

# THE INFLUENCE OF INTERNAL ACTORS ON THE SOPHISTICATION OF COSTING SYSTEMS IN TUNISIA

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## ABSTRACT

This research investigated the extent to which internal actors influence the sophistication of costing systems in Tunisia. It is based on Rogers' Theory (1995) and the theoretical perspectives of Abrahamson (1991) explaining the diffusion of administrative technologies. The empirical study was conducted using a questionnaire given to 65 management accountants in Tunisia. The role of internal actors was investigated through the competence of the costing system manager, top management support, resistance to change, and membership in a group. The findings show that competence, membership in a group, and top management support positively affect the sophistication of costing systems, while, resistance to change blocks the adoption of management accounting innovations like activity-based costing (ABC). This study is the first piece of research that investigated the relationship between the role of internal actors and the sophistication of costing systems. It contributes to the management accounting research as it is one of the few studies conducted in developing countries and dealing with management accounting characteristics. Previous research was limited either to the factors affecting the adoption of ABC or conducted in developed countries. This study can be useful for managers when choosing a costing system and defining its characteristics.

**Keywords:** costing system, internal actors, sophistication, Tunisia

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## **INTRODUCTION**

This research investigated, on the one hand, the sophistication of costing systems and on the other hand, the role of internal actors in the design of these systems. Therefore, it is not limited to the question of adoption or rejection of activity-based costing (ABC). Besides, it is interested in the actors that make decisions related to the definition of costing system characteristics.

Previous research has largely investigated the relationship between the contextual and environmental variables and the adoption of ABC (e.g. Rankin, 2020; Elhamma & Moalla, 2015; Chenhall & Langfield-Smith, 1998; Gosselin, 1997). Results have shown that many contingency variables were not associated with ABC (Rankin, 2020). As a result, the adoption or rejection of ABC cannot be explained by the only contingency factors. Also, limiting the investigation to the relationship between contingency factors and ABC means that managers' choices are always rational and efficient. However, this rationality is limited by cognitive abilities and subjective assessments (Alcouffe, Berland, & Levant, 2008). Therefore, some researchers were interested in the influence of actors on the adoption of ABC (e.g. Wijerathne & Gooneratne, 2019; Malmi, 1999; Moalla, 2007) and management accounting systems (e.g. Diab, 2020).

Few studies were interested in the characteristics of the costing systems (e.g. Al-Omiri & Drury, 2007; Drury & Tayles, 2005). They were conducted mainly in developed countries and have only addressed the issue of the relationship between the sophistication of costing systems and contingency factors. They have not investigated the influence of actors in defining the characteristics of the management accounting systems.

In line with Holm and Ax (2020), Al-Omiri and Drury (2007) and Drury and Tayles (2005), we were interested not only in the adoption of ABC but also in the characteristics of the costing systems. This research was based on Rogers' theory of the diffusion of innovations (Rogers, 1995) and the theoretical perspectives of Abrahamson (1991). It aimed to study the influence of internal actors on the sophistication of costing systems in Tunisia. Internal actors choose management tools to be used and make decisions related to management accounting systems. Their influence

was analyzed through the competence of costing system managers, top management support, resistance to change, and membership in a group. In line with Al-Omiri and Drury (2007) and Drury and Tayles (2005), the sophistication of costing systems was analyzed not only through the adoption or non-adoption of ABC but also through three other proxies, namely the number of cost pools in the first stage of allocation, the number of cost drivers in the second stage of allocation and the use of a full or a direct costing system.

Data were collected through a questionnaire given to 65 companies in Tunisia. Consistent with the findings of previous research (e.g. Alcouffe et al., 2008; Malmi, 1999), the results revealed a low rate of adoption of ABC. In addition, competence and membership in a group positively affect the adoption of ABC and the number of cost pools in the first stage of allocation, while, resistance to change blocks ABC adoption. Furthermore, top management support positively affects the sophistication of costing systems measured by the number of cost drivers in the second stage of allocation.

This study adds to knowledge in the area of management accounting since it is the first research that investigated the relationship between internal actors and the sophistication of costing systems. Previous research has analyzed the relationship between either the contingency variables and the sophistication of accounting systems or the influence of actors on ABC adoption. Besides, this piece of research is one of the few studies dealing with management accounting systems in developing countries. It can be helpful for managers in choosing their costing systems and in defining their characteristics.

The remainder of the paper is organized as follows: Section 2 develops the sophistication of costing systems and explains the Tunisian context, Section 3 exposes the theoretical framework, Section 4 presents the research design, Section 5 exposes and analyzes the results and Section 6 concludes.

# THE SOPHISTICATION OF COSTING SYSTEMS AND THE TUNISIAN CONTEXT

## The Sophistication of Costing Systems

In line with Holm and Ax (2020), Al-Omiri and Drury (2007) and Drury and Tayles (2005), besides the criteria of adoption and non-adoption of ABC for analyzing the characteristics of costing systems, other proxies are used. Especially, the following proxies are used for the sophistication of an accounting system: the use of a full or a direct costing system, the number of cost pools in the first stage of allocation, and the number of cost drivers in the second stage of allocation. The level of sophistication is defined according to these four dimensions. The most simplistic is the accounting system based on the direct costing while a highly sophisticated management accounting system is based on ABC, with a high number of cost pools in the first stage of allocation and a high number of cost drivers in the second stage of allocation (Al-Omiri & Drury, 2007). According to Al-Omiri and Drury (2007) costing systems represent a continuum that reflects various levels of sophistication. Costing systems that are based on a high number of cost pools and a high number of cost drivers are more sophisticated than those with a low number of cost pools and a low number of cost drivers.

The dimensions used for measuring the sophistication of costing systems cannot be combined since they are not homogenous (Al-Omiri & Drury, 2007). Broad categories are used to classify the costing systems according to their sophistication. Thus, the costing systems are classified into full costing and direct costing and ABC and non-ABC. Besides, costing systems with a high number either of cost pools in the first stage of allocation or of cost drivers in the second stage of allocation are more sophisticated than those with a low number of cost pools or cost drivers.

## The Tunisian Context

Tunisia was under the French protectorate for seventy-five years (1881-1956), which greatly influenced culture, education, the field of business, and management systems used by companies. Management accounting systems in Tunisia have for a long time been influenced by the French method of homogeneous sections (*Méthode des Sections Homogènes*). This method

was described by the French Chart of Accounts of 1947 (*Plan Comptable Français de 1947*) and then by the French Chart of Accounts of 1957. This same method has been adopted by the Tunisian Chart of Accounts of 1968 (*Plan Comptable Tunisien de 1968*). This Tunisian chart of accounts was largely inspired by the French chart of accounts of 1957.

In December 1996, the Tunisian accounting system was promulgated and gave birth to an accounting law in Tunisia (Law No. 96-112 dated December 31, 1996, Official Journal of the Tunisian Republic). The Tunisian accounting system is composed of an accounting law, a conceptual framework, and a set of accounting standards that are broadly in line with the international accounting standards published by the IASC (i.e. replaced by IASB). This accounting system has not reserved a section for costing systems. However, the Fourth Tunisian Standard, entitled “inventories” described the method that should be used in calculating inventory costs, to prepare the financial statements. The method described is based on the method of rational allocation of fixed production costs which is previously described by the Tunisian Chart of Accounts of 1968, but with some amendments.

The adoption of accounting standards that are largely inspired by international accounting standards is due to the opening of the Tunisian economy to the international community. Also, Tunisia promotes and encourages foreign investments. Furthermore, international management and accounting practices and standards (e.g. international accounting standards, international standards of auditing, activity-based costing, etc.) are included in the educational programs in the Tunisian universities. Therefore, the cost accounting systems in Tunisia may be influenced by the French heritage or by international innovations.

## **THEORETICAL FRAMEWORK**

### **The Perspectives of Abrahamson (1991) and The Theory of Rogers (1995)**

Management accounting practices are not only the result of efficient and rational choices, but actors and social relations contribute to the

definition of costing systems (Diab, 2020; Ax & Greve, 2017). Abrahamson (1991) identified four perspectives that explain the adoption or rejection of administrative technologies. These perspectives are the efficient choice, forced selection, fad, and fashion perspectives. According to the efficient choice perspective, adopters make independent, efficient, and rational choices. Abrahamson (1991) had developed counter-hypotheses to reject the perspective of efficient choice: organizations that are outside the social system (e.g. government agencies, parent companies, etc.) can influence the firm's choices and thus, the decisions made by firms can no longer be free and independent. Similarly, if the objectives of the organization are unclear, or if the degree of uncertainty about the technical efficiency of administrative technologies is high, the possibility of efficient choice can be rejected (DiMaggio & Powell, 1983). Thus, the efficient choice perspective is insufficient to explain the characteristics of costing systems. The forced selection implies that organizations have no choice and that they play no role in the decision of adoption or rejection of innovations. In this context, the adoption of ABC can be explained by the influence of the parent company. The fad perspective assumes that organizations that set fashion have an impact on adoption (Abrahamson, 1991). These organizations may be represented by consultants, universities, and mass media. Companies imitate the administrative models promulgated by organizations that set fashion (Abrahamson, 1991). In the case of a fashion perspective, organizations are assumed to imitate other adopting organizations instead of organizations that set fashion (Abrahamson, 1991).

Diffusion studies have shown that most individuals do not make objective evaluations of innovations, they rely on subjective criteria instead (Rogers, 1995). The social system is one of the main elements of the diffusion of innovations (e.g. ABC) in the theory of Rogers (1995). The members of a social system may be individuals, informal groups, organizations, and/or subsystems (Rogers, 1995). Based on this theory we highlight the role of internal actors in defining the characteristics of a costing system.

## **Review of Literature and Hypotheses Development**

Little research has addressed the role of actors in defining the sophistication of management accounting systems. Al-Omiri and Drury (2007) investigated the relationship between the characteristics of the

costing system and contingency factors. Azudin and Mansor (2018) were interested in the relationship between contingency factors and management accounting practices in Malaysia. Other research was limited to the link between contingency factors and ABC adoption. Some studies have analyzed the relationship between ABC adoption and the role of actors (Wijerathne & Gooneratne, 2019; Alcouffe et al., 2008; Malmi, 1999; Bjornenak, 1997).

Alcouffe et al. (2008) investigated the role of actors in the diffusion of ABC and George Perrin Method (GP). They revealed that some academics have played the role of change agents not only for ABC but also for the homogeneous section method. Similarly, in Tunisia, the French homogeneous sections method has been widely taught in all management universities. Alcouffe et al. (2008) showed that in the French context, some companies using ABC played the role of witnesses, to influence other organizations. Furthermore, Bjornenak (1997) analyzed the adoption of ABC in Norway. He found that a few adopters acted as witnesses for ABC and that adoptions were due to personal contacts with internal and external change agents. Chenhall and Langfield-Smith (1998) found that the intense network that has been developed between several large firms is one of the factors that may explain the high adoption rate of new management accounting techniques in Australia.

In an emerging research area, we investigated the influence of internal actors not only on ABC adoption but also on the sophistication of costing systems. Based on Rogers' theory and the theoretical perspectives of Abrahamson, we studied this relationship through the competence of the management accountant, top management support, resistance to change, and membership in a group. These are the main actors that can make decisions related to management accounting systems.

## **Competence**

Nair and Nian (2017) and Ahmad (2014) provided evidence that level of qualification of the management accounting staff can affect management accounting practices. Thus, competence can influence the sophistication of costing systems. The competence of the management accountants is based on their knowledge and know-how: these are requirements that allow the management accountants or the operational staff to organize the company,

allocate resources and response to any critical statement (Marianela, Jocelyne, & Armelle, 2003). Some skills are required, such as the ability to analyze and synthesize, human contact, listening, diplomacy, ability to convince, rigor, identification of objectives to be achieved, the definition of job content and missions (Montano, Anes, Hassall, & Joyce, 2001). They are essential to ensure the success of the methods and to overcome and mitigate the problem of costing systems' complexity (Marianela et al., 2003). Nguyen, Nguyen, Dao, and Dang (2019) found that the quality of accountants is one of the main factors that can affect the development of managerial accounting in the case of the manufacturing and trade Vietnamiens companies. According to Rogers (1995), leadership opinion is the degree to which an individual can influence the attitudes of other individuals or direct their behavior informally in the desired direction. This informal relationship depends on technical skills, social accessibility, and compliance with the system's standards (Rogers, 1995). In this context, we assume that the competence of the costing system's managers can influence the sophistication of these systems. Accepting a sophisticated costing system requires skills to manage complexity. Thus, we formulated the following hypothesis:

**Hypothesis 1:** Competence positively affects the sophistication of costing systems.

### **Top Management Support**

The lack of top management support is one of the main reasons for not adopting ABC systems (Wijerathne & Gooneratne, 2019; Innes, Mitchell, & Sinclair, 2000). Also, Liu and Pan (2007) revealed that top management support mitigates the difficulties of implementation. Al-Sayed and Dugdale (2016) revealed that top management support is positively associated with the adoption of activity-based innovations. Similarly, and as expected, Brown, Booth, and Giacobbe (2004) found that top management support is positively associated with ABC adoption. Cotton, Jackman, and Brown (2003) found that top management support is the most important determinant of the success of ABC. The literature review provided evidence that top management support is positively associated with activity-based based innovations (e.g. Hofmann & Bosshard, 2017; Al-Sayed & Dugdale, 2016). Consistent with previous research, we assume that top

management support is positively associated with the sophistication of costing systems and thus, we formulated the following hypothesis:

**Hypothesis 2:** Top management support positively affects the sophistication of costing systems.

## **Resistance to Change**

The resistance to the new information systems is mainly due to motivational, social, and behavioral factors rather than technical factors attributed to the system (Diab, 2020; Godowski, 2004). ABC increases the accuracy of product costs, but ABC data makes changes in the organization (Argyris & Kaplan, 1994; Shields & Young, 1989). It creates threatening conditions for existing managers who respond defensively to block implementation (Argyris & Kaplan, 1994; Shields & Young, 1989). They consider these changes as a threat to their position and remuneration (Godowski, 2004). Previous research has shown that managers and employees do not easily accept an innovation, such as a new and sophisticated costing system like ABC (e.g. Diab, 2020; Wijerathne & Gooneratne, 2019; Godowski, 2004).

Based on previous research and the Rogers' theory (Rogers, 1995) according to which the resistance to change can block innovations' adoption, the following hypothesis was formulated:

**Hypothesis 3:** There is a negative association between resistance to change and the sophistication of costing systems.

## **Membership in a Group**

The parent company or group influences the management accounting system of its subsidiary (Amara & Benelifa, 2017; Malmi, 1999; Jones, 1985). It may even define the costing system to be used (Jones, 1985). Membership in a US parent company may be the main factor of ABC adoption, as is the case of Hewlett Packard (Lacombe & Bescos, 2000).

The qualitative research of Walley, Blenkinsop, and Duberley (1994) showed that two companies among the twenty that were studied adopted

ABC because they were influenced by the foreign parent company. For one of them, pressure from the parent company was the only reason for adopting ABC. Similarly, Ballas and Venieris (1996) investigated the case of 14 companies in Greece and showed that four companies using or initiating ABC were influenced by international parent companies. The parent company influences its subsidiaries in the choice of management tools, in their implementation and in the characteristics of costing systems (Alcouffe et al., 2008). Thus, the subsidiaries become mere executors of the tasks imposed by the parent companies. Their role is simply to follow the instructions of the parent company, which makes them merely executing entities. Thus, the independence and autonomy of the subsidiaries are questionable, as they no longer have freedom of decision. Besides, according to Rogers (1995), authoritarian innovation-decision positively affects the rate of innovation adoption. As a result, subsidiaries use the same costing methods, the same allocation cost drivers, and the same systems. The following hypothesis was formulated:

**Hypothesis 4:** There is a positive association between membership in a group and the sophistication of costing systems.

## RESEARCH DESIGN

### Definition of Variables and Models

#### ***The sophistication of costing system (Dependent variable)***

Based on Al-Omri and Drury (2007), the sophistication of the costing system was analyzed through the four following measures:

1. The use of an ABC system or a traditional costing system.
2. The use of a full costing system or a direct costing system.
3. The number of cost pools in the first stage of allocation.
4. The number of cost drivers in the second stage of allocation.

The most sophisticated accounting system is the system which is based on ABC, on a full costing model, on a high number of cost pools in the first stage of allocation and on a high number of cost drivers in the second stage of allocation.

## **Independent Variables**

### ***The competence***

In line with Marianela et al. (2003), competence was measured through the characteristics of management accountants. This measure is inspired by the items developed by Montano et al. (2001). The following eight items are used: the ability to analyze and synthesize, human contact, listening, diplomacy, ability to convince, rigor, identification of objectives to be achieved, the definition of job content and missions. A 5-point Likert scale was used (i.e. ranging from 1=very low to 5=very strong) to specify the strength of the relationship between the management accountants and their coworkers.

### ***Top management support***

A measure developed by Ulrich (1996) was used to study the degree of top management support. Respondents were asked to specify the importance of each of the following proposals for the company's managers: drive the change, strengthen the motivation of employees, effectively manage administrative tasks, manage the human resources strategy. A 5-point Likert scale was used (i.e. ranging from 1=not at all important to 5=very important) to specify the importance of each of the above items.

### ***Resistance to change***

To measure the degree of resistance to change, a measure developed by Sulaiman and Mitchell (2005) was used. Respondents were asked to specify on a 5-point Likert scale (i.e. ranging from 1=strongly disagree to 5=totally agree), the degree of agreement on each of the following items: addition (i.e. the introduction of new techniques), replacement (i.e. the introduction of new techniques to replace existing techniques), modification of the information, operational modification, reduction (i.e. the elimination of a management technique without replacement).

### ***Membership in a group***

The role of the parent company was measured by membership in a group. It is a dummy variable coded as follows: (1) if the company belongs to a group (i.e. subsidiary or parent company) and (0) in the case of an independent company.

## Control Variables

We controlled for the size of the company and sector because they are assumed to affect the management accounting systems. Previous research revealed that big-sized and industrial companies are more likely to adopt a sophisticated accounting system like ABC (e.g. Malmi, 1999). The size was measured by the number of employees and sector was measured by a binary variable coded as follows: (1) manufacturing and (0) otherwise.

## Models

Four regressions were conducted, following the measures of the dependent variable. The following general model was analyzed:

$$\text{Sophistication}_i = \beta_0 + \beta_1 \text{Competence}_i + \beta_2 \text{Support}_i + \beta_3 \text{Resis}_i + \beta_4 \text{Group}_i + \beta_5 \text{Sector}_i + \beta_6 \text{Size}_i + \varepsilon_i$$

*Where,*

Sophistication: The sophistication of the costing system; Competence: Competence; Support: Top management support; Resis: resistance to change; Group: Membership in a group (i.e. subsidiary or parent company); Sector: Sector; Size: Company's size.

## Data Collection

Data were collected via a questionnaire given to 352 Tunisian companies that had a costing system. Respondents were cost-accounting managers. The questionnaire was hand-delivered to some cost accounting managers and sent by e-mail or post for others. Telephone and e-mail reminders were sent to increase the response rate. A total of 65 questionnaires were received, resulting in a response rate of 20.63%. This rate may be acceptable compared to other studies conducted in African countries (e.g. Elhamma & Moalla, 2015). The questionnaire began with a cover letter explaining the purpose of the research and the usefulness of the data to be collected. It was based on the literature and it was divided into three parts as follows: the costing systems, internal actors' roles, and company characteristics (i.e. sector and the number of employees). A pre-survey was

conducted with 5 cost accounting managers. Its purpose was to check the understandability of the questions formulated.

Non-response bias was investigated by comparing the distribution of the respondents and that of non-respondents, in terms of employees' number and sector. The Mann–Whitney U test showed a non-significant difference between the respondents and non-respondents, in terms of the number of employees. Furthermore, based on the Chi-square test, no significant difference was found between the sectors of respondents and those of non-respondents.

To investigate response bias, the 20 early respondents were compared with the 20 late ones, in terms of the dependent variable (i.e. adoption/non-adoption of ABC; full costing/direct costing and number of cost pools in the first stage of allocation and number of cost drivers in the second stage of allocation). The Chi-square test for the type of costing system and the Mann-Whitney U test for the number of cost pools and the number of cost drivers revealed no significant difference between early and late respondents.

## **RESULTS**

### **Characteristics of Costing Systems and Descriptive Statistics**

Table 1 presents the various costing methods used and Table 2 exposes the descriptive statistics of the variables in the model.

**Table 1: Costing Methods**

<b>Costing Methods</b>	<b>Number of Respondents</b>	<b>Percentages</b>
Traditional full costing method	24	36.9%
Activity-based costing (ABC)	16	24.6%
Direct costing	23	35.4%
Other methods	2	3.1%
Total	65	100%

The findings show an ABC adoption rate of 24.6%, which was close to that found by Moalla (2007) in Tunisia and higher than the rate of 12.9% found by Elhamma and Moalla (2015) in Morocco. Moreover, 61.5% of

companies used a full costing method (i.e. ABC or a traditional full costing system).

### Validity and Reliability of Measurements

The principal component analysis showed the measurement’s unidimensionality of the perception variables (i.e. Competence, top management support, and resistance to change). Thus, a one-factor solution was shown for each of these variables. The Cronbach Alpha tests the validity and reliability of these variables’ measurements. The values of Cronbach Alpha were 85%, 70%, and 65%, respectively for competence, top management support, and resistance to change. These values were acceptable and demonstrate the reliability and validity of the measurements.

**Table 2: Descriptive Statistics**

<b>Descriptive Statistics for Quantitative Variables</b>					
<b>Variables</b>	<b>Mean</b>	<b>Standard deviation</b>	<b>Min</b>	<b>Max</b>	<b>N</b>
Number of cost pools in the first stage	8.368	9.100	1	32	40
Number of drivers in the second stage	6.654	6.658	1	25	40
Competence	3.262	0.825	1.375	5	65
Top management support	3.379	0.802	1.75	5	65
Resistance to change	2.852	0.746	1	4.4	65
Number of employees	161.85	411.850	30	3062	65
<b>Descriptive Statistics for Qualitative Variables</b>					
<b>Variables</b>	<b>Percentages</b>	<b>Frequency</b>	<b>N</b>		
<b>Membership in a group</b>					
<i>Member in a group</i>	40%	26	65		
Independent company	60%	39			
<b>Sector</b>					
<i>Manufacturing</i>	55.4%	36	65		
Other sectors	44.6%	29			

## Correlation Analysis

Spearman correlations between the quantitative variables are shown in Table 3. Results show no problem of multi-collinearity between independent variables. Besides, the mean VIF of 1.33 with a maximum of 1.67 confirms the absence of multi-collinearity problems.

**Table 3: Spearman Correlation**

	ABC	Full cost	Nb stage 1	Nb stage 2	Comp	TM sup	Resis	Group	Sector	Nb emp
ABC	1									
Full cost	0.531***	1								
Nb stage 1	0.627***	0.755***	1							
Nb stage 2	0.649***	0.869***	0.888***	1						
Comp	-0.221	0.057	0.014	-0.011	1					
TM sup	0.022	0.198	0.169	0.217	0.178	1				
Resis	-0.203	0.104	-0.067	-0.014	0.390***	0.508***	1			
Group	0.061	-0.041	0.006	-0.015	-0.373***	-0.210	-0.272*	1		
Sector	0.082	0.161	0.168	0.181	0.4631	0.119	0.195	-0.183	1	
Nb emp	0.517***	0.449**	0.607***	0.591***	0.112	0.344*	0.061	0.045	0.407***	1

**Notes**

ABC: ABC or non-ABC system; Full cost: Full costing or direct costing; Nb stage1: number of cost pools in the first stage of allocation; Nb stage2: number of cost drivers in the second stage of allocation; Comp: Competence; TM sup: Top management support; Resis: Resistance to change; Nb emp: Number of employees; Group: Membership in a group; Sector: Manufacturing/Other sectors.

## Regression Results and Discussion

The regression results are shown in Table 4. Robust standard error was used to solve heteroscedasticity problems. As expected, competence and membership in a group had a significant and positive effect on the sophistication of costing systems measured by either the adoption of ABC or the number of the cost pools in the first stage of allocation. Besides, resistance to change negatively impacted the sophistication of costing systems, measured by ABC adoption (p<10 percent). These results were consistent with Rogers’ theory, as resistance to change blocked the diffusion of innovations. Moreover, the relationship between ABC adoption and membership in a group confirmed the effect of the forced selection perspective of Abrahamson (1991) on innovation adoption and the effect of the authoritarian decisions made by parent companies as explained by Rogers (1995). These findings are in line with those of Moalla (2007) who found that the rate of ABC adoption is higher for subsidiaries of foreign

groups than for other companies. They are also consistent with those of Marianela et al. (2003) who showed that competence is essential to overcome and mitigate the complexity of costing systems. The results also showed that there is no significant relationship between ABC adoption and top management support. These findings can be explained by the fact that companies that are members of a group do not choose their costing systems and innovations to be adopted. Their choice is not necessarily efficient. They must comply with the decisions made by the group, regardless of top management support.

The results of Panel B related to the sophistication of costing systems measured by the use of a full or a direct costing system showed that manufacturing companies are more likely to use a full costing system. This may be explained by the complexity of industrial companies' activities and for which a full costing system is needed. However, the model is globally not significant. Thus, it can be concluded that independent variables do not explain the use of a full or a partial costing system.

Top management support and sector had positive effects on the sophistication of costing systems measured by the number of cost drivers in the second stage of allocation. This result can be explained by the fact that a company that reaches the second stage of allocation must have a fairly sophisticated costing system compared to companies that are limited to the first stage of allocation. Achieving the second level of allocation cannot be without top management support. In addition, manufacturing companies need more cost drivers in the second stage of allocation than companies in other sectors. This can be explained by the complexity of the production process of manufacturing firms. These companies need a sophisticated costing system that addresses the complexity of production processes and not a simple system that masks this complexity. This result confirms that of Al-Omiri and Drury (2007).

Regarding company size, the results of Panel A and Panel C showed a positive relationship between the size of the company and the adoption of ABC. Moreover, big sized companies used a higher number of cost pools in the first stage of allocation compared to the small-sized companies. These results are consistent with those of previous research (e.g. Al-Omiri & Drury, 2007; Malmi, 1999). They may be explained by the need for a

more detailed and sophisticated costing system for the big-sized companies. This may allow them to better manage the complexity of their activities. Furthermore, big firms have more resources than smaller firms and can, therefore, use sophisticated costing systems (Malmi, 1999).

**Table 4: Regression Results**

		Panel A: Adoption of ABC		Panel B: Adoption of a full costing method	
Variables	Coefficients	p-value	Coefficients	p-value	
Competence	<b>0.339</b>	<b>0.000***</b>	0.045	0.927	
Support	-0.319	0.443	0.323	0.491	
Resistance	<b>-1.288</b>	<b>0.075*</b>	-0.069	0.884	
Group	<b>3.953</b>	<b>0.001***</b>	-0.244	0.732	
Sector	-0.027	0.956	<b>0.139</b>	<b>0.046**</b>	
Size	<b>0.013</b>	<b>0.052*</b>	0.016	0.851	
Constant	-3.173	0.000	-2.411	0.290	
Pseudo R2	0.2429		0.1490		
p-value	0.0464**		0.1115		
		Panel C: Number of cost pools in the first stage of allocation		Panel D: Number of cost drivers in the second stage of allocation	
Variables	Coefficients	p-value	Coefficients	p-value	
Competence	<b>0.6490</b>	<b>0.072*</b>	-0.194	0.571	
Support	-0.123	0.712	<b>0.438</b>	<b>0.099*</b>	
Resistance	-0.133	0.611	-0.026	0.909	
Group	<b>0.766</b>	<b>0.099*</b>	-0.107	0.718	
Sector	-0.627	0.268	<b>0.911</b>	<b>0.079*</b>	
Size	<b>0.001</b>	<b>0.014</b>	-0.001	0.402	
Constant	-3.544	0.086	0.374	0.772	
Pseudo R2	0.1526		0.1262		
p-value	0.0000		0.0010		

**Notes**

For Panel A, the dependent variable is the use of an ABC system or a traditional costing system, for Panel B, the dependent variable is the use of a full costing system or a direct costing system, for Panel C, the dependent variable is the number of cost pools in the first stage of allocation, and for panel D, the dependent variable is the number of cost drivers in the second stage of allocation.

Competence: Competence; Support: Top management support; Resistance: resistance to change; Group: Membership in a group (i.e. subsidiary or parent company); Sector: Sector; Size: Company's size.

## **CONCLUSION**

This research investigated the influence of internal actors on the characteristics of management accounting systems in Tunisia. Based on the diffusion of innovations theory (Rogers, 1995) and the theoretical perspectives explaining the diffusion administrative technologies of Abrahmson's (1991), it tried to analyze the influence of the management accountant competence, top management support, resistance to change and membership in a group on the sophistication of costing systems.

Findings highlight the influence of competence and membership in a group on the sophistication of costing systems measured by both the adoption of ABC and the number of the cost pools in the first stage of allocation. Besides, resistance to change blocked ABC adoption. Top management support positively affected the sophistication of costing systems measured by the number of cost drivers in the second stage of allocation.

This research has limitations, especially the small-sized sample does not allow the generalization of the results. Thus, the findings should be interpreted with caution. It has practical implications since it can be useful for managers in defining the characteristics of their costing systems. On the theoretical level, this research overcomes the limitations of previous research based on the contingency theory and rationality. It is the first piece of research that investigated the relationship between the role of internal actors and the sophistication of costing systems. It adds to the knowledge of the management accounting area as it is one of the few studies conducted in developing countries and dealing with management accounting characteristics. Previous research was limited, either to the factors affecting the adoption of ABC or conducted in developed countries.

This study only considered the influence of internal actors who were involved in the decision-making within the company. Further research can analyze the influence of external actors (e.g. consultants, academics) on the characteristics of costing systems. Besides, future qualitative research can better explain the role played by actors in defining the characteristics of costing systems in African countries.

## REFERENCES

- Abrahamson, E. (1991). Managerial fads and fashions: The diffusion and rejection of innovations. *Academy of Management Review*, 16(3), 586-612.
- Ahmad, K. (2014). The adoption of management accounting practices in Malaysian small and medium-sized enterprises. *Asian Social Science*, 10(2), 236-249.
- Alcouffe, S., Berland, N., & Levant, Y. (2008). Actor-networks and the diffusion of management accounting innovations: A comparative study. *Management Accounting Research*, 19(1), 1-17.
- Al-Omiri, M., & Drury, C. (2007). A survey of factors influencing the choice of product costing systems in UK organizations. *Management Accounting Research*, 18(4), 399-424.
- Al-Sayed, M., & Dugdale, D. (2016). Activity-based innovations in the UK manufacturing sector: Extent, adoption process patterns, and contingency factors. *The British Accounting Review*, 48(1), 38-58.
- Amara, T., & Benelifa, S. (2017). The impact of external and internal factors on the management accounting practices. *International Journal of Finance and Accounting*, 6(2), 46-58.
- Argyris, C., & Kaplan, R. S. (1994). Implementing new knowledge: The case of activity-based costing. *Accounting Horizons*, 8(3), 83-150.
- Ax, C., & Greve, J. (2017). Adoption of management accounting innovations: Organizational culture compatibility and perceived outcomes. *Management Accounting Research*, 34(1), 59-74.
- Azudin, A., & Mansor, N. (2018). Management accounting practices of SMEs: The impact of organizational DNA, business potential, and operational technology. *Asia Pacific Management Review*, 23(3), 222-226.

- Ballas, A., & Venieris, G. (1996). A survey of management accounting practice in Greek firms. In A. Bhimani (Ed.), *Management accounting: European perspectives* (pp. 123-139). Oxford: Oxford University Press.
- Bjornenak, T. (1997). Diffusion and accounting: The case of ABC in Norway. *Management Accounting Research*, 8(1), 3-17.
- Brown, D. A., Booth, P., & Giacobbe, F. (2004). Technological and organizational influences on the adoption of activity-based costing in Australia. *Accounting and Finance*, 44(3), 78-89.
- Chenhall, R. H., & Langfield-Smith, K. (1998). The relationship between strategic priorities, management techniques, and management accounting: An empirical investigation using a systems approach. *Accounting, Organizations and Society*, 23(3), 243–264.
- Cotton, W. D. J., Jackman, S. M., & Brown, R. A. (2003). Note on a New Zealand replication of the Innes et al. UK activity-based costing survey. *Management Accounting Research*, 14(1), 67-72.
- Diab, A. A. (2020). The appearance of community logics in management accounting and control: Evidence from an Egyptian sugar beet village. *Critical Perspectives on Accounting*. Forthcoming.
- DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48(2), 147-160.
- Drury, C., & Tayles M. (2005). Explicating the design of overhead absorption procedures in UK organizations. *The British Accounting Review*, 37(1), 47-84.
- Elhamma, A., & Moalla, H. (2015). Impact of uncertainty and decentralization on activity-based costing use. *International Journal of Accounting and Economic Studies*, 3(2), 148-155.
- Godowski, C. (2004). La dynamique d'assimilation des approches par activités dans le domaine bancaire [The dynamics of assimilation of

- activity-based approaches in banking]. *Comptabilité – Contrôle - Audit*, 10(2), 179-196.
- Gosselin, M. (1997). The effect of strategy and organizational structure on the adoption and implementation of activity-based costing. *Accounting, Organizations and Society*, 22(2), 105-122.
- Hofmann, E., & Bosshard, J. (2017). Supply chain management and activity-based costing: Current status and directions for the future. *International Journal of Physical Distribution & Logistics Management*, 47(8), 712-735.
- Holm, M., & Ax, C. (2020). The interactive effect of competition intensity and customer service competition on customer accounting sophistication - Evidence of positive and negative associations. *Management Accounting Research*, 46(1), 1-12.
- Innes, J., Mitchell, F., & Sinclair, D. (2000). Activity-based costing in the U.K.'s largest companies: a comparison of 1994 and 1999 survey results. *Management Accounting Research*, 11(3), 349-362.
- Jones, H. (1985). *Accounting, costing and cost estimation*. Cardiff: University of Wales Press, UK.
- Lacombe, I., & Bescos, P. L. (2000). *Case one – ABC-ABM at Hewlett-Packard Europe for customer support*, in Groot T., Lukka K., Cases in management accounting. Pearson Education, US.
- Liu, L. Y. J., & Pan, F. (2007). The implementation of activity-based costing in China: An innovation action research approach. *The British Accounting Review*, 39(3), 249–264.
- Malmi, T. (1999). Activity-based costing diffusion across organizations: An exploratory empirical analysis of finish firms. *Accounting Organizations and Society*, 24(8), 649-672.
- Marianela, F., Jocelyne, D., & Armelle, G. (2003). Les Compétences clés des contrôleurs de gestion: Résultats d'une Etude Empirique [Key

- Competencies of Management Controllers: Results of an Empirical Study]. Proceedings of the 14<sup>th</sup> Congress of AGRH, Grenoble, France.
- Moalla, H. (2007). Les mécanismes de diffusion, d'adoption et de rejet de la méthode ABC en Tunisie [Mechanisms for diffusion, adoption and rejection of the ABC method in Tunisia]. Proceedings of the 28<sup>th</sup> Congress of the AFC, Poitiers, France.
- Montano, J. L. A., Anes, J. A. D., Hassall, T., & Joyce, J. (2001). Vocational skills in the accounting professional profile: The Chartered Institute of Management Accountants (CIMA) employers' opinion. *Accounting Education*, 10(3), 299–313.
- Nair, S., & Nian, Y. S. (2017). Factors affecting management accounting practices in Malaysia. *International Journal of Business and Management*, 12(10), 177-184.
- Nguyen, D. T. P., Nguyen, L. T. H., Dao, D. P., & Dang, G. H. (2019). The determinants influencing managerial accounting in Vietnamese manufacturing and trading enterprises. *Academy of Accounting & Financial Studies Journal*, 23(5), 1-11.
- Rankin, R. (2020). The predictive impact of contextual factors on activity-based costing adoption. *Journal of Accounting and Finance*, 20(1), 66-81.
- Rogers, E. M. (1995). *Diffusion of innovations* (4th ed.). New York: Free Press.
- Shields, M. D., & Young, S. M. (1989). A behavioral model for implementing cost management systems. *Journal of Cost Management*, Winter, 17-27.
- Sulaiman, S., & Mitchell, F. (2005). Utilising a typology of management accounting change: An empirical analysis. *Management Accounting Research*, 16(4), 422-437.
- Ulrich, D. (1996). *Human Resource Champions: The next agenda for adding value and delivering results*. Boston, Harvard Business School Press, US.

- Walley, P., Blenkinsop, S., & Duberley, J. (1994). The adoption and non-adoption of modern accounting practices: A study of 20 manufacturing Firms. *International Journal of Production Economics*, 36(1), 19-27.
- Wijerathne, C., & Gooneratne, T. (2019). Appearance, disappearance and reappearance of activity-based costing: A case study from a Sri Lanka manufacturing firm. *Asia-Pacific Management Accounting Journal*, 14(3), 49-81.