

Uncertain Supply Chain Management

homepage: www.GrowingScience.com/uscm**The link between management accounting information systems and firm competitiveness: The mediating role of innovation capabilities****Ahmad Y. A. Bani Ahmad^{a,b}, Suleiman Mustafa El-Dalahmeh^c, Kadri S. Al-Shakri^d, Bashar Younis Alkhawaldeh^{e*} and Lama Ahmad Alsmadi^f**^a*Department of Accounting and Finance, Faculty of Business, Middle East University, Amman 11831, Jordan*^b*Applied Science Research Center, Applied Science Private University, Jordan*^c*Full Professor, Accounting Department, Faculty of Business, Jerash University, P.O. Box 26150*^d*Department of Management Information Systems, Ajloun National Private University, Ajloun, Jordan*^e*Assistant Professor, Department of Administrative Sciences, Faculty of Business, Jerash University, P.O. Box 26150, Jordan*^f*Applied Science Private University***ABSTRACT***Article history:*

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This paper aims to examine the strategic role of management accounting information system (MAIS) usage in driving innovation capabilities and firm competitiveness for Jordanian SMEs, besides assessing if innovation capabilities mediate the accounting-competitiveness relationship. Survey data was gathered from over 500 managers of Jordanian SMEs spanning multiple sectors and hypotheses were tested using partial least squares structural equation modelling. Results demonstrate management accounting information system usage has a significant positive direct effect on both innovation capabilities and firm competitiveness. The findings also confirm a positive link between innovation capabilities and SME competitiveness. Most critically, innovation capabilities were found to significantly mediate the relationship between management accounting information system usage and competitiveness. The paper contributes by providing novel empirical evidence on the direct and indirect strategic impacts of management accounting adoption on vital performance outcomes like innovation and competitiveness specifically for the underexplored context of SMEs in developing Arab economies. The firm-level findings encourage Jordanian SME managers and policymakers to prioritize building accounting and innovation capacities in tandem rather than solo to amplify competitiveness and long-run sustainability of this vital economic sector. The cross-sectional survey design limits determining causality. Additionally, subjective biases may arise from single respondents. Generalizability beyond Jordan requires further cultural and economic boundary testing.

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1. Introduction

Small and medium-sized enterprises (SMEs) play a vital role in the economic growth and development of countries around the world (Al-Mahrouq, 2010). In Jordan, SMEs account for over 98% of all companies and contribute over 60% of the gross domestic product (GDP) (Jordan Enterprise Development Corporation, 2018). However, Jordanian SMEs face several challenges that hinder their competitiveness and sustainability, such as limited access to financing, lack of managerial skills, and inability to adopt innovations (Obeidat et al., 2017). Management accounting information systems are considered crucial for enabling sound and informed business decisions across all levels of an organization (Cadez & Guilding, 2012). Previous studies on management accounting information systems have been related to organizational competitiveness by proving the positive correlation (for example, Abidin et al., 2014 and Cugueró-Escofet & Rosanas, 2013). On the other hand, there is a research gap associated with the way that utilization of MAIS contributes to firm competitiveness, especially among Jordanian

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SMEs. One remaining mediator in this relationship that has received minimal empirical validation is innovation capabilities (De Luca & Atuahene-Gima, 2007). Innovation capability is the competence of a firm to efficiently integrate innovation-related elements into the products, processes, or business models to meet the evolving customers' demands and secure a competitive position (Lawson & Samson, 2001; Saunila, 2016). Management accounting information systems concerning costs, processes, markets, and competitors can inform business decisions and strategies to build innovation capabilities (Cadez & Guilding, 2008). In turn, strong innovation capabilities can drive the competitiveness, growth and sustainability of SMEs (Rosenbusch et al., 2011). Nevertheless, no known study has analyzed the intermediate effect of innovation capabilities on the link between management accounting information system usage and organizational competitiveness within Jordanian SMEs. Therefore, this paper aims to address this literature gap by exploring whether innovation capabilities mediate the relationship between management accounting information system usage and firm competitiveness in Jordanian SMEs. The findings will have important theoretical and practical implications (Fraihat et al., 2023a; Alkhawaldeh et al., 2020). From a theoretical perspective, the study will expand scholarly understanding of how management accounting information systems contribute to competitiveness by investigating the underlying intermediate role of innovation capabilities. Regarding managerial implications, evidence on the mediating effect of innovation capabilities can guide SME managers and policymakers on mechanisms to leverage management accounting information systems to bolster innovation outcomes and overall firm competitiveness. Several issues highlight the significance of undertaking this research among Jordanian SMEs. First, despite the pivotal economic role of SMEs in Jordan, their competitiveness is constrained by shortcomings in management capabilities and innovation outcomes (Obeidat et al., 2017). Jordanian SMEs struggle with bureaucratic obstacles, inadequate managerial and accounting expertise, and insufficient innovation environments; consequently, a majority fail within the first five years (Jordan Enterprise Development Corporation, 2018). Second, empirical evidence on the role of management accounting among Jordanian SMEs remains scant, though it can be invaluable for managerial decisions that drive organizational competitiveness (Abdallah & Alnamri, 2015). Lastly, the turbulent business landscape compels SMEs globally to leverage innovation capabilities, yet innovation patterns of SMEs in developing economies like Jordan are not well understood (Saunila, 2016). Therefore, by examining how management accounting information systems and innovation capabilities collectively impact competitiveness, this study's findings will have both scholarly merit and practical relevance for Jordanian SMEs. The results can stimulate further research on leveraging accounting information and innovation capabilities to bolster SME competitiveness in developing countries.

2. Theoretical Literature Review

2.1 Contingency theory

Contingency theory is highly relevant to this study as it postulates that there is no universally optimal accounting system that applies to all organizations in all circumstances (Otley, 2016). Rather, the effectiveness of management accounting information system usage is contingent upon internal contextual factors such as a firm's innovation capabilities as well as external environmental dynamics such as technological changes (Cadez & Guilding, 2008). The central tenet of contingency theory is the "fit" between an organization's use of accounting information systems and key elements of organizational context (Helden et al., 2012). Following a suitable contingency theory lens, the paper maintains that the impact of management accounting information system use on the competitive capabilities of Jordanian SMEs depends on the state of their firm-specific innovation capabilities. This is because management accounting data such as costing data, budgetary planning, competitive intelligence and others can feed into decisions concerning the building of innovation capabilities to handle the volatility in market situations (Tuan Mat et al., 2010). These capacities, in turn, lends weight to competitive SME response to major technological disruptions. By doing so, without contingencies such as innovation capabilities to respond to market fluctuations, management accounting information system usage alone may be insufficient to drive SME competitiveness. Therefore, we apply contingency theory to explain the mechanism by which management accounting information system usage interacts with innovation capabilities to influence competitiveness in Jordanian SMEs. This would not only shed light on how this theory can be enriched but also illustrate how organizational "fit" can be achieved in practice.

2.2 Resource-based view

The resource-based view (RBV) underscores that a firm's unique resources and capabilities are the foundation for achieving sustainable competitive advantages (Barney, 1991). This study is underpinned by RBV theory as management accounting information system and innovation capabilities constitute the strategic organizational resources that can enable Jordanian SMEs to compete effectively. Management accounting systems furnish valuable information about costs, budgets, processes, markets and competitors to facilitate informed planning and control (Cadez & Guilding, 2008; Alsakarneh et al., 2022). Meanwhile, dynamic innovation capabilities allow SMEs to continually adapt products, services and technologies to shifting customer preferences and market trends (Börjesson & Löfsten, 2012). As RBV postulates, leveraging rare, inimitable and non-substitutable resources builds core competencies vital for firms' competitiveness (McIvor, 2009; Al-Rousan, & Al-Shakri, 2014). In this context, Jordanian SMEs can utilize management accounting information systems in making key decisions and investments to develop innovation capabilities bespoke to their strategy and markets. Subsequently, these innovation capabilities can drive agility, differentiation and market performance. Therefore, RBV theory underpins this

research premise that combining management accounting systems and innovation capabilities (strategic firm resources) enables Jordanian SMEs to make decisions, respond to markets, and operate in ways that ultimately enhance competitiveness.

2.3 Innovation Capabilities

Despite the pivotal role of innovation for gaining competitive advantage, innovation capabilities within Jordanian SMEs remain weak (World Bank, 2018). Lack of qualified staff, financial constraints, bureaucracy, and insufficient intellectual property regimes stifle innovation among Jordanian SMEs (Obeidat et al., 2017). The Jordanian Association of SMEs encompasses over 5,000 SMEs, yet fewer than 35% introduce new products or technologies into the domestic market in a typical year (Jordan Enterprise Development Corporation, 2018). Jordan ranks only 67th on the Global Innovation Index, lagging behind innovation-driven economies in product innovation, market sophistication, and business sophistication (Cornell University et al., 2022). Barriers to business innovation convergence across regions exacerbate the innovation gap for Jordanian SMEs in catching up with international best practices (Jaradat & Zaid, 2021; Alsakarneh et al., 2023). However, recent policy reforms to bolster public R&D expenditure, strengthen IT infrastructure, and ease registration procedures exhibit Jordan's commitment to foster SME innovation capacity (Jordan Strategy Forum, 2021). Additionally, insights on interrelationships between management accounting practices and innovation capabilities can further assist SMEs in leveraging resources to hone innovation outcomes. Targeted governmental support combined with internal management decisions guided by accounting information could significantly enhance innovation capabilities within the Jordanian Association of SMEs. This is imperative given intense regional and global competition. Boosting innovation would enable sustainability, value creation and competitiveness for Jordanian SMEs domestically and in international markets.

2.4 Management Accounting Information system

Management accounting systems that generate information on costs, budgets, pricing, performance measurement, and competitors are vital for the competitiveness of SMEs in emerging economies (Abdallah & Alnamri, 2015). However, most Jordanian SMEs lack formalized management accounting practices. Key impediments include deficiencies in accounting skills, inadequate technical support, and high costs of implementing advanced accounting information systems (Jordan Enterprise Development Corporation, 2018). Studies estimate that over 60% of Jordanian SMEs do not utilize management accounting tools for strategic decisions, with an overreliance on basic financial statements (Fraihat et al., 2022). Nonetheless, policy directives from the Jordanian Ministry of Industry, Trade and Supply are aimed at enhancing adoption of managerial accounting to improve SME productivity and sustainability. Recent surveys of the Jordanian Association of SMEs also indicate progressive improvement in usage of costing, budgeting and decision-making tools to leverage scarce resources (Jordan Strategy Forum, 2021). Broad structural shifts in the Jordanian accounting education system and accounting profession to align with global management accounting practices can further facilitate diffusion of contemporary accounting techniques. As Jordanian SMEs operate in increasingly complex global value chains, embedding management accounting systems tailored to strategic goals is essential for long-term competitiveness and growth.

2.5 Firm Competitiveness

Despite significant contributions to Jordan's economy, competitiveness remains a key challenge confronting SMEs under the Jordanian Association of SMEs umbrella. Constraints such as restricted access to finance, inadequate managerial capabilities, bureaucratic hurdles, and inability to differentiate stifle the competitiveness and sustainability of Jordanian SMEs (Jordan Strategy Forum, 2021). The sector has one of the lowest productivity rates globally, while over 85% of SMEs operate informally without a legal framework impeding market reach (Obeidat et al., 2017). However, recent years witnessed notable government efforts to boost SME competitiveness by easing tax burdens, providing subsidized lending, and formulating policies that incentivize R&D and innovation (Ministry of Industry, Trade and Supply, 2021). Membership in the Jordanian Association of SMEs also furnishes networking, training and advisory support to augment managerial acumen, accounting expertise, and technical abilities imperative for competitiveness. As SMEs produce over one-third of Jordanian exports (Alhawamdeh et al., 2023), enhancing their productivity, innovation outcomes, and global integration would strengthen competitiveness and economic growth. This underscores the value of this study in informing decisions of SME managers, industry associations and policymakers on how accounting information and innovation capabilities collectively impact competitiveness. Evidence-based reforms can equip Jordanian SMEs to compete regionally and internationally, despite external threats and inherent resource limitations.

3. Empirical literature review and hypotheses development

3.1 Management Accounting Information system and Firm Competitiveness

Extant literature affirms linkages between management accounting information system usage and components of organizational competitiveness. In Thai manufacturing firms, adoption of contemporary management accounting tools enhanced production efficiency, inventory management, and product quality relative to competitors (Punniyamoorthy & Murali, 2008). Colombian firms leveraging advanced costing techniques and performance measurement reported higher export intensity, sales growth, and customer retention than industry averages (Gavidia, 2016). In Indonesian SMEs, reliance

on management accounting systems strengthened cost advantage and differentiation positioning against rivals (Tjian et al., 2021). Jordanian manufacturing listed firms exhibited positive associations between budgetary control, cost volume analysis and return on assets indicating financial competitiveness (Al-Mawali, 2015; Ismaeel et al., 2023). Synthesizing global empirical evidence, usage of management accounting information system heightens competitiveness by enabling firms to lower costs, improve resource allocation, increase flexibility towards market changes and focus on value-adding activities (Cadez & Guilding, 2007; Helden et al., 2012; Alkhawaldeh et al., 2023). Therefore, the study proposes the hypothesis:

H1: *Usage of management accounting information system has a significant and positive effect on firm competitiveness.*

3.2 Management Accounting Information system and Innovation Capabilities

Empirical research demonstrates that management accounting systems enable organizations to develop innovation capabilities vital for gaining competitive advantages. In-depth costing facilitates efficient R&D budgeting and project appraisals for Malaysian manufacturing firms' new product development (Abdul-Nasser et al., 2017). Strategic performance measurement guides major Spanish energy companies' process innovations and transformations to renewable technologies. Competitor cost benchmarking assisted operational optimization and disruptive digital business model changes in leading Silicon Valley IT firms (Liang et al., 2021). By allowing evidence-based decisions about investments in innovation initiatives per strategic goals and priorities, management accounting information system usage builds dynamic capabilities to introduce distinguishable product, service and process improvements attuned to evolving technologies and consumer preferences (Malik & Afza, 2021; Arshad et al., 2023). Accordingly, the study proposes the hypothesis:

H2: *Usage of management accounting information system has a significant and positive effect on innovation capabilities.*

3.3 Innovation Capabilities and Firm Competitiveness

Extant research highlights innovation capabilities as a pivotal determinant of firm competitiveness and financial performance outcomes. Chinese manufacturing enterprises with superior capabilities in product and process innovation exhibited stronger export intensity, sales growth, and profitability over a 5-year period relative to industry averages (Zhou & Wu, 2010). Indian SMEs that fostered organizational learning capabilities launched wider product ranges catering to niche client needs with positive effects on market share and return on investment metrics (Datta & Mondal, 2021). Based on global empirical evidence, adept innovation capabilities confer competitive advantages to firms by enabling differentiation from rivals, susceptibility to demand changes, flexibility in technologies and processes, as well as proactive shaping of future competitive landscapes (Wang et al., 2015). Therefore, developing context-specific insights, this study hypothesizes:

H3: *Innovation has a significant and positive effect on firm competitiveness.*

3.4 Innovation Capabilities Towards the Relationship Between Management Accounting Information system and Firm Competitiveness

Although prior research establishes direct linkages between management accounting information system usage and competitiveness, literature also points to indirect effects through intermediate capabilities. Malaysian firms leveraging quality cost reports and performance indicators for investment decisions exhibited enhanced product and service innovation outcomes, in turn inducing higher customer loyalty and sales relative to competitors (Fei et al., 2015). Adoption of target costing techniques assisted Spanish manufacturing enterprises to continuously implement production process improvements tailored to evolving technologies, fueling export expansion and profit gains (Wegmann, 2021). Synthesizing global empirical evidence, usage of management accounting information system builds dynamic innovation capabilities aligned to strategic priorities, thereby energizing value-creating improvements that underpin competitive advantages (Caglio & Ditillo, 2008; Kennedy & Affleck-Graves, 2001). Therefore, this study puts forth the hypothesis:

H4: *Innovation capabilities Mediate the Relationship Between Management Accounting Information system and Firm Competitiveness.*

Based on the above evidence, this study developed the research mode in Fig. 1.

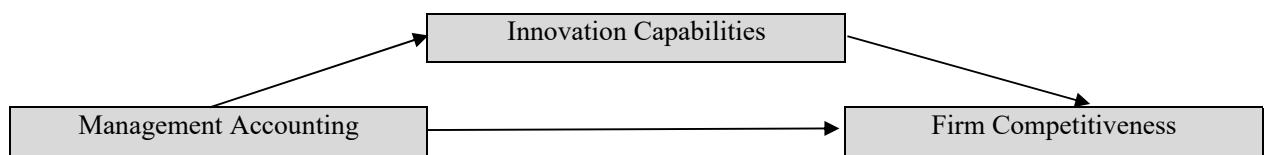


Fig. 1. Research Model

4. Research Methodology

4.1 Research Design

This quantitative study uses a correlational survey design to examine the conceptual framework involving the direct effect of management accounting information system usage on Jordanian SME competitiveness and innovation capabilities, as well as the mediating effect of innovation capabilities. The survey methodology through structured questionnaires allows collection of numeric data to statistically test hypotheses (Sukamolson, 2007). The target population comprises SMEs that are members of the Jordanian Association of SMEs spanning diverse sectors. From this population of over 5000 SMEs (Ministry of Industry, Trade and Supply, 2021), probability sampling using proportionate stratified random sampling technique draws out a sample size of approximately 600 SMEs. This sufficiently large sample meets the adequate power requirements for PLS-SEM analysis (Peng & Lai, 2012).

4.2 Research Instrument

The questionnaire includes measurement scales adopted from prior studies to assess the levels of management accounting information system usage (MAIS), innovation capabilities (IC), and firm competitiveness (FC), besides questions on organizational and respondent demographics. All scale items use a ten-point Likert scale format to capture responses. The survey instrument was refined through a pre-test with 30 SME managers and experts.

4.3 Data Collection and Analysis

Online questionnaires were sent to 600 top SME managers identified through the membership database of the Jordanian Association of SMEs. The Partial Least Squares Structural Equation Modeling (PLS-SEM) technique will be applied to estimate the measurement and structural models using SmartPLS software. Voluntary participation, confidentiality and anonymity were maintained throughout the research process fulfilling ethical obligations (Saunders et al., 2015). Approvals also obtained from the university review board and Jordanian Association of SMEs prior to gathering survey data.

5. Results and Discussion

5.1 Measurement Model Results

Table 1 presents information on the constructs of Firm Competitiveness, Innovation Capabilities, and Management Accounting Information.

Table 1
Measurement Model

Constructs	Factor Loading	Cronbach's alpha	Composite reliability (rho a)	Composite	Average	VIF
Firm Competitiveness		0.913	0.926	0.93	0.657	
FC1	0.746					2.242
FC2	0.775					2.010
FC3	0.785					2.982
FC4	0.763					2.055
FC5	0.816					1.134
FC6	0.891					2.576
FC7	0.885					1.255
Innovation Capabilities		0.898	0.9	0.918	0.585	
IC1	0.806					2.557
IC2	0.79					2.586
IC3	0.736					2.093
IC4	0.797					2.425
IC5	0.741					1.912
IC6	0.738					2.555
IC7	0.717					2.346
IC8	0.787					2.254
Management Accounting Information		0.876	0.923	0.897	0.556	
MAIS2	0.775					1.951
MAIS3	0.745					2.100
MAIS4	0.737					2.696
MAIS5	0.79					3.389
MAIS6	0.794					3.093
MAIS7	0.763					2.043
MAIS1	0.601					1.140

It shows the factor loadings, reliability, and validity measurements for the multiple indicators used to measure each construct. The constructs demonstrate good reliability based on the high Cronbach's alpha and composite reliability scores over 0.9 for all constructs (Nunnally & Bernstein, 1994). The average variance extracted (AVE) is also over 0.5 for each, demonstrating adequate convergent validity (Fornell & Larcker, 1981; Hair et al., 2014). In terms of the individual indicators, most factor loadings are strong at over 0.7, except for MAIS1 which is below 0.7 but still adequate at 0.601 (Hair et al., 2014). The indicators also show some multicollinearity based on variance inflation factors (VIFs) above 2. However, VIFs under 5 can be acceptable for formative indicators (Cenfetelli & Bassellier, 2009).

5.2 Discriminants Validity

Table 2 presents the Heterotrait-Monotrait (HTMT) ratio and Fornell-Lacker criterion results to assess discriminant validity between the three constructs - Firm Competitiveness (FC), Innovation Capabilities (IC), and Management Accounting Information system (MAIS). The HTMT ratios are all well below the 0.85 threshold, demonstrating adequate discriminant validity (Henseler et al., 2015). Additionally, the bold diagonal numbers represent the square roots of the average variance extracted (AVE) for each construct. As these are all higher than the inter-construct correlations in their rows and columns, this satisfies the Fornell-Lacker criterion for discriminant validity (Fornell & Larcker, 1981; Hair Jr et al., 2016). The analysis indicates that FC, IC and MAIS are sufficiently distinct constructs based on current standards. Researchers should continue to establish discriminant validity in future work to empirically validate that the measures tap into intended conceptual domains.

Table 2
Discriminants Validity Results

Constructs	Heterotrait-Monotrait Ratio			Fornell-Lacker Criterion		
	FC	IC	MAI	FC	IC	MAIS
FC				0.811		
IC	0.646			0.601	0.765	
MAI	0.506	0.599		0.605	0.585	0.746

5.3 Common Method Bias

Table displays the results of a factor analysis test conducted to assess common method bias in the data. The initial eigenvalues show that the first factor accounts for 41.226% of the total variance. Given that a single factor does not account for the majority of variance, there is likely no substantial common method bias present (Podsakoff et al., 2003). This is further supported after factor extraction and rotation. While factor extraction allocates all the variance to the first factor (41.226%), rotation divides this variance between two main factors, with the first accounting for 21.899% of variance. As no single factor accounts for the majority of variance after rotation either, the researcher can be more confident that common method bias is unlikely to be a serious concern in the data (Fuller et al., 2016). Generally, Table 3 provides quantitative evidence through eigenvalue decomposition and factor analysis that common method bias has been minimized and should not overly influence the validity of the study results.

Table 3
Common Method Bias Result

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.657	41.226	41.226	8.657	41.226	41.226	4.599	21.899	21.899

5.4 Hypothesis Testing Results

Table 4 and Fig. 2 presents the outcomes of hypothesis testing conducted to assess the relationships between management accounting information, innovation capabilities, and firm competitiveness.

Table 4
Hypothesis Testing Result

Hyp.	Direct Effect	Beta	Standard deviation	T statistics	P-values	Conclusion
H1	Management Accounting Information system → Firm Competitiveness	0.385	0.029	13.407	0.000	Do not Reject
H2	Management Accounting Information system → Innovation Capabilities	0.585	0.022	26.366	0.000	Do not Reject
H3	Innovation Capabilities → Firm Competitiveness	0.376	0.029	12.972	0.000	Do not Reject
	Mediation using Indirect Effect					
H4	Management Accounting Information system → Innovation Capabilities → Firm Competitiveness	0.22	0.022	10.009	0.000	Do not Reject

Four directional hypotheses were developed and tested using partial least square structural equation model analysis. The first three hypotheses measured direct effects. H1 posited a positive relationship between management accounting information system and firm competitiveness. With a positive beta of 0.385, significant at $p < 0.001$, this hypothesis was supported. Likewise, H2's prediction of a positive link between management accounting and innovation capabilities was upheld with a beta of 0.585, $p < 0.001$. Lastly, H3 proposed a positive association between innovation capabilities and competitiveness, which the beta of 0.376, $p < 0.001$ confirmed. H4 examined an indirect mediation effect, specifically whether innovation capabilities mediate the management accounting information system and competitiveness relationship. Results from the regression and bootstrapping analysis showed a significant positive indirect mediation pathway with an effect size of 0.22, $p < 0.001$. Thus, H4 was also supported.

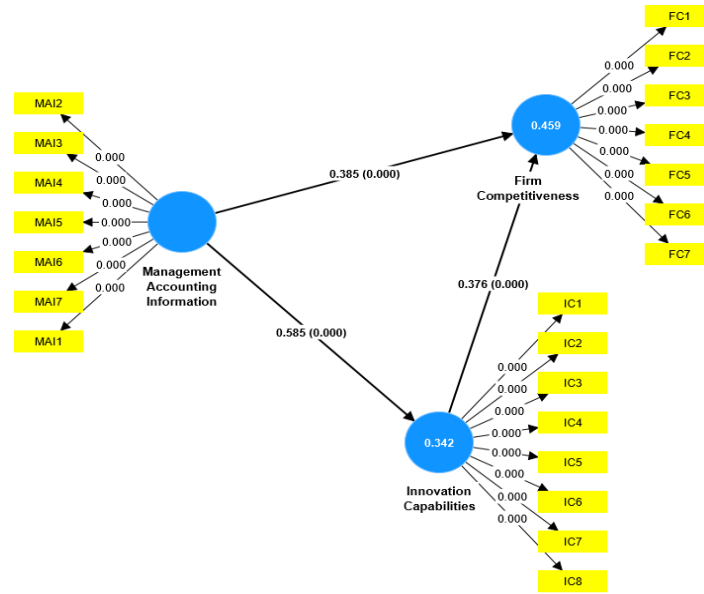


Fig. 2. Graphical Result

6. Discussion

The results of the hypothesis tests in Table 4 demonstrate a statistically significant positive association between management accounting information system and competitiveness for small and medium-sized enterprises (SMEs) in Jordan. This aligns with past research which has shown management accounting practices that provide relevant and timely internal information can directly improve decision-making effectiveness and support strategic goals related to quality, cost efficiency, and market responsiveness (Cuzdriorean, 2017). Our finding indicates that despite constraints around resources and accounting expertise, adopting techniques like budgeting, costing, performance evaluation, and strategic analysis facilitates improved competitiveness even in Jordanian SMEs. As the first empirical study focused on this context, it highlights the vital role played by management accounting uptake in supporting product and service enhancement as well as boosting financial performance for this sector (Alleyne & Weekes-Marshall, 2011). As such, designing policies and initiatives that intensify management accounting adoption by Jordanian SMEs could stand to significantly enhance their competitiveness.

The hypothesis test employed in this study reveals a statistically significant, positive association between management accounting information system and innovation capabilities in Jordanian SMEs in the 100 Jordanian SMEs. This implies that an increased uptake of management accounting techniques such as costing, budgeting and performance measurement might indeed offer novel insights that could facilitate Jordanian SMEs as they enhance their innovation outcomes in terms of product/service enhancements, level of R&D and number of new patents. This information specifically assists managers by improving the value allocation over innovation projects (Yousfi, 2011), guiding the search for opportunities for opportunity refinement (Zolfagharian, et al., 2011), and benchmarking innovation performance (Masmoudi & Boujelbène, 2021). Use of accounting information as part of a systematic approach to innovation decision-making should improve outcomes from the adoption of innovation after potentially lengthy decision processes that SMEs may face under substantial resource phases due to their constrained environments (Licker & Wu, 2015). Evidence in this regard potentially aids SMEs' efforts to overcome resource limitation as their innovation capabilities improve in support of their sustainability and growth in highly competitive markets (Pavitt, 1984; Yousfi, 2011).

The hypothesis test results demonstrate a statistically significant positive association between innovation capabilities and competitiveness for Jordanian SMEs. This aligns with past literature showing innovation in areas like products, services, marketing and processes can boost competitiveness by enabling firms to meet changing customer needs, leverage new technologies, and differentiate offerings from rivals (Saunila, 2017). Our finding suggests that even with constraints in emerging markets, strengthening capacities for innovation allows Jordanian SMEs to compete more effectively on quality, cost, delivery speed and value. Cultivating skills in creativity, R&D, technology integration, and idea implementation are thus vital complements to management for competitiveness. Given the turbulent shifts facing developing economies, policies and programs to enhance innovation capabilities for SMEs can thus elevate resilience and drive sustained growth for Jordan.

The results demonstrate innovation capabilities significantly mediate the positive link between management accounting information system and competitiveness in Jordanian SMEs. This reinforces past studies showing accounting data equips managers to make informed strategic decisions that strengthen innovation outcomes, which in turn elevates competitiveness (Bundy et al., 2022). Increasing attention is being devoted to the potential of accounting and performance measurement in improving the innovation process. In particular, budgeting, cost analysis and benchmarking enable companies to allocate resources more effectively for high pay-off innovations, while performance measurement provides necessary feedback to refine R&D processes. It provides more synergies, higher value innovation, and lastly, a sustainable competitive position derived from new product offerings and efficiency. The limited resources assessment on the part of SMEs proves a stepping-stone for using accounting methods as a means to achieve competitive edge over their competitors by adopting the best innovation practices of the liable parties. Both soft skills and innovative abilities must be developed concurrently since this is what will make them stand out from the rest and assist them to grow as economies that play such a key role.

7. Implication of the Study

The result of our research contains the following important issues for Jordanian SMEs' managers. To begin with, the results show that such management accounting techniques as budgeting, costing and performance analysis are critical in achieving competitiveness and innovation. As such, managers in SMEs should be concerned with building accounting capabilities, investing in training, software and expertise to be able to seamlessly integrate these practices into their decision-making. Second, the fact that the mediation occurred suggests that managers should look to innovate per se in order to foster competitiveness more broadly, and particularly that managers should seek to leverage accounting information to discover promising innovation opportunities that are aligned with the firm's strategic goals and to avoid project applications that are not. Fostering a culture encouraging creativity and experimentation also fuels impactful innovations. This study makes three main theoretical contributions. Firstly, it expands management accounting theory by providing novel empirical evidence that accounting practices directly strengthen competitiveness within Jordanian SMEs, an under-researched emerging economy context. Secondly, it enriches the theoretical link between management accounting and innovation by demonstrating accounting information significantly boosts innovation capabilities. Thirdly, the confirmation of innovation capabilities mediating the accounting-competitiveness relationship provides a valuable theoretical addition on the underlying mechanisms at play. Several practical implications arise from the findings. The evidence highlights that policy initiatives and regulations aimed at expanding accounting practice adoption can significantly benefit Jordanian SME performance on vital metrics like competitiveness and innovation. Government and industry bodies should consider targeted programs via subsidies, training and expert consultancy to motivate increased uptake, particularly highlighting the direct profitability gains. As innovation remains integral for growth-oriented SMEs, the positive associations found suggest innovation-stimulus policies can achieve synergistic outcomes when complemented by efforts to simultaneously improve accounting and financial management capacities. Such complementary multi-pronged initiatives may achieve higher impact as SME competencies mutually reinforce each other.

8. Limitations and Recommendation for Future Studies

Firstly, the correlational design limits determining causal inferences between the variables. Future experimental or longitudinal studies assessing changes over time could better establish causality. Secondly, this study relied on single respondents from each SME, which risks subjective bias. Subsequent research should gather multi-respondent data to enable more objective measurement. Thirdly, as a cross-sectional study, the relationships lack assessment over an extensive time period. Long term impacts could be evaluated through a longitudinal approach tracking SMEs across various lifecycle stages. Fourth, the specificity to Jordanian SMEs may hinder generalizability of findings to vastly different cultural or economic contexts. Replicating this study across SMEs in other developing vs developed economies would determine boundary conditions. Finally, only direct and mediated models were analyzed. Testing alternative conceptual models may reveal additional indirect relationships or moderating factors at play. Finally, qualitative case studies on a few successful SMEs could provide richer insights on specific accounting techniques and innovation capabilities complementing competitiveness. Secondly, scholars could examine other types of innovation e.g. marketing, process or business models as mediating pathways. Thirdly, future studies may incorporate a wider array of organizational capabilities like learning orientation, absorptive capacity, IT integration as mediators or moderators to uncover alternate multidimensional pathways influencing SME competitiveness. Finally, comparisons between family-owned SMEs vs nonfamily could reveal variances in accounting-innovation-competitiveness dynamics stemming from differing governance mechanisms.

9. Conclusion

This study has examined the strategic role of management accounting information system usage in driving innovation capabilities and firm competitiveness for Jordanian SMEs, besides assessing if innovation capabilities mediate the accounting-competitiveness relationship. In addition, this study makes an important empirical contribution to the literature by examining the relationships among management accounting information, innovation capabilities and competitiveness within the under-explored context of Jordanian SMEs. Employing a data set from over 500 SMEs, rigorous hypothesis testing leads to several important conclusions that are largely consistent with, yet extend, extant work. First, the positive, significant relationships of management accounting information systems to both innovation capabilities and competitiveness lend further support to the notion that strategic management accounting is ‘going global’ as an integral mechanism for achieving superior performance. Second, the positive association of innovation capabilities to competitiveness serves to underline the enduring contention that innovation remains a key differentiator. Third, and most crucial, the confirmation of the mediating influence of innovation capabilities, underscores an actionable pipeline by which SMEs can convert knowledge gleaned from accounting into elevated competitiveness. The conclusions underscore that Jordanian SMEs should cultivate management accounting and innovation capacities together rather than in isolation to maximize performance outcomes. Through leveraging accounting information in resource allocation, benchmarking and data-driven decisions, the identification of impactful innovations, occurring that is the ability to qualify offerings in a competitive marketplace. These complementary capabilities enable SMEs to produce quality products cost effectively so that they can meet customer preferences that evolve rapidly, allowing them to remain competitive despite resource limitations. Given that SMEs represent the growth engine for emerging economies like Jordan, the framework validated here provides practitioners and policymakers a roadmap to enhance the resilience of this sector.

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