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## **The moderating role of entrepreneurial orientation on the effect of knowledge management capabilities on organisational performance**

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**Abstract:** This study aims to investigate the moderating role of entrepreneurial orientation on the effect of knowledge management capabilities on organisational performance in Ethiopian manufacturing firms. In order to achieve the stated objectives, the study adopted an explanatory research design. Data were collected via structured questionnaires from medium and large manufacturing firms operating in Addis Ababa city administrations, and cities surrounding Addis Ababa, part of Ormia regional state, Ethiopia. The study applied multi-stage sampling to select the 247 firms. The collected data were analysed using a hierarchical regression model to test the hypothesis with the help of the SPSS version 23. The outcome of the study indicated that knowledge infrastructure capabilities, knowledge process capabilities, and entrepreneurial orientation have a significant positive effect on organisational performance. On the other hand, entrepreneurial orientation positively moderates the relationship between knowledge infrastructure capabilities, knowledge management process capabilities, and organisational performance.

**Keywords:** knowledge management capabilities; KMC; knowledge management infrastructure capabilities; KMIC; knowledge management process capabilities; KMPC; entrepreneurial orientation; organisational performance.

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## 1 Introduction

The current global economy is experiencing a significant change from an industry-based to a knowledge-based model where innovation and knowledge are principal factors for competitiveness and organisational growth. Seidl (2023) argues that the prosperity of firms, individuals, and societies at large depends on the extent of knowledge-based capital they possess or control. Consequently, knowledge management capabilities (KMC) are becoming increasingly significant for better organisational management practice, improved organisational behaviour, better management decisions and high organisational performance (OP). KMC is an approach that leverages knowledge and other assets through creative problem-solving methods for enabling and sustaining value (Yi et al., 2021). Thus, in a contemporary changing business environment, the organisation's ability to produce, distribute, and apply updated knowledge plays a significant role in the long-term survival and success of organisations (Alkathiri et al., 2024; Koster, 2023; Mobolade and Ibojo, 2023). In a similar vein, organisations are expected to launch large-scale knowledge management initiatives to gain a long-lasting competitive advantage (Ngah et al., 2016; Rehman et al., 2022), increasing productivity and business competitiveness (Abdi et al., 2018). Therefore, possessing knowledge resources comprising KMC helps carry out organisational activities effectively and efficiently.

On the one hand, the firm's entrepreneurial orientation (EO) is poised to be the leader in the future global economy, with its role being crucial in a knowledge-based economy (Fuentes-Fuentes et al., 2015; Mortazavi and Bahrami, 2012). Consequently, the real competitive power of firms depends on their KMC and ability to seek opportunities, innovativeness, risk-taking, and respond to the changing environment. Therefore, organisations must be entrepreneurial-oriented in the challenging, complex, and turbulent business environment of the 21st century in order to attain a competitive advantage. EO is a strategic orientation process that captures entrepreneurial aspects of decision-making styles, management methodologies, and practices that utilise knowledge-based resources to discover and exploit an opportunity (Chen et al., 2020; Li et al., 2019). It refers to the firms' behavioural intentions toward entrepreneurial activities, such as proactively capturing and exploiting opportunities, being innovative, and taking calculated risks. Thus, firms are entrepreneurially oriented when their methods, practices, and decision-making support the identification of opportunities, innovative approaches to achieving the firm's objectives, and incidents of proactive market entry (Hughes et al., 2022). Therefore, to stay competitive and improve performance, firms must proactively update and exploit their knowledge base to effectively use and deploy their resources (Ngah et al., 2016). Knowledge production influences perceptions of opportunity and resource usage (Hughes et al., 2022), leading to organisational choices and the instillation of EO as an organisational attribute. Therefore, integrating KMC and EO is key to successful OP.

Despite the established connection between KMC and OP, prior research has not thoroughly explored the moderating effect of EO in this association. The lack of prior studies implies that the interaction between KMC and EO in organisations' performance has not been extensively addressed in the literature and needs to be clarified. Thus, we cannot explain how EO can advance the organisation's performance by changing the relationships between KMC and OP. Moreover, the existing studies on the moderating of EO have observed only the interaction effect without giving due attention to measuring the direct effect of EO on the organisation's performance in an integrated way. In order to fill the gap, the study examines the moderating role of EO on the effect of KMC on OP and the direct effect of KMC and EO on OP by choosing a manufacturing firm to expand the scope of relevant studies in the case of a developing country and serve as a reference for future researchers in the field.

This article contributes to the body of existing knowledge in the following three ways: First, the article contributes to scholarly debate on the moderating role of EO s in the relationship between KMC and manufacturing performance by providing evidence from the perspectives of a developing country, where there are limitations on research on the study area. Second, the article assists practitioners and scholars in having a better understanding of the implication of EOs in the association between KMC and manufacturing firms. Third, the article explains how KMC and EO affect firm performance, although there are few articles on the subject. The article is organised as follows. The next section presents the theoretical foundation and hypothesis development. Research methods are presented in the subsequent section, followed by the results and discussion section. The paper's last sections include the research's conclusion, implications, and limitations.

## **2 Theoretical background and hypothesis development**

### *2.1 Resource-based theory*

According to the resource-based view, a firm consists of a bundle of heterogeneous tangible and intangible resources that are a potential source of superior performance. These resources must not be isolated; rather they must be combined into groups to build capabilities that can produce strategic opportunities (Balashova and Gromova, 2016; Holdford, 2018; Kozlenkova et al., 2014). Scholars suggest that understanding the resource-based view involves identifying organisational capabilities that enable firms to mobilise, reconfigure, and deploy resources (Collins, 2021; Teece, 2012). According to the theory, the differences in performance between firms from the same industry can be explained by the variations in their resources that allow them to gain a competitive advantage. The theory recognises that the nature of resources and capabilities significantly influence the firm's ability to generate profit (Zhang et al., 2021b). Moreover, the firm's ability to generate superior performance depends on having resources that are valuable, rare, imperfectly substitutable and costly to imitate (Helfat et al., 2023). These attributes include the combination of human resources, physical resources and the organisational capital of the firm, which increases customers' willingness to pay and reduces costs (Campbell and Park, 2017). The firms can sustain their competitive advantage and performance when their resources are path-dependent, socially complex, intangible, and causally ambiguous (Barney et al., 2021; Moreno et al.,

2012). Therefore, the resource-based view argues that the success of an organisation depends upon its internal resources and having the capabilities to utilise the resources to develop a competitive advantage that contributes to the firm's performance.

## *2.2 The knowledge-based view (KBV)*

In the KBV, knowledge production is a crucial process that involves acquiring, converting, storing, managing, and distributing knowledge within the firm for strategic development and organisational behaviour. This theory offers innovative and analytical tools for understanding the new economy and aligns with the growing awareness of managing information resources and employee knowledge (Alguezaui and Filieri, 2014). KBV conceptualises an organisation as a knowledge-processing body by considering knowledge as the most significant strategic resource for ensuring sustainable competitive advantage (Curado and Bontis, 2006; Zhang et al., 2021a). It assumes that an organisation's ability to create wealth is based on the capabilities and knowledge it acquires and retains. This theory suggests that effective knowledge management practices lead to distinctive capabilities that improve OP (Kane, 2017). Therefore, organisations with superior knowledge management experiences are likely to achieve higher performance (Li et al., 2020; Lopes et al., 2017; Sahibzada and Mumtaz, 2023). Accordingly, the theory emphasises the role of individuals in carrying, generating, and preserving knowledge within an organisation while managers govern the integration of the knowledge for application (Herden, 2020; Welch, 2015). The key responsibility of the firm is to create value within the firm by transforming knowledge possessed by individuals into products and services. Knowledge integration and application depend on its transferability, which depends on its form: explicit or tacit (Bezzina et al., 2020; Sivagiri, 2018). Explicit knowledge is easy to articulate, transmittable, and observable, while tacit knowledge is difficult to articulate, not wholly transferable, and costly to transfer (Grant, 1996; Kogut and Zander, 1992). The KBV emphasises the role of the knowledge management process in leveraging knowledge-related processes to influence business processes and OP. As a result, a KBV indicates that the organisation exists to generate, convert, apply and protect knowledge into competitive advantage.

## *2.3 Knowledge management capabilities*

KMC refers to the organisational abilities that enable businesses to mobilise, incorporate and deploy knowledge-based resources to create organisational competencies. According to Zhao (2021), it refers to various capabilities that coordinate, integrate, and restructure knowledge within and outside an organisation to generate new knowledge. KMC is the ability of the firm to leverage existing knowledge (Tseng, 2014). In this study, we develop the KMC by using the knowledge management infrastructure capabilities (KMIC) and knowledge management process capabilities (KMPC) derived from Gold et al. (2001).

Knowledge management infrastructure capability refers to organisational elements and resources that foster organisational knowledge creation and development. It refers to those factors supporting knowledge management-related activities in the organisations and contributing to their overall effectiveness and efficiency (Hajir et al., 2015). KMC can be measured from various dimensions in the existing literature, such as culture, technology and structure (Gold et al., 2001); organisational structure, culture, people, and

information technology support (Lee and Choi, 2003); and organisational hierarchy, culture, structure, people, and information technology (Gray and Durcikova, 2005). This article has incorporated leadership in the existing Gold et al. (2001) KMIC measuring dimensions. Therefore, this study measured KMIC from information and technology, organisational culture, structure and leadership perspectives.

On the other hand, knowledge management process capability is an organisation's ability to encompass a series of processes from acquiring knowledge to creating new knowledge. It provides the approach through which organisations can produce new knowledge, sustain current knowledge and dispose of old knowledge (Alavi and Leidner, 2001). The KM process has been widely studied in the literature, and its measurement dimensions are broad and varied based on the nature of the studies. For instance, Alavi and Leidner (2001) operationalised KMPC as knowledge creation, knowledge storage, knowledge transfer and application, while knowledge generation, knowledge flow and knowledge storage were proposed by Obeso et al. (2020) along with knowledge creation, sharing, storage and documentation and acquisition (Migdadi, 2022), and knowledge generation, storage, sharing and utilisation of knowledge (Zaim et al., 2007). Therefore, consistent with the previous research, this study incorporated knowledge acquisition, knowledge conversion, knowledge application, and knowledge protection as the components of knowledge management process capability.

#### *2.4 Development of hypothesis and research model*

Based on the previous sections, the researchers formulated five hypotheses to test the relationship between KMIC and OP: KMPC and OP, EO and OP, the moderating role of EO in the relationship between KMIC and OP, and the moderate role of EO in the relationship between KMPC and OP.

##### *2.4.1 KMIC and OP*

According to the RB theory, achieving continuous competitive advantage requires unique, rare, and non-imitable capabilities that enhance firms' ability to adapt to dynamic environments. The firm's capabilities that have been found in its infrastructure capabilities affect many aspects of how organisations acquire, transform, apply, and protect knowledge. Liu et al. (2023) assert that the utilisation of knowledge management technology enhances several OP metrics. IT resources, leadership, flexible organisational structure, and culture provide a suitable environment for organisations to improve their competencies and realise goals. An organisation's KM infrastructure capabilities support the organisation in meeting its goals (Aviv et al., 2021; Noh et al., 2016), respond to a fast-changing environment, enhancing organisational competency and reducing development time (Akram et al., 2019; Hammami et al., 2021). Moreover, Andrej et al. (2023) state that knowledge infrastructure capabilities are the key success factor. KMIC enable organisations to improve and perform project tasks more efficiently and effectively (Alghail et al., 2024). According to Qandah et al. (2020), KMIC capabilities provide the necessary platform to increase organisations' efficiency and effectiveness. The findings in the previous research indicated the positive effects of KMIC on OP (Imran, 2018; Smaradhani et al., 2023; Tsetim et al., 2020). Therefore, the following hypothesis is suggested:

- Hypothesis 1: KMIC have a significant positive effect on OP.

#### 2.4.2 *KMPC and OP*

KM processes transform implicit and private knowledge into valuable assets that enhance an organisation's competitive advantages and performance. It involves creating, sharing, applying, storing and protecting knowledge as a capability to enhance organisational values (Setiyani et al., 2020). These processes allow organisations to create new knowledge, address complex problems, accelerate informed decision-making, and adjust to changing business environment (Alharbi and Aloud, 2024). Additionally, as noted by Shehzad et al. (2024), knowledge process capabilities are critical elements for product improvement, developing efficient services, and better employee and firm innovation. It also brings significant changes in the business environment and increases competition (Idrees et al., 2023). Moreover, an effective knowledge management process capability enhances performance, fosters innovation, and provides a sustainable competitive advantage (Asiaei and Bontis, 2020; Deshmukh et al., 2024; Joshi and Chawla, 2019). Moreover, effectively implementing KM processes enhances an organisation's capacity to leverage employee knowledge, use external resources, and promote a culture of continuous innovation and learning (Sahibzada et al., 2023). Furthermore, various studies have shown the significant effect of KMPC on OP (Alharbi and Aloud, 2024; Demir et al., 2024; Migdadi, 2022; Obeso et al., 2020). Thus, we hypothesise:

- Hypothesis 2: KMPC have a significant positive effect on OP.

#### 2.5 *EO and OP*

EO refers to the managerial processes, practices, habits, methods, and decision-making used by managers to act entrepreneurially (Adam et al., 2022). It is characterised by innovation behaviour, proactive behaviour, and willingness to take calculated risks (Li et al., 2019). Innovativeness refers to a company's commitment to promoting and sustaining new ideas, research and development, philosophies and creative processes (Anwar and Shah, 2021; Cuevas-Vargas et al., 2019). Proactiveness deals with the response to new opportunities and anticipation of predicted changes and desire (Donbesuur et al., 2020), while risk-taking refers to the manager's willingness to accept risky projects and resource commitments without certainty about potential benefits (Rezaei and Ortt, 2018).

Wales et al. (2013) stated that EO is the tendency and behaviour that help organisations introduce changes by applying resources and taking up new opportunities. The study conducted by Alshehhi et al. (2019) on public sector firms showed EO's significant effect on the company's business performance. Furthermore, a study conducted on two-star hotels located in Poland showed EO's positive effects on hotel financial performance (Suder, 2023). Taan et al. (2023) assert that EO significantly and positively determines the organisation's performance, while Wales et al. (2013), Kiyabo and Isaga (2020), Putniņš and Sauka (2020) and Arabeche et al. (2022), showed the significant and positive effects of EO on business, operational, financial and non-financial performance.

- Hypothesis 3: EO has a significant and positive effect on OP.

### 2.6 The moderating role of EO

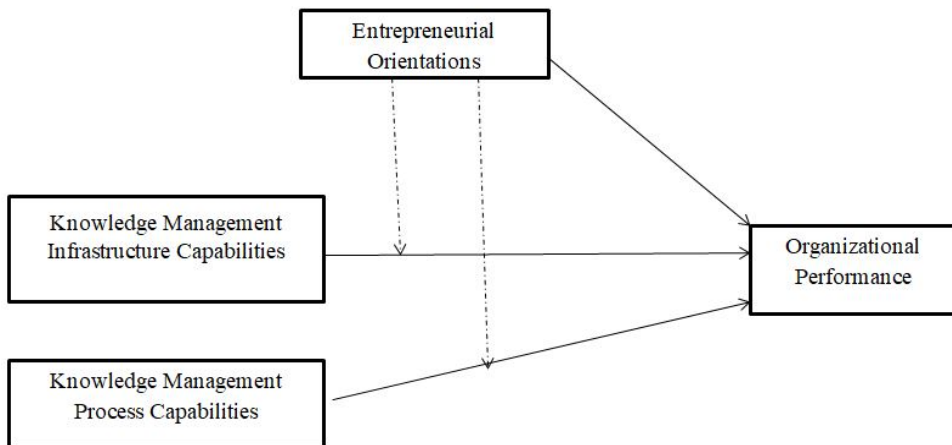
The discovery and utilisation of opportunities for knowledge-based resources are positively related to firm performance; the firm’s EO enhances the relationship between knowledge-based resources and the firm’s performance (Wiklund and Shepherd, 2003). Thus, firms with strong EOs inspire knowledge management that facilitates changes, and they desire to improve the implementation of organisational KMC to enhance performance. The moderating effect of EO was studied by Li et al. (2019), who discovered that EO positively moderates the relationship between intra-firm knowledge sharing and firm innovation performance. Similarly, Chavez et al. (2017) identified that EO strengthens the relationship between manufacturing capabilities and the organisation’s performance. Moreover, Ha et al. (2021) posited that EO positively moderates the relationship between knowledge management and MSE performance. Thus:

- Hypothesis 4: EO positively moderates the relationship between KMIC and manufacturing companies’ performance.
- Hypothesis 5: EO positively moderates the relationship between KMPC and manufacturing companies’ performance.

### 2.7 Research model

Based on the aforementioned discussion, Figure 1 illustrates the proposed research framework, of which EO moderating variables, knowledge management infrastructure, and KMPC are independent variables, and OP is the dependent variable.

**Figure 1** Proposed research framework



### **3 Research methodology**

#### *3.1 Research design, data collection and sampling*

Research design is a plan, structure, and arrangement for solving research problems and achieving research objectives (Rehman et al., 2019). Research design can be categorised as exploratory, descriptive, and explanatory (Cooper and Schindler, 2014; Kothari, 2004; Saunders et al., 2019; Sekaran, 2003). In order to realise the objectives, the study adopted an explanatory research design by collecting data through structured questionnaires. It emphasised studying a situation or a problem to explain the relationships between variables (Saunders et al., 2016). The study populations contain medium and large manufacturing firms operating in Addis Ababa city administration and cities nearby Addis Ababa, part of the Oromia regional states, Ethiopia. The choice of this study area was justified by the fact that nearly half of the manufacturing firms in the country operate in Addis Ababa and the surrounding Oromia regional state (Ethiopian Statistics Services/ESS, 2022).

The study employed multi-stage sampling methods to select the sample representatives. In the first stage, because of the high concentrations of manufacturing firms in Addis Ababa and the surrounding area, manufacturing companies operating in Addis Ababa, Sheger city administration, and the special Oromia zone surrounding Finfinnee of Oromia regional state became the target population of the study through cluster sampling. In the second stage, manufacturing companies were stratified into different strata, i.e., food, beverage, chemical, and pharmaceutical industries. In the third stage, the sample representatives were selected randomly from each stratum based on proportional stratified sampling. The data were collected via structured questionnaires from 247 manufacturing firms when the survey was conducted. The study adopted and contextualised structured questionnaires' from the prior studies.

#### *3.2 Questionnaire development and measures*

The study utilised a self-administered, closed-ended questionnaire on a five-point Likert scale ranging from strongly disagree (1), disagree (2), medium (3), agree (4), and strongly agree (5), which was adopted from previous studies. This study used the following four variables: KMIC, KMPC, EO, and OP. The KMIC were operationalised in terms of ICT, structure, culture and leadership. The knowledge management process was operationalised as knowledge acquisition, conversion, application and protection, while the moderating variable EO was operationalised as proactiveness, innovativeness, and risk-taking and OP measured in terms of financial and non-financial performance. All research variables were measured using the questionnaires adopted from previous studies.

The questionnaire developed by Gold et al. (2001) was used to measure KMIC consisting of 22 question items and KMPC consisting of 28 question items. The EO was measured using a questionnaire adapted from Covin and Wales (2012) and Zhang et al. (2014), consisting of 13 question items. OP was measured using a scale designed by Tseng and Lee (2014), and 11 question items on the Likert scale were given to the respondents.

### 3.3 *Data analysis*

The collected data were recorded, checked for errors, and cleaned using SPSS version 23 to generate composite scores for each scale, which were then used for statistical analysis. Before the test hypothesis, the data passed different tests, such as reliability, validity, multicollinearity, common method bias (CMB), and measurement model. Therefore, the assumptions of different parametric tests were run and confirmed. Different tests were conducted using SPSS and AMOS software, while the hypotheses were tested using hierarchical regression moderation analysis with the aid of SPSS software version 23. Hierarchical regression is an important statistical technique for researchers aiming to analyse and understand the effect of several independent on the dependent variable in a structured way. It enables researchers to add variables in steps, providing information on how additional predictor variables change the explanation of variance in the outcome variable. Its unique feature is that it can show how the relationships' strength or nature might alter when new variables are added to the model. Tests for moderation were conducted in this study to establish the nature of moderation and the extent to which EO influences the effect of KMC on OP.

### 3.4 *Common method bias*

Researchers used a questionnaire to simultaneously collect data on exogenous and endogenous constructs, potentially causing CMB in behavioural studies. Researchers minimise the influence of CMB through procedural and statistical measures. From a procedural perspective, the researchers used easy language, maintained anonymity, ensured that respondents' information was secure during data collection, and guaranteed their privacy (Podsakoff et al., 2012; Rehman and Iqbal, 2020). From a statistical perspective, the study utilised Herman's single-factor test to examine scale items for potential CMB; the percentage of variance is 22.10%, indicating no evidence of CMB.

### 3.5 *Evaluation of measurement model*

The measurement model was used to evaluate whether the constructs under consideration were accurately measured using the chosen indicators (Hair et al., 2022). The administered questionnaire consists of 54 items to measure four construct-level variables adapted from previous studies. Therefore, the model must be evaluated for proper outer loading values, the existence of a collinearity problem, and the validity and reliability of the examined constructs.

### 3.6 *Reliability and validity*

This study used reliability and validity (discriminant and convergent validity) to evaluate the internal consistency and measurement model quality. A confirmative factor analysis (CFA) was conducted to identify the validity and reliability of the instruments. Before conducting PCA for scales, the researchers evaluated the data's suitability for factor analysis based on sample size adequacy using Kaiser-Meyer-Olkin (KMO), and Bartlett's test of sphericity. All scales satisfied the statistical significance level ( $P < 0.05$ ) based on the statistical test. In CFA, all items show reasonable loading values (0.72–0.92) and

model fits (CMIF/DF = 1.324; RMR = 0.18; Tucker-Lewis index (TLI) = 0.926; comparative fit index (CFI) = 0.929; root-mean-square error of approximation (RMSEA) = 0.036.

**Table 1** Reliability and validity

	CR	AVE	MSV	MaxR(H)	KMIC	KMPC	EO	OP
Knowledge management infrastructure capabilities (KMIC)	0.813	0.523	0.416	0.827	0.723			
Knowledge management process capabilities (KMPC)	0.819	0.531	0.423	0.821	0.493***	0.729		
Entrepreneurial orientation (EO)	0.923	0.801	0.101	0.945	0.288**	0.204*	0.895	
Organisational performance (OP)	0.728	0.572	0.423	0.728	0.645***	0.650***	0.318***	0.756

The reliability of the constructs was evaluated using Cronbach's alpha ( $\alpha$ ) and composite reliability (CR). Chin (2010) and Hair et al. (2017) assert that a construct is considered reliable for internal consistency if its Cronbach's alpha ( $\alpha$ ) and CR value exceed 0.70. The CR for KMIC = 0.813, KMPC = 0.819, EO = 0.923, and organisation performance = 0.728 indicates the reliability of the variable. The study assessed the convergent validity through average variance extracted (AVE). An AVE score value higher than 50 is a threshold for accepting convergent validity (Chin, 2010; Hair et al., 2021). Accordingly, as shown in Table 1, the AVE varies between 0.523 and 0.803, indicating adequacy for convergent validity. Discriminant validity was assessed using the Fornell-Larcker and Henseler criterion to validate the measurement model (Hair et al., 2022). The variable has no discriminant validity issue if the square root of the AVE of the variable is larger than the correlation with the other variables in the model (Fornell and Larcker, 1981). Table 2 illustrates constructs, their indicator variables, CR and AVE values as a measure of convergence validity, and correlation matrix to evaluate discriminate validity using Fornell and Larcker criteria.

## 4 Results and discussion

### 4.1 Hierarchical moderated regression analysis

Multicollinearity statistics were accessed using variance inflation factor (VIF) and tolerance value for independent variables. The tolerance value for the independent variable ranges from 0.619 to 0.926, which is greater than 0.1, while the VIF value ranges from 1.080 to 1.616 and is below 5 for all independent variables, which indicates multicollinearity is not a problem in this study. All data were transformed to Z-values (normalised) before entering the data for the test in the regression model. Then, hierarchical moderated regression analysis was executed to define whether EOs can predict the OP and variability of KMC. In this case, EOs were considered the moderator variable. First, in model 1 of the hierarchical moderated regression analysis, the independent variables (KMIC and KMPC) were input. Consequently, in model 2, the

moderator variable (EO) was incorporated. Then, in model 3, the interaction variables (KMIC\*EO and KMPC\*EO) were added. The cut-off statistical significance level was arranged at  $p < 0.05$ , and SPSS 23 was utilised for statistical analysis.

**Table 2** Hierarchical regression result

Model	Model 1			Model 2			Model 3		
	B	T	P	B	T	p	B	T	p
KMIC	0.306	5.312	0.000	0.280	4.846	0.000	0.156	2.817	0.005
KMPC	364	6.320	0.000	0.348	6.092	0.000	284	5.247	0.000
EO				0.142	2.618	0.009	0.185	3.715	0.000
KMIC_EOC							0.139	2.286	0.023
KMPC_EOC							0.282	4.778	0.000
Model fit statistics									
F	F(2,244) = 55.242***			F(3,243) = 39.995***			F(5,241) = 39.325**		
R2	0.312			0.331			0.449		
Change in R2	0.312			0.019			0.119		

Note: \*\*\* $p < 0.01$ .

#### 4.2 Hierarchical moderated regression analysis

Table 2 shows the results of the hierarchical moderated regression analysis used to test the formulated hypothesis. The predictor variable affecting organisation performance in model 1 was KMIC and KMPC ( $R^2 = 0.0312$ ;  $p < 0.01$ ;  $F(2,244) = 55.24$ ), and the independent variable affecting organisation performance in model 2 was KMIC, KMPC, and EO ( $R^2 = 0.331$ ;  $p < 0.01$ ;  $F(2,243) = 39.995$ ). In model 3, the predictors affecting organisation performance were KMIC, KMPC, and EO, and the interaction variable was KMIC\*EOC and KMPC\* EOC ( $R^2 = 0.449$ ;  $p < 0.01$ ;  $F(5,241) = 39.325$ ). The interaction effects in the table indicated that EO positively moderates the relationship between knowledge management infrastructure, process capabilities, and organisation performance.

## 5 Results and discussion

The hypothesised relationship, as shown in Figure 1, was tested using hierarchical regression analysis. This included testing the direct effect of KMIC, knowledge process capabilities, EO, and dependent variable organisation performance, apart from testing for the moderating role of EO. The study used multiple hierarchical regressions to test hypotheses by analysing each independent variable separately and calculating the incremental change in the R2 statistic. The inclusion of the interaction variable has resulted in an additional change in R2 by 0.119.

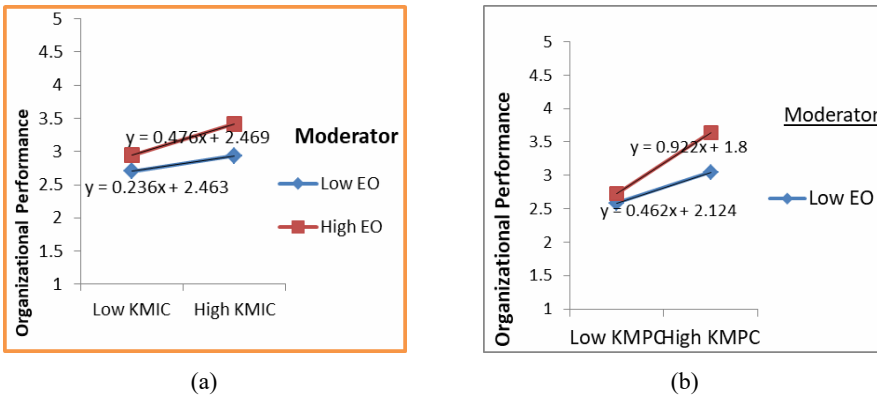
The test results of Hypothesis 1 show the relationship between KMIC and OP. The effect has been found positive and significant ( $\beta = 0.306$ ,  $t = 5.321$ ,  $p < 0.001$ ), which means KMIC predict organisation performance in the proposed direction as per the model. Therefore, the result of the hierarchical regression shows that the KMIC

accounted for a 30.6% variance in organisation performance ( $P < 0.001$ ), and the result showed a significant effect of the KMIC on organisation performance, which supported Hypothesis 1. Thus, improving KMIC was associated with an increase in OP. The result extends previous research with the findings by Aviv et al. (2021), Idrees et al. (2024), Maraqa et al. (2021), Smaradhani et al. (2023), Shehzad et al. (2024) and Ting et al. (2021), which demonstrate the significant effect of KMIC on OP.

Hypothesis 2 measures the significant effect of KMPC on OP. The test results of Hypothesis 2 show the relationship between KMPC and organisation performance. The relation is positively significant ( $\beta = 0.364, t = 6.32, P < 0.01$ ), which means KMPC predict organisation performance in the proposed direction as per the model. As depicted in Table 2 of model 1, the KMPC explained 36.4% of the variations in organisation performance. The outcome of the current study shows that KMPC statistically significantly and positively affect OP. This suggests that KMPC increase the organisation’s performance because it develops the involvement of organisations in acquiring and applying important knowledge that enhances performance. Since the effect is significant, it is maintained that H2 is supported. Therefore, we accept research Hypothesis 2. This result aligns with the existing studies (Al-Muayad and Chen, 2024; Flores López et al., 2023; Sahibzada et al., 2023; Shehzad et al., 2024; Wongmahesak et al., 2024; Yildirmaz et al., 2018; Zia et al., 2024). Also, the inclusion of EO in model 2 increases R square by 0.019 and predicts OP ( $\beta = 0.142, t = 2.618, P = 0.09$ ), indicating that Hypothesis 3 was accepted. The result of the study is consistent with Akinwale et al. (2025), Bedi et al. (2025), Cuevas-Vargas et al. (2019), Basco et al. (2020), Yang and Aumeboonsuke (2022) and Taan et al. (2023).

Hypothesis 4 measures the moderating role of EO on KMIC and OP. The regression results of the interaction (KMIC\*EO) presented in Table 2 clearly show that the moderating role of EO is positive and statistically significant ( $\beta = 0.139, t = 2.286, p < 0.05$ ). The researchers plotted an interaction plot to show how EO alters the association between KMIC and OP. As shown in Figure 2(a), the line is much steeper for the high EO. Researchers found that high EO significantly strengthens the positive relationship between KMIC and OP. Therefore, EO strengthens the positive relationship between KMIC and OP. Thus, EO moderates the relationship between KMIC and OP.

**Figure 2** (a) The moderating effect of EO on the relationship between KMIC and OP and (b) The moderating effect of EO on the relationship between KMPC and OP (see online version for colours)



Hypothesis 5 tested the moderating effect of EO on the relationship between KMPC and OP, and EO is represented in the regression coefficient results of the interaction of KMPC and EO (KMPC\*EO). The regression coefficient of KMPC\*EO on OP is positive and significant, as shown in model 3 Table 2 ( $\beta = 0.282$ ,  $t = 4.778$ ,  $p < 0.01$ ), which supports Hypothesis 3. The findings confirmed that EO moderates the relationship between KMPC and OP. As Figure 2(b) shows, in an entrepreneurial-oriented firm, the effect of knowledge process capabilities on OP is significant.

## **6 Conclusions and implications**

### *6.1 Conclusions*

In the changing competitive environment that organisations face today, firms need to be proactive and take calculated risks for survival. Those proactive firms are expected to acquire, convert, apply and protect information and knowledge from both internal and external environments. Therefore, the organisation's knowledge infrastructure and competence are essential for continuously renovating its knowledge assets to achieve better than competitors. This research examined the moderating role of EO on the effect of KMC on OP. Based on the findings of this study; the research concludes that EO, KMIC and KMPC have significant positive direct effects on organisation performance. Moreover, the study revealed that EO significantly moderates the relationship between KMC (knowledge management infrastructure and KMPC) and OP.

### *6.2 Theoretical implications*

In the literature, there is lack of studies on the impact of KMC and EO on firm performance in an integrated way. The theoretical implication contributes to the growing body of literature linking KMC, EO, and OP. As such, this study sought to show the existing relationships among KMC, EO, and OP. Beginning with the non-moderating model, the study has found that KMC and EO significantly affect OP. Moreover, in addition to its direct effect, the research model offers insight into the moderating role of EO in examining the relationship between KMC and OP. Therefore, the study has shown that EO positively and significantly moderates the relationship between KMC and OP. Therefore, by examining the joint KMC, EO, and OP, the findings of this research contribute to the existing literature by showing the relationships among the variables. In addition, this study contributes to the empirical body of knowledge on the topic by applying it to an underdeveloped country perspective, which is currently under-researched.

### *6.3 Managerial implication*

This article provides several managerial implications for organisations in the new dynamic business environment. First, the results demonstrate that firms that have a better understanding of the nature and quality of KM capabilities and EO are more likely to achieve improved OP. Therefore, the managers of manufacturing firms should not only pay keen interest in exploiting and transforming their available knowledge assets but also exploit opportunities, be innovative and take calculated risks in developing new products,

methods, markets, and processes that contribute to improving their OP. Moreover, managers must construct strong technological capabilities, avoid bureaucratic structures, and promote knowledge-oriented leadership and a learning culture that enable organisations to acquire, convert, apply, and protect knowledge to achieve sustainable OP. Second, the findings recommend actively promoting KMC and EO within organisations. Ideally, this study advances managers' understanding of the significant positive effect of knowledge infrastructure, knowledge process capabilities, EO, and their simultaneous effects on the growing research in KMC in the manufacturing industry. Moreover, the findings offer insights for key players in the manufacturing industries, such as top, middle, and operational level decision-makers, to understand the character of the current KMC and EO implementation in their organisation and re-think leveraging their knowledge resources and assets. Therefore, managers must look at different factors profoundly and broadly to identify and appraise a firm's KM capability contributions to OP. Moreover, firms with entrepreneurial organisation perform better at facilitating growth opportunities. Therefore, the study attempts to enlighten the management of business organisations that achieving superior performance and competitiveness in a changing business is not only about deciding on investment but also about understanding and developing organisation capabilities for knowledge acquisition, conversion, application, and protection. Moreover, an organisation with innovative, proactive, and calculated risk-taking managers is expected to raise the effect of KMC on OP.

#### *6.4 Limitations*

First, the study employed a quantitative approach, and data analysis depends on quantitative data. Future studies are expected to use a mixed approach by collecting qualitative and quantitative data better to understand the complete view of the relationship among variables. Second, the research was conducted in a small area, only in Addis Ababa and the cities surrounding it, and over a limited timeframe. Future studies should use longitudinal data and should be performed on a broader scale for better generalisability. Third, the study data were collected from top-level managers. Therefore, future studies must involve different firm stakeholders for a better understanding of the interactions among the variables.

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There is no potential for competing interests.

#### **Data availability statement**

We confirm we can make the data available upon request of the corresponding author.

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