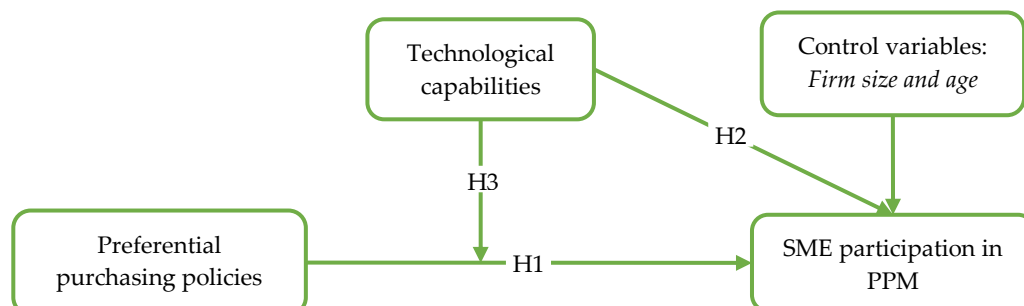


Figure 1. The conceptual framework

Source: Figure by the authors

3. Research methodology

3.1 Research design and study area

The study used a positivism paradigm and cross-sectional research design to examine the moderating role of TEC in the relationship between PPPs and participation of SMEs in PPM. Positivism paradigm is highly appropriate when authors aim at testing and validating the hypotheses in the proposed model using quantitative data (Eichelberger, 1989), as in the case of this study. Alternatively, the choice of a cross-sectional research design was informed by the fact that the research sought to gather information about a phenomenon at a certain point in time, as opposed to tracking changes over time (Saunders et al., 2019). The research study was carried out in Dodoma, Arusha, Mbeya, Mwanza and Dar es Salaam regions of Tanzania. Tanzania was selected for this study because it experiences a relatively low rate of SME participation in PPM (4%), compared to neighbouring developing countries like Uganda (8%) and Kenya (25%) (World Bank, 2023). On the other hand, the five regions were selected for the study for three main reasons. Primarily, the regions are the economic centres of Tanzania, which, in aggregate, account to 47.77% of all SMEs in the country (United Nations, 2020). Second, PEs in these regions have consistently exhibited varying levels of SME participation in PPM, with only 2% complying with PPPs [Public Procurement Regulatory Authority (PPRA, 2021)]. Lastly, each of the selected regions represent a unique zone of the country. Dodoma represents the Central region, Arusha the Northern region, Mbeya the Southern Highlands region, Mwanza the Lake region, and Dar es Salaam the East and Coastal regions. These factors render the selected regions as the most appropriate and representative zones to examine how TEC interact with the PPPs to influence the participation of the SME in PPM.

3.2 Sampling

The unit of analysis in this research was SME suppliers operating in the aforementioned five study regions. SME suppliers were considered for the study because they account for lowest participation rate (13%), compared to other services (20%), consulting services (14%) and construction sector (13%) (Bas et al., 2019). In addition, SME suppliers constitute the largest proportion of SMEs in the country, representing 55.1% of establishment (URT, 2024), and the majority (95%) of the country's businesses (URT, 2022), but yet underrepresented in PPM (Jama & Muloosi, 2025; Mutangili, 2024). Given their numbers, promoting SME participation in PPM has broader socio-economic implications because it stimulates employment, innovation, development of local firms, and overall economic growth (Kinyua et al., 2025). Focusing on the interplay between PPPs and TEC may determine whether SMEs can address structural barriers and effectively engage in PPM for sustained and inclusive economic growth.

Specifically, the study targeted SME suppliers who were already registered in the National e-Procurement System of Tanzania (NeST) as of December 2024, before commencement of data collection in February 2025. The reason to include SME suppliers who are registered in the NeST was to capture the current state of the phenomenon being studied. NeST registration implies that SMEs are interested in actively engaging in government e-procurement system (Siwandeti et al., 2021). Therefore, they were believed to be in a position to provide relevant information with respect to the study variables. As of December 2024, there were 2,717 SME suppliers registered in the NeST across the five regions, as indicated in the records provided by the PPRA. This was distributed as follows: Dar es Salaam (1,550), Dodoma (238), Arusha (296), Mbeya (310) and Mwanza (323). Yamane's (1967) formula for a finite population was used to determine the minimum sample size of 349 SME suppliers from the total population of 2,717 (see Equation 1). The estimated sample size, i.e., 349 was allocated proportionally in each region to maintain diversity, representation and to prevent bias in selecting participants in the study. Random sampling was then used to sample SME managers of each enterprise as units of inquiry.

$$n = \frac{N}{1 + N(e)^2} = \frac{2,717}{1 + 2,727(0.05)^2} = 349 \dots \dots \dots (1)$$

3.3 Data collection

Primary quantitative data was collected in this study using a self-administered structured questionnaire survey with a series of closed-ended questions. Questionnaire survey is chosen as a method of data collection due to its ability to deal with a large variety of the population and provide a significant amount of data within a short period of time (Saunders et al., 2019). The research questionnaires were distributed to the respondents in two ways. An email system was employed as an effective channel of sending questionnaires to the remote respondents. Nonetheless, the questionnaires were given face-to-face to the respondents that were physically close. Initially, 349 questionnaires were distributed to SME managers. Following the data processing and elimination of non-responses, 283 useful responses were generated. This represents an 81.09% response rate. The realised response rate satisfied the minimum sample size of 200 required for conducting confirmatory factor analysis (CFA) and moderation analysis (Hayes, 2022; Wolf et al., 2013). Table 1

provides detailed information about the sample profile of the 283 respondents. It exhibits significant differences in respondents' gender, age, academic qualifications, operational experience, firm size and region of location. The questionnaire survey was pre-tested before the data collection on six SME managers, and academia in the field. Changes and modifications were introduced in response to suggestions to ensure that the face and content validity of the questionnaire were maintained. Data were collected over a seven-month period, spanning February to August 2025.

Table 1: Overview of sample characteristics (n = 283)

Variable	Response	Frequency	Percentage
Sex respondents	Female	149	52.7
	Male	134	47.3
Age groups	20 - 30 years	49	17.3
	31 - 40 years	82	29.0
	41 - 50 years	62	21.9
	51 - 60 years	50	17.7
	61 years and above	40	14.1
Academic qualification	Secondary education	91	32.2
	Diploma	73	25.8
	First degree	87	30.7
	Postgraduate	32	11.3
Operational experience	1 - 5 years	68	24.0
	6 - 10 years	88	31.1
	11 - 15 years	75	26.5
	16 years and above	52	18.4
Region of location	Dodoma	26	9.2
	Arusha	33	11.7
	Mwanza	36	12.7
	Mbeya	35	12.4
	Dar es Salaam	153	54.0
Number of employees	5 - 49	218	77.0
	50 - 99	65	23.0

Source: Table by the authors

3.4 Measures of constructs

The measures for constructs used in this study were adapted from previous studies. The predictor variable (PPPs) was assessed with a 5-item scale based on two studies, which are Arrowsmith (2010), and Hoekman and Taş (2022). The measures capture the extent to which SMEs benefit from regulatory and policy-based procurement exclusive schemes. The moderator variable (TEC) was measured using 4-item scale adopted and modified from Liao et al. (2020) and Nakabuye et al. (2023). The measures reflect SMEs' ability to use e-procurement systems, digital communication tools and internal ICT infrastructure to support tendering activities. Finally, the outcome variable (participation of SMEs in PPM) was measured using a 5-item scale adapted from Flynn and Davis (2016), Mwai and Senelwa (2018), Kibari et al. (2020), and Tukamuhabwa and Namagembe (2023).

All the measurement items were modified to reflect the nature of SME suppliers and the context of PPM in Tanzania. The complete list of measurement items and their sources are provided in Table 2. Each measure was rated on a five-point Likert scale (1 - strongly disagree to 5 - strongly agree). A pre-testing (n = 56) was conducted among SME suppliers to assess the reliability of the scale using Cronbach's alpha (α). Based on the analysis in Table 2, all the constructs (PPPs, TEC and SME participation in PPM) demonstrated reasonable reliability, with Cronbach's alpha coefficients being above the recommended threshold of 0.7.

Table 2: Constructs and measures

Constructs and indicators	Code	References
<i>Preferential purchasing policies (PPP): $\alpha = 0.708$</i>		
• Our firm is capable of utilizing set-aside procurement contracts that are exclusively reserved for SMEs.	Ppp1	Arrowsmith (2010)
• Our firm leverage tender lot sizing to effectively participate in public procurement contracts.	Ppp2	Hoekman and Taş (2022)
• Prioritizing purchases from local SMEs enhances our firm's ability to engage in public sector markets.	Ppp3	
• Our firm leverages bid price preferences to win public procurement contracts.	Ppp4	
• Our firm leverages relief from financial requirements to effectively participate in public procurement.	Ppp5	
<i>Technological capabilities (TEC): $\alpha = 0.899$</i>		
• Our firm has the ability to conduct research to create innovative products.	Tec1	Liao et al. (2020)
• Our firm has qualified technical staff to handle e-procurement-based processes.	Tec2	Nakabuye et al. (2023)
• We use standard ICT tools that support e-procurement tendering processes.	Tec3	
• Our firm supports technical skills through continuous training programmes.	Tec4	
<i>Participation of SMEs in PPM: $\alpha = 0.795$</i>		
• Our firm is pre-qualified for public procurement opportunities.	Ppm1	Flynn and Davis (2016)
• Our firm regularly seeks and searches for tender requests in public sector markets.	Ppm2	Mwai and Senelwa (2018)
• Our firm consistently submits bids in response to public sector tender requests.	Ppm3	Kibari et al. (2020)
• Our firm has effectively secured contracts with the public sector through competitive bidding.	Ppm4	Tukamuhabwa and Namagembe (2023)
• Our firm has successfully supplied goods, works, and services to the public sector through the acquisition of tenders.	Ppm5	

Source: Table by the authors

3.5 Common method variance

This study utilised both procedural and statistical remedies to deal with any common method variance (CMV) that could emerge due to self-reported data. Procedurally, the questionnaire survey was able to guarantee anonymity of respondents and made thoroughly aware of the purpose of the study. In addition to that, the measurement items of independent, moderator, and dependent variable were separated in the questionnaire. These procedures aimed to reduce the likelihood of biased responses. Harman single-factor test as recommended by Podsakoff et al. (2003) was statistically done to assess CMV. This involved performing exploratory factor analysis (EFA) on all measures of PPPs, TEC and participation of SME in PPM without rotation to establish whether a single measure explained most of the variance. The findings indicated that the first factor explained 43.18% of the total variance, which is quite smaller than 50%. These findings indicate that CMV could not have had a major influence on the outcome of the study.

3.6 Data analysis

This study involved three steps of data analysis. Initially, EFA was conducted in statistical package for the social sciences (SPSS) for each construct to assess the underlying data structure and its dimensionality. This was conducted in accordance with the recommendations of Costello and Osborne (2005), because the measures of the theoretical constructs were adapted from different sources. Factor loadings and dimensions of each measure were extracted using principal component analysis (PCA) with varimax rotation and Kaiser normalisation. In the second stage, items that met the criteria EFA (factor loadings ≥ 0.5 and eigenvalues > 1) were subjected into CFA using the analysis of moment structures (AMOS) v.24 to validate the latent variables and measure defining PPPs, TEC and SME participation in PPM to confirm that they are sufficiently loaded. Subsequently, the Hayes PROCESS macro (Model 1) was employed to examine the moderation effect of TEC on the relationship between PPPs on SMEs participation in PPM through

bootstrap procedure with a 5,000 iterations sample. In this study, the Hayes PROCESS macro provides a more computationally efficient approach for estimating the conditional moderation effect with the inclusion of covariates (Hayes, 2022). Primarily, the study focuses on testing a single moderation effect (Model 1), rather than a complex model with multiple latent constructs (Ramayah et al., 2018).

4. Results

4.1 Dimensionality of constructs

Table 3 presents the results of EFA that was conducted to establish the dimensionality of the PPPs, TEC and SME participation in PPM through PCA with Varimax rotation. The process led to the extraction of three components, with a cumulative of 72.098% of the total variances explained. All components demonstrated the adequate level of internal reliability with Cronbach alpha values (α) of 0.706 for PPP, 0.822 for TEC and 0.819 for SME participation in PPM. Each component had eigenvalues exceeding the recommended value of 1. Furthermore, the Kaiser-Meyer-Olkin (KMO) values that assesses the adequacy of sampling was 0.718, exceeding the recommended value of 0.50. Besides, the test of sphericity based on Bartlett resulted in significant results with Chi-square = 1429.518 and degree of freedom (df) = 132 at $p = 0.005$. This also implies that the sample was adequate for performing EFA. The three constructs were captured using 14 items drawn from previous studies. One item (marked with*) exhibited a loading less than the recommended threshold of 0.5, hence was excluded due to its weak contribution (Morgan et al., 2020).

Table 3: Factor rotated analysis results

Components	Loadings	α	Initial Eigenvalues		
			Total	% of Variance	Cumulative %
Preferential purchasing policies (PPP)		0.706	8.843	43.1752	43.675
Ppp1	0.484*				
Ppp2	0.783				
Ppp3	0.811				
Ppp4	0.804				
Ppp5	0.875				
Technological capabilities (TEC)		0.822	4.496	19.864	63.539
Tec1	0.765				
Tec2	0.877				
Tec3	0.880				
Tec4	0.778				
Participation of SMEs in PPM		0.819	1.771	8.559	72.098
Ppm1	0.827				
Ppm2	0.814				
Ppm3	0.855				
Ppm4	0.796				
Ppm5	0.797				

Extraction method: PCA

Note(s): * indicates deleted item with loading < 0.5

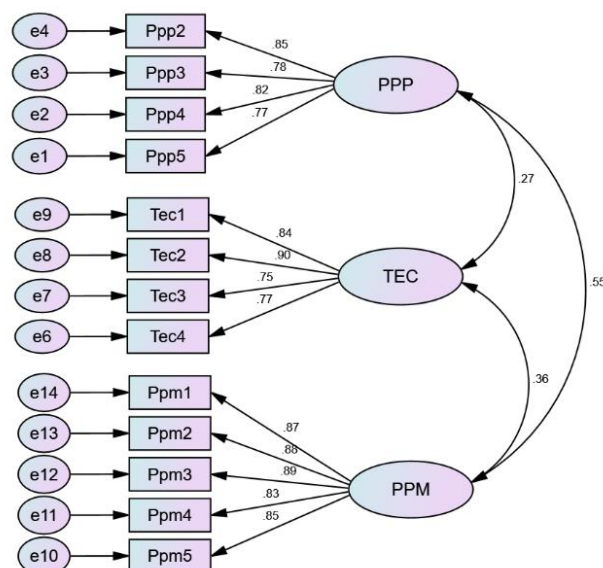
Source: Table by the authors

4.2 Validity and reliability analysis

After the EFA, a CFA was performed to assess the model's structure (see Figure 2) and its alignment with the observed data for validity and reliability. The CFA results indicated satisfactory model fit indices. A chi-square (χ^2) value of 173.171 ($p < 0.000$), degrees of freedom (df) = 62, and a χ^2/df ratio of 2.793 were obtained. Figure 2 contains the results of other fit indices, including the adjusted goodness of fit index (AGFI), root mean square error of approximation (RMSEA), standardised root mean square residual (SRMR), goodness of fit index (GFI), root mean residual (RMR), Tucker-Lewis index (TLI), incremental fit index (IFI), normed fit index (NFI), comparative fit index (CFI) and probability of close fit (PClose). All of these indices exhibited marginally acceptable fit statistics that exceed commonly recommended thresholds (Hair et al., 2020).

More importantly, the model reveals high validity and reliability (see Table 4). Specifically, each measure and construct exhibited AVE values and factor loading above the threshold of 0.50. These results reveal that indicators adequately capture their respective latent constructs, thereby signifying convergent validity (Hair et al., 2020). In

addition, composite reliability (CR) and the alpha of Cronbach of each theoretical construct were above the criterion of 0.7. This confirms a high internal consistency and reliability (Hair et al., 2020). Furthermore, the square roots of AVE (diagonal italicised values in Table 5) are greater than the inter-construct correlations, while MSV and ASV values are lower than AVE for all constructs. This confirms discriminant validity (Fornell & Larcker, 1981; Hair et al., 2020), suggesting that TEC, PPPs and PPM are empirically distinct concepts despite being theoretically related. These tests validate that the theoretical model was testable and fitted well with the data (Fornell & Larcker, 1981; Hair et al., 2020).



Model fit indices: GFI = 0.909, NFI = 0.935, IFI = 0.957, TLI = 0.946, CFI = 0.957, RMSEA = 0.080, RMR = 0.028, and PClose = 0.176

Figure 2. The measurement model

Source: Figure by the authors

Table 4: Measurement model estimates

Constructs and indicators	λ	α	CR	AVE
<i>Preferential purchasing policies (PPP)</i>		0.793	0.882	0.651
• Ppp2	0.852			
• Ppp3	0.781			
• Ppp4	0.822			
• Ppp5	0.770			
<i>Technological capabilities (TEC)</i>		0.805	0.890	0.670
• Tec1	0.840			
• Tec2	0.905			
• Tec3	0.752			
• Tec4	0.768			
<i>Participation of SMEs in PPM</i>		0.828	0.935	0.742
• Ppm1	0.867			
• Ppm2	0.876			
• Ppm3	0.887			
• Ppm4	0.831			
• Ppm5	0.846			

Source: Table by the authors

4.3 Descriptive statistics and correlation analysis

The distribution, variability and relationship of constructs under study are presented by means of descriptive statistics including mean and standard deviation (SD) and inter construct correlation analysis (see Table 5). PPP and TEC have relatively moderate mean scores of 3.862 (SD = 0.948) and 3.654 (SD = 0.813), respectively. PPM has also a moderate mean score of 3.940 (SD = 1.070), indicating a slightly moderate level of participation of SMEs in PPM. The inter-constructs correlation analysis indicates a significant positive association. Specifically, TEC is positively associated with PPM ($r = 0.356$, $p < 0.01$) and PPP is positively associated with PPM ($r = 0.546$, $p < 0.01$). TEC reveals a positive but

relatively weaker association with PPPs ($r = 0.267$, $p < 0.01$). This suggests that TEC supports the effective utilisation of PPP. These results underscore the critical role of PPPs and TEC in enhancing SME engagement and success in PPM. The highest correlation (0.546) remains below the critical threshold of 0.7, indicating that multicollinearity is not a concern and that the constructs retain distinct conceptual identities (Pallant, 2020).

Table 5: Descriptive statistics and constructs inter-correlation matrix

Construct	Mean	SD	AVE	MSV	ASV	TEC	PPP	PPM
TEC	3.654	0.813	0.670	0.127	0.099	0.819		
PPP	3.862	0.948	0.651	0.298	0.185	0.267**	0.807	
PPM	3.940	1.070	0.742	0.298	0.212	0.356**	0.546**	0.862

Note(s): **Correlation is significant at the 0.01 level (2-tailed).

Italic fonts (italicised-diagonal values) are the square root of AVE

Source: Table by the authors

4.4. Structural model and hypotheses testing

4.4.1 Testing for the direct and moderation effects

The study examined the direct effect of PPPs on SME participation in PPM, as well as the moderating role of TEC in this relationship, using Hayes' PROCESS macro model 1. Table 6 presents the results of hypothesis testing, path coefficients, explained variance (R^2) and R^2 change, t-values, p-values and confidence intervals through a 5,000-sample bootstrapping procedure. The results revealed a significant positive effect of PPPs ($\beta = 0.331$, $p < 0.001$) and TEC ($\beta = 0.300$, $p < 0.001$) on SME participation in PPM, hence supporting H1 and H2. Overall, the model was significant with an R^2 of 0.205 ($p = 0.000$) and an F value of 23.775. This suggest that 20.5% of the variation in SME participation in PPM was explained by PPPs and TEC. The interaction term between TEC and PPPs was positive but statistically insignificant ($\beta = 0.160$, $p > 0.05$). As such, H3 was not supported. The R^2 change for SME participation in PPM was 0.011, with $F = 3.826$ and $p > 0.05$. This suggests that TEC insignificantly strengthens the effect of PPPs on SME participation in PPM by 1.10%. With regard to control variables included in the model, only firm size demonstrated a significant positive effect on SME participation in PPM ($\beta = 0.593$, $p < 0.05$). Firm age exhibited insignificant direct effect on SME participation in PPM ($\beta = 0.032$, $p > 0.05$).

Table 6: Regression results

Hypothesised variables	Estimate	S.E.	T	p	LLCI	ULCI
Main effects						
Constant	2.879	0.040	71.533	0.000	2.800	2.958
H1: PPP $\rightarrow$ PPM	0.331	0.065	5.075	0.000	0.203	0.203
H2: TEC $\rightarrow$ PPM	0.300	0.050	6.039	0.000	0.202	0.397
Moderation effect						
H3: PPP*TEC $\rightarrow$ PPM	0.160	0.082	1.956	0.051	-0.001	0.321
Control variables						
Firm age $\rightarrow$ PPM	0.032	0.029	1.118	0.265	-0.089	0.075
Firm size $\rightarrow$ PPM	0.593	0.029	20.404	0.000	0.536	0.651
R^2	0.205					
F(sig.)	23.775			0.000		
R^2 change	0.011					
F(Sig) Change	3.826			0.051		

Source: Table by the authors

4.4.2 Testing the conditional direct effects

Table 7 presents the results of the conditional direct effects of PPP on PPM at values of TEC. Following Hayes (2022) recommendations, the study presents the conditional effects at one standard deviation below the mean (-1SD), at the mean (0.0), and one standard deviation above the mean (+1SD). Specifically, the conditional effect of PPPs on SME participation in PPM across the three levels of TEC is positive and statistically significant ($\beta = 0.201$ for low TEC, $\beta = 0.331$ at the mean, and $\beta = 0.461$ for high TEC). In all cases, the confidence intervals at each level of TEC for the conditional effects do not include zero. These findings suggest that TEC strengthens the positive effect of PPPs on SME participation in PPM, despite the statistically insignificant moderation effect. This is further supported by the slope plot (see Figure 3), which shows that the effect of PPPs on SME participation in PPM is stronger at high levels of TEC and

weaker at low levels. This is further supported by the p-value of the interaction effect of 0.051 (see Table 6), which is marginally above the conventional threshold of 0.05.

Table 7: Conditional direct effects of PPP on PPM at values of TEC

Predictor	Moderator	Condition	Effect	SE	LLCI	ULCI
PPP	TEC	Low (-0.813)	0.201	0.084	0.037	0.366
		Mean (0.000)	0.331	0.065	0.203	0.460
		High (+0.813)	0.461	0.102	0.261	0.661

Source: Table by the authors

5. Discussion

The results from the statistical analysis presented in the previous section support all three proposed research hypotheses. Among other insights, the findings provide support for the first hypothesis (H1). They underscore the significance of PPPs, such as set-asides, bid price preferences, bid lot sizing, reserved contracts and simplified tender requirements in enhancing SME participation in PPM, irrespective of firm-level TEC. This finding is consistent with prior empirical studies by Malcolm et al. (2024) and Di Mauro et al. (2020) in New Zealand and Canada, which document PPPs as enablers of SME participation and success in PPM. However, the finding contradicts the empirical study by Glas and Eßig (2018) in the United Kingdom, which reports insignificant effects of PPPs on SME participation in PPM. Such inconsistencies, according to Matveev (2024), and Mahuwi and Israel (2024) can be attributed to weak institutional enforcement, excessive compliance requirements or limited policy awareness among SMEs. In particular, this finding reinforces the coercive dimension of IT (Meyer & Rowan, 1977), suggesting that when PPPs are clearly articulated and effectively enforced, they can serve as a powerful institutional mechanism for broadening SME inclusion in PPM. From an IT perspective, PPPs operate as external pressures through which the government establishes rules, incentives, and compliance expectations that favour SME inclusion in PPM. As such, PPPs are conceptualised as institutional mechanisms that level the market structure of public procurement for SMEs. They enable SMEs to overcome structural barriers, competition, financial constraints, and procedural incapacities, ultimately increasing their bidding activity and engagement in PPM (Flynn, 2018; Patil, 2017).

Besides, the study findings support the second hypothesis (H2), which proposed a positive direct effect of TEC on SME participation in PPM. The finding implies that SMEs that possess better ICT infrastructure, technical skills and system integration are in a better position to access, comply and compete in digital environment of PPM. This finding contradicts prior empirical findings by Temponi and Cui (2008) who reported no significant association between TEC and SME involvement in PPM. This inconsistency may be explained by the fact that the level of TEC among SMEs varies considerably across countries and regions (Nakabuye et al., 2023; Rahimi & Oh, 2025). On the other hand, this finding is consistent with prior empirical studies by Brandon-Jones and Kauppi (2018) and Siwandeti (2021), who similarly reported a significant positive relationship between TEC and SME participation in PPM. The insight from this finding reflects the theoretical argument of TAM (Davis, 1989), suggesting TEC as a propensity that shapes both the perceived usefulness and ease of e-procurement platforms and engaging effectively in PPM. From a TAM perspective, this finding implies that SMEs with well-developed TEC are more likely to perceive public e-procurement system as useful and easy to use. With robust TEC, SMEs can easily search for tender opportunities and prepare and submit competitive bids through online platforms. This, in turn, translates into a higher level of SME participation in PPM (Israel & Mwenda, 2024). Such capabilities, as also noted by Nakabuye et al. (2023), help SMEs reduce the procedural complexity of e-procurement systems. This orientation reflects the perceived usefulness and ease of use dimensions of TAM, as shaped by TEC, in fostering SME engagement in PPM.

Lastly, the study's findings failed to support the third hypothesis (H3), which speculated that TEC significantly moderates the effect of PPPs on SME participation in PPM. The finding suggests that, within the context of the sample drawn from five regions in Tanzania, PPPs can independently stimulate SME participation in PPM, regardless of their level of TEC. However, the significant direct effect of TEC on SME participation highlights that TEC remains a critical enabler in its own way. The coexistence of a non-significant moderating effect and a significant direct effect suggests that PPPs and TEC operate through parallel rather than interactive mechanisms. Anchored in the IT perspective, PPPs primarily level the playing field for SME participation by institutionally lowering or removing structural and financial barriers (Kemboi & Thogori, 2025; Matveev, 2024). On the other hand, TEC enhances SMEs' operational readiness to exploit procurement opportunities by strengthening perceived usefulness and perceived ease of use of e-procurement platforms (Brandon-Jones & Kauppi, 2018; Temponi & Cui, 2008), as suggested by TAM (Davis, 1989). These findings contradict earlier studies (Temponi & Cui, 2008), which conceptualised TEC as a complementary or facilitating condition

rather than a direct enabler of SME engagement in PPM. This divergence may be attributed to the increasing maturity of e-procurement systems and rising levels of digital literacy among SMEs, which enhance the explanatory power of TAM in e-public procurement contexts. This transformation has elevated TEC from a supportive resource to a critical determinant of SME participation in modern PPM (Israel & Mwenda, 2024; Sun & Lee, 2025).

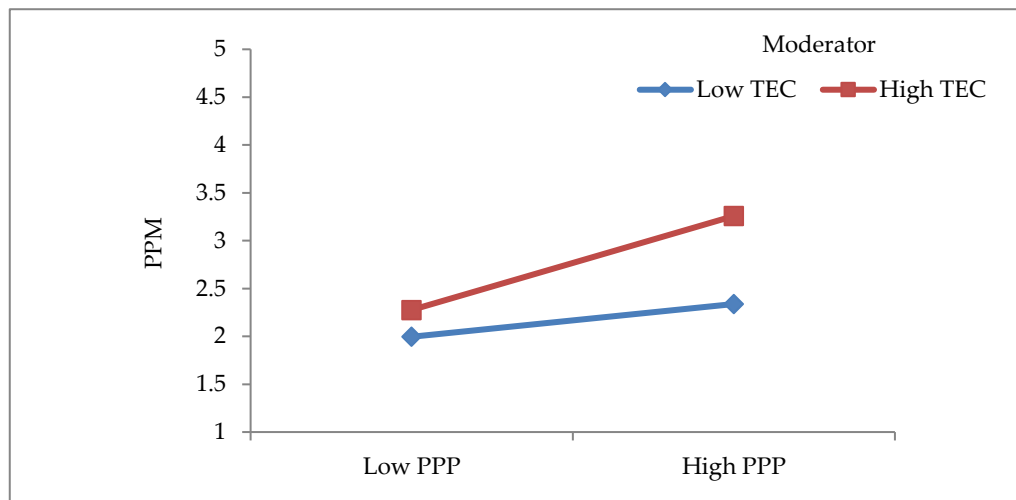


Figure 3. Slope plotting for the interaction effect of PPP and TEC on SME participation in PPM

Source: Figure by the authors

6. Conclusion, implications and direction for further studies

6.1 Conclusion

This research examined the importance of PPPs in fostering the involvement of SMEs in PPM with a particular focus on whether TEC can strengthen this relationship. In particular, the results highlight significant positive direct effects of PPPs and TEC in reducing entry barriers and legitimising the participation of SMEs in digitally-enabled PPM. Surprisingly, the findings indicate a positive though statistically insignificant moderating effect of TEC on the relationship between PPPs and SME involvement in PPM. The study findings imply that TEC primarily exert direct effect on SME participation in PPM rather than conditioning the effect of PPPs. Thus, TEC plays an autonomous role in instilling SMEs' confidence to engage in PPM by enhancing their perceptions of the usefulness and ease of use of e-procurement systems. However, the positive moderating trend suggests that PPPs may remain effective in benefiting SME engagement in PPM across varying levels of TEC. Based on the TAM and IT, the paper comes up with the conclusion that SME involvement into PPM can be explained through the parallel influence of the institutional support schemes and institutionalised perceptions of the use of technologies. While PPPs create coercive and normative pressures that legitimize SME inclusion in PPM, TEC fosters cognitive acceptance and promotes practical engagement with public e-procurement systems. Therefore, the policy interventions to increase the involvement of SME should go beyond policy formulation, to long-term investments in digital infrastructure, capacity building, and user-friendly e-procurement mechanisms.

6.2 Theoretical implications

The study offers a more holistic framework for understanding SME participation in PPM by bridging macro-level institutional forces such as PPPs and micro-level TEC. The novelty of this study lies in integrating TAM with IT to explain SME participation in PPM as a dual-pathways of PPPs and TEC. In contrast to this study, prior studies have largely examined barriers (Djojosoeparto et al., 2025; Mahuwi & Israel, 2020), as well as the direct effects of PPPs (Glas & Eßig, 2018; Flynn, 2018) and TEC (Israel & Mwenda, 2024; Temponi & Cui, 2008) on SMEs' participation in PPM. This study dives deeper, examining the moderation effect of TEC in the relationship between PPPs and SME participation in PPM, which has not been explored in existing literature. Empirically, the study enriches the existing literature on institutional frameworks and ICT competence by addressing the interaction effect of PPPs and TEC on SME engagement in PPM. At its core, the study findings suggest that PPPs can independently legitimise SME inclusive participation in PPM, irrespective of TEC. This aligns with the theoretical posture of IT, which explains how firm performance and behaviour are influenced by rules, norms and beliefs in a given environment.

Importantly, the positive moderation effect suggests that TEC still remains an important complementary factor for enhancing the effectiveness of PPPs on SME participation in PPM. Interpreted through TAM, the findings imply that

TEC can help SMEs leverage the potential of PPPs (which are mainly digitalised) and enhance the perceived usefulness and ease of use of e-procurement platforms. Therefore, SMEs aiming for inclusive participation in PPM must continuously uphold their TEC and embrace PPPs. In particular, TEC helps SMEs reduce operational complexity, transaction costs and errors associated with digital tendering processes (Brandon-Jones & Kauppi, 2018; Kemboi & Thogori, 2025). PPPs, on the other hand, create an institutional and policy environment that removes structural barriers, recognizes and supports SME participation (Hawkins et al., 2018; Patil, 2017). Theoretically, the study extends the IT by highlighting the primacy of coercive and normative institutional pressures in levelling the procurement market structure for inclusivity of SMEs. Concurrently, the study advances the TAM by elevating TEC from a peripheral facilitator to a direct behavioural driver of SME engagement in PPM. Collectively, PPPs and TEC are positioned as market-shaping dynamics that reduce structural entry barriers and redefine participation norms in e-public procurement systems, reinforcing the theoretical frameworks of TAM and IT.

6.3 Managerial implications

The study has significant managerial implications to SME managers, oversight authorities, policymakers, PEs and support institutions. To policy makers and oversight authorities, the study recommends that exclusive schemes like lot unbundling, set-aside contracts and bid price preferences towards SMEs should be operationalised explicitly in e-procurement systems and be applied consistently across PEs. This can foster compliance and reduce discretionary behaviour, thereby instilling SMEs' confidence in the fairness and transparency of PPM. To support institutions and PEs, the research recommends ongoing training and mentorship programmes for procurement officials and SMEs regarding preferential schemes and efficient utilisation of e-procurement systems. This is crucial in order to reduce technical inflexibility and compliance burden. Further, given the significance of TEC, SME managers should invest in basic digital infrastructure (e.g. standard ICT tools and internet), staff ICT skills and system integration. Such investments can strengthen SMEs' capacity in search for tender opportunities, submit compliant bids, and participate effectively in e-procurement system. Finally, policymakers and oversight bodies should establish clear performance indices to measure the operationalisation of the PPPs across PEs, as well as how SMEs apply them. These evaluations could help reveal aspects for improvement, highlight the efficacy of PPPs and TEC, and optimize strategies to enhance SME participation in PPM. Collectively, these policy interventions may contribute to an inclusive procurement ecosystem where institutional support can be complemented by the technological preparedness of SMEs to maximise their involvement in PPM.

6.4 Study limitations and future directions

Despite its theoretical and empirical contributions, this study acknowledges several limitations. First, the study employed a cross-sectional quantitative research design. As such, longitudinal studies should be conducted to capture dynamic changes in the interaction between PPPs and TEC over time, particularly as e-procurement systems mature and SMEs accumulate digital experience. Moreover, future research could employ a mixed-methods design, combining quantitative techniques such as PLS-SEM with qualitative approaches such as case studies, interviews or focus group discussion. Second, the study was limited to participation of SME suppliers in PPM in five selected regions of Tanzania, a developing economy. Therefore, future research could apply multi-group analysis or comparative studies across regions or countries to examine whether the relationships observed in this study are context-specific or generalizable across different geographical contexts. In addition, subsequent studies should expand the unit of analysis beyond SMEs to include procurement officers, policymakers and suppliers in both public and private sectors. This could reduce single-source bias and yield deeper insights into the effect of PPPs and TEC on SME engagement in PPM. Third, the study focused primarily on TEC as a moderator of the relationship between PPPs and SME participation in PPM. Further research may consider other mediating or moderating factors, such as organisational learning, procedural capabilities and support from intermediary institutions, to assess their interactive or intervening effects on the link between PPPs and SME participation in PPM using advanced structural modelling techniques (e.g., PLS-SEM).

Declarations

Funding

The authors acknowledge the full financial support for this study from the College of Business Education (CBE).

Ethical approval

Ethical approval for this study was obtained from the Institutional Research Review Ethics Committee (IRREC) of the University of Dodoma (UDOM) with Ref. No. MA.84/261/84/12 on 27th December, 2024.

Authors' contributions

Baraka Israel: Conception, validation, design, data collection, formal analysis, interpretation of the data, writing original draft and review. **Alban Dismas Mchopa:** Conception, supervision, design, validation, analysis, and writing (review and editing). All authors have read and approved the final version of the manuscript and have agreed to be responsible for all sections of the work.

Acknowledgment

The author would like to thank the anonymous reviewers for their valuable comments which increased the value of this article.

Consent to publish

All the authors have consented to publish the article.

Consent to participate

Informed consent was obtained from all participants prior to their participation in this study.

Competing interest

The authors declare no competing interests.

Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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