

DETERMINANTS OF THE CHOICE OF MANAGEMENT ACCOUNTING ACCORDING TO THE IFAC (1998) MODEL

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Abstract

How to cite this paper: Benelifa, S., & Nasfi Salem, F. (2025). Determinants of the choice of management accounting according to the IFAC (1998) model. *Corporate Ownership & Control*, 22(3), 73–83.

<https://doi.org/10.22495/cocv22i3art6>

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ISSN Online: 1810-3057

ISSN Print: 1727-9232

Received: 07.05.2025

Revised: 21.07.2025; 06.08.2025

Accepted: 02.09.2025

JEL Classification: M4, M410, M480

DOI: 10.22495/cocv22i3art6

This study explores how various contingency factors influence the sophistication of management accounting practices (MAPs) in manufacturing firms in Tunisia, based on the International Federation of Accountants (IFAC, 1998) framework. Data were collected through structured surveys administered to both managers and accountants, providing a comprehensive dataset for the quantitative analysis. The research is particularly relevant as it addresses a gap in the literature on MAPs in developing and Arab economies, offering new insights into how contextual factors shape accounting practices in these settings. The study uses a robust dataset encompassing responses related to 38 MAPs and eight contingency variables across a representative sample of Tunisian manufacturing firms. Using the non-parametric Kruskal-Wallis test, the findings indicate that organizational structure, business strategy, total quality management (TQM), just-in-time (JIT) systems, advanced manufacturing technology (AMT), and environmental uncertainty significantly influence the adoption of advanced MAPs. Conversely, firm size and market competition were not found to be significant predictors, which contrasts with common assumptions in the existing literature. Overall, the study highlights the importance of achieving a contextual “fit” between firm characteristics and accounting practices to ensure the effectiveness of MAPs as tools for information and decision-making. It represents the first known analysis of this scale in the Arab region, contributing original empirical evidence to the field of management accounting.

Keywords: Management Accounting Practices, IFAC Model, Contingency Theory, Firm Characteristics

Authors’ individual contribution: Conceptualization — F.N.S.; Methodology — S.B.; Software — F.N.S.; Validation — S.B.; Formal Analysis — S.B.; Investigation — S.B.; Resources — S.B.; Data Curation — S.B.; Writing — Original Draft — S.B.; Writing — Review & Editing — F.N.S.; Visualization — F.N.S.; Supervision — F.N.S.; Project Administration — F.N.S.; Funding Acquisition — F.N.S.

Declaration of conflicting interests: The Authors declare that there is no conflict of interest.

1. INTRODUCTION

In today’s global economy, where firms are increasingly pressured to improve transparency,

internal control, and decision-making efficiency, management accounting (MA) has become a strategic function with growing importance. However, in many developing economies, including Tunisia, MA

remains underdeveloped and underutilized. Despite being formally recognized in the 1996 Tunisian Accounting Law, MA continues to be viewed primarily as a support to financial accounting rather than a standalone decision-support system. The adoption of advanced MA techniques, such as activity-based costing, balanced scorecards, and strategic performance measurement, remains relatively low compared to both developed economies and peer countries in the Middle East and North Africa (MENA) region.

This underdevelopment is not merely a technical issue — it has strategic consequences. Firms that fail to integrate advanced machine learning (ML) systems may lack the agility and insight required to compete in dynamic, uncertain, and increasingly globalized markets. Furthermore, the absence of a robust MA framework may hinder firms from complying with international standards, attracting investment, or participating in global supply chains.

In response to these challenges, the International Federation of Accountants (IFAC) proposed in 1998 a conceptual model that classifies management accounting practices (MAPs) into four stages of sophistication: from basic cost determination to value creation (IFAC, 1998). This framework provides a useful lens to evaluate the maturity of MA systems within organizations and across economies. While this model has been applied in several empirical studies in countries such as China, Malaysia, Vietnam, and India, its use remains limited in Arab and North African contexts. Tunisia, in particular, has received little attention despite its strategic industrial base and ongoing economic reform efforts.

This paper aims to fill that gap by applying the IFAC (1998) model to the Tunisian context, analyzing the extent to which contingency factors, such as organizational structure, business strategy, technological adoption, and environmental uncertainty, affect the sophistication of MA practices in manufacturing firms. By surveying both accountants and managers and analyzing 38 MA practices across eight contingency variables, this study provides one of the first large-scale empirical analyses of MA development in Tunisia and the broader Arab world.

The contribution of this research is twofold. First, it offers empirical validation of the IFAC framework in a new regional context, demonstrating its applicability and limitations in North African economies. Second, it identifies the specific organizational and environmental factors that are most closely associated with higher levels of MA sophistication. In doing so, the study offers actionable insights for policymakers, educators, and business leaders seeking to modernize accounting systems and improve management capabilities in Tunisia and similar economies.

The rest of this paper is organized as follows: Section 2 presents the literature review and hypothesis development based on the IFAC (1998) model. Section 3 details the research design, data collection methods, and the variables used. Section 4 presents and analyzes the empirical results. Section 5 discusses the findings about prior literature, Section 6 identifies the conclusion, limitations, and proposes future research directions.

2. LITERATURE REVIEW AND DEVELOPMENT OF THE HYPOTHESES

2.1. The IFAC (1998) framework for the development of management accounting practices

The International Federation of Accountants proposed a framework for the development of MA in its 1998 revised version of the Management Accounting Practice Statement. According to this framework, MAPs are classified into four levels of sophistication. They correspond respectively to cost determination and financial control (before 1950); the provision of information for planning and control (1950–1964); the reduction of waste (1965–1984), and the creation of value (from 1985 to the present).

Numerous studies, not only in developed economies but also in developing and transition economies, have examined the level of sophistication of MAPs through the framework proposed by IFAC (1998). Over time, the main findings of these studies, such as Ahmad (2012) in Malaysia, Huang et al. (2014) in China, Liu et al. (2014) in Thailand, Shahzadi et al. (2018) in Pakistan, Kalifa et al. (2020) in Libya, and Al-Dhubaibi et al. (2014) in Yemen, Pham et al. (2020) in Vietnam, have consistently shown that companies tend to rely more on traditional MAPs rather than contemporary ones.

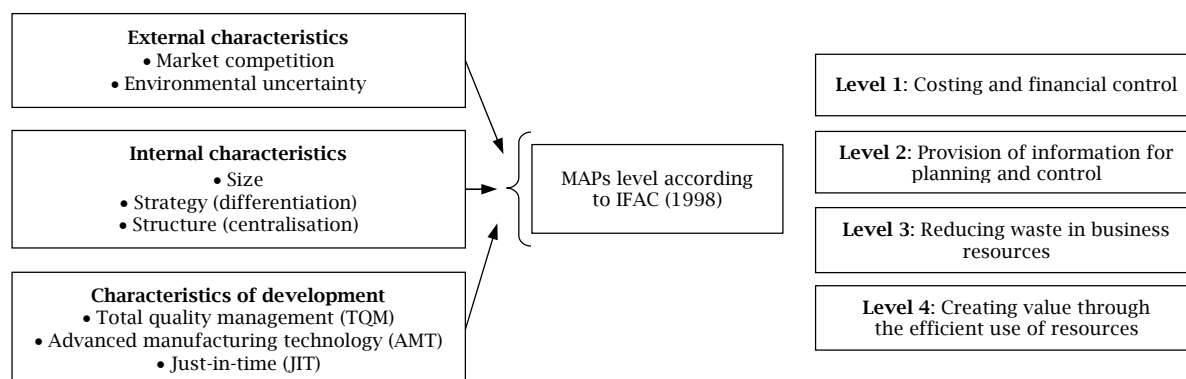
Similarly, for developed countries such as Armitage et al. (2016) in Canada and Australia, Hutaibat and Alhatabat (2020) in the United Kingdom, and McLean et al. (2015) in the United States yielded the same results. This raises an important question:

RQ: Why is traditional management accounting practice the primary choice for companies?

Subsequently, the accounting literature has addressed this question from the perspective of contingency theory, which was developed in the 1960s by Lawrence and Lorsch (1967). The fundamental premise of this theory is that there is no universal and adequate control system applicable to all organizations in all circumstances. Instead, specific contexts dictate the best choice of management control system. Various research studies have shown that the choice of MAPs varies from one company to another, depending on a number of contingency factors linked to the organization.

The Tunisian accounting literature is characterized by a limited contribution to the subject of the contingent reality of MAPs, except for the few studies that focus on the relationship between a singular number of accounting practices and some contingent factors in small and medium-sized enterprises (SMEs) (Mnif, 2008; Ghorbel, 2012; Ayadi & Affes, 2014). Indeed, a call to enrich the accounting literature with additional studies that bring together both a range of MAPs and a set of contingent factors has become a necessity to affirm or confirm previous research.

To answer the question of this research, we take eight contingent factors inspired by previous studies (Ahmad, 2012; Huang et al., 2014; Liu et al., 2014; Shahzadi et al., 2018; Truong et al., 2020) that are classified according to their relationship with the firm into three groups: 1) internal, 2) external, and 3) developmental, in relation to four levels of sophistication of MAPs according to IFAC (1998).

Figure 1. Management accounting practices level according to IFAC (1998)

Despite growing global interest in the evolution of MA, Tunisia remains largely absent from the empirical literature. Very few studies have assessed how contingency factors influence MA sophistication in Tunisian firms, and none have applied the IFAC (1998) model to this context. This gap is particularly important given Tunisia's ongoing economic reforms, the maturity of its manufacturing sector, and the need to align with international accounting practices. By addressing this void, the present study offers the first Arab-region empirical application of the IFAC model and a comprehensive assessment of the factors influencing MA development in Tunisia.

2.2. Research hypotheses

2.2.1. External determinants of companies

The external determinants in our research are environmental uncertainty and market competition.

Environmental uncertainty is one of the first contingent factors to have been examined in the accounting literature. Several studies, like Gordon and Narayan (1984), Abdel-Kader and Luther (2008), and Cescon et al. (2019), found the same result, which predicts that high environmental uncertainty requires an MA system based on advanced accounting techniques.

This result is explained by the fact that companies, to cope with a high degree of environmental uncertainty, need to integrate MAPs containing non-financial measures such as the balanced scorecard.

H1: Perceived environmental uncertainty positively affects the level of sophistication of management accounting practices.

The second external determinant that has been the subject of several studies is market competition. Some authors have found a positive association between the intensity of market competition and the level of sophistication of MAPs, while others have found that market competition does not explain the choice of MAPs (Azudin & Mansor, 2018; Erserim, 2012; Abdul-Rashid et al., 2017; Shahzadi et al., 2018).

H2: The intensity of market competition positively affects the level of sophistication of management accounting practices.

2.2.2. Internal determinants

The internal characteristics of the company are its organizational structure, size, and strategy. In terms

of organizational structure, as opposed to centralization, decentralization is a type of organizational structure that refers to where decisions are made within the organization, i.e., the level of autonomy that is delegated to managers for their decision-making. Among others, Abdel-Kader and Luther (2008), Fasesin et al. (2015), and Nguyen and Le (2020) found a positive relationship between decentralization and the level of sophistication of MAPs. Within this framework, we adopt our hypothesis.

H3: Decentralized structure positively affects the level of sophistication of management accounting practices.

Studies by Nguyen and Le (2020), Kordlouie and Hosseinpour (2018), Azudin and Mansor (2018), Armitage and Webb (2013), and Ahmad (2012) found that large companies use the most sophisticated MAPs. Their results are argued by the idea that large companies with strong financial capacity and sufficient infrastructure can facilitate the application of MA.

H4: Company size positively affects the level of sophistication of management accounting practices.

Other studies strongly support the idea that strategy is a contingent factor, among others, for agile development methodologies (ADM) design. Empirical results from Cadez and Guilding's (2012) study show that strategic management accounting is positively and significantly associated with a prospecting strategy, while Pavlatos (2015), Pavlatos and Kostakis (2018), and Petera and Šoljaková (2020) found that strategic management accounting is positively and significantly associated with a differentiation strategy. According to Nguyen et al. (2020), each business strategy requires distinct MAPs. Our fifth hypothesis is as follows:

H5: Differentiation strategy has a positive impact on the level of sophistication of management accounting practices.

2.2.3. Determinants of development

Advanced manufacturing technology (AMT), total quality management (TQM), and just-in-time (JIT) are the first innovations in the industrial sector (Kannan & Tan, 2005). Since their inception, the use of traditional accounting techniques has been inadequate for these technological developments (Abdel-Kader & Luther, 2008). Companies are faced with the challenge of implementing an MA system in line with current requirements. Indeed, several studies have addressed the issue, predicting the existence of a relationship between technology and the integration of MAPs.

The study by Nguyen and Le (2020) proved that technology has a positive impact on the application of MA. This result is consistent with previous studies by Kordlouie and Hosseinpour (2018) that who claimed that operational technology significantly impacts the choices of MAPs. Kordlouie and Hosseinpour (2018) also found that there is a significant relationship between AMT and MAPs. The same result was found by Lavia López and Hiebl (2015). Abdel-Kader and Luther (2008) found that the levels of sophistication of MAPs are explained by TQM, JIT, and AMT. Within this framework, our hypotheses are as follows:

H6: Companies that apply advanced manufacturing technology tend to adopt more sophisticated management accounting practices.

H7: Companies that apply total quality management tend to have more sophisticated management accounting practices.

H8: Companies that apply the just-in-time system tend to have more sophisticated management accounting practices.

3. RESEARCH METHODOLOGY

We collected our data by distributing questionnaires to Tunisian manufacturing companies. The objective of this questionnaire is to study the factors that determine the adoption of MAPs by companies at different levels of sophistication.

The number of questionnaires collected is 72 copies, representing a rate of 38.09% of the total sample (189). The questionnaires distributed and collected are as follows in Table 1.

Table 1. Questionnaire distributed and collected

<i>Distribution method</i>	<i>Copies distributed</i>	<i>Collected copies</i>	<i>Participation rate</i>
Questionnaires via direct contact	100	72	72%
Questionnaires via email	89	0	0%
Total	189	72	38.09

The questionnaire for this study consists of four parts. In the first part, the questions were designed to obtain information on the general characteristics of the respondent companies (size, sector, type of control, category). In the second part, the questions relate to environmental uncertainty, degree of centralization, strategic orientation, and intensity of market competition. The third part contains questions relating to transformation factors, AMT, TQM, and JIT. The last part contains questions related to MAPs.

The purpose of this section is to determine the degree of use of a set of MAPs in the companies covered by our questionnaire. A five-point Likert scale was adopted to measure our explanatory variables on five ordered levels of preferences.

In order to determine the impact of the internal, external and developmental characteristics of the companies on the level of MAPs, the companies are classified into different groups according to the IFAC (1998) model which dictates four levels of classification of MAPs which are: 1) cost determination and financial control (*CDFC*), 2) information for management, planning and control (*IPC*), 3) reduction of resource waste in the business process (*RWR*), and 4) value creation through resource efficiency (*CV*).

Based on a literature review closely related to the history of the evolution of MA (Hoque et al., 2001; Haldma & Lääts, 2002; Abdel-Kader & Luther, 2008).

Thirty-eight (38) MAPs have been assigned between the four levels put forward by IFAC (1998). In this sense, practice usage scores that are attached to each IFAC stage have been used to classify individual firms into groups.

After classifying the companies according to the level of sophistication of their MAPs, we move on to testing the validity of our hypotheses.

We test these hypotheses using Kruskal-Wallis tests on the equality of the population. Details of the variables and their references are given in Table 2.

Table 2. Research variables

<i>Variables</i>	<i>Type of variable</i>	<i>Measure</i>	<i>No. of questions</i>	<i>References</i>
<i>Level of MAPs</i>	Dependent	Quiz	38	Abdel-Kader and Luther (2008), Garrison and Vaughan (2008), Ahmad (2012)
<i>Company size</i>	Independent	Quiz	4	Ahmad (2012), Abdel-Kader and Luther (2008)
<i>Environmental uncertainty</i>	Independent	Quiz	9	Hoque (2005), Gordon and Naryanan (1984)
<i>Intensity of market competition</i>	Independent	Quiz	6	Anh et al. (2011), Abdel-Kader and Luther (2008), Tuanmat and Smith (2011), Chong and Rundus (2004)
<i>Company structure</i>	Independent	Quiz	5	Jermias and Gani (2004), Chia (1995)
<i>AMT</i>	Independent	Quiz	17	Snell and Dean (1992), Abdel-Kader and Luther (2008)
<i>TQM</i>	Independent	Quiz	5	Abdel-Kader and Luther (2008), Snell and Dean (1992)
<i>JIT</i>	Independent	Quiz	9	Abdel-Kader and Luther (2008)
<i>Strategy</i>	Independent	Quiz	9	Jermias and Gani (2004), Chia (1995)

4. RESEARCH RESULTS

4.1. Questionnaires

The questionnaire sent to measure the various variables is categorized as described in the following subsections.

4.1.1. Environmental uncertainty

This part of the questionnaire attempts to measure the perception of the predictability of the company's external environment. The participants are asked to select (X) their answer on a five-point scale.

Table 3. Measure of the perception of the predictability of the company's external environment

Item	1	2	3	4	5
Supplier actions					
Customer requirements, tastes, and preferences					
Deregulation					
Globalisation					
Competitors' market activities					
Information and production technologies					
Government regulation and policy					
Business environment					
Industrial relations					

Note: 1 = Very unpredictable, 2 = Unpredictable, 3 = Neither unpredictable nor predictable, 4 = Predictable, 5 = Extremely predictable.

4.1.2. Market competition

The next part of the questionnaire attempts to measure the perception of market competition.

Table 4. Measure of the perception of market competition

Item	1	2	3	4	5
Price competition					
Competition for new product development					
Marketing competition					
Competition for market share					
Competitors' actions					
The number of competitors in your market segment					

Note: 1 = Very unpredictable, 2 = Unpredictable, 3 = Neither unpredictable nor predictable, 4 = Predictable, 5 = Extremely predictable.

4.1.3. Competitive strategy

The following questionnaire tries to measure the perception of competitive strategy.

Table 5. Measure of the perception of competitive strategy

Item	1	2	3	4	5
The selling price of the product					
Percentage of sales devoted to research and development					
Product quality					
Product characteristics					
Brand image					
Introduction of new products					
Design changes					
Speed of delivery					
After-sales service					

Note: 1 = Very low, 2 = Low, 3 = Neutral, 4 = High, 5 = Very high.

4.1.4. Company structure

This questionnaire attempts to measure the perception of the company structure.

Table 6. Measure of the perception of the company structure

Item	1	2	3	4	5
Development of new products					
Hiring and firing management staff					
Selection of major investments					
Budget allocations					
Pricing decisions					

Note: 1 = No delegation, 2 = Rarely, 3 = Neutral, 4 = Often, 5 = Absolute delegation.

4.1.5. Advanced manufacturing technology

This questionnaire attempts to measure to what extent are the following transactions between production processes are carried out using computers in your company. It is up to the participants to choose (X) their answer on a five-point scale.

Table 7. Measure of the perception of advanced manufacturing technology

Item	1	2	3	4	5
Manufacturing resource planning					
Computer-aided design					
Numerical control					
Computer numerical control					
Direct numerical control					
Flexible manufacturing systems					
Robotics					
Automated materials handling					
Computer-aided testing and inspection					
Computer-aided process planning					

Note: 1 = Never, 2 = Occasionally, 3 = Neutral, 4 = Often, 5 = Very often.

4.1.6. Total quality

This section of the questionnaire seeks to measure the perception of total quality.

Table 8. Measure of the perception of total quality management

Item	1	2	3	4	5
The time plant management staff needs to improve quality					
The time you spend with suppliers to improve their quality					
The ability to measure the cost of quality in your business					
The current approach to supplying quality products					
The percentage of the plant's manufacturing processes under statistical control					

Note: 1 = Very unpredictable, 2 = Unpredictable, 3 = Neither unpredictable nor predictable, 4 = Predictable, 5 = Extremely predictable.

4.1.7. Just-in-time

This questionnaire attempts to measure the perception of JIT.

Table 9. Measure of the perception of just-in-time

Item	1	2	3	4	5
Frequency of internal deliveries					
Quantity of safety stock					
Number of suppliers					
Total number of components in the material list					
Product range length					
Products are driven by the specific customer order					
Attention is paid to minimising configuration time					
Preventive and pre-determined maintenance plans are respected?					
Time is devoted to improving the stability of the production programme by re-engineering the plant					

Note: 1 = Very unpredictable, 2 = Unpredictable, 3 = Neither unpredictable nor predictable, 4 = Predictable, 5 = Extremely predictable.

4.2. Determining costs and financial control

In the following tables, we test the extent to which a range of the MAPs listed below are used

in your strategic business units. It is up to the participants to choose (X) their answer on a five-point scale.

Table 10. Stage 1: Determining costs and financial control (CDFC)

Item	1	2	3	4	5
The use of a plant-wide overhead rate					
A budget to control costs					
Flexible budgeting					
Performance evaluation based on financial measures					
Evaluation of major investments based on the period studied					

Note: 1 = Never, 2 = Occasionally 3 = Neutral, 4 = Often, 5 = Very often.

Table 11. Stage 2: Provision of information for planning and management control (IPC)

Item	1	2	3	4	5
A distinction is made between variable/additional costs and non-differential/fixed costs					
Use of departmental general rates					
Use of regression and/or learning the techniques of the curve					
A budget for planning					
Budgeting with "what if" analysis					
Budgeting for long-term (strategic) plans					
Performance evaluation based on non-financial measures linked to operations					
Cost-benefit-volume analysis for major products					
Product profitability analysis					
Inventory control models					
Valuation of major investments based on the discounted cash flow					
Long-term forecasts					

Note: 1 = Never, 2 = Occasionally 3 = Neutral, 4 = Often, 5 = Very often.

Table 12. Stage 3: Reducing waste in business resources (RWR)

Item	1	2	3	4	5
Business accounting					
Activity-based budgeting					
Cost of quality					
Zero-based budgeting					
Performance evaluation based on non-financial measures in relation to employees					
Assessing the risk of major investment projects using either analysis or computer simulation					
What to do if the practice is rarely or never applied					

Note: 1 = Never, 2 = Occasionally 3 = Neutral, 4 = Often, 5 = Very often.

Table 13. Step 4: Creating value through the efficient use of resources (CV)

Item	1	2	3	4	5
Target cost					
Assessment of performance based on non-financial measures in relation to customer relations					
Assessing performance based on the measured value or economic value					
Benchmarking					
Customer profitability analysis					
For the evaluation of major investments, the non are documented and reported					
Calculation of the use of the cost of capital in the discounting of cash flows for the stake valuation of capital investment					
Analysis of shareholder value					
Industry analysis					
Analysis of competitive position					
Product life-cycle analysis					
Value chain analysis					
Opportunities for integration with suppliers and/or customers of value chains					
Analysis of competitors' strengths and weaknesses					

Note: 1 = Never, 2 = Occasionally 3 = Neutral, 4 = Often, 5 = Very often.

4.3. Results of the scale reliability test using Cronbach's alpha test coefficient

The results of Cronbach's alpha reliability index show correlations and internal consistency for each group of explanatory and endogenous variable items. These results are summarised in Table 14.

Table 14. Reliability test for variables

Variable	Cronbach's alpha
Environmental uncertainty	0.713
Market competition	0.690
Competitive strategy	0.774
Company structure	0.687
TAM	0.809
TQM	0.710
JIT	0.759
CDFC	0.675
IPC	0.790
RWR	0.711
VC	0.800

4.4. Results of company classification using principal component analysis

On the basis of the principal component analysis (PCA), we found that there were three principal components grouping together 88.883% of the information (Table 15). This rate is sufficient to be able to segment our initial sample into three subsamples representing three levels with a minimum loss of information of around 11.117%. The Kaiser-Meyer-Olkin (KMO) index and the Bartlett statistic are used to validate the factor analysis. The KMO is equal to 0.728. According to Tabachnick and Fidell (2000), values above 0.6 are acceptable. The Bartlett test demonstrates that each variable is perfectly correlated with itself, but not with the other variables. In our case, the test is perfectly significant (Table 16).

Table 15. Percentage of information captured by the three components

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	2.173	54.328	54.328	2.173	54.328	54.328
2	0.754	18.861	73.189			73.189
3	0.628	15.694	88.883			88.883
4	0.445	11.117	100.000			

Table 16. KMO and Bartlett tests

Kaiser-Meyer-Olkin measure of sampling adequacy		0.728
Bartlett's test of sphericity	Approx. Chi-square	53.800
	Df	6
	Sig.	0.000

According to the grouping procedure, we found that 36 companies belong to group 1, 23 companies are in group 2, and 13 companies are in group 3.

The mean scores of the variables in each group are presented in Table 16, together with the F-tests for each grouping of variables as shown in Table 17.

Table 17. Final ranking and contribution of variables

Variable	Cluster			F-test	Prob.
	Group 1 (36)	Group 2 (23)	Group 3 (13)		
CDFC	2.66	2.75	3.43	19.311	0.000
IPC	2.47	3.11	3.31	34.261	0.000
RWR	2.50	3.01	3.16	24.329	0.000
CV	2.63	2.93	3.51	34.954	0.000

4.5. Kruskal-Wallis results and validation of hypotheses

The pairwise comparison, based on the Kruskal-Wallis test at 1%, 5% and 10% significance levels, respectively, shows that the relationships between *Environmental uncertainty*, *Strategy*, *Company structure*, *AMT*, *TQM*, and *JIT* are significantly and positively associated with MAPs (Table 18). These results confirm the empirical findings of previous studies such as those by Andesto (2016), Shahzadi et al. (2018), and Cescon et al. (2019). However,

the negative relationship between firm size and MAPs contradicts Abel-Kader and Luher (2008) and Pasch (2019) that who found that size is among the contingent factors that explain the level of sophistication of MAPs. Similarly, the relationship between the intensity of market competition and MAPs is not significant. This result confirms the empirical results of previous studies by Abdel-Kader and Luther (2008) and Pham et al. (2020), while it contradicts the results of studies by Hoque (2011), Al-Dhubaibi et al. (2014), and Nair and Soon Nian (2017).

Table 18. Kruskal-Wallis test comparison results

Measure	Environmental uncertainty	Market competition	Strategy	Company structure	AMT	TQM	JIT	Company size	Technological environment	Strategic alignment
Chi-square	9.479***	2.561	7.431**	8.241**	14.667***	16.278***	8.056**	3.979	3.250	0.736
Df	2	2	2	2	2	2	2	2	2	2
Asymp. Sig.	0.009	0.278	0.024	0.016	0.001	0.000	0.018	0.137	0.197	0.692

Note: ***, **, and * significant at the 1%, 5%, and 10% levels.

On the basis of our analyses, we found that the hypotheses concerning the positive relationships between *Environmental uncertainty*, *Strategy*, *AMT*, *TQM*, and *JIT*, and the levels of MAPs are accepted. Whereas the hypotheses that predict that the intensity of market competition, as well as size, explain the levels of sophistication of MAPs are rejected.

5. DISCUSSION

The aim of this study was to examine the determinants influencing the choice of MAPs within the Tunisian manufacturing sector. Specifically, we investigated the extent to which various contingency factors, including external environmental characteristics, organizational strategy, structure, size, and production systems, explain the sophistication levels of MAPs, as defined by the IFAC (1998) model.

The results revealed that six of the eight tested contingency factors were significantly associated with the level of MAP sophistication. These include:

- Environmental uncertainty (*H1*);
- Organizational strategy (*H5*);
- Organizational structure/decentralization (*H3*);
- AMT (*H6*);
- TQM (*H7*);
- JIT (*H8*).

On the other hand, no significant relationships were found between MAP sophistication and either market competition intensity (*H2*) or firm size (*H4*).

These findings support the notion that firms operating in environments characterized by high uncertainty tend to adopt more advanced MAPs — corresponding to stages 3 and 4 of the IFAC (1998) model. This is consistent with earlier studies (Erserim, 2012; Ajibolade, 2013; Mokhtar et al., 2016; Cescon et al., 2019), which also established that environmental turbulence compels organizations to rely on more comprehensive and integrated accounting information for strategic decision-making. As Gerdin (2005) argued, uncertainty increases the demand for both financial and non-financial information, which is a hallmark of sophisticated MAPs.

Contrary to expectations and prior research (Al-Dhubaibi et al., 2014; Nair & Soon Nian, 2017), the intensity of market competition did not significantly influence MAP sophistication in this study. While it is widely assumed that firms in highly competitive environments seek to enhance their performance through improved information systems (Baines & Langfield-Smith, 2003), our findings suggest that this may not be a dominant driver in the Tunisian context. Possible explanations include varying perceptions of competition or limited managerial responsiveness due to institutional or resource constraints.

The positive relationship between organizational decentralization and MAP sophistication aligns with previous findings (Abdel-Kader & Luther, 2008; Al-Dhubaibi et al., 2014) and underscores the information needs of managers operating in more autonomous environments. Sophisticated MAPs serve to equip decentralized managers with timely, relevant, and decision-oriented data.

Strategic orientation — specifically differentiation strategies — also emerged as a key determinant of MAP sophistication. This reinforces the conclusions of Cescon et al. (2019), Guilding et al. (2005), and Adu-Gyamfi et al. (2021), who observed that firms

pursuing innovation and differentiation require advanced accounting tools to track non-financial performance, product development costs, and customer profitability.

While some scholars (Lavigne & St-Pierre, 2002; Pasch, 2019) argue that firm size is a determinant of MAP sophistication, our findings align with those from Vietnam (Anh et al., 2011) and Yemen (Al-Dhubaibi et al., 2014), suggesting that size alone does not guarantee the use of sophisticated MA tools. Small firms, driven by agility and the need for competitiveness, may adopt advanced practices just as readily as larger firms, particularly when they face fewer bureaucratic constraints and demonstrate higher levels of innovation (Nooteboom, 1994).

Finally, the results confirm that technological development, including AMT, TQM, and JIT systems, is significantly associated with higher levels of MAP sophistication. As previous studies have shown (Mia, 2000; Alsharari et al., 2015; Ogungbade & Oyerogba, 2020), modern manufacturing environments demand integrated, real-time, and cross-functional information systems — functions that advanced MAPs are well positioned to fulfill.

6. CONCLUSION

This study has contributed to the growing body of literature on the determinants of MAP sophistication by applying the IFAC (1998) model to a new and under-researched context: Tunisian manufacturing firms. By analyzing eight contingency factors grouped into internal, external, and technological categories, we identified six that significantly influence the sophistication of MAPs.

The findings demonstrate that the sophistication of MAPs is not determined by firm size or market competition intensity, as traditionally assumed. Rather, firms operating in uncertain environments, with decentralized structures, innovation-driven strategies, and investments in advanced production technologies, are more likely to implement high-level MA systems. These results underscore a shift in the role of MA from operational cost tracking to strategic decision support.

Theoretically, this study affirms the relevance of contingency theory in explaining the variability in MAPs across different organizational settings. Practically, it provides valuable insights for Tunisian business leaders, policymakers, and educators who aim to modernize the accounting infrastructure and align it with international standards. Encouraging the adoption of more advanced MAPs can help improve transparency, responsiveness, and competitiveness in an increasingly demanding global market.

However, the study is subject to certain limitations. The relatively small sample size — primarily consisting of SMEs — may limit the generalizability of the findings, particularly concerning the variable of firm size. Additionally, the cross-sectional nature of the data collection provides only a snapshot of current practices and does not account for potential changes over time.

For future research, we recommend a longitudinal approach to examine the evolution of MAPs and to include cultural, institutional, and behavioral variables, such as accounting culture and managerial attitudes, particularly in the context of developing economies. Such studies could offer a more holistic understanding of the factors shaping the transformation of management.

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