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Modelling of Non-Financial Factors Affecting Yemen Small Medium Enterprises (SMEs) Performance Using AMOS

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Abstract

This study exhibits the construction of a structural relationship model of Non-Financial Factors that include innovation, training, human capital, and market orientation on the performance of Yemen's Small Medium Enterprises (SMEs). The modelling was done using the AMOS-SEM software. Structural Equation Modelling (SEM), route analysis, and confirmatory factor analysis are all performed using the software. It is well-known for its visual approach, which enables users to graphically build models with basic sketching tools and analysts to participate in intricate statistical modelling. The modelling examines the specific effects of these factors and discloses key contributors to the success or failure of SMEs. Data used for modelling was collected from 350 valid responses of employees in the Yemeni manufacturing SME. The findings from the modelling highlight the dominant significance of innovation, as proved by its highest beta coefficient of 0.90, signifying its profound impact on SME performance. Following closely is training, with a coefficient of 0.3, further establishing its crucial role in influencing performance outcomes. Ultimately, this research concludes that the four factors—human capital, innovation, training, and market orientation—exhibit a statistically significant relationship with SME performance within manufacturing sector. The inferences of these findings are of paramount importance to policymakers and practitioners as it offers actionable insights for enhancing SME performance and driving economic growth within Yemen.

1. Introduction

Due to the prolonged political instability experienced in Yemen since 2015, there has been a notable increase in the number of small and medium-sized enterprises (SMEs) in the country. This situation has led many employees to work in fields unrelated to their professional qualifications to meet their basic needs. Consequently, SMEs in Yemen are facing significant challenges as they lack essential components necessary for sustaining and improving their operations, including human capital, innovation, training, and market orientation. Extensive research has shown that incorporating these variables into SME operations contributes to superior performance and enables them to thrive even in complex and economically volatile environments. Conversely, neglecting these variables can have a detrimental effect on organizational performance (Buli, 2017). Yemen, being one of the poorest countries, is currently facing an ongoing crisis characterized by a continuous decline in currency rates and high inflation since 2018 (Bal-Kheer & Al-Nahdi, 2019). This economic situation has made it difficult for Yemeni SMEs

to adopt various forms of innovation. However, in a developing country like Yemen, innovation in product development and marketing is crucial, and its absence significantly hampers organizational performance (Al-Qershi, 2020). Scholars have emphasized the importance of studying the factors that influence the successful adoption and utilization of innovations in businesses, emphasizing the need to analyze the impact of innovation on organizational performance (Uğurlu & Kurt, 2016). The Yemeni Ministry of Industry and Trade (2017) has reported that despite the large number of small and medium-sized manufacturing firms in the country, their contribution to the GDP is not significant. The World Bank's assessment of Yemen's economic performance (2015) also reveals the weakness of the industrial sector, attributing it to a lack of innovation. Over the years, the contribution of the manufacturing sector to Yemen's GDP has declined. These findings highlight the challenges faced by Yemeni SMEs in this regard (AlQershi, Abas & Mokhtar, 2018). Yemen's manufacturing industries commonly face obstacles in their innovation processes, hindering their ability to develop valuable products and meet evolving customer expectations. Despite the crucial importance of innovation for businesses of all sizes and sectors, Yemeni businesses suffer from a scarcity of cutting-edge technology and rank low in global innovation capacity (GII rankings, 2016). Considering the vital role of SMEs in Yemen's economic progress, extensive research efforts are necessary due to the country's low rankings in terms of innovation, visible wealth, economic growth, and job opportunities (AlQershi, 2020). Training holds a critical position for businesses, including SMEs, as it enhances employees' skills and enables them to contribute effectively to the organization's goals. Market orientation and innovation have a partially positive effect on competitive advantage and organizational performance, indicating that an increase in market trends, competitive advantage, and innovation positively influences organizational performance (Udriyah, Tham, & Azam, 2019). However, SMEs in Yemen face various challenges, including limited technological and technical skills, restricted access to finance and markets, workplace and infrastructure issues, lack of knowledge about international markets and production technology, entrepreneurial skills, poor product quality, and concerns regarding productivity. Overcoming these challenges requires significant commitment from SMEs and potential partners to become more market-oriented (Buli, 2017). Human capital is a key factor for organizational success, and the capabilities it encompasses heavily influence organizational performance. The relationship between human capital and SME performance has received limited attention in countries with unique cultural practices, such as those in the Middle East, including Yemen. This makes it an interesting subject for further research (AlQershi, Abas, & Mokhtar, 2019).

2. Small and Medium Enterprises (SMEs)

Small and Medium Enterprises (SMEs) constitute businesses within a specific size range, characterized by their smaller scale compared to larger corporations, contributing significantly to global economic growth, employment generation, and innovation (Badri, Nahidi, & Ghalami, 2018). Particularly vital in developing nations, SMEs are considered the backbone of many economies, fostering entrepreneurship, local development, and economic diversification (Ali, Hilman & Gorondutse, 2020). Their flexibility allows them to adapt more agilely to market changes, establishing closer relationships with customers. Despite their importance, SMEs face challenges such as limited access to financial resources and regulatory constraints. Initiatives, including microfinance programs and government support, aim to address these challenges (Badri, Nahidi, & Ghalami, 2018). Notably, certain countries have experienced economic growth due to favorable conditions for entrepreneurs and robust infrastructure supporting innovation (Badri, Nahidi, & Ghalami, 2018).

Economists differentiate SMEs based on criteria such as employee count, ownership structure, workforce size, income, and industry. Classification criteria vary across countries, including Saudi Arabia, Jordan, Egypt, Bahrain, and Yemen, based on factors like workforce size, capital employed, and sales turnover (AlBar & Hoque, 2019; Elseoud et al., 2019; Abdullah, Thomas, & Metcalfe, 2015). SMEs are crucial contributors to national economies, fostering innovation, efficiency, and employment opportunities (Wu et al., 2017). They also play a role in poverty reduction by increasing income ratios, creating job opportunities for youth, and providing affordable goods and services to low-income segments of the population (Wu et al., 2017; AlBar & Hoque, 2019; Elseoud et al., 2019; Abdullah, Thomas, & Metcalfe,

2.1 Yemeni SMEs

The Yemeni economy is predominantly characterized by the presence of micro and small enterprises (SMEs), which constitute 97% of registered businesses in the private sector and contribute to over 90% of the country's total employment. In contrast, medium and large companies are limited, and state-owned enterprises play a significant role. The civil war in 2011 had a profound impact on the SME sector, resulting in job losses, salary reductions, and extended periods of unpaid leave for employees. To realize its vision of a more stable, secure, and prosperous Yemen, it is imperative to provide indirect support to the transition process. This involves fostering the private sector to create employment opportunities and promoting increased investment in the economy. In 2013, a study conducted an in-country scoping analysis to scrutinize the primary obstacles hindering SME development in Yemen, assess existing support mechanisms, and identify areas of deficiency. The study included

a political economy analysis that highlighted key features of the private sector. Additionally, an extensive donor-mapping initiative within the private sector revealed a predominant donor focus on microfinance and concentrated value chain development, particularly in the agricultural sector. Against this backdrop, the study put forth several recommendations for potential interventions. Each recommendation was accompanied by a balanced risk analysis, featuring a comprehensive table assessing the attractiveness and feasibility of implementing these interventions across Yemen's 22 Governorates (Aliriani, K., 2013). Another study conducted by Abdullah, Thomas, and Metcalfe, (2015) pointed out approximately 23.5% of SMEs in Yemen that embraced e-business had workforces ranging from 1 to 9 employees, while 76.5% had employee counts between 10 and 49, signifying a prevalence of medium-sized enterprises. Furthermore, around 51% of these SMEs had been in existence for 10 years or less, with the remaining 49% surpassing the 10-year mark. The study suggests that Yemeni SMEs are in the early phases of adopting e-business practices. In a 2021 study by Al-Hakimi, Saleh, and Borade focusing on the entrepreneurial orientation and supply chain resilience of manufacturing SMEs in Yemen, it was discovered that there exists a positive correlation between entrepreneurial orientation and supply chain resilience in SMEs. Additionally, the study identified that this relationship is mediated by both absorptive capacity and innovation. It was concluded that the enhancement of supply chain resilience in SMEs is achieved through entrepreneurial orientation when accompanied by efforts to cultivate absorptive capacity and innovation.

Globally, small and medium enterprises (SMEs) have been recognized as crucial catalysts for the economic development of both developed and developing nations, owing to their substantial numbers and the significant workforce engagement they generate. In developing countries, SMEs constitute a substantial portion, accounting for no less than 90% of businesses, contributing to 40–60% of the GDP, and playing a role in nearly 40% of global industrial production and 35% of world exports (Asgary et al., 2020). However, in a developing context like Yemen, despite SMEs dominating the manufacturing sector, their contribution to the national GDP is relatively modest (Al-Hattami and Borade, 2021; Al-Hakimi, Hashed, Kabra, 2021). The manufacturing sector's contribution to Yemen's GDP has experienced a decline, falling from 19% between 1990 and 1994 to 15% between 2005 and 2010, as reported by the World Bank in 2015. According to a 2020 USAID report, manufacturing SMEs in Yemen only account for 9.9% of the GDP and employ a mere 4% of the workforce, indicating a notably low percentage compared to other developing economies. This underperformance of SMEs in Yemen highlights a critical issue, prompting academic researchers to investigate the primary factors contributing to this situation. One significant challenge affecting the poor performance of Yemeni SMEs is the disruption of the supply chain caused by the country's conflict and political crises. These disruptions encompass rigorous inspections at seaports limiting imports, delayed delivery of raw materials, and increased costs.

The classification of a Small and Medium Enterprise (SME) varies across different countries, with criteria such as the number of employees, annual turnover, and the company's balance sheet being essential for determination. In European legislation, a Medium-Sized Enterprise is characterized by having a workforce ranging from 50 to 249 employees and an annual turnover less than or equal to 50 million Euros. A Small-Sized enterprise is identified by a workforce between 10 and 49 employees, with an annual turnover not exceeding 10 million Euros. Meanwhile, a Micro enterprise is a company with a workforce of 1 to 9 employees and an annual turnover of 2 million Euros or less (EC, 2005). Conversely, the Yemen Government defines SMEs differently, considering a Medium-Sized Enterprise as having employees ranging from 10 to 50, and a Small-Sized enterprise as one with a workforce between four and nine employees (YMIT, 2014). The comparative details are outlined in Table 1.

Table 1 *Comparative of a Small and Medium Enterprise (SME)*

Types of Enterprises	Numbers of Employees	
	European Definition	Yemen Definition
Medium-Sized	50-249 and annual turnover less or equal to 50 million Euros	10-50
Small	10-49 and annual turnover less or equal to 10 million Euros	4-9
Micro	1-9 and annual turnover less or equal to 2 million Euros	1-3

According to the YMIT (2014) report, there are approximately 27,796 SMEs in Yemen, specifically in the manufacturing sector, as indicated in table 2.

Table 2 *SMEs in Yemen*

SMEs in Yemen	Items	Percentage
Enterprise	Large	0.51
	Medium	1.91
	Small	19.15
	Micro	78.43
Location	Sana'a	18.06

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	Taiz	13.93
	Rest of the cities	68.01
Type of Enterprises	Food products and beverage	43.75
	Fabricated metal products	14.78
	Non-metallic mineral products	11.02
	Apparel products	10.80
	Other (services, retail)	19.65

Additional data from the Yemen Ministry of Trade and Industry pertaining to SMEs is sourced from the 2017 guide for small and medium-sized manufacturing firms. The guide identifies a total of 3,048 SME manufacturers, as presented in Table 3.

Table Error! No text of specified style in document. *Demography of SMEs in Yemen*

No.	Governorate	Number of Small Manufacturers	Number of Medium Manufacturers
1	Sana'a	1450	151
2	Aden	336	28
3	Hadramout	450	64
4	Taiz	669	84
5	Dhamar	209	12
Total		**2709**	**339**

Source: Yemeni Ministry of Industry and Trade, (2017)

2.2 SMEs Organization Performance

Organizational performance refers to the assessment and evaluation of an organization's overall effectiveness in achieving its goals and objectives. It encompasses various dimensions, including financial performance, operational efficiency, productivity, customer satisfaction, employee engagement, innovation, and market share. Evaluating organizational performance provides insights into how well an organization is functioning and whether it is successfully delivering value to its stakeholders.

Organizational performance refers to the evaluation of a company's market position and its ability to fulfil the needs of its stakeholders (Hanaysha et al, 2022). It encompasses the extent to which the company achieves its performance goals (primary measurements) and satisfies the requirements of its customers (secondary measures) (Lee et al, 2022). Previously, organizational performance was often defined using financial measurements such as profitability, return on assets (ROA), return on investments (ROI), and return on equity (ROE). However, traditional performance measurement systems that heavily rely on financial metrics are increasingly criticized for their short-term focus (Alshurideh et al, 2022).

Many scholars have adopted a more balanced approach to performance measurement, incorporating both financial and non-financial indicators (Hanaysha et al, 2022). While financial performance is considered the goal of any business as it reflects how effectively the company utilizes its assets to generate income (Lee et al, 2022), non-financial performance metrics relate to a company's long-term operational objectives or future performance indicators that cannot be adequately captured by current financial measures (Alshurideh et al, 2022). The literature on the growth of small and medium-sized enterprises (SMEs) extensively explores the factors that contribute to their success or hinder their performance and how their success contributes to economic development. Previous research has identified a wide range of factors influencing enterprise success or failure, categorized as internal and external aspects. External determinants encompass macroeconomic factors, political and institutional dynamics, market opportunities, and socio-cultural elements, while internal factors include managerial skills, human capital, financial management, demographics, and organizational innovation (Alshurideh et al, 2022). Numerous studies on SMEs in developing countries have focused on identifying specific factors that impact their performance and sustainability (Hanaysha et al, 2022). The significance of these factors varies depending on the country. Recent research by Vyas et al. (2015) highlighted critical success factors for SMEs operating in the banking industry in India, including supportive organizational factors, responsive services, target-based marketing, SME banking policy and model, and improved customer service. Overall, the performance of small and medium-sized businesses has gained significant attention in the literature, with researchers emphasizing the need for effective management practices (Lee et al, 2022).

3. Affecting SMEs Performance

This study categorizes the factors influencing the performance of Manufacturing Small and Medium-sized Enterprises (SMEs) into the non-financial group, specifying training, innovation, market orientation, and human capital as the key factors.

3.1 Training

Training is a key element for organizational success and gaining a competitive edge (Abdelwahed and Mufti, 2023). Its role in enhancing competencies and improving organizational efficiency is widely acknowledged (Suryadi et al., 2019; Yadav and Mathew, 2023). Investing in training becomes crucial for achieving organizational goals and improving overall effectiveness. Tailoring training programs to specific needs and objectives can maximized its impact (Ramya, 2016). Engagement methods like coaching and mentoring actively involve employees, contributing to enhanced organizational performance (Alshahrani et al., 2023). Proper training aligns employees' actions with organizational goals, exerting a positive influence on performance (Alshahrani et al., 2023). It plays a crucial role in addressing challenges, increasing efficiency, and driving company productivity (Suryadi et al., 2019; Abdelwahed and Mufti, 2023). Effective training design, aligned with organizational objectives, stands out as a key determinant of success (Alshahrani et al., 2023; Samwel, 2018). In summary, training significantly enhances employee performance, leading to increased productivity, improved quality, and cost reduction (Khair, 2018). For SMEs, leveraging training becomes a strategic tool to meet market demands and acquire essential competencies for growth (Short & Gray, 2018; Alshahrani et al., 2023).

3.2 Innovation

Innovation is the creation and implementation of new ideas, products, services, or processes, plays a crucial role in organizational performance. It involves creative thinking, research, and development to address challenges, seize opportunities, and drive progress. Innovation enhances efficiency, customer satisfaction, and profitability, serving as a catalyst for organizational transformation and differentiation (Abdel Fattah & Daoudi, 2017). Innovation is essential for companies to survive and succeed in a dynamic business landscape, contributing to economic and social advancements (Gebremichael & Tekle, 2020).

Impact of innovation on company performance is influenced by factors such as company size and human capital (Ukpabio et al., 2018; AlQershi, 2020). In the automotive industry, a positive relationship has been observed between innovation and organizational performance (Atalay, Anafarta & Sarvan, 2013; Hadid & Naima, 2016). Small and medium-sized enterprises (SMEs) should emphasize strategic innovation to gain competitive advantages (AlQershi, Abas, & Mokhtar, 2019). Innovation in internal processes enhances efficiency and reduces costs (Beltramino, García-Perez-de-Lema, & Valdez-Juárez, 2020). Innovation positively influences job performance, making it a key strategy for growth and survival in competitive business environments (Ukpabio & Siyanbola, 2017). The adoption and successful utilization of innovation in companies are influenced by various factors, such as robotic systems and flexible manufacturing systems (Jandab, Ali, Abdulsamad, & Al-Sharif, 2019).

Innovation encompasses various types, including technological and non-technological innovations. Product innovation, process innovation, organizational innovation, and marketing innovation are recognized formulations of innovation. Embracing innovation is crucial for organizations to adapt to a changing business world, avoid market failure, and improve performance (Jundub, Ali, & Al-Sharif, 2019). Ultimately, innovation serves as a fundamental driver of progress and success in organizations and societies, addressing social, economic, and environmental challenges while offering opportunities for improvement (ESCWA, 2018).

3.3 Market Orientation

As asserted by Abdullah (2017), market orientation involves the effective execution of marketing strategies aligned with customer needs, aiming for superior performance through the creation and maintenance of customer value (Bin Aliouche & Tawfiq, 2018). It involves a comprehensive understanding of market requirements, a focus on customer value, and responsiveness to market information (Udriyah, Tham, & Azam, 2019). Market orientation cultivates a customer-centric culture, offering guidelines for organizational development (Laukkanen et al., 2015), and strengthens the customer-provider relationship, reflecting the organization's culture and shared values (Bin Aliouche & Tawfiq, 2018). Key dimensions of market orientation include customer orientation, competitor monitoring, and inter-departmental coordination. Particularly impactful for SMEs, market orientation significantly contributes to performance and competitive advantage (Harjadi, Fatmasari, & Nurhasanah, 2020). Encouraging for governmental and policymaker support in implementing market orientation strategies for SMEs, Alhakimi & Mahmoud (2020) highlight its positive influence on marketing performance and its crucial role in adapting to a changing environment. Continuous enhancement of market orientation proves instrumental in improving SME performance.

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3.4 Human Capital

Human capital plays a significant role in influencing success, efficiency, and overall performance (Brahimi, 2019). It encompasses the collective knowledge, skills, and abilities of individuals within an organization (Dar & Mishra, 2019; Lin et al., 2017). The development of human capital through internal growth and strategic external recruitment not only enhances managerial capabilities but also fosters innovation and competitive advantage (Odhon'g & Omolo, 2015; Vixathep et al., 2017). While the relationship between human capital and organizational performance needs further exploration, especially in culturally diverse regions like the Middle East (AlQershi, Abas & Mokhtar, 2020), the significance of enhancing human capital in SMEs cannot be overstated. SMEs is essential for economic development, benefit from strategic initiatives in areas such as international marketing and customer service (Tjahjadi et al., 2020). Empowering employees and cultivating a supportive work environment are key factors contributing to increased human capital and improved company performance (Ata Allah, 2018). The positive influence of human capital extends to innovation, competitiveness, and job performance, particularly within specific industries (Samagaio & Rodrigues, 2016; Rahim & Kamaluddin, 2017; AlQershi, Abas, & Mokhtar, 2019; Gebremichael & Tekle, 2020). This study endeavours to explore the complicated relationship between human capital and SME performance in Yemen.

4. Research Conceptual Model

The conceptual model for this study was developed based on the Resource-Based View (RBV) theory. The theory suggests that a company can outperform competitors by effectively utilizing their resources and skills, leading to improved work efficiency. Key elements of resources include human capital, innovation, training, and market orientation (Chatterjee et al, 2023). Unique and difficult-to-imitate resources contribute to sustainable competitive advantage (Nayak et al, 2023), and developing human capital through training, innovation, and market orientation enhances SMEs' competitive advantage and job efficiency. Improving firm efficiency is linked to internal processes, and firms leverage their distinct capabilities to enhance organizational effectiveness (Kosiol et al, 2023). Resources can be considered both tangible which are financial and physical assets and intangible which are intellectual capital, innovation, training, human capital (Chatterjee et al, 2023).

Training is an ongoing process designed to equip individuals with valuable skills, knowledge, and insights, enabling proficient performance of practical tasks. It represents a continuous commitment to enhancing employees' abilities and effectiveness (Hooper, 2016). Employees who undergo comprehensive training possess the capability to effectively share their talents and experiences, leveraging their creativity to augment organizational productivity (Elnaga & Imran, 2013). Research indicates that training generally elevates employee motivation and enhances their efficiency (Githinji, 2014). Further, increased training correlates with heightened job enthusiasm, positively influencing job outcomes (Amos & Natamba, 2015). According to Manzoor et al. (2019), job training serves as a learning process that not only enhances employees' skills and enthusiasm but also increases awareness and sharpens capabilities, ultimately resulting in improved employee efficiency. Drawing from the reviewed literature, the following hypothesis is suggested:

H1: training has a positive relationship with SMEs performance.

Organizational innovation as defined by Oslo Manual (OECD, 2005), involves the integration of novel concepts to enhance products and the incorporation of fresh organizational processes or approaches. This innovation, spanning both technological and non-technological realms, encapsulates a diverse spectrum of organizational advancements (Donate & de Pablo, 2015). Nevertheless, existing research has predominantly concentrated on a traditional perspective of organizational innovation (Brettel & Cleven, 2011). The adoption of organizational innovation significantly shapes the execution of business strategies by influencing employee roles, establishing internal and external decision-making processes (Le Bas, Mothe, & Nguyen-Thi, 2015), and delineating relationships with other organizations. Empirical evidence indicates that organizations failing to embrace innovation in their operations exhibit lower descriptive capacity and organizational performance compared to their innovative counterparts (Armbruster et al., 2008). Consequently, the following hypothesis is proposed:

H2: innovation has a positive relationship with SMEs performance.

Market orientation forms the bedrock of marketing and strategic planning, guiding a company's endeavours towards delivering exceptional value to customers. Empirical findings indicate that market orientation exerts a positive influence on business performance across diverse contexts characterized by varying levels of market volatility, technological disruption, and competitive pressure (Joensuu-Salo et al., 2018). Market orientation, as highlighted by Verhoef et al. (2011), can have a direct or indirect impact on market success. Moreover, the nexus between customer orientation and job performance proves essential in enhancing job effectiveness across both large and small businesses (Spillan et al., 2013). Considering these insights, the following hypothesis is suggested:

H3: Market orientation has a positive relationship with SMEs performance.

Human capital is crucial for elevating job efficiency within organizations, comprising a spectrum of resources like expertise, experience, and capabilities that directly impact the firm's performance, including its profitability (Samagaio & Rodrigues, 2016). The significance of human capital has grown markedly, exerting a substantial influence on job performance across both large corporations and small businesses (Felcio et al., 2014). In the context of SMEs businesses, human capital plays a vital role in growth and development, emerging as a key driver of organizational success and contributing to heightened efficiency in competitive markets (Danso et al., 2016; Capelleras et al., 2019). The merger of complementary skills, such as professional education, commercial experience, and managerial expertise, allows companies to augment their overall efficiency. Numerous studies emphasize the positive correlation between human capital and a company's profitability, growth, and success, making a significant contribution to the enhancement of job performance (Chen & Chang, 2013). Therefore, the following hypothesis is proposed:

H4: There is a positive correlation between human capital and job performance in SMEs.

Hence the study's conceptual model considered the non-financial factors which are human capital, innovation, training, and market orientation affecting or impacting the SMEs performance as figure 1.

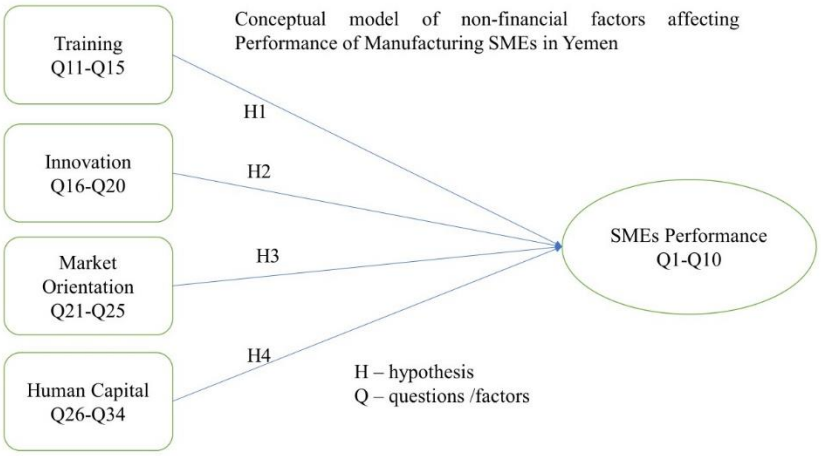

Fig. 1 *Conceptual model*

In Figure 1, the graphical representation illustrates the interconnections among four key factors—human capital, innovation, training, and market orientation—serving as independent constructs influencing the performance of SMEs, the dependent construct. Within the training construct, there are five contributing factors, while both the innovation and market orientation constructs encompass five factors each. The human capital construct comprises nine factors. Additionally, SMEs Performance is described through ten distinct attributes.

5. Data Collection

Given the unstable conditions in Yemen, the population of 3,048 manufacturers, as identified by the Yemen Ministry of Trade and Industry in the 2017 guide for small and medium-sized manufacturing firms (Table 3.1), serves as the basis for determining the sample size. Following the guidelines by Krejcie and Morgan cited in Aseminachin (2023), a minimum sample size of 341 participants is deemed necessary for robust results in Structural Equation Modelling (SEM) research. Consequently, the study aimed to secure at least 341 responses. Anticipating potential non-response or inaccuracies, and acknowledging the typically low response rate associated with survey methods, a total of 500 questionnaires were distributed to managers. The research centres on the perspectives of managers working in SMEs situated in Yemen's cities, including Sana'a, Aden, Hadramout, Taiz, and Dhamar. The selection of managers as respondents is predicated on their extensive experience and expertise in evaluating factors contributing to job performance enhancement in SMEs. The choice of these five governorates is strategic, driven by the substantial concentration of SMEs in these cities and their representation of diverse geographical regions across Yemen, encompassing the north, central, and south.

To collect data, a questionnaire was employed, targeting managers of SMEs in Sana'a, Aden, Hadramout, Taiz, and Dhamar in Yemen. This decision was rooted in the managers' comprehensive experience and ability to assess factors contributing to the improvement of SMEs' job performance. The selection of these five governorates was influenced by the significant concentration of SMEs in these cities, along with their diverse geographical locations spanning the northern, central, and southern regions of Yemen.

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6. Modelling

The modelling of this study used Analysis of Moment Structures (AMOS). AMOS provides a user-friendly graphical interface for building, estimating, and evaluating structural equation models. It allows researchers to specify and test complex theoretical models that involve latent variables and observed variables. AMOS is particularly known for its capabilities in conducting both Confirmatory Factor Analysis (CFA) and path analysis within the framework of Structural Equation Modelling (SEM). CFA is used to assess and confirm the relationships between observed variables and latent constructs. CFA helps in testing the hypothesized factor structure and determining the extent to which the observed variables align with the underlying constructs. While, Path Analysis, where it examines the relationships (paths) among the latent constructs. This includes testing the direct and indirect relationships between variables and assessing how well the overall model fits the observed data. Path analysis allows for the examination of causal relationships and helps in understanding the complex interplay between variables (Awang, 2015; Hair et al., 2011; Hooper, 2008).

6.1 Fitness Index

According to Field (2009), the index of fitness is a measure of how well a model fits the data it was constructed from. It evaluates the accuracy of the model's predictions by comparing them to the observed data. In SEM, achieving the objective effectively requires the model to meet a set of suggested acceptable values for multiple indices that apply to both the measurement and structural models. However, the suggested acceptable values for these indices have been subject to challenges by experts in the SEM field. Table 4 provides a reference for meeting the SEM target effectively.

Table Error! No text of specified style in document. *The Criteria of Successfully Achieving the Goal in SEMAwang (2015); Cangure & Ercan (2015)*

Criteria Category	Acceptance level values	Applicability
Factor loading for items	≥ 0.6	Measurement model +structural model
Correlation coefficient	≤ 0.85	Measurement model
Standardized beta	≤ 0.85	Structural model
Significance level	≤ 0.05	Structural model
Average Variance Extracted (AVE).	≥ 0.5	Measurement model
Construct Reliability (CR)	≥0.6	Measurement model
Modification Index	≤15	Measurement model +structural model

As stated by Hair et al. (2010), fitness indices are measures that assess the extent to which a specified model reproduces the covariance matrix among the indicator variables. To ensure an accurate evaluation of the model's performance, Hair et al. (2006) and Hair et al. (2010) recommend the use of at least three fitness indices, with at least one index from each of the three categories: absolute fit, incremental fit, and parsimonious fit. Table 5 presents information regarding the categories of fitness indices and their accepted values, drawing from various sources. This table provides details on the specific fitness indices adopted in this research along with their acceptable values.

Table Error! No text of specified style in document. *The Criteria of Fitness Indices in SEM (Ramayah & Lee (2012); Hair et al. (2010)*

Index	Fitness Indices	Recommended value	Applicability
Absolute fit	Goodness-of-Fit Index (GFI)	≥ 0.8	Measurement model + Structural model
	Root Mean Square Error of Approximation (REMSEA).	≤ 0.08	
Incremental fit	Tucker-Lewis Index (TLI)	≥ 0.9	
	Comparative Fit Index (CFI)	≥ 0.9	
	Normed Fit Index (NFI)	≥ 0.8	
Parsimonious fit	Chi-Square/Degree of Freedom (ChiSq/df,)	≤ 3.0	

6.2 Confirmatory Factor Analysis (CFA)

Confirmatory Factor Analysis (CFA) is a reliable method used to assess the agreement between observed variables and the researcher's perspective of a construct (Awang, 2014). CFA has gained prominence as a means to establish construct validity, surpassing older techniques like exploratory factor analysis (EFA) (Awang, 2015). In this research, a combination of SEM and CFA was employed following established steps recommended by experts (Awang, 2015; Hair et al., 2011; Hooper, 2008). These steps include model specification, identification, parameter estimation, fitness index measurement, and model re-specification. The validity of the measurement model was assessed prior to evaluating the structural model, using maximum likelihood estimation. Fitness indices and acceptance criteria for assessing the models' fitness are presented in Table 4.12. Model re-specification was performed, guided by modification indices (MI), to identify specification errors. The subsequent sections provide a comprehensive evaluation of the measurement model for each latent construct, showcasing the initial models, fitness indices, modification indices, and final models. It is important to note that the research has been completed, and the results and conclusions are presented in subsequent sections.

6.2.1 CFA for SMEs Performance

The measurement model for SMEs performance, illustrating the relationship between response items and their underlying constructs, is graphically presented. Confirmatory Factor Analysis (CFA) was conducted to assess the model's fit to the data, and the results are depicted in Figure 2.

Fitness indices play a crucial role in evaluating construct validity, ensuring that response items effectively measure the intended constructs. In CFA, if the fitness indices fall below the required level, a stepwise process involves removing items with low factor loadings from each construct until the desired fitness is achieved.

Conversely, if the model is deemed fit but includes items with low factor loadings, those items may be retained unchanged, as they do not significantly impact the overall fitness of the model.

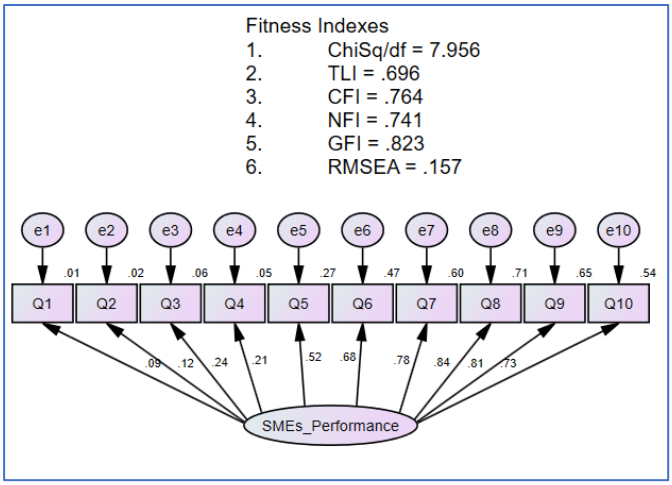

Fig. Error! No text of specified style in document. *The Measurement Model for SMEs Performance*

The SMEs Performance measurement model initially comprised ten indicator items; however, due to low factor loadings, four of them (Q1-Q4) were excluded. The final measurement model for the SMEs Performance construct adhered to all recommended cutoff values by fitness indexes (Awang, 2014). This process involved ensuring that all item factor loadings surpassed 0.5 and scrutinizing Modification Indices (MI). Employing the methodologies outlined by Byrne (2013) and Hair et al. (2006), high MI values indicating significant covariance and regression weights were used to identify problematic items. Consequently, items Q1-Q4 were removed. Subsequent to this refinement, the measurement model underwent a re-run, and the conclusive CFA model, depicted in Figure 3, includes the remaining six indicator items.

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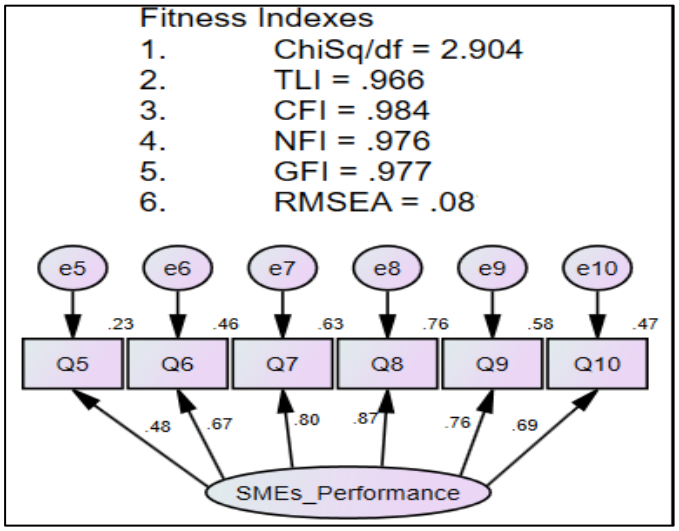

Fig. Error! No text of specified style in document. *Final Measurement Model for SMEs Performance*

The fitness index values generated in Figure 3 of the final measurement model for SMEs' performance are presented in the accompanying table 6.

Table 6 *Results of fitness*

Fitness Indices	Threshold value	Generated value	Fitness Achievement
ChiSq/df	≤ 3.0	2.904	Achieved
TLI	≥ 0.9	0.966	Achieved
CFI	≥ 0.9	0.984	Achieved
NFI	≥ 0.8	0.976	Achieved
GFI	≥ 0.8	0.977	Achieved
REMSEA	≤ 0.08	0.08	Achieved

Table 6 shows that all the fitness indices for the final measurement model for SMEs performance have achieved the fitness threshold values which means that the model is fit.

6.2.2 CFA for Training

Confirmatory Factor Analysis was performed on the Training construct's measurement model, and the results are illustrated in Figure 4. The model, consisting of five indicator items (Q11-Q15), reveals the fitness indices of the Training construct. Further scrutiny of the model for additional fitness criteria, such as factor loading and squared multiple correlation, affirms that all these factors meet the necessary threshold levels of ≥ 0.50 for factor loading and ≥ 0.20 for squared multiple correlation.

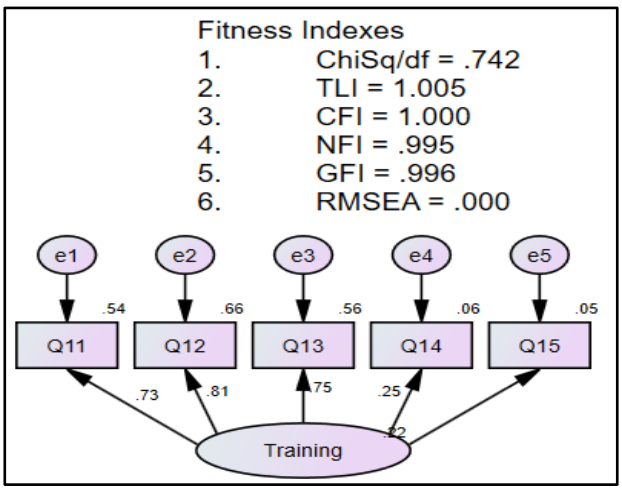

Fig. Error! No text of specified style in document. *Measurement Model for Training*

The fitness index values generated in Figure 4 of the initial measurement model for training are presented in the accompanying table 7

Table 7 *results of fitness*

Fitness Indices	Threshold value	Generated value	Fitness Achievement
ChiSq/df	≤ 3.0	0.742	Achieved
TLI	≥ 0.9	1.005	Achieved
CFI	≥ 0.9	1.000	Achieved
NFI	≥ 0.8	0.995	Achieved
GFI	≥ 0.8	0.996	Achieved
REMSEA	≤ 0.08	0.000	Achieved

After evaluating the fitness indices in table 7 for the Training model, it is evident that all recommended values, including NFI, TLI, GFI, RMESA, and Chisq/def, have been met. This confirms that the final measurement model for the Training construct fulfils the necessary criteria for a good fit. As per the goodness-of-fit indices recommended by Awang (2014), the Training model satisfies all acceptable cut-off values.

6.2.3 CFA for Innovation

The results of the Confirmatory Factor Analysis (CFA) for the Innovation measurement model are displayed in Figure 5, showcasing factor loadings, squared multiple correlations (R2), and fitness indices for each of the five indicator items in the same order.

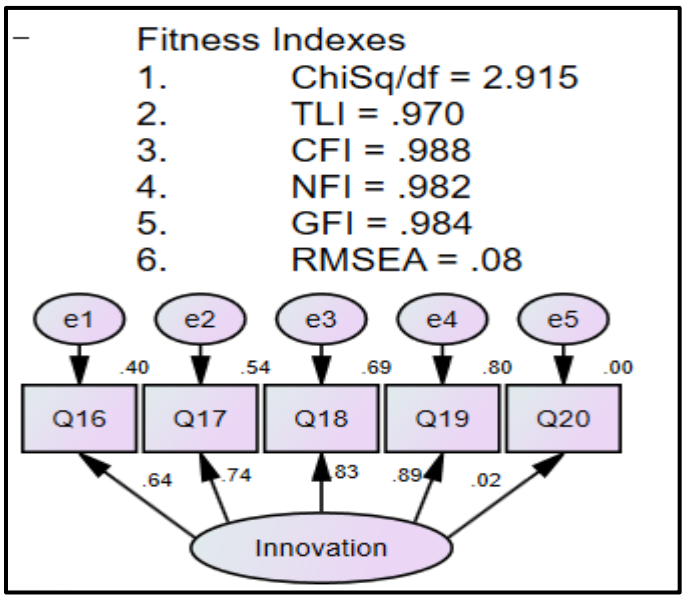

Fig. 5 *Initial Measurement Model for Innovation*

The fitness index values generated in Figure 5 of the initial measurement model for innovation construct are presented in the accompanying table 8.

Table 8 *Results of fitness*

Fitness Indices	Threshold value	Generated value	Fitness Achievement
ChiSq/df	≤ 3.0	2.915	Achieved
TLI	≥ 0.9	0.970	Achieved
CFI	≥ 0.9	0.988	Achieved
NFI	≥ 0.8	0.982	Achieved
GFI	≥ 0.8	0.984	Achieved
REMSEA	≤ 0.08	0.080	Achieved

Upon reviewing the fitness criteria of the Innovation model in Table 8, including factors such as factor loading and squared multiple correlation, it is evident that all factor loadings and squared multiple correlations meet the necessary thresholds of ≥ 0.50 and ≥ 0.20, respectively. In summary, only five items from the Innovation construct

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are utilized in the structural equation modelling process. These five items have met the required standards, affirming their suitability for analysis.

6.2.4 CFA for Market Orientation

The visual depiction of the Market Orientation measurement model illustrates the connection between response items and the underlying construct. Utilizing Confirmatory Factor Analysis (CFA), the factor loading and fitness indexes of the nine indicators in the model were assessed. Upon additional scrutiny of the model using alternative fitness criteria, it was determined that all factor loadings and squared multiple correlations surpassed the necessary thresholds of at least 0.50 and 0.20, respectively. Figure 6 presents all the indicators in the Market Orientation measurement model.

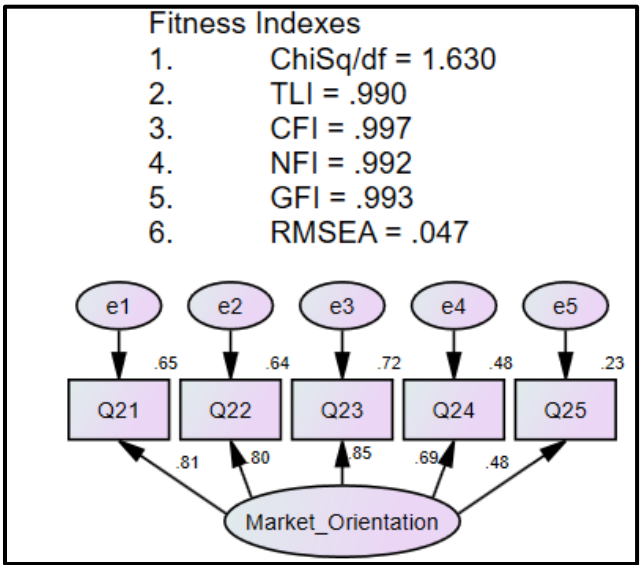

Fig. Error! No text of specified style in document. *Measurement Model for Market Orientation*

The fitness index values generated in Figure 6 of the initial measurement model for market orientation construct are presented in the accompanying table 9.

Table 9 *Results of fitness*

Fitness Indices	Threshold value	Generated value	Fitness Achievement
ChiSq/df	≤ 3.0	1.630	Achieved
TLI	≥ 0.9	0.990	Achieved
CFI	≥ 0.9	0.997	Achieved
NFI	≥ 0.8	0.992	Achieved
GFI	≥ 0.8	0.993	Achieved
REMSEA	≤ 0.08	0.047	Achieved

Table 9 demonstrates that all fitness indices for the market orientation construct's measurement model have successfully reached the fitness threshold values, indicating a well-fitted model.

6.2.5 CFA for Human Capital

The results of the Confirmatory Factor Analysis (CFA) for the Human Capital measurement model, comprising factor loadings, squared multiple correlations (R2), and fitness indices, are presented in the same order. The Human Capital measurement model, consisting of eleven indicator items, is visually depicted in Figure 7, which also provides the fitness indices for the Human Capital construct. Upon closer scrutiny of the model, including factor loadings and squared multiple correlations, it was established that all factor loadings and squared multiple correlations met the required thresholds.

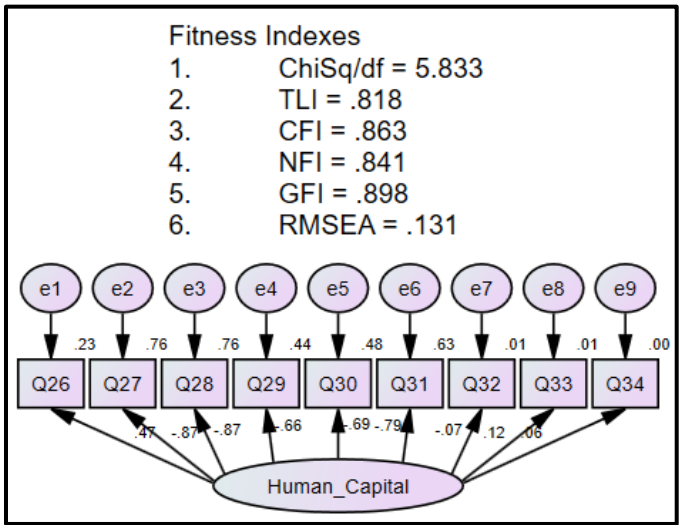

Fig. Error! No text of specified style in document. *The Measurement Model for Human Capital*

Upon reviewing the fitness indices of the Human Capital model in comparison to the recommended values, none of the fit indices met the specified criteria. The researcher initially examined the factor loadings of the items, ensuring they exceeded 0.5. Subsequently, Modification Indices (MI) were scrutinized, resulting in the removal of Q32-Q34 due to low factor loadings. After addressing these problematic items, the measurement model underwent a recommended re-run. The final CFA model is depicted in Figure 8.

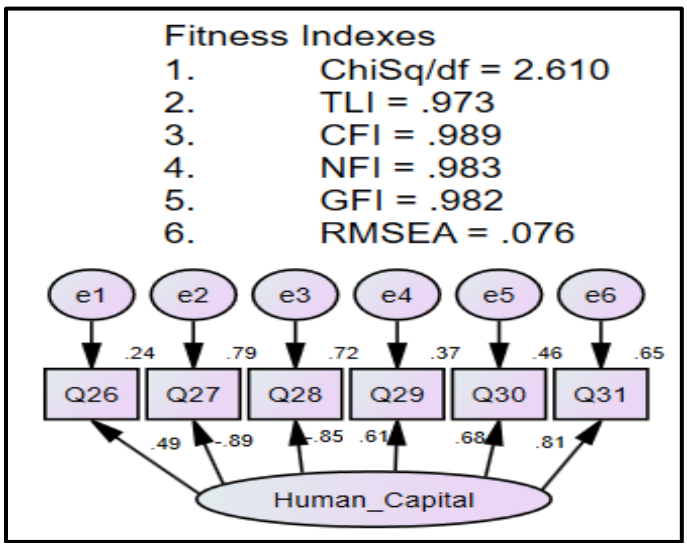

Fig. 8 *Final Measurement Model for Human Capital*

The fitness index values generated in Figure 8 of the initial measurement model for Human Capital construct are presented in the accompanying table 10.

Table 10 *Results of fitness*

Fitness Indices	Threshold value	Generated value	Fitness Achievement
ChiSq/df	≤ 3.0	2.610	Achieved
TLI	≥ 0.9	0.973	Achieved
CFI	≥ 0.9	0.989	Achieved
NFI	≥ 0.8	0.983	Achieved
GFI	≥ 0.8	0.982	Achieved
REMSEA	≤ 0.08	0.076	Achieved

Upon scrutinizing the fitness indices in comparison to the final measurement model values in Table 10, it was determined that all fit indices for the Human Capital model met the recommended values. Subsequently, the model was re-specified until these recommended values were attained. Ultimately, the final measurement model for the

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Human Capital construct successfully adhered to all acceptable cut-off values as recommended in the goodness-of-fit indexes (Awang, 2014).

6.2.6 CFA for All Constructs

A Confirmatory Factor Analysis (CFA) was conducted on all five measurement models, including SMEs Performance, human capital, innovation, training, and market orientation. The examination of modification indices highlighted significant covariance and regression weights, prompting the identification of problematic items. Subsequently, these identified items were removed, and a subsequent rerun of the measurement model was executed. The final integrated CFA models are illustrated in Figure 9.

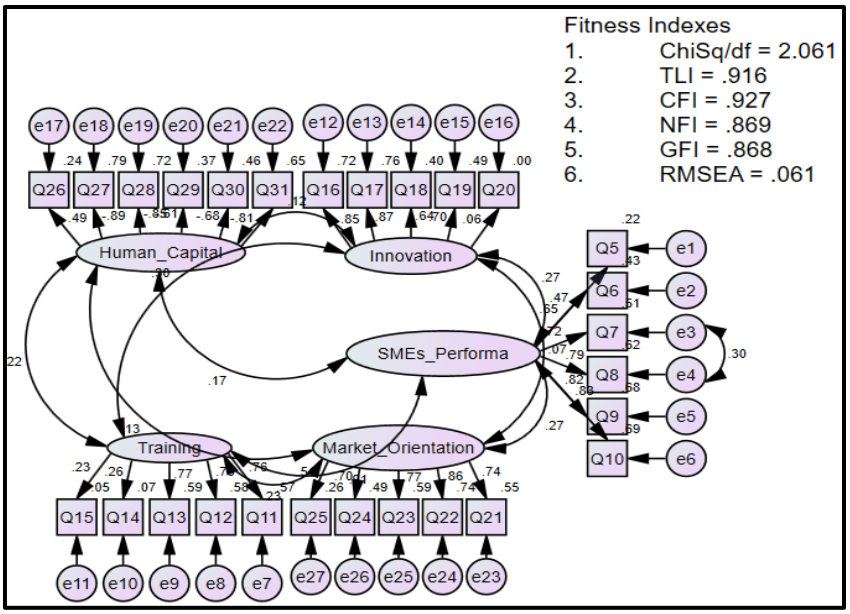

Fig. Error! No text of specified style in document. *Final CFA Model*

The final constructed integrated measurement model illustrated in Figure 9 demonstrated a favourable fit, as indicated by the indices. TLI and CFI scores surpassed 0.90, while NFI and GFI exceeded 0.80, signifying a high level of goodness of fit. It is crucial to consider the factor loading size, as recommended by Hair et al. (2010), during result analysis. The generated fitness values are presented in table 11.

Table Error! No text of specified style in document. *Fitness Indexes for All Constructs Simultaneously (Initial CFA Model)*

Index	Level of Acceptance	IndexValue	Fitness Achievement
Chisq/df	Chisq/df ≤ 3	2.061	Achieved
TLI	TLI ≥ 0.9 means satisfactory	0.916	Achieved
CFI	CFI ≥ 0.9 means satisfactory fit	0.927	Achieved
NFI	NFI ≥ 0.80 suggests a good fit	0.869	Achieved
GFI	GFI ≥0.80 suggests a good fit	0.868	Achieved
RMSEA	RMSEA ≤ 0.08 means mediocrefit.	0.061	Achieved
Model is accepted			

Table 11 indicated that all indices for the measurement model met the recommended values, signifying the successful fulfilment of all Confirmatory Factor Analysis (CFA) fitness criteria by the integrated measurement model.

6.2.7 Assessment of Reliability and Validity of the Measurement Model

In this study, the assessment of construct reliability and validity involved a comprehensive examination of key psychometric properties. Convergent validity was explored to determine the extent to which a construct correlates with other theoretically related constructs. Discriminant validity, on the other hand, aimed to assess the distinctiveness of a construct from unrelated counterparts. The Average Variance Extracted (AVE) was utilized for evaluating convergent validity, with values of 0.5 or higher indicating satisfactory results. To establish

discriminant validity, the AVE estimates for any two factors were compared to ensure they exceeded the squared correlation coefficient between them.

In tandem with validity assessments, construct reliability was scrutinized using the construct reliability measure (CR). The CR values were examined to ensure they met or exceeded the recommended threshold of 0.60, indicating the reliability of the measurement model (Fornell and Larcker,1981; Hair et al. 2010). The reliability construct measures, including CR and AVE, are presented in Table 12, providing valuable insights into the reliability and validity of the study's measurement model.

Table 12 *Results of CR and AVE*

Construct	Construct Reliability **CR (≥ 0.6)**	Convergent Validity **AVE (≥ 0.5)**
SMEs Performance	0.736	0.555
Training	0.713	0.505
Innovation	0.610	0.502
Market Orientation	0.872	0.536
Human Capital	0.800	0.613

For discriminant validity, the generated values are presented in Table 13. The bolded values along the diagonal represent the square root of the Average Variance Extracted (AVE), while the remaining values indicate the correlations between the respective constructs. Discriminant validity is confirmed when the diagonal value exceeds the values in its corresponding row and column, as outlined by Fornell and Larcker (1981).

Table Error! No text of specified style in document. *Discriminant validity values*

Constructs	**Performance**	**Training**	**Innovation**	**Market Orientation**	**Human Capital**
SMEs Performance	**(0.655)**				
Training	0.122	**(0.797)**			
Innovation	0.291	0.295	**(0.754)**		
Market Orientation	0.271	0.098	0.218	**(0.712)**	
Human Capital	0.182	0.085	0.154	0.152	**(0.744)**

According to the findings in Table 13, all constructs in this study successfully meet the criteria for convergent validity, attaining an acceptable level. Consequently, the reliability and validity of the research constructs are deemed satisfactory.

6.3 Path Analysis

Upon confirming the uni-dimensionality, reliability, and validity of the research constructs, the analytical framework advanced to integrate all constructs into a structural equation model using Analysis of Moment Structure (AMOS). The endogenous variable, SMEs Performance, along with exogenous variables—Human capital, innovation, training, and market orientation—were systematically organized within the model. The hypothesized relationships were represented by directional arrows, as depicted in Figure 10. The final structural model which shows perfect compliance with the goodness-of-fitness for the Model.

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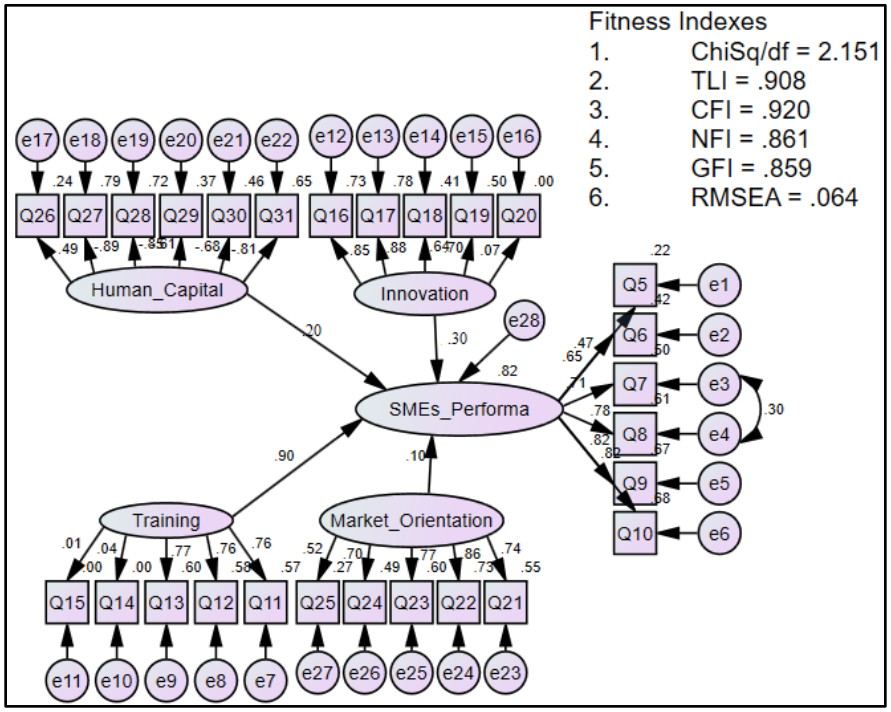

Fig. Error! No text of specified style in document. *Structural Model*

Nevertheless, the structural model of figure 10 was utilized to scrutinize the multidirectional relationships among all the research constructs. The subsequent step encompassed the evaluation of fitness indices for the structural measurement models, outlined in Table 14.

Table Error! No text of specified style in document.**14** *Fitness Indexes for the Structural Model*

Fitness Indexes	Acceptance Level	Generated Index Value	Comments
Chisq/df	Chisq/df ≤ 3	2.151	Fitness Indexes achieved
TLI	TLI ≥ 0.9	0.908	Fitness Indexes achieved
CFI	CFI ≥ 0.9	0.920	Fitness Indexes achieved
NFI	NFI ≥ 0.80	0.861	Fitness Indexes achieved
GFI	GFI ≥ 0.80	0.859	Fitness Indexes achieved
RMSEA	RMSEA ≤ 0.08	0.064	Fitness Indexes achieved

These indices in table 14 served to assess the goodness-of-fit between the model and the observed data. The acquired fitness indices indicated that the model's fit reached an acceptable level, signifying a reasonable alignment between the hypothesized relationships and the collected data.

After establishing that the structural model of the research achieved satisfactory fitness with the collected data, meeting the requirements for model adequacy, the hypotheses for each path are explained upon. This information is presented in Table 15, which outlines the results of each specific path in the structural measurement model, providing insight into the anticipated outcomes.

Table 15 *Hypothesis results of the path modelling*

Hypothesis	Path	p-value	Beta coefficient	Status
H1	SMEs Performance <--- Training	. 001	0.30	Supported
H2	SMEs Performance <--- Innovation	.000	0.90	Supported
H3	SMEs Performance <--- Market Orientation	.049	0.10	Supported
H4	SMEs Performance <--- Human Capital	. 024	0.20	Supported

Table 15 summarised the hypothesised outcome of each respected path in the structural model. **H1: *Training*** *has significant positive relationship with SMEs' performance which is consistent with previous research that emphasizes the importance of training and development programs for enhancing SMEs' performance (Suryadi, Komar, & Riswanto, 2019; Abdelwahed and Mufti, 2023; Alshahrani et al, 2023)*. This finding provides support to the human capital theory by emphasising the importance of investing in employees' knowledge and abilities to

improve organisational performance. The strong positive relationship discovered between training initiatives and SMEs' performance highlights the importance of SMEs prioritising investments in employee training programmes, as such endeavours can improve productivity, efficiency, and innovation capabilities, resulting in increased profitability and growth. Furthermore, the findings suggest that policymakers develop tailored training measures for SMEs, such as low-cost programmes, mentorship, and advisory services. Overall, the positive association between training and SME performance highlights the critical importance of training in improving the competitiveness and sustainability of SMEs, prompting both SMEs and policymakers to actively invest in and support training programmes.

H2: *Innovation is positively related to manufacturing SMEs" indicates that there is a significant correlation between innovation and small and medium-sized enterprises (SMEs) operating in the manufacturing industry*. This finding is consistent with previous research that has identified innovation as a critical driver of development and success in the manufacturing industry (Ukpabio et al., 2018; AlQershi, 2020; Alhakimi & Mahmoud, 2020; Singh & Hanafi, 2020). The beneficial relationship between innovation and manufacturing SMEs has major policy and practice consequences. Policymakers may use this knowledge to develop measures that encourage innovation and foster an environment conducive to the expansion of SMEs in the manufacturing sector. Similarly, SME owners and managers can apply this knowledge to create their business strategies, emphasising innovation in their operational efforts.

.**H3:** *Market Orientation has a positive relationship with SMEs' performance suggests that SMEs that are more market-oriented tend to perform better than those that are less market-oriented*. Market orientation involves a proactive approach to understanding and satisfying customers' needs, considering competitors, and navigating market forces, ultimately leading to enhanced sales and profitability. Small and medium-sized enterprises (SMEs), known for their agility and innovation, may encounter challenges in competing with larger counterparts, emphasizing the importance of adopting a market-oriented strategy for competitiveness. This finding aligns with prior research indicating that a market-oriented approach leads to enhanced financial performance, increased customer satisfaction, and greater innovation for SMEs (Udriyah et al., 2019; Harjadi et al., 2020; Alhakimi & Mahmoud, 2020). In conclusion, the positive relationship between market orientation and SME performance, substantiated by statistical evidence and previous research, underscores the critical importance of SMEs prioritizing customer-centric strategies for success in a competitive business environment.

H4: *There is a positive relationship between human capital and the SMEs' performance in the manufacturing sector*. In SMEs manufacturing sector, the significance of human capital is particularly pronounced, given the limited resources of these firms and their substantial reliance on the expertise and productivity of their workforce. The discovery that human capital positively influences SME performance in Yemen's manufacturing sector is consistent with findings in diverse contexts. Numerous studies, including those by Odhon'g & Omolo (2015), Vixathep et al. (2017), and Al Qershi, Abas, & Mokhtar (2019), have highlighted the advantageous impact of investing in employee training and development on organizational performance, emphasizing that enterprises with elevated levels of human capital tend to exhibit greater innovation and adaptability. The study's outcomes carry significant implications for policymakers and managers in Yemen's manufacturing sector, advocating for strategic investments in human capital development to enhance SME performance. This involves offering training opportunities, fostering employee development, and securing skilled personnel. Overall, the study provides valuable insights into the connection between human capital and SME performance in Yemen's manufacturing sector, underscoring the pivotal role of investing in this critical resource.

7. Conclusion

This study exhibits the construction of a structural relationship model of Non-Financial Factors that include innovation, training, human capital, and market orientation on the performance of Yemen's Small Medium Enterprises (SMEs). The modelling was done using the AMOS-SEM software. Structural Equation Modelling (SEM), route analysis, and confirmatory factor analysis are all performed using the software. It is well-known for its visual approach, which enables users to graphically build models with basic sketching tools and analysts to participate in intricate statistical modelling. The modelling examines the specific effects of these factors and discloses key contributors to the success or failure of SMEs. Data used for modelling was collected from 350 valid responses of employees in the Yemeni manufacturing SME. The findings from the modelling highlight the dominant significance of innovation, as proved by its highest beta coefficient of 0.90, signifying its profound impact on SME performance. Following closely is training, with a coefficient of 0.3, further establishing its crucial role in influencing performance outcomes. Ultimately, this research concludes that the four factors—human capital, innovation, training, and market orientation—exhibit a statistically significant relationship with SME performance within manufacturing sector. The inferences of these findings are of paramount importance to policymakers and practitioners as it offers actionable insights for enhancing SME performance and driving economic growth within Yemen

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