
FACTORS AFFECTING USAGE OF MODERN MANAGEMENT ACCOUNTING TECHNIQUES IN INDUSTRIAL COMPANIES LISTED IN AMMAN STOCK EXCHANGE

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ABSTRACT

This research examined effect of external (perceived environmental uncertainty and intensity of market competition) and internal factors (advanced manufacturing technology, differentiation strategy, low-cost strategy, organizational culture and organizational structure (Decentralization)) on usage modern management accounting techniques of industrial companies listed in Amman Stock Exchange. The questionnaire was used to collect data from 46 companies operating in industrial activities, a total of 152 questionnaires were distributed to employees in the financial business units in the companies, and data of 116 questionnaires were used in the analysis process through Smart-PLS software. the results showed that perceived environmental uncertainty and intensity of market competition as external factors had strongly positive and significant effect on modern management accounting techniques. Also, the result revealed that advanced manufacturing technology, differentiation strategy and low-cost strategy as internal factors had a positive and significant effect on modern management accounting techniques, but no significant effect of organizational culture and organizational structure (Decentralization) as internal factors on modern management accounting techniques.

KEYWORDS: External factors, Internal factors, Modern Management Accounting Techniques, Industrial companies

INTRODUCTION

Management accounting has received more attention since (1987) when Johnson and Kaplan debated that Management Accounting (MA) lag behind with recent developments in technology. They also point out that the evolution and adoption of MA is highly appreciated to keep up with the dynamic and complex business changes these days (Talha, Raja & Seetharaman, 2010). Each company and institution falls under specific configuration of contingencies. The contingencies of organizations depend upon the market dynamic and the environment of technology in that it runs, volume and the abundance of its activities, and workforce diversity. The organizations should adopt a suitable design in order to adapt their internal and external factors which allow to effectively competing in the marketplace (Sreekumar, 2015). The increasing level of world competition has intense the challenges for managers and lots of consultants have warned that if MA is to keep up its connection, it must adapt

to satisfy the ever-changing wants of managers. In reaction to those considerations, spread of contemporary Management Accounting Techniques has featured to serve the strategic goals of the organization, this suggests that Traditional Management Accounting (TMA) can no longer meet the information needs of management (Pavlatos & Paggios, 2009; Mijoč, Starčević, & Mijoč, 2014; Ogungbade, Idode & Alade, 2016).

In 1998, IFAC summarized development of management accounting through four stages starting with the period pre-1950, where they describe it as a “technical” activity with a focus on product costs. This approach resulted in an orientation towards manufacturing and internal data (Robles & Robles, 2000). During this time costing systems were developed albeit slowly and according to Wyatt (2002) continue to be the main form of management control in organizations. Stage two of IFACs development of management accounting took place in the 1950s and 60s with more information being produced for management control, though the continued emphasis on product costing, led to much of the controls being reactive, and having little influence on management decision making in organizations (Epstein & Lee, 1999). Stage three was reached by the mid-1980s fuelled by major world events that took place including the world recession next in 1973 oil price shock and increasing global competition in early 1980s (AbdelKader & Luther, 2006). The increase in competition brought with it an increase in use of technology streamlining manufacturing processes and also enhancing information processing within organizations (Ashton et al 1995). The final stage of IFAC’s model which was in place by 1995 charted the continued influence of technology and flatter organization structures and shifts the management accountants' focus towards creating value by proper use of resources (AbdelKader & Luther, 2006).

The adoption of management accounting techniques are explained by a set of dynamic changes such as; market competition, environmental uncertainty, strategy, technology, national culture, and structure which are known as contingency factors (Chenhall, 2003; AbdelKader & Luther, 2008). Ajibolade (2013) emphasize that to clarify the adoption of Management Accounting Practices (MAPs) in organizations, mostly uses the concept of fit between external and internal factors which suggested by contingency theory. It has been utilized to determine the factors that influence usage MMATs in the study of Ayadi and Affes (2014).

Jordan's centric position has awarded economic and strategic significance as a dynamic business and connections center, as it is located in the heart of the Middle East and the Arab world (Al Sawalqa, 2011). Since the early 1990s, Jordan has pursued reconstructed economic and lawful framings to entice exterior investment. Jordanian politics of economic has endeavored to reconstruct its economy through subscription with commerce conventions with developing and developed countries (Shanikat, 2008), which opened the door for the intensive competition from overseas companies in the domestic market. This has resulted in a situation where most firms are now competing in a highly competitive global

market. This implied that there were little incentives for firms to maximize efficiency, improve management accounting practices or minimize costs. However, many organizations including manufacturing firms began to encounter severe competition from foreign competitors that offered high-quality products at low prices. The privatization of government-controlled entities in the same period contributed to the change in the business environment.

It seems that MA in eastern countries has the same features as those which reflect traditional MAPs more than contemporary ones (Nishimura, 2005). MAPs could be broadly classified into traditional or conventional and contemporary or advanced; Conventional MAPs focus on organizational issues and financially oriented; whereas, advanced MAPs that focus on financial and nonfinancial information tend to be more strategically oriented (Chenhall & Langfield-Smith, 1998; Angelakis, Theriou & Floropoulos, 2010). This study focuses on the MMATs and how such techniques have been adopted by industrial companies listed in Amman Stock Exchange (ASE).

RESEARCH PROBLEM

The organizations need to techniques to equipping the management with the necessary information to planning, controlling, direction and decision making; Many authors debated that the MMATs have changed its concentrate from a function of financial control and cost determination to function developed which interested of creating value through optimal utilization of resources (AbdelKader & Luther, 2008).

The previous studies in this domain have not shown much interest in using MMATs, especially in companies operating in developing countries (Lay, 2014; Sreekumar, 2015; Ogunbade, Idode & Alade, 2016). To best explain the application of MMATs, external and internal factors are often used (Ajibolade, 2013; Ayadi & Affes, 2014). Al-Mawali (2015) and Nouri and Soltani (2017) emphasized that the association between factors (internal and external) and usage MMATs requires further research to obtain more insights and clearer evidence because of that current studies have not examined the whole dimensions of this relationship and results inconclusive.

Rababa"h (2014); Al-sayyed (2015); Hasan (2017) and Jbarah (2018) all of them confirmed that the growth of MMATs has been limited and most Jordanian companies ongoing in adopting conventional techniques. There have been a few studies of whether performance is impacted with external, internal factors and MMATs. The studies conducted are only considered one contingent factor. Furthermore, the necessity for more studies on MMATs, and the knowledge in the relation between external, internal factors and MMATs based on contingency theory in Jordanian context are well documented in the literature (Al-Mawali, 2015; Jbarah, 2018). Thus, this study attempts to bridge the gap through the understanding effect of contingency dynamics on MMATs to answer the call of prior research works on this field. It is against this background that the following research questions arise:

1. What is the effect of external factors (perceived environmental uncertainty and intensity of market competition) on the usage of MMATs in industrial companies listed in ASE?
2. Do internal factors (advanced manufacturing technology, differentiation strategy, low-cost strategy, organizational culture and organizational structure (Decentralization)) have impacts on the usage of MMATs in industrial companies listed in ASE?

RESEARCH OBJECTIVE

Based on the mentioned research questions, the objective of this study is set to reveal the factors influencing MMATs of industrial companies listed in ASE within the context of external, internal factors. The objectives of this study are detailed as follows:

1. To identify the relationship between external factors (perceived environmental uncertainty and intensity of market competition) and usage MMATs in industrial companies listed in ASE.
2. To examine the relationship between internal factors (advanced manufacturing technology, differentiation strategy, low-cost strategy, organizational culture and organizational structure (Decentralization)) and usage of MMATs in industrial companies listed in ASE.

LITERATURE REVIEW

The first basic principle of contingency theory that there is no single optimal method of organizing; secondly, effectiveness of organizing differs from one circumstance to another and is not same in all circumstances (Galbraith, 1973). According to contingency theory approach, management accounting studies assumes that conditions in which an entity works will decide key traits of its accounting system. Therefore, they would not be an effective Management Accounting System (MAS) and Management Control System (MCS) that applies evenly into all companies with all circumstances (Waterhouse & Tiessen, 1978, Otley, 1980, Emmanuel et al., 1991, Fisher, 1995). Therefore, organizations with different business environments will have different strategic plans and will respond according to their situations, and consequently to attain the desired goals may require different management information systems (Hoque, 2004). Major studies in contingency- based research have stressed the importance of external and internal factors as explanatory variables when examining the development of MAPs.

In businesses such as industrial, one reason that might limit the adoption of MAPs is the external factors. Researches of industrial companies have focused on the significance of external factors which include (Perceived Environmental Uncertainty (PEU) and The Intensity of Market Competition (INMCOMP)) as variables that may be related to the usage and development of MAPs. Amara and

Benelifa (2017) investigated the relationship between PEU and MMATs. PEU was recognized as a factor impact on MMATs usage. The study summarized that PEU awareness in industrial companies may help management make relatively accurate estimates on the market which easier to MMATs usage. Ghasemi, Mohamad, Karami, Bajuri and Asgharizade (2015) also discovered a positive association between INMCOM and MAPs usage. Increasing market competition creates turbulence, stress, and risk for organizations. Active organizations scan the environment in terms of social, economic and technological changes to take benefit from them accordingly. Hence, while facing extensive competition, it is important for managers to use market information for decision making. It demands that organizations mount appropriate strategies to the threats and opportunities in the competitive environment and that they design and use appropriate management accounting systems for this purpose.

Abdel-Kader and Luther (2008); Ayadi and Affes (2014); Amara and Benelifa (2017); Shahzadi, Khan, Toor and Haq (2018); Lucianetti, Jabbour, Gunasekaran and Latan (2018) have argued a positive relationship between environmental uncertainty and the more complex MAPs where that the organizations under condition of high environment uncertainty need more sophisticated accounting information systems to provide more financial, non-financial and external information that is not only presented on request, is current and provides rapid feedback on decisions.

Given the above-mixed views on the nature of the relationship between environmental uncertainty and MAS, The influence of perceived environmental uncertainty on the usage of MMATs is hypothesized as follows:

H1a: The perceived environmental uncertainty influences positively on usage MMATs.

H1b: The intensity of market competition influences positively on usage MMATs.

Applying a broader viewpoint, Haldma and Laats (2002); Abdel-Kader & Luther (2008); Albu and Albu (2012); Ayadi & Affes (2014); Amara and Benelifa (2017); Nair and Nian (2017) and Shahzadi et al. (2018) presented evidence linking internal factors and MAPs. They found that variables recognized by the contingency-based studies are valuable for forecasting MMATs. They discovered the usage of MMATs to be associated with Advanced Manufacturing Technology (AMT), business strategy (Differentiation (DIFF), Low-Cost Strategy (LCS), Organizational Culture (OC) and Organizational Structure (OS) (Decentralization).

This view was subsequently supported by Haldma and Laats (2002); Abdul-Kader and Luther (2008); McLean, McLean, McGovern, and Davie (2014); Tuan Mat & Smith (2014); Ahmad and Zabri (2015); Ern, Abdullah & Yau (2016); Ogungbade and Olweny (2017); Nair and Nian (2017) and Shahzadi et al. (2018) whereby they also found a positive relationship between adoption of advanced

manufacturing technology and adoption of sophisticated MAS design. This finding contradicts the finding of Baines and Langfield-Smith (2003) that the increased use of advanced manufacturing technology did not result in increased use of modern management accounting practices in Australia.

According Ahmad and Zabri (2015) the manufacturing technology advances prompted firms to adopt more sophisticated MAS to interpretation of the information in order to ensure relevant information are provided on a timely basis to assist managers at all levels and be more careful in planning and controlling their activities in order to survive and compete effectively in the market. Thus, this study will examine the relationship between advanced manufacturing technology and usage MMATs, by the following hypothesis is suggested:

H2a: The Advanced Manufacturing Technology influences positively on usage MMATs.

The strategic priorities need to be supported by appropriate control and accounting management systems (e.g. McLellan & Abdel Al, 2013; Tuan Mat & Smith, 2014). Jermias and Gani (2004) reported that Porter (1985) argues that the company must derive sustainable competitive advantages either through applying a generic strategy of cost domination or through a differentiation strategy. Differentiation strategy implies the provision of a superior product or service whereas cost leadership strategy needs to find the lowest cost compared to competitors (Porter, 1985). The results in the literature regarding the relationship between the generic strategy of differentiation, cost domination, and the new management accounting practices were divergent. The findings of Urquidi and Ripoll (2013) appear significant for the association between cost leadership strategy, differentiation followers and the use of new management accounting techniques. Also, the results of the study of Ghasemi et al., (2015) confirmed that there is a positive relationship between differentiation product strategy and the use of sophisticated management accounting. In addition, Sreekumar (2015) found that the relationship between cost leadership strategy and modern management accounting techniques such as Target costing and activity-based costing is positive. Amara and Benelifa (2017) found that the differentiation products strategy and cost leadership strategy has significant in the new management accounting practices.

On the other hand, in the study of Ayadi and Affes (2014), the results came to show that the cost leadership strategy has a negative effect on the use of new management accounting practices. This came to confirm the previous results by Simons (1990) Shank and Govindarajan (1993). Shahzadi et al. (2018) found that an insignificant relationship among competitive strategy in Pakistani companies and management accounting practices. This leads to suggest the following hypothesis:

H2b: The differentiation strategy influences positively on the usage of MMATs.

H2c: The low-cost strategy influences positively on the usage of MMATs.

Bhimani (2003) found that organizational culture can affect the design, usage, and effectiveness of MA. Similarly, Erserim (2012) examined the relationship between organizational culture and usage MAPs. The findings of the study revealed that organizational culture influences the degree of usage of MAPs in organizations. The results of studies of Chongruksut (2009) and Atout (2017) emphasized that there is a positive relationship between organizational culture and the Use of Management Accounting Innovations. While Sumkaew (2016) pointed out that there is no significant relationship between organizational culture and MAPs. Based on the discussion above and findings of previous researchers, it can be hypothesized that:

H2d: The organizational culture influence positively on usage MMATs.

Among the important structural parameters that have received a lot of attentions in organizational research are those related to the definition of the extent to which decision-making within the organization is centralized or decentralized (Amara & Benelifa, 2017). Organizations that face high uncertainty require a decentralized structure and more sophisticated MAS (Abdel-Kader & Luther, 2008). The decentralization empowers the organizations' internal functions to be divided into different parts that are manageable by managers to perform organizational activities (Chenhall, 2003). Gosselin (1997) found that organizations with decentralization are more likely to adopt advanced MAPs. Studies of Abdul-Kader and Luther (2008); Pavlatos (2018); Shahzadi et al. (2018) founds a positive relationship between decentralization and the level of sophistication of management accounting practices. Chenhall (2008) argues that advanced MAPs such as ABC, BSC have not had any significant association with decentralization. Erserim (2012); Ayadi and Affes (2014); Ern et al. (2016) and Amara and Benelifa (2017) showed that decentralization has an insignificant effect on the use of new management accounting practices. Thus, it can be hypothesized that:

H2d: The more decentralization influences positively on usage MMATs.

Abdel-Kader and Luther (2008) examined the impact of 10 selected contingency factors on the adoption of 38 MAPs in the UK's largest industry sector based on a questionnaire survey. The results revealed that environmental uncertainty, customer power, decentralization, size, advanced manufacturing technology (AMT), TQM and JIT were used to explain differences in MA sophistication. Competitive strategy, processing system complexity, and product perishability, however, did not associate with the sophistication of MA.

Albu and Albu (2012) conducted a survey in 109 Romanian companies to investigate the relationship between the use of MAPs and contingency factors including environmental uncertainty, market competition, industry, and size. The findings indicated that large-sized companies adopted budgets and performance management systems as activities control mechanisms. Manufacturing companies

used the complexity of costing techniques more than non-manufacturing ones. The intensity of market competition was positively related to the complexity of the planning and budgeting system whereas perceived environmental uncertainty was negatively associated with the adoption of MA for strategic planning.

Ayadi and Affes (2014) investigated the impact of the perceived environmental uncertainty, the relational capital with suppliers, the generic strategy of cost domination, the organizational architecture and the company size on the use of the Activity-Based Costing (ABC), Balanced Scorecard or (BSC) and the financial and accounting benchmarking in 100 industrial Tunisian companies operating in different business areas. The results showed that the explanation of the variation of the use of new management accounting practices is mainly due to the perceived environmental uncertainty, relational capital with suppliers and the company size. More specifically, the large companies that receive a high degree of environmental uncertainty and characterized by a high level of relational capital with suppliers are more accessible to the use of new management accounting practices. Regarding organizational architecture and generic strategy of cost domination have only little influence on the use of new management accounting practices because that companies that follow this strategy prefer the use of traditional management accounting practices that are mainly based on the cost determination and financial control in order to put costs under control and reduce them.

Amara and Benelifa (2017) used a 189 questionnaire was distributed by direct contact and by email to determine the effect of environmental uncertainty, market competition, structure, size, strategy, business line, and type of affiliation on the adoption of management accounting practices of distinct levels of development in different activity sectors in Tunisia. The associations between a set of environmental uncertainty, strategy, structure and the sophistication of management accounting practices were found. Also, the result showed that market competition, size, business line and type of affiliation not associations with the sophistication of management accounting practices. Although sophisticated management accounting was of less priority than traditional management accounting in Tunisian sectors, except that the managers in sectors with decentralized power tended to use sophisticated management accounting for operational and strategic decisions. Additionally, companies operating under styles of a low level of uncertainty were often positive in their adoption of sophisticated management accounting. An increase in concern of differentiation strategy and low-cost strategy had encouraged the implementation of sophisticated management accounting.

Nair and Nian (2017) investigated the impact of organization size, the intensity of market competition, level of qualification of accounting staff and advanced production technology on MAPs adoption. A total of 200 respondents from Klang Valley, Malaysia were involved in the survey using purposive sampling. The results indicated that the adoption of MAPs in Malaysia companies was derived from

organization size and advanced production technology. This study suggested that when organizations were a large size and use advanced production technology would be a better assessment of MAPs such as return on investment, residual income, economic value added in measuring and comparing a company's performance and. Also, product designers, production engineers, and the finance department should work closely with management in order to ensure the right MAPs are applied in their planning, controlling of cost, decision making and appraising of performance when advanced technologies are used in the production process.

Shahzadi et al. (2018) conducted a survey on a sample of Pakistani companies from different fields of activity, to investigate the relationship between five contingent factors (namely; environmental uncertainty, market competition, competitive strategy, organizational structure, and advanced manufacturing technology). The findings indicated that firms operating in higher environmental uncertainty and advanced manufacturing technology obtain higher usage of MAPs. Where the companies working under high environmental uncertainty may need more open, externally oriented, nonfinancial and sophisticated information, such as this information generated by MAPs, to support their operations. Also, It is expected that greater acceptance of AMT will be related to the wider use of new accounting systems such as ABC and non-financial performance indicators.

The next section discusses the research method and data collection techniques. Results and discussion will be presented in the third section. The final section will present the conclusions of the study.

RESEARCH METHOD

Sample and Data

This study examines industrial companies listed in ASE in 2018. According to the information gathered from the websites of listed companies obtained from ASE, there are about 46 companies engaged in industrial activities out of around 192 companies listed on Bursa Amman Main Board. The unit of analysis for the study is the financial business units (FBUs) of industrial companies listed in ASE which engaged their core business in the industry. 152 questionnaires to all the respondents in the industrial companies listed on ASE, asking for their responses, yielded a total of 128 returned questionnaires. Out of these 128 questionnaires, 12 questionnaires were excluded from the analysis as more than 50% of their questions were not completed by the respondents according to the suggestion by (Hair, Black, Babin, & Andersen, 2010). 116 usable questionnaires for further analysis accounted for an overall 76.3% valid response rate. According to Saunders, Lewis and Thornhill (2012) state that the likely response rate for self- administered questionnaires in business studies is between 30-50 %.

Variable measurement

The measure of perceived environmental uncertainty in this study is based on the instrument used by Hoque (2004, 2005); Bastian and Muchlish (2012); Dropulić (2013); Al-Mawali (2015); Andesto

(2016); Alshbiel (2017) which were developed mainly by Gordon and Narayanan (1984) and Govindarajan (1984). However, perceived environmental uncertainty was measured by using eight items (B1-B8) of section B of the questionnaire. Respondents were asked on a seven-point Likert scale ranging from “1” (very low extent) to “7” (very high extent) to indicate the relative predictability of their companies external environment.

Competition is measured using the same instrument applied by Hoque, Mia & Alam (2001); Al-Rfou (2012); Alshbiel (2017), which were modified from Khandwalla (1972). The intensity of market competition was measured by using questions (C1- C5) of section C of the questionnaire. Using a seven-point scale ranging from “1” (very low extent) to “7” (very high extent), respondents were asked to indicate the perceived intensity of competition.

In this study, AMT consisted of eight items (D1-D8) taken from Ogungbade and Olweny (2017). Respondents were asked on a seven-point scale, ranging from “1” (very low extent) to “7” (very high extent), to indicate the extent to which their companies use each of the AMT applications.

Measurement of Porter’s (1980) competitive strategy is based on scales developed by Narver and Slater (1990), and Chenhall and Langfield-Smith (1998), this variable was measured by using two strategic priorities: product differentiation strategy which was measured using questions (E1-E5) Based on Chenhall and Langfield-Smith (1998); and Al Sawalqa (2011); McLellan and Abdel Al (2012); Tuan Mat and Smith (2014), and low-cost strategy which was measured using questions (E6-E11) consistent with Narver and Slater (1990); Lay (2014); Ogungbade and Olweny (2017). Respondents were asked on a seven-point scale, ranging from “1” (very low extent) to “7” (very high extent), to measure the product differentiation strategy and low-cost strategy.

This study uses the competing value model to operationalize organizational culture, where that the studies in Jordan (i.e. Hutaibat, 2005; Rabaai, 2009) revealed that organizational culture emphasizes flexibility values with group type focus (Hutaibat, 2005; Rabaai, 2009; Al-Sawalqa, 2011). Therefore, the flexibility values of group culture were measured by using questions (F1-F5). Respondents were asked on a seven-point Likert-type scale to what extent do their companies emphasize the culture values.

Organizational Structure by decentralization constructs was measured. This organizational structure dimension has been most commonly examined in past researches such as (Gordon & Narayanan, 1984; Lay, 2014; Amara & Benelifa, 2017). Respondents were asked to find out the typical influence the general managers have in affecting the outcome of following decisions with 7 points Likert-type scale, ranging from 1 (no delegation) to 7 (full delegation) in questions (G6-G10).

The instrument from Fuad and Fiah (2006); Nassar et al (2011); Al-Bawab (2018); Alzoubi (2018) was applied to measure the degree of MMATs usage. The 12 MMATs are listed together with a Likert-type scale ranging from “1” (not at all) to “7” (to a great extent). The respondents were asked to indicate the extent their organizations make use of each of these techniques consisted of twelve items (H1-H12). Figure 1 showed summarized the framework of this study.

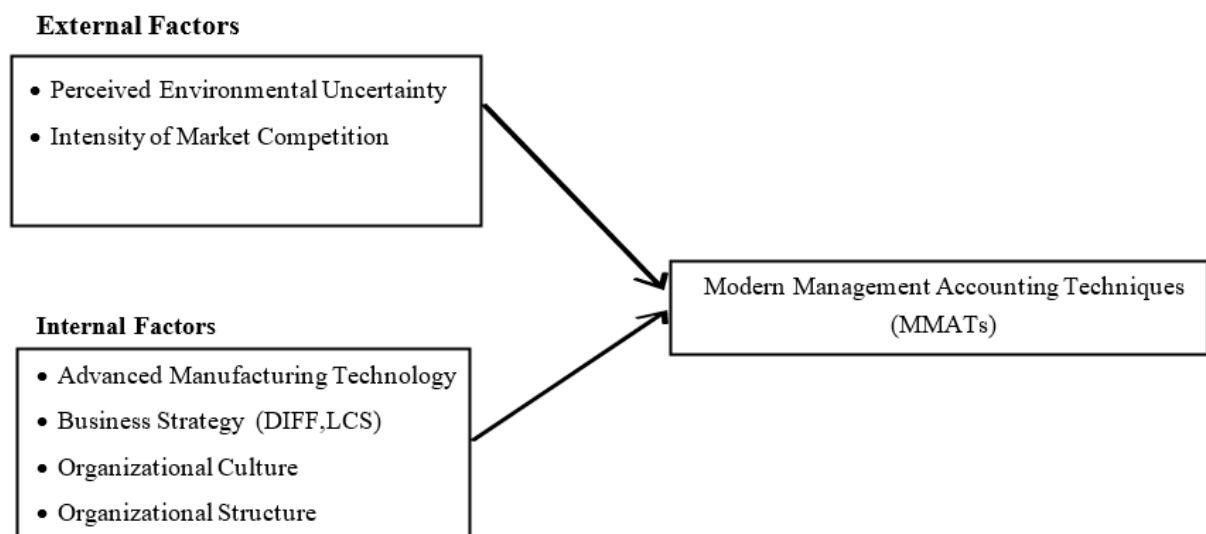


Figure 1: framework

DATA ANALYSIS

To achieve the research objectives this study was used Partial Least Square Structural Equation Modeling (PLS-SEM) version 3.0 to analyzing both measurement and structural models. The measurement model was determined by running PLS algorithm while the structural model was determined through the bootstrapping method (Hair, Hult, Ringle & Sarstedt, 2014).

Descriptive statistics

The overall mean for the dimensions of the constructs measured by seven Likert scales ranged between 4.44 to 5.32; this suggests that all the dimensions were at the somehow high level, except the differentiation strategy was a high level. The results showed that the mean value of PEU and INMCOM were 4.70 and 4.91 with a standard deviation of 1.05 and 1.21 respectively. This revealed that the responding firms have a somehow high-level tendency to respond to the perceived environmental uncertainty and intensity of market competition. Responding to these variables limits the degree of external influence that threatens the success of an organizational goal. The high value of standard deviation shows that the responding firms' perception about responsiveness to these changes is different. This explains that industrial companies do not have the same resources and capabilities.

With regard to the dimensions of internal factors, the results show that product differentiation strategy among the other dimensions of internal factors and the other dimensions of the constructs had the maximum mean value of 5.32 with a standard deviation of 1.28. Therefore, the adoption of a product differentiation strategy is perceived as high by virtually all responding firms. The results also show that advanced manufacturing technology, low-cost strategy, and organizational culture had the next highest values, besides product differentiation strategy based on the respondents' perception. The mean values of advanced manufacturing technology, low-cost strategy, and organizational culture were 5.05, 4.79 and 4.63 with standard deviation 1.29, 1.21 and 1.26 respectively. This also revealed that the responding firms were a somehow high extent on advanced manufacturing technology, low-cost strategy, and organizational culture practices to achieve the desired objectives. Somehow high extent of decentralization had been realized by responding to firms with a mean value of 4.444 with a standard deviation of 1.32. As reported in Table 1.3, the usage of modern management accounting techniques was somehow high with a mean 5.14 and a standard deviation of 1.04. Table 1 reports the descriptive statistics of the variables in the study.

Table 1. Descriptive statistics of the variables in the study Variable

Construct	Dimension	N	Actual Minimum	Actual Maximum	Mean	Std. Deviation
External factors	PEU	116	1.38	6.75	4.70	1.05
	INMCOM	116	1.20	7.00	4.91	1.21
Internal factors	AMT	116	1.63	6.88	5.05	1.29
	DIFF	116	2.00	7.00	5.32	1.28
	LCS	116	1.00	7.00	4.79	1.21
	OC	116	1.20	7.00	4.63	1.26
	OS	116	1.20	7.00	4.44	1.32
MMATs		116	1.75	7.00	5.14	1.04

Measurement Model

The goodness of the measurement was evaluated in order to confirm the validity and reliability of the output of the analysis processes using the PLS-SEM technique. Based on Henseler, Ringle & Sinkovics (2009) and Hair et al. (2014), this study was used convergent validity and discriminant validity before testing the hypotheses of the model.

All the construct of this paper has achieved the composite reliability above 0.7 and AVE above 0.5 (Hair et al., 2014). However, two items B8 from the construct PEU, D7 from the construct AMT, E5 from the construct DIFF, E11 from the construct LCS and H10, H11, H12 from the construct MMATs

are deleted from further analysis due to the low loading (see figure 2 and Table 2).

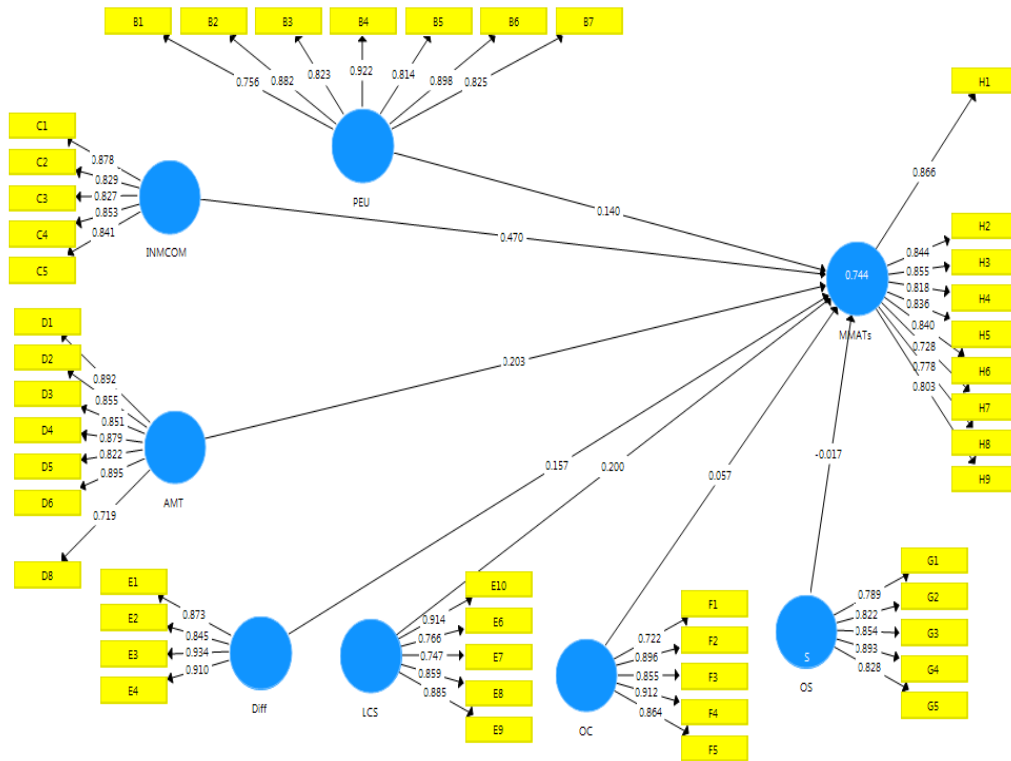


Figure 2. Measurement model

The discriminant validity analysis result is shown in Table 3. The square roots of AVE for all the constructs are on the diagonal line signifying a higher square root of AVE. All the square roots of AVE for the constructs are greater than the off-diagonal correlation coefficients in the corresponding rows and columns. In addition, this indicates that each and every variable shares more variance with its items than with other constructs, and, thus supports discriminant validity (Hair et al., 2010).

Table 2. Reliability and Validity of Construct

Variable	Indicators	Loading	Cronbach's	Composite	AVE
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			Alpha	Reliability	
AMT	D1	0.892	0.933	0.946	0.717
	D2	0.855			
	D3	0.851			
	D4	0.879			
	D5	0.822			
	D6	0.895			
	D8	0.719			
Diff	E1	0.873	0.913	0.939	0.794
	E2	0.845			
	E3	0.934			
	E4	0.910			
INMCOM	C1	0.878	0.901	0.926	0.715
	C2	0.829			
	C3	0.827			
	C4	0.853			
	C5	0.841			
LCS	E6	0.914	0.891	0.921	0.701
	E7	0.766			
	E8	0.747			
	E9	0.859			
	E10	0.885			
MMATs	H1	0.866	0.939	0.948	0.672
	H2	0.844			
	H3	0.855			
	H4	0.818			
	H5	0.836			
	H6	0.840			
	H7	0.728			
	H8	0.778			
	H9	0.803			
OC	F1	0.722	0.905	0.930	0.727
	F2	0.896			
	F3	0.855			
	F4	0.912			
	F5	0.864			
OS	G1	0.789	0.893	0.922	0.702
	G2	0.822			

PEU	G3	0.854	0.934	0.947	0.718
	G4	0.893			
	G5	0.828			
	B1	0.756			
	B2	0.882			
	B3	0.823			
	B4	0.922			
	B5	0.814			
	B6	0.898			
	B7	0.825			

Table 3. Discriminant Validity Variable

Variable	AMT	Diff	INMCOM	LCS	MMATs	OC	OS	PEU
AMT	0.847							
Diff	0.391	0.891						
INMCOM	0.274	0.485	0.846					
LCS	0.096	0.447	0.533	0.837				
MMATs	0.452	0.593	0.778	0.586	0.820			
OC	0.023	0.318	0.393	0.354	0.351	0.853		
OS	0.092	0.284	0.441	0.401	0.392	0.771	0.838	
PEU	0.280	0.181	0.383	0.226	0.448	- 0.025	0.098	0.847

Structural Model

The structural model was assessed by evaluating the beta value and the corresponding t-values through the bootstrapping procedure with 5000 resample. Therefore, the bootstrapping result from the Smart PLS reveals that PEU ($\beta = 0.140, t=2.444, p < 0.05$) and INMCOM ($\beta = 0.470, t=5.029, p < 0.01$) had strongly positive and significant effect on MMATs supporting H1a and H1b respectively. In regard to the dimensions of internal factors, the obtained results were mixed. AMT ($\beta = 0.203, t = 3.420, p < 0.01$), DIFF ($\beta = 0.157, t = 2.269, p < 0.05$) and LCS ($\beta = 0.200, t = 2.568, p < 0.01$) had a positive and significant effect on MMATs supporting H2a, H2b and H2c respectively. On the contrary, OC ($\beta = 0.057, t = 0.510, p > 0.1$) and OS ($\beta = -0.017, t = 0.147, p > 0.1$) had no significant effect on MMATs. Therefore, the hypotheses proposed in H2d and H2e were not supported. (See Figure 3 and Table 4)

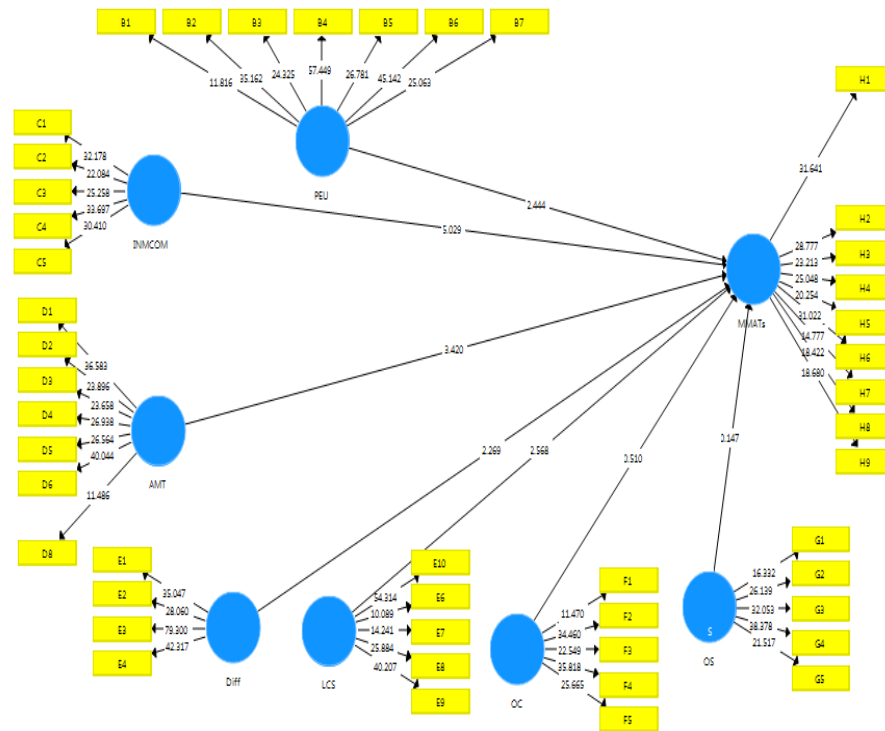


Figure 3. Structural model

Table 4. Result of the structural model analysis

Relationship	Beta	Standard Deviation (STDEV)	T Statistics	P Values
AMT -> MMATs	0.203	0.059	3.420	0.001
Diff -> MMATs	0.157	0.069	2.269	0.023
INMCOM -> MMATs	0.470	0.094	5.029	0.000
LCS -> MMATs	0.200	0.078	2.568	0.010
OC -> MMATs	0.057	0.112	0.510	0.610
OS -> MMATs	-0.017	0.114	0.147	0.883
PEU -> MMATs	0.140	0.057	2.444	0.015

DISCUSSION OF FINDINGS

PEU is one of the external variables that were found to be the significant variable influencing the

MMATs. This result is consistent with the findings of studies carried out by Abdel-Kader and Luther (2008); Ayadi and Affes (2014); Amara and Benelifa (2017); Shahzadi et al. (2018); Lucianetti, Jabbour and Gunasekaran (2018). As that PEU as one of the external environment condition of an organization in a given area such as competitors' action in the market, customers' preferences and changes of economic is an important antecedent of the management accounting system design which affects the adoption of the most developed management accounting practices. Similar to the result of PEU, INMCOM is also found to be a very significant variable affecting the MMATs. This result is an agreement with what the researcher tries to prove based on the claim made by scholars such as Abdel-Maksoud et al. (2012); Albu and Albu (2012); Ahmad and Zabri (2015) and Ghasemi et al. (2015) who reported the significant impact of INMCOM on the MMATs. This implies that the MMATs of industrial companies can be enhanced by the quick response to the changes in the market such as price competition and competition for new product development. where the studies revealed that the awareness with the pressures from a perceived intensive competition, companies are induced to obtain a more broad scope of information by adopting new management accounting practices (Albu, Albu, 2012; Shahzadi et al., 2018).

The second objective of the study is to examine the effect of internal factors variables on MMATs. AMT, one of the internal factors, can be proved as the significant variable influencing MMATs. There is not enough evidence to accept the hypothesis with $p > 0.05$. This result is the result the researcher seeks to prove based on the findings of prior research works of Haldma and Laats (2002); Abdul-Kader and Luther (2008); McLean McLean, McGovern, and Davie (2014); Tuan Mat & Smith, 2014; Ern et al. (2016); Ogungbade and Olweny (2017); Nair and Nian (2017) and Shahzadi et al. (2018) who concluded the significant effect of AMT on MMATs. The results showed indicate that differentiation strategy is positively and significantly associated with MMATs. Also, the cost leadership strategy has a significant association and positively with MMATs. This result is in line with the previous studies examining the management accounting practices such as Urquidi (2013); Ghasemi et al., (2015); Sreekumar (2015) and Amara and Benelifa (2017). Same argument as before, although this result confirms the significant effect of business strategy on MMATs and supports the previous literature regarding this relationship. The result implicates that MMATs are more effective for firms applying differentiation strategy and low-cost strategy. Where companies used MMATs to support their decision needs and assist them to monitor progress against their strategies in view of the uncertain external environment.

Organizational culture, one of the internal factors, the findings of this research showed that the group organizational culture is insignificantly associated with MMATs. This indicates that the group organizational culture of the departments in industrial companies listed in ASE, not significant with the use of MMATs. This result confirms the result of the study of Sumkaew (2016), while studies of Chongruksut (2009) and Atout (2017) reported otherwise. From the above discussion, one possible

explanation for the non-significant relationship is that the experience of industrial companies in ASE in making use of flexible values is limited as they have not gained enough experience in using and benefiting from these values in different aspects of their work such as use MMATs. On the other hand, it can be argued that industrial companies in ASE easily influenced by Arabian business culture in using a broad set of management accounting practices. Thus, unlike other contingent factors that this study confirmed with respect to their effect on the extent of MMATs usage. The organizational structure was measured by decentralization as one of the internal factors, the findings of this study showed that decentralization is insignificantly associated with MMATs. This result confirms the result of the study of Erserim (2012); Ayadi and Affes (2014); Ern et al. (2016) and Amara and Benelifa (2017), while studies of Abdul-Kader and Luther (2008); Pavlatos (2018); Shahzadi et al. (2018) reported otherwise. Similarly, the researcher tries to provide plausible reasons for figuring out the emergence of such a result. The organic organizations that contain few hierarchical layers, greater decentralization and a horizontal mode of communication did not give impetus to the probability of MAP adoption. A possible explanation is MA information may not be essential for some employees. Decentralization provides local managers with discretion in managing their operations; therefore, when problems emerge, managers may prefer to have other solutions or tools for their decisions.

CONCLUSION

This study reveals that external and internal factors can improve the adoption of MMATs in industrial companies listed in ASE. Moreover, the mixed finding of an effect of both external and internal factors on MMATs offers a significant finding with regard to the contingency theory that there is no universally acceptable MAS that is equally applicable to organizations in all circumstances within the context of industrial companies listed in ASE.

LIMITATIONS AND RECOMMENDATIONS

Generally, the scope of the study was limited to the industrial sector listed in ASE; however, it is possible to generalize these findings in similar industries. Moreover, the levels of awareness of external, internal factors and MMATs within the sector are viewed differently from the other sectors. This limitation opens for the opportunity of future research works in other sectors such as financial and services in order to draw conclusions. Thus, generalization can be made for all the sectors listed in ASE. Moreover, the findings of this study also cannot be generalized to other developing countries due to different levels of orientations towards applying these techniques and the surrounding circumstances of the countries. It was highly recommended to further investigate the study model in other Arab countries for obtaining more insights and generalization.

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