

Changes in the business environment and the level of management accounting practices in Egypt: a case study

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Abstract: The aim of this research is to investigate whether changes in the **business** environment lead to changes in the level of management accounting practices (MAPs), and whether the level of MAPs affects the company's ability to achieve competitive advantages. The research follows a case study method to achieve its goal. El Araby Company, a leading company in manufacturing and marketing of electronic devices and appliances located in north of Cairo, Egypt, is selected to validate hypotheses of the study. Findings indicate that the company applies modern technology in all its activities, especially production systems, and faces fierce price competition. Findings also reveal that the company applies traditional and modern MAPs alike. Results indicate that the level of MAPs in El Araby Company keeps pace with technological developments and intensity of competition, and MAPs play a basic role in developing the company's ability to achieve competitive advantages.

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1. Introduction

The successive studies in the field of management accounting (Simmonds 1981; Johnson & Kaplan 1987; Waweru et al. 2004; Abdel-Kader & Luther 2006; Langfield-Smith 2008; Pavlatos & Paggios 2009; Alleyne & Weekes-Marshall 2011; Tuanmat & Smith 2011; Sleihat et al. 2012) suppose that the environment in which management accounting is practiced clearly appears to have changed because of rapid developments in computer-based production technology, local and global fierce competition, and new management strategies that focus on quality, lower cost, and customer satisfaction. These changes lead to the inability of traditional management accounting techniques to provide appropriate information (non-financial, future, external) for making strategic decisions (Ma & Tayles 2009). To keep pace with these changes, many management accounting techniques are invented to provide appropriate information for formulation, implementation, and evaluation of an organization's strategy. The new techniques that are commonly used are activity based costing, target costing, product life cycle costing, quality cost management, customer accounting, value chain analysis, benchmarking, and the balanced scorecard (Maiga & Jacobs 2003; Cadez 2006; Simon 2006). Many surveys (Islam & Kantor 2005; Abdel-Kader & Luther 2006; Cadez 2006; Shank 2007; Pavlatos & Paggios 2009) are carried out in developed countries to monitor the level of management accounting practices (MAPs). The majority of these studies provide evidence that traditional MAPs are still

widely used, while they report a limited use of modern MAPs. This unbalanced use, which tends to favor traditional practices, comes despite the enormous developments in the technology of production systems that impact on the cost structure, and despite the emergence of new strategies and philosophies of management to face fierce global competition which focuses on quality, zero inventory, and customer satisfaction. It is clear that the results of these studies are inconsistent with expectations in accounting literature. These Expectations assume that changes in the business environment are coupled with changes in the practice of management accounting (Waweru et al. 2004, 678).

There are a few studies conducted in some developing countries, such as Malaysia (Ilias et al. 2010; Tuanmat & Smith 2011), Singapore, Malaysia, China, India (Sulaiman et al. 2004), South Africa (Waweru et al. 2004), and Jordan (Sleihat et al. 2012). These studies point to the prevalence of traditional MAPs and the scarcity of advanced MAPs. Also, there are very few studies on the sophistication level of MAPs in Egypt which report on conflicting results. Triest and Elshahat (2007) indicate the lack of advanced MAPs in Egypt based on a survey of 40 companies belonging to four sectors (pharmaceuticals, foodstuff, chemicals, and packaging and wrapping industries). In a survey of 250 industrial companies in Egypt, Abdel Al and McLellan (2011) find that companies still apply and believe in the usefulness of traditional MAPs because they fit well with management functions in light of economic transformations taking place in Egypt. On

the other hand, Abdel-Maksoud et al.(2012) find a high level of contemporary MAPs based on a survey of manufacturing firms operating in the three biggest industrial areas in Egypt.

Conflicting results of studies conducted in Egypt are probably due to several reasons. First, concepts and techniques of strategic management accounting are relatively new. Second, there is an overlap between the accounting and management disciplines, where some of disciplines consider most strategic management accounting techniques as part of it. Also, some terminologies and concepts of strategic management accounting are introduced in the scope of other management functions (Langfield-Smith 2008). So, there is no wonder when we find that management accounting techniques are applied by some companies in different departments such as marketing, financial analysis, plan and budget, and human resources. In practice, most companies have no department for management accounting (Abdel-Kader & Luther 2006; Sleihat et al. 2012)

Third, the survey method may not be appropriate because only one responsible person for a company will be mostly mailed by a structured questionnaire. This responsible person may not be familiar with all management accounting techniques applied in his company, while many of these techniques are implemented by other departments perhaps under different names other than scientific terms. Accordingly, the survey may not accurately reflect the level of MAPs in the study sample. Most surveys that targeted identifying the level of MAPs in developed and developing countries may fall into this error. Results of previous studies support this view. For example; Abdel-Kader & Luther's (2006) and Sleihat et al.'s (2012) survey explore low levels of MAPs, while Waweru et al.'s (2004); Alleyne & Weekes-Marshall's (2011) case study reveals high levels of MAPs.

Fourth, the response rate in the case of postal surveys may equal zero in Egyptian surveys because of certain aspects of the Egyptian culture such as a tendency towards secrecy (Triest & Elshahat 2007), the fear from managerial penalties, and the top management teams do not commonly believe in the value of scientific research. In addition, face-to-face interviews help explain the meaning of new terminologies and techniques of strategic management accounting that may be applied by the companies under different names rather than those that are scientifically known.

Based on the above mentioned reasons, this research follows a case study method. El Araby Company, located in north of Cairo, is selected as a case study because it is the largest company in the manufacture of electronic devices and appliances in

Egypt, and the oldest private sector company in its field. It depends on advanced Japanese technology in its operation, produces a broad range of electronic household appliances, has excellent successes in this industry, and has great confidence in Egyptian, Arab, and African markets.

The aim of this research is to identify the level of MAPs in the context of the changes in the business environment in Egypt, to find out whether the technological developments and the intensity of competition affect the level of MAPs, and whether the level of practice leads to achieving competitive advantages.

The main scientific contribution of this study can be summarized in the following points: (1) it may be the first study on the level of MAPs pursuing a case study method in Egypt. (2) it comes in response to the call of researchers (Sulaiman et al 2004; Ismail 2007; Triest and Elshahat 2007; Abdel-Al & Mclellan 2011; Sleihat et al. 2012) to bridge the apparent gap in prior research which belongs to the paucity of research on the level of MAPs in developing countries, including Egypt. (3) it examines the validity of the following beliefs in the accounting literature: (a) the development of MAPs is mainly due to changes in the business environment especially competition and technology, (b) advanced MAPs support the organization's ability to achieve competitive advantages.

The remainder of this paper is organized as follows: after the introduction, part two presents the background and theoretical framework, part three identifies El Araby Company and explains the study method, part four demonstrates results of the case study, part five discusses the study results, and finally part six provides the conclusion of research, limitations, and future studies.

2 - Background and theoretical framework

2.1 Changes in the business environment

The global business environment has witnessed numerous and successive developments during the past three decades. The most important facets of these changes are as follows: (Islam & Kantor 2005; Cable et al. 2009; Mat et al. 2010; Tuanmat & Smith 2011; Abushaiba & Zainuddin 2012) (1) World Trade Organization (WTO) is urging the acceding countries to remove the protection barriers against the global trade and to allow free movement of people and capital among nations, leading to increased globalization. (2) The rapid developments in information and communication technology make the whole world a small village in which every individual or organization knows events, innovations, and new products on time. (3) The development of computer-based production systems

and short product life cycles led to the emergence of new products constantly and to changing the cost structure of production. (4) The integration of local and international companies, and the emergence of multinational companies which allocate large budgets for research and development to create new products constantly. (5) The fierce competition relies on high quality, low price, responsiveness, reliability, security, and customer satisfaction. (6) The emergence of new philosophies and theories of management such as just-in-time, total quality management, and comprehensive performance management based on strategic thinking and evaluation of competitors' capabilities.

There are interrelationships between the previous facets. For example; globalization leads to increasing the intensity of competition and the emergence of multinational companies. The development in information and communication technology leads to further globalization and more competition. Competition leads to the emergence of new philosophies of management to create a competitive advantage which, in turn, leads to the competition becoming stronger.

The ratification of the free trade agreements by developing countries, including Egypt, leads these countries to open their markets to global competition. Encouraging foreign investments results in bringing advanced production technology through the branches of foreign companies, and the modernization of production lines of national industries. These changes in the intensity of competition and technology supposedly force firms to adopt modern philosophies of management, such as JIT, TQM, lean production, and strategic performance management systems (Islam & Kantor 2005; Cable et al. 2009; Tuanmat & Smith 2011).

The Egyptian business environment has particularly undergone drastic changes in the past few decades (Abd-Elsalam & Weetman 2003; HassabElnaby et al. 2003; Triest & Elshahat 2007; Dahawy et al. 2009). These changes began from the mid-seventies of the last century by applying a policy of openness to the outside world, establishment of free economic zones, issuance of a law to encourage Arab and foreign investments in 1974, re-opening the Egyptian Stock Exchange in 1991, adopting the privatization policy at an accelerated pace (1993-2010), and Egypt's ratification of a number of international free trade agreements, such as the World Trade Organization in 1995, COMESA in 1998, European Partnership in 2002, and QIZ in 2004.

All these changes direct Egypt's economy towards the application of market mechanisms. Since that time, the Egyptian economy powerfully entered the international competition circuit. Foreign

companies' branches have emerged in Egypt and brought advanced production technology. These force Egyptian companies, particularly the manufacturers of electronic devices and household appliances, to keep pace with technological developments in the production and information systems and to apply modern management theories.

2-2 Management Accounting practices

The main objective of accounting information is to assist external and internal users for making valuable decisions. Management accounting is a branch of accounting that produces information for internal (managerial) purposes (Ilias et al. 2010). Since the beginning of the eighties of the last century, many of the pioneers of accountancy, such as K. Simmonds; R. S. Kaplan; D. P. Norton; H. T. Johnson; R. Cooper; R. H. Chenhall; A. G. Hopwood, have realized that traditional MAPs - in the context of last changes in the business environment – were not suitable for the provision of appropriate information to develop an organization's competitive strategy on the bases of quality, responsiveness, on-time delivery, flexibility, lower cost, and other competitive advantages. Since that time, those pioneers have called for developing new techniques of management accounting to provide non-financial information besides financial information, extending the attention of management accounting to cover strategic operations, and focusing on the external environment of the organization in addition to its internal environment (Simmonds 1981; Kaplan 1984; Johnson and Kaplan 1987; Cooper 1996; Langfield-Smith 2008; Hopwood 2008; Chenhall 2012).

In response to these calls, many contemporary techniques of accounting are developed. Accounting literature groups these new techniques under the title of “strategic management accounting”. These advanced techniques are difficult to count because of the absence of agreed management accounting theory (Roslender and Hart 2003; Cadez 2006; Langfield-Smith 2008; Ma & Tayles 2009; Malmi & Granlund 2009) and the overlap among disciplines. Some techniques are considered by accountants as a core of strategic management accounting while other disciplines consider it as a part of them. This overlap is evident in practice where studies (Chenhall & Langfield-Smith 2003; Langfield-Smith 2008) indicate that many of the strategic management accounting techniques are implemented outside the scope of the accounting function by human resources, marketing, financial analysis, plan and budget, and other departments. Sleihat et al (2012) find that 40% of Jordanian companies which are surveyed do not have a department of management accounting, and

management accounting techniques are exercised by other departments such as financial analysis, strategic planning and others.

Despite the lack of agreement on a specific framework for strategic management accounting, researchers (Guilding et al. 2000, Cadez 2006) identify three characteristics of strategic management accounting, which are to focus on the outside environment (customers, competitors and technology), future and long term oriented, and providing financial and non-financial information for decision-making.

Many researchers (Guilding et al. 2000; Cravens & Guilding 2001; Guilding & McManus 2002, Cadez 2006) do their best efforts to count strategic management accounting techniques, but it is premature to claim reaching the final list of strategic management accounting techniques so far. The modern techniques frequently stated in surveys (Cadez 2006; Abdel-Kader & Luther 2006; Langfield-Smith 2008; Pavlatos & Paggios 2009; Sleihat et al. 2012) are activity based costing, activity based budgets, life cycle costing, target costing, quality costing, value chain costing, benchmarking, the balanced scorecard, competitor performance appraisal, attribute costing, strategic position analysis, and customer profitability analysis.

Over the last three decades, many studies have traced the level of MAPs in many developed and developing countries. Some studies (Cadez 2006; Langfield-Smith 2008) have judged the level of practice (conventional or strategic) based on whether the technique provides strategic information (future, external) or not. Other studies (Tuanmat & Smith 2011; Sleihat et al. 2012) have relied on the model of the International Federation of Accountants (IFAC 1998), which identify four stages of the development of management accounting objectives. Stage one: cost determination and financial control (pre 1950), Stage two: information for management planning, control and decision-making (by 1965), Stage three: reduction of resource waste in business processes (by 1985), and Stage four: creation of value through effective resource use (by 1995). These stages are cumulative so that each stage covers the objectives of the previous stages.

Most surveys provide evidence about the prevalence of traditional MAPs, but they indicate that the key personnel have awareness of the benefits of modern techniques and they intend to apply them in the future. A pioneering study (Abdel-Kader & Luther 2006) conducted on the food and beverage industry in the UK finds that strategic management accounting techniques come in lower order versus traditional techniques which have a widespread use. Abdel-Kader & Luther's (2006) study interprets these

results that the respondents may not know the modern practices of management accounting undertaken by other departments in their company. For instance; the study finds that product life cycle analysis is performed by specialists in the production department, while competitive position analyses and competitors' strengths and weaknesses analyses are conducted by the marketing department. The study predicts that advanced management accounting techniques will have a widespread use in the future because the managers recognize their usefulness.

A USA study (Shank 2007) has reviewed the surveys that investigated "strategic cost management" during the period from 2000 to 2005. The study found that companies surveyed in that period did not move beyond the pilot studies and few companies offered their successes in this regard. Also, Shank's (2007) study found that many corporate programs focused on teaching traditional management accounting techniques.

A Greek study (Pavlatos & Paggios 2009), conducted on the hospitality industry, finds that the traditional management accounting techniques (for example; budgets, measures of profitability, product profitability analysis, customer profitability analysis, absorbed costing, and non-financial metrics for performance evaluation purposes) are widely used versus the new developed techniques. The study points that many of the hotels are going to apply modern techniques in the future, especially techniques of activity-based costing, the balanced scorecard, and benchmarking.

Mat et al.'s (2010) study indicates that Malaysian companies still apply, to a large-scale, traditional management accounting systems to meet the needs of internal and external reporting, on the reverse of foreign companies operating in Malaysia which apply advanced techniques of management accounting.

A study on the financial sector in Jordan (Sleihat et al. 2012) finds that most of the companies surveyed are located in the first and second phase according to the model of the International Federation of Accountants (IFA,1998). The study also finds that traditional practices are still largely used, whereas it finds a limited use of advanced techniques. In general, the study finds that budgets and financial metrics are widely used, and the decision-making and strategic analysis techniques are scarcely used.

In contrast to previous surveys, research that relies on case study reports different results. A case study (Alleyne & Weekes-Marshall 2011) is conducted on three Indian companies, finds that most of the management accounting techniques (traditional and modern) are widely used and effectively

contribute to the success of the organization. Another case study (Waweru et al. 2004), conducted on four companies for retail in South Africa, finds that there is a significant increase in the use of modern management accounting techniques especially activity-based costing and the balanced scorecard.

2-3 Study model and hypotheses

Accounting literature (Gupta & Gunasekaran 2005; Abdel-Kader & Luther 2006; Pavlatos & Paggios 2009; Ma & Tayles 2009; Mat et al. 2010) assumes that changes in the business environment are the main engine for the invention of new management accounting techniques. These changes lead to increasing uncertainty and risks that surround decisions concerning development of a competitive strategy to achieve superiority over competitors. This situation creates a need for more non-financial information, necessitating the innovation of new techniques of management accounting.

Sulaiman and Mitchell (2005); Gupta and Gunasekaran (2005) argue that management accounting systems are not static in nature; if the business environment changes, the role of management accounting will change also. Gupta & Gunasekaran (2005); Mat et al. (2010) have evidenced that when the business environment had changed, the role of management accounting changed also. Some studies (Garg et al. 2004; Ma & Tayles 2009; Ilias et al 2010) claim that with the changes in the business environment, the role of management accounting changes and management accountants are increasingly perceived as business partners in performing management functions. They focus on key strategic issues which are beyond the boundaries of the conventional financial role. Abdel-kader & Luther (2006) allege that contemporary MAPs shift the focus of management accounting from the simple or naive role of cost determination and financial control to a sophisticated role of creating value through better use of resources. Pavlatos & Paggios's (2009) study finds that hotels that use new techniques of management accounting have a high proportion of indirect costs, gain high sales revenue, and face stronger price competition compared to hotels that do not apply these advanced techniques.

Some studies investigate the influence of the external and internal factors on the extent of the usage of MAPs, and the benefit of using these practices by using a variety of theories such as the institutional theory (Hussain and Gunasekaran 2002; Ma and Tayles 2009; Chenhall 2012) and the contingency theory (Burns et al. 2004, Waweru et al. 2004). They find that the increase in global competition and technological development are the

two main factors affecting MAPs in South Africa. Accordingly, in this study we limit our investigation to technological development and competition variables because we expect that those two factors have the greatest impact on the level of MAPs in Egypt.

Strong competition and quick technological developments force companies to recognize the need for more objective information about the use of resources and processes (Waweru et al. 2005; Islam & Kantor 2005). Those two factors make management accounting systems provide accurate and timeliness information to facilitate cost control efforts, measure and improve productivity, and make better pricing decisions (Johnson & Kaplan 1987).

Technological development takes many facets; the most important of which is the integration between production technology and information systems (Islam & Kantor 2005; Mat et al 2010). Therefore, robot and computer based production systems emerged. These computerized systems monitor and decide -on time- on the progress of operations. They provide convenient operational information for automatic intervention or for taking appropriate management decisions to achieve the greatest value from the use of resources. Advanced production systems result in fading the need for standard cost systems and changing the cost structure of production (Tuanmat & Smith 2011). This necessitates changing the techniques of cost management to achieve proper measurement of the cost of activities, processes, and products. Then, new techniques of management accounting are invented such as activity-based costing, activity-based budgeting and activity-based management, which depend on the activity as a driver of cost rather than the volume of production.

The competition is the degree to which a company can create a defensible position in the face of its competitors (Porter 1985). It depends on the competitive capabilities that allow the company to distinguish itself from its competitors (Hosseini & Sheikhi 2012). Competitive capabilities are activities that can be undertaken by the company better than its competitors. The way the company chooses to improve its competitive advantages must create great difficulties for competitors to imitate. This achieves sustainable competitive advantages for the company (Porter 1985). Competitive advantage is the possible excellence based on providing great value to the customer or achieving a relative low cost (Mohamed et al. 2010). These competitive advantages are the outcome of critical management decisions (Porter 1985), which need strategic information about competitors, customers, quality, pricing and market share, competitive position, strength of the brand, and

value drivers. Then, it is necessary to develop modern techniques of management accounting to provide such information which traditional techniques fail to provide. In the very complex competitive environment, Roslender (1995); Abushaiba & Zainuddin (2012) claim that management accounting should provide the necessary information to formulate, implement, and evaluate management strategies for achieving competitive advantages.

Many studies (Chenhall & Langfield-Smith 1998; Hyvonen 2005; Islam & Kantor 2005; Abdel-Kader & Luther 2006; Abd Allah 2011; Sleihat et al. 2012) find that modern management accounting techniques help in achieving competitive advantages. Through appropriate and useful information provided by those techniques, organizations can draw a clear vision to formulate their competitive strategies and make better decisions.

Several studies in various countries examine the benefits of advanced MAPs and discuss the role of management accounting information in managing organizations. A study in Germany (Heidmann et al. 2008) finds that the upper and middle management get appropriate information from management accounting systems for strategic decision-making. In Spain, Lobo et al.'s (2008) study reveals that the management accounting information plays an important role for continuous improvement and facilitates implementation and evaluation of an

organization's strategy. In India, a case study of three companies (Alleyne & Weekes-Marshall 2011) explains that managers realize that management accounting techniques applied in their companies effectively provide appropriate information for the decision-making process. Malaysian study (Mohamed et al. 2010) finds a positive relationship between strategic performance measurement systems (BSC) and organizational competitive advantages.

From the above discussion, we conclude that the management accounting literature assumes that both competition and technological development necessitate applying new management accounting systems to provide adequate information for strategic decision-making. Management accounting literature also assumes that the level of MAPs determines the organization's ability to achieve competitive advantages. Figure 1 presents the proposed model which describes the relationships between these concepts. Based on the above discussion, we formulate the following hypotheses:

H1 - There is a positive relationship between technological development and the level of MAPs.

H2 - There is a positive relationship between the intensity of competition and the level of MAPs.

H3 - There is a positive relationship between the level of MAPs and the organization's ability to achieve competitive advantages.

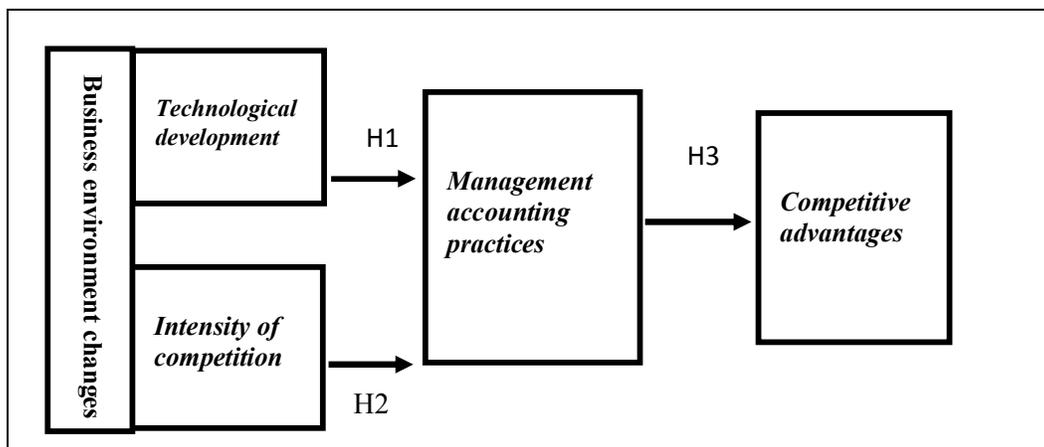


Figure 1: Proposed theoretical framework

3- El Araby Company and Research Method

El Araby Company is an Egyptian joint-stock family enterprise owned by three brothers, located in north of Cairo. Since its establishment in 1964, El-Araby Company has been evolving year after year in the field of electronics and consumer durable goods. Today, El-Araby Company has become one of the most significant industrial and

commercial corporations in Egypt and the Middle East.

El Araby Company is a group of factories concentrated in two industrial complexes located in Banha and Quesna town. Each factory is called a company and treated as an economic entity.

Presently, El Araby Company embraces a Group of companies (factories). In Banha town: El Araby Company for Trading and Manufacturing. In

Quesna town: El Araby Company for Engineering Industries, El Araby Company for Air-conditioning and Cooling Industry, El Araby Company for lighting technology, El Araby Company for Home Appliances industries, Toshiba El Araby for Visual Products

El Araby Company is managed by a board of directors chaired by one of the three owners. It is organized in several sectors. The general manager for sub-company (factory) is responsible to the head of the sector. For example; industrial general manager is responsible to the head of the industrial sector. In turn, the latter is responsible to El Araby Company president, who in turn is responsible to the board of directors.

According to the gathered information by interviews, El Araby's investments (assets) are approximately 2 billion Egyptian pounds. It employs over 18,500 skilled workers receiving wages half a billion Egyptian pounds per year, in addition to social insurance and other benefits. Its turnover is over 6 billions Egyptian pounds annually. But, rate on investment do not exceed 3% for 2012, because of the current political situation. After the Egyptian revolution in January 25, 2011, the cost of labor and materials has increased.

El Araby Company strives to achieve its vision specified in this statement: "To become a leading company working in the field of technological products and durable devices in Africa and the Middle East."

The qualitative methodology (i.e. use of semi-structured interviews including open-ended questions) was deemed to be appropriate since the research required opinions and feelings on the topic (Saunders et al. 2003; Alleyne & Weekes-Marshall 2011). The researcher visited El Araby Company on ground and viewed its websites. He obtained some preliminary data, and selected key personnel in various positions of responsibility who were likely to have knowledge about changes in the business environment and MAPs in the Company. Heads of sectors and general managers were commonly targeted for an interview, namely financial, production, quality control, marketing, sales, strategic planning and analyses, human resources, and after-sales services. Telephone calls were made to the key personnel to secure success of interviews. Face-to-face interviews were conducted. Interviewees were informed of the nature of the research. The interviews were performed in June-July, 2013. Each interview lasted about two hours with each key personnel that the researcher was able to meet with. In addition, the researcher visited the factories to view the production technology, quality control systems, performance data collection systems, and performance reporting systems. Although the researcher explained that

sensitive matters obtained during the interview will not be included in the paper, and promised that the identity of data source would not be referenced, the researcher was allowed to view a few documents due to confidentiality and personnel's fear of losing their jobs.

According to the proposed study model we have four basic variables: technological development, competition, management accounting practice, and competitive advantage. These variables are described by asking interviewees many open questions, in particular the following four questions: (modified to be more polite during interviews)

Q1: what are the modern technology applications used in El Araby Company over the last five years?

Q2: what are the types of competition that faced El Araby Company over the last five years?

Q3: what are the competitive advantages that differentiate El Araby Company from its competitors over the last five years?

Q4: what are the MAPs applied by El Araby Company over the last five years?

4- Results

4-1 Technological development:

The key personnel who were interviewed responded that El Araby Company applied the latest Japanese technology. "The company practices not only the Japanese technology but also the Japanese behavior ", a head of a sector added. The key personnel remarked and the researcher viewed during the visits of factories that El Araby Company was highly dependent on robots. The head of the Industrial Sector said, "Our company applies the Flexible Manufacturing System, Computer Aided Design, Computer Aided Engineering, and Computer Integrated Manufacturing." The head of the Quality Sector stated, "Finished products are automatically inspected on a complete basis (100%), in addition to quality control during operation 'In Process Quality Control'.

In El Araby Company, technological developments are not only constricted to production and quality control systems, but extend to the data collection and reporting systems. Where a computerization control system "Supervisory Control and Data Acquisition (SCADA)" is applied, automatically collecting data and conveying it to the central site, it does necessary analyses, and calculates many actual performance indicators. Also SCADA presents figures and graphs on operator screens. Beside that, computers are used to provide on time performance information for each machine "Purifying Systems" and for the entire production line "In Circuit Tester". Performance reports are prepared at least twice a day to take appropriate decisions regarding any obstacles or dysfunctions.

System application program (SAP) is also implemented. SAP is an integrated electronic accounting system to collect, process, and report financial information and certain non-financial indicators, and prepare the financial statements. Accounting performance reports are presented on a daily or weekly basis and upon request about key process factors. A duration financial report is prepared every three months for a sub-company and for a company as a whole, and audited by an internal audit function. In addition, annual financial reports are prepared and audited by a famous domestic audit firm and a branch of foreign audit firm located in Egypt.

The head of the Financial Sector commented:

After the completion of the computerization process, the financial sector now is able to report its information more quickly and broadly, more senior managers can view the financial and performance reports online. This reduces the duration of management meetings and improves the quality of decision making.

4-2 Intensity of competition

Some directors acknowledged that El Araby Company had been facing an increasingly fierce competition. The Company relies on seven dimensions (7M) to face this competition: first class Materials quality, advanced Machine, best Methods to deal with production elements, attract skilled Men, modern Management theories, customer oriented Marketing, and Money to fund operations and projects.

One director expressed the intensity of price competition by saying:

Our company was forced to sell about 1500 television devices at prices lower than the production cost to maintain the market.

In facing competition on the basis of quality, El Araby Company depends on Lean Production and Zero Defects strategy. It applies the latest quality control and inspection systems, and provides long guarantee periods, up to ten years. The Company is a pioneer in the introduction of new products. The head of the Quality Sector stated:

The product life cycle in our company is not more than six months. The product is monitored from the time it is introduced to the market and during the growth and maturity phases to determine the time a new product is launched.

The General Manager of Marketing said:

Our company holds the largest market share and it is constantly evaluating opening new markets and distribution channels at home and abroad.

Another manager of marketing said:

Our company is facing an increased number of Egyptian and foreign competitors. Market reaction

is quick toward new prices and products. So, our company is constantly working to assess the capabilities and strategies of competitors.

4-3 Competitive advantages

El Araby Company aims to be the first Egyptian Arabic African company in its field by the end of 2014. To achieve superiority over competitors, it relies, first, on a set of ethical values in trading with all parties like piety, honesty, courage, and compassion. Second, the value received by the client is higher than the money paid. It always tries to make the prices of its products less than competitors. The company's sales policy is "more sales with less margin". One of its directors commented:

The cost of production is the key factor in determining the product price but the market mechanisms are the ultimate determinant of the price, so all managers are required to submit a monthly report on the actual reduction in operating costs and his vision to reduce cost in the future.

The company offers a wide range of products and is also keen to provide a higher quality than a competitor, so that the unique characteristics of the product must meet the client wishes. It applies strict programs for the control and inspection of quality to maintain the image of the company's products in the customer's mind and to continue his/her loyalty to the company's products. It is also eager to make the product near to the customer by using thousands of distribution outlets and sales agents.

After-sales service and technical support are also provided. One manager of marketing said:

El Araby Company has a call center in which 320 employees are ready to receive complaints from customers seven days a week. The center submits an immediate report of customer data and his/her complaint to the department of technical support which, in turn, decides the date of service, ranging from one to five days at most, and then the customer is contacted to make sure whether he was better serviced according to the time schedule and to measure his satisfaction.

4-4 Level of management accounting practices

4.4.1 Costing systems

El Araby Company separated costs into their fixed and variable components, and classified production costs into direct costs and indirect costs. This classification was mainly subjectively based on managerial experience. In spite of the high-tech production environment in which indirect costs constitute a higher percentage of cost structure, the General Manager of Accounts said:

In our company, direct costs are close to the indirect costs due to increased workers' wages and the high exchange rate of dollar after the Egyptian revolution in January 25, 2011.

Indirect costs are mainly allocated to individual products based on activities that are regarded as an allocation base. A different overhead rate is used for each activity center. The activity-based costing technique was introduced after the company suspected that some of its product prices were not realistic. So, ABC was used to provide accurate cost data for pricing and control purposes.

The target costing technique is also applied in the planning and design phases of the product, where the sales price is estimated before production, then the target margin is subtracted, and the rest is the target cost. The same approach is applied after production. Accordingly, manufacturing alternatives are studied for cost reduction to reach the target cost. Deviations are analyzed based on estimated costs, not standard costs. The three kinds of quality cost are calculated: prevention cost, internal failure cost, and external failure cost.

4.4.2 Budgeting

El Araby Company prepares activity based budgeting for a year divided into twelve months to serve the purposes of planning and control. "What If" is applied to get different scenarios of budget to manage the changing circumstances and uncertainty. Based on actual data for the last two months, budget is adjusted for the following two months. Based on the pull system philosophy the company constantly monitors the relationship between Production, Sales and Inventory (PSI), where managers submit monthly reports on these three variables, and then the production volume is determined. In addition to the operating budget, El Araby Company prepares the capital budget for the purpose of long-term planning. The payback period and net present value are mainly used to prepare the capital budget.

4.4.3 Performance evaluation

El Araby Company applies a strategic performance measurement system, where the balanced scorecard at the level of sub-company is prepared based on sub-company's strategy. It also prepares the balanced scorecard for the company as a whole, based on the general strategy of the company which stems from its mission: "to provide high quality products using advanced technology to meet consumer desires and expectations". One head of sectors commented:

A meeting is monthly held in which the general managers display sub-company's performance metrics according to the four perspectives of the balanced scorecard: learning and growth, operations, customer, and financial. Incentives are monthly determined based on actual data of the balanced scorecard.

Computer aided performance measurement systems are implemented to provide information

about non-financial performance for each machine and for the entire production line. The data is immediately reported to the general managers and heads of sectors. This data is the basis for evaluating the work of every machine, operator, and production line. It is also used to assess availability of product components, plan maintenance programs, determine training needs, and estimate the incentives.

El Araby Company applies benchmarking to evaluate its performance compared to the performance of competitors and Japanese standards. The JIT system is applied to a limited extent due to the prevailing culture in the Egyptian business sector, conditions of import from abroad, and the political and security conditions after the revolution of January 25, 2013 In Egypt. One head of sectors said:

The daily political demonstrations that disrupt traffic, security decay, and the continuous rising of the dollar exchange rate hinder the application of JIT as well as applied in Japanese companies.

4.4.4 Information for decision making

Because of the belief in the modern scientific management, El Araby Company practices several management accounting techniques to serve operational and non operational decisions. The researcher finds that the company carries out cost volume profit (CVP) analysis, differential analysis, product profitability analysis, and customer profitability analysis. It prepares a contribution income statement for the sub-company and the total. It also performs inventory control models based on the moving average method.

Capital investments are evaluated on the base of payback period for small investments, while discounted cash flows are widely used for bigger investments. In all cases, the decision on whether to implement a project or not is made based on the judgment and approval of company owners. Several projects were implemented in the past although they had failed to pass the evaluation accounting bases like net present value test. Interestingly, the majority of these projects had later proved to be viable. The company also conducts sensitivity analyses (what if), probability analyses, and simulation to assess the risk of the investment proposals. This is consistent with what happens in Egypt, which encounters high levels of uncertainty nowadays due to the Egyptian revolution

4.4.5 Strategic analysis

El Araby Company conducts an analysis of the industry to determine future trends in the philosophy of manufacturing. An analysis of the product life cycle is performed from the emergence of the product idea until design, production, marketing, and stopping. Continuous value chain

analyses are also practiced to remove any activities that have no value. One director stated:

Value chain analysis is the main practice for the cost reduction in our company.

El Araby Company also conducts an analysis of the supply chain which covers the activities of suppliers, the company, and customers in order to reduce costs and get the best performance. It also conducts an analysis of the competitive position, estimates the costs of competitors' products, and analyzes competitors' strengths and weaknesses.

5- Discussion of results

After discussing the key personnel, it is clear that El Araby Company applies traditional and advanced MAPs alike. The most important traditional techniques applied are (1) classification of costs into variable and fixed, direct and indirect (2) use of multiple overhead rates for assigning indirect cost (3) budgets (4) CVP analysis, and (5) inventory control models. The advanced techniques that are commonly used, are (1) activity-based costing (2) analysis of the product life-cycle cost (3) balanced scorecard (4) benchmarking (5) competitor analysis, and (6) customer accounting.

Findings indicate that there is no department of management accounting, but El Araby Company has a central department for analyses and measurements. The term strategic management accounting is not familiar among managers, including the financial sector. Findings also reveal that more than one department are involved in the adoption of management accounting techniques, namely financial, marketing, quality control, production and industrial engineering, human resources, customer service, and department of analysis and measurement. The key personnel have a deep belief in the value of modern management accounting techniques. That is clear from the three managers' comments:

One manager said: The balanced scorecard creates a clear mechanism for implementing the company's strategy. It helps us to look at one goal and induces cooperation among units. The card provides the fair basis to decide incentives and promotion of staff in our company.

Another manager said: Activity-based costing changes our understanding of cost management in our company.

A third manager said: Benchmarking contributes to the assessment of our company's strategic position for the competitors.

Based on data collected, the researcher finds that El Araby Company applies advanced technology in all of its activities, especially the production systems, and it encounters increased fierce competition on the local and international levels. The level of MAPs in El Araby Company keeps pace with the technological

developments and the intensity of competition. Managers and directors believe that the traditional and advanced MAPs provide the necessary information for effective decision making to achieve the competitive advantages.

When one director was asked whether he views a relationship among technological developments and the intensity of competition on the one hand and the level of MAPs on the other hand, he amusingly said:

Our Company can not progress in the application of modern technology without adopting contemporary MAPs. In our company all the modern production systems have a computer system providing real-time information about the machine performance and the employees' performance. Accounting applications are accomplished electronically to provide quick information at different levels of details. Modern management methods can not be applied to achieve competitive advantages without financial and non-financial information. We regard managerial accounting as the primary source for this information.

In sum, the researcher finds that the data obtained from the case study, through either interviews or views, supports the validity of the study hypotheses that suppose the technological development and the competition positively affect the level of MAPs, which in turn affect the company's ability to achieve competitive advantages.

6- Conclusion

The primary focus of this research paper is to examine whether the change in the business environment affects the level of MAPs, and whether the level of MAPs affects the company's ability to achieve competitive advantages. The case study method is adopted to achieve the research goal. El Araby Company, a leading company in the engineering industries and electronic devices, is chosen as a case study to validate the three proposed hypotheses. The research finds that the modern technology is applied in all company activities, especially the production systems. The Company encounters a fierce price competition. The level of MAPs keeps pace with technological developments and intensity of competition. The level of MAPs strongly effects the company's ability to achieve competitive advantages. These findings are consistent with a wide body of conceptual and empirical literature about changes of MAPs based on competitive and technological environments (referenced in 1, 2, and 3 previous sections of this paper)

Similar to most studies, this one does have limitations. So, considerations should be made of the limitations that accompanied this paper, which can be

summarized in these points. (1) The key personnel who were interviewed may paint a favorable picture of their company. (2) The limited number of interviewees the researcher was able to meet. (3) The researcher was allowed to view few documents because of the secrecy and personnel's fear of losing their jobs. These limitations may reduce the credibility of paper results. But mitigating the impact of these limitations, the researcher visited the company several times, watched the nature of production systems, and viewed some advanced MAPs like the balanced scorecard, budgeting system, and quality control techniques.

There are opportunities to perform further future research. For instance; perform the same study on a limited number of companies using the multiple case study approach with expanding the number of business environment variables to include organizational and cultural variables besides the technological development and the intensity of competition.

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