

Financial Managers' Perceptions on the Successful Implementation of Activity-Based Costing in China Industrial Shareholding Companies

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Abstract: *The activity-based costing (ABC) system is now thought to be the most effective replacement to traditional costing systems. The purpose of this article is to describe and shed light on the ABC implementation, as well as to demonstrate the value of implementing the system in terms of increasing profitability and aiding decision-making processes. Furthermore, discuss the shortcomings of the current ABC approach used in Chinese industrial shareholding enterprises. Additional goal is to achieve results and recommendations that will aid in the better use of the ABC system in Chinese industrial companies. To answer the study objectives, a quantitative method design was used, with a questionnaire. The current study included a sample of financial managers/heads of accounts from Chinese industrial businesses. From an economic standpoint, the ABC system is innovative, and the findings of this study could be applied to improve the industrial sector and product quality in the future. It was also expected to help Jordan's economy grow, since the industrial sector served as a stepping stone toward that goal.*

Keywords: Activity-based costing (ABC), Implementation, China.

Introduction

Addressing the shortcomings of conventional volume-based costing systems, Cooper and Kaplan (1988) came up with an alternative, the Activity-Based Costing (ABC) technique; and they proclaimed: "ABC certainly ranks as one of the two or three most important management accounting innovations of the twentieth century" (Cooper & Kaplan, 1988, p.15). Roztocki and Schultz (2003) and Byrne (2011) noted that ABC offered substantial advantages over the traditional costing approach. For example, ABC did not depend on single-cost drivers, like machine hours and direct labor. It was rather based on multiple-cost drivers, which were utilized to determine the overhead costs of industrial activities, and allocate costs to products by estimating the sum of costs incurred during the activities necessary for the production of these products (Kim *et al.*, 1997). As multiple activities were used as cost drivers, ABC was able to decrease the risk of distortion and generate more reliable costing data (Kim *et al.*, 1997). This explains why ABC system has been growing in popularity among both intellectuals and businessmen since its introduction in the late 1980s (Innes *et al.*, 2000; Bjoernenak & Michelle, 2002; Byrne *et al.*, 2009). Introducing ABC system to firms helped to change the traditional costing systems and with 1990s, researchers have started the use of contingency theory to examine the variables affecting ABC implementation. Thus, the researchers use contingency approach framework in order to describe the role of contingency variables in management accounting practices-

Numerous researches and academic works have considered the implementation of ABC, purposes for applying it, the barriers linked with ABC and the key factors relating to its successful implementation. However, the empirical evidence from works and reports of ABC research is dilemma. ABC context (Kongchan, 2013). Majid & Sulaiman (2008), Zhang (2010), Aldukhil (2012), Saad Al-Dhubaibi & Haniff (2013), Kongchan(2013) and Intakhan (2014) have identified the impacts of contingency factors on the process of ABC implementation. However, they came out with identifying the success factors as proposed by shields (1995). Abusalama (2008) and Zhang (2010) reported that for the success of ABC implementation, the behavioral, organizational and technical factors require for more consideration. A number of reports started to disregard the effects of technical variables altogether as other variables (behavioral, organizational and cultural) were almost conclusively shown to be more substantial. When the ABC has been started in the mid of 1980, the studies related to adoption and implementation were highlighted on technical issues such as, cost drivers selections, activities identification and gathering of cost data (Zhang, 2010). Shields (1995) identified key behavioural and organizational factors that are essential for the success of ABC implementation. These identified factors are sub-groups of contingency factors and comprise of: Top management support, Linkage of the ABC system to competitive strategies especially quality initiatives, Linkage of the ABC system to performance evaluation and compensation, Adequate internal resources, Training in designing, implementing and using the ABC system, non-accounting ownership, Consensus about and clarity of the objectives of ABC. Although ABC offers much more compared with traditional costing systems, implementing ABC has been shown to be hindered by a number of factors. A decision to implement ABC was found to be subject to the perceptions of corporate leaders about the amount of necessary work. The decision was often halted on account of more impending tasks.

The present study aimed to explain and shed light on the ABC system and display the usefulness of implementing the system in terms of improving profitability and serving the decision-making process. Moreover, to describe the weaknesses of the current ABC system applied in Chinese industrial shareholding companies. Additional objective, to reach to results and recommendations that may help in better using of the ABC system in Chinese Industrial companies.

Theoretical Review

The Definition of Activity-Based Costing System

Over the years, large numbers of reports have discussed the ABC system, and many definitions of the system have been proposed. Below is a list of some of these definitions: According to Turney (1996), ABC is a means of estimating the cost and effectiveness of processes and cost objects. The cost of particular activities is estimated by determining how much resources would be necessary to complete it. ABC then identifies cost-to-cost objects by examining the activities that they require. Thus, according to Turney's definition, ABC serves more than for the purpose of product cost estimation as it also represents a tool that can enable the measurement of activity performance to provide a clear picture regarding the progress made in various activities. Krumwiede and Roth (1997) believed that ABC was an accounting system that enabled the estimation of the cost and effectiveness of different activities, products and other cost objects. Krumwiede and Roth observed that when elaborate industrial procedures are involved and when products are produced in large quantities, ABC tends to generate more reliable data compared to volume-based costing systems. Needy *et al.* (2000) described ABC merely as a tool for cost management designed to overcome issues associated with the use of more traditional costing approaches to manage overhead costs. On the other hand, Baxendale (2001) defined ABC as a strategic tool for corporate planning that utilizes accounting data generated by accounting standards to better evaluate product profitability and extract previously unprocessed expenditure data. This conviction was also adopted by Needy (2000), who held that ABC was an invaluable system for cost assessment and a highly effective tool for corporate strategy making. ABC is believed to represent a costing methodology that takes indirect costs and allocates them to activities and process cost pools; and later allocates these costs to users. It efficiently does so for all the activities that involve products and customers (Player and Keys, 1997).

ABC Benefits

ABC has been shown to be superior to traditional costing systems in many aspects (Johnson and Kaplan, 1987). According to Majid and Sulaiman (2008), upon adoption of ABC, an organization readily reaps two kinds of benefits: strategic and operational. Johnson and Kaplan (1987) pointed out that the strategic benefits of ABC were consequences of the minimal cost of data generation as it had direct effects on a large number of corporate decisions, including those pertaining to pricing, developing a novel product and dropping outdated products. ABC was also found to be associated with more effective and timely responses to competitors. The system resulted in more reliable product cost estimates, provided much more expenditure-related data to support a better evaluation of operations, generated useful information to enhance the decisions of corporate leaders, facilitated sensitivity analyses and served as an advanced model for value-added corporate transactions and processes (Chung *et al.*, 1997).

According to Swenson (1995), ABC may be a useful tool for product designers to land the optimum decision on trade-offs that would minimize the cost and realize desirable performance targets. This is possible because ABC enables product designers conduct valuable comparisons among the different types of expenditure-relevant data generated by the system (Johnson and Kaplan, 1987). Studying the operational advantages associated with ABC in the US, Shields (1995) found that 75% of organizations expected to reap financial gain following ABC implementation. The elaborate data acquired by ABC may also enable corporate leaders to enhance the efficiency of present procedures and eliminate non-value-added activities. Investigating Irish organizations, Clarke *et al.* (1999) noted that the most cited advantages of ABC adoption were the generation of more reliable expenditure data that proved to be useful for product costing and pricing; enhanced cost manipulation and supervision; having more reliable tools for cost justification; and being able to assess the progress and analyze sales profitability efficiently. According to Malmi (1999), once implemented, ABC allows organizations to seemingly update the costing system, which would enable the accounting system to cope with market competition. Assessing tangible enhancements in financial procedures following ABC implementation, Malmi (1999) proclaimed that the data produced by ABC platforms enabled corporate leaders to carry out a variance more effectively. In 2001, Kennedy and Affleck-Graves found that ABC users produce a higher level of stock return than ABC non-users. Listing the major advantages of ABC over conventional costing systems, the authors noted that ABC allowed unbiased determination of overheads as it efficiently picked out dormant "activity drivers". By virtue of being a "new technology", ABC was able to handle a progressively intricate and random cost base. Kennedy and Affleck-Graves believed that ABC was an approach for task recognition that was capable of integrating non-accounting elements, and an empowering tool similar to a "panopticon" that took advantage of existing statistics generated by managerial data systems.

Based on field data collected in 1997 through an investigation that covered over 2,789 industrial facilities in the US, Ittner *et al.* (2002) proclaimed that ABC implementation resulted in significantly better-quality products, minimized production durations and a substantial enhancement of first-pass quality.

Key Crucial Factors to ABC Implementation Success

Introducing ABC system to firms helped to change the traditional costing systems and from 1990s, researchers have started the use of contingency theory to examine the variables affecting ABC implementation. Thus, the researchers use contingency approach framework in order to describe the role of contingency variables in management accounting practices-ABC context (Kongchan, 2013). Majid and Sulaiman (2008), Zhang (2010), Aldukhil (2012), Saad Al-Dhubaibi and Haniff (2013), Kongchan (2013), and Intakhan (2014) have identified the impacts of contingency factors on the process of ABC implementation. However, they came out with identifying the success factors as proposed by shields (1995). Abusalama (2008) and Zhang (2010) reported that for the success of ABC implementation, the behavioral, organizational and technical factors need to be considered. A number of reports started to disregard the effects of technical variables altogether as other variables (behavioral, organizational and cultural) were almost conclusively shown to be more substantial. When the ABC has been started in the mids of 1980, the studies related to adoption and implementation were highlighted on technical issues such as, cost drivers selections, activities identification and gathering of cost data (Zhang, 2010). Shields (1995) identified key factors that are essential for the success of ABC implementation. These identified factors are sub-groups of contingency factors.

Barriers to ABC Implementation

Although ABC offers much more compared with traditional costing systems, implementing ABC has been shown to be hindered by a number of factors in the developed countries (Cohen *et al.*, 2005). An investigation conducted by Innes and Mitchell (1995) involving 187 British managerial accountants revealed that when a proposal to implement ABC was turned down, usually one of the following reasons was cited: (1) the system's being unsuitable for the needs of the business; (2) the lack of advantages over an existing system; (3) overhead's being minimal compared with the total costs; (4) the benefits' not reflecting the cost of implementation; and (5) the lack of a good ABC software package.

According to Innes and Mitchell (1995), data collected from seven of the organizations that had implemented ABC revealed that the major difficulties experienced when attempting to adopt ABC were (1) the massive work needed to implement the system,

(2) having to attend to matters of higher priority, (3) the staff's being preoccupied with other tasks, (4) limitations in computer resources, (5) problems related to the collection of data on cost drivers and activities, (6) inability to allocate the resources needed to discard an existing system and adopt ABC, (7) the high cost of implementation, and (8) suboptimal cooperation from senior corporate leaders. The study showed that although over 20 organizations were considering ABC, no final decision was taken to implement the system in any of these organizations. A decision to implement ABC was found to be subject to the perceptions of corporate leaders about the amount of work necessary. The decision was often halted on account of more impending tasks; the lack of good ABC software packages; limitations pertaining to the number of accounting and information technology personnel capable of finalizing the designs and implementing the system; and the difficulty of performing data collection to determine cost drivers and have them integrated into available product lines to effect a marked change in product costing. It is noteworthy that most of the issues cited above were, in fact, experiential obstacles associated with change and not technical difficulties. Interestingly, a large number of studies have rather pointed out specifically to the difficulty of data collection as the principal factor preventing ABC implementation in most organizations (Innes and Mitchell, 1995; Chen *et al.*, 2001). This is because to be effective and successful, ABC must be fed accurate, elaborate data that could help the system identify cost-drivers, and assess the interactions between these drivers and products (Booth and Giacobbe, 1997).

Research model

The literature review added a field to the research including particular factors suggested by Shields (1995) which enrich and contribute in a successful implementation of management accounting system. In fact, the literature review about ABC research adds particular boundaries regarding the inclusion of key factors identified by Shields. Thus, Shields (1995) reported that the success of ABC implementation depends on how well it is affected with key technical, behavioral and organizational variables. These identified factors are sub-groups of contingency factors and comprise of: top management support, linkage of the ABC system to competitive strategies especially quality initiatives, linkage of the ABC system to performance evaluation and compensation, adequate internal resources, training in designing, implementing and using the ABC system, non-accounting ownership, and consensus about and clarity of the objectives of ABC. In addition, the technical factors that are essential for a successful implementation of ABC. Considering the essential role of information technology that affects ABC success implementation is significant. Reynolds, A., (2013) reported that the companies that have a higher information technology level are more likely to contribute in ABC success. Kongchan, P., (2013) and Xiao *et al.*, (2011) argued that the literature hasn't get benefits from the significant relationship between information technology and ABC.

In the present study, list of reasons for applying the ABC system were used to test the main purposes for implementation of ABC. These reasons referred to perspectives called: fashion, fad and forced pressures. In addition, the present study seeks to identify and explore the barriers for ABC implementation. ABC-related literature, there is no specific

agreed definition of a successful ABC implementation and past studies examined ABC success measures differently (Aldukhil, 2012; Kongchan, 2013). Success of ABC means different things to different people (Zhang, 2010; Aldukhil, 2012), it's measured differently across firms (Aldukhil, 2012), and this study's definition of ABC success is derived from Byrne *et al.* (2009) vision on ABC success. The present study follows the vision of Byrne *et al.* (2009) on ABC success as it's considered to be the most powerful basis toward the ABC success measurement in ABC research; therefore, the present study followed this vision. The variables that will be used in the current research as indicators for this success are technical characteristics, organizational process impact, and perceived usefulness in improving job performance (McGowan, 1998).

Research methodology

A number of researches on ABC system use the survey method (Like: Fei, Z. Y., 2010 ; Askarany *et al.*, 2010 ; Aldukhil, Y. ,2012). In order to examine the theories about developments in management accounting, the survey method is used (Young and Selto, 1991). Also, this method is the most popularly used in business studies. The present research adopted the quantitative approach by employing a questionnaire using five-point Likert scale closed questions. As the current research is important in Chinese economy, it focuses in the industrial sector in Jordan. So, the target population was financial managers / heads of accounts in Chinese industrial companies, excluding the respondents who are working in the companies that have less than 50 workers as management accounting systems would be irrelevant at such companies. The sample size of this study comprises of 378 financial managers / heads of accounts who are working on Chinese industrial companies (Sekaran, 2003).

Research results and Descriptive analysis

Descriptive statistics were performed to describe the purpose of using ABC, the motivation to implement ABC, the reasons for not implementing ABC. Descriptive statistics includes mean and standard deviation.

Implementation of Activity-Based Costing System

This section presents various pieces of information related to ABC system implementation in Chinese industrial companies.

Knowledge of ABC

The participants were required to show their degree of knowledge relating to ABC system. The answers indicated that 16 or 4.23% of participants have no knowledge, 20 or 5.29% and 43 or 11.38% of participants mentioned that they were experts of ABC and they have extensive knowledge of ABC and respectively. Approximately 117 or 30.95% claimed to have a good knowledge of ABC. Finally, 182 or 48.15% of participants have a general knowledge of the system according to Table 1.

Table 1: Knowledge of ABC

Knowledge of ABC	Frequency	Percent
No knowledge	16	4.23%
General knowledge	182	48.15%
Good knowledge	117	30.95%
Extensive knowledge	43	11.38%
Expert knowledge	20	5.29%

Initial Source of ABC Knowledge

The participants were asked to indicate how they first learned ABC system. The answers show that 39.78 % and 33.15 % of the participants learned ABC firstly at university as well as professional training respectively. Then seminars or conference 13.81%, followed by self-reading 13.26% as presented in Table 2.

Table 2: ABC First Source

Initial Source of ABC Knowledge	Frequency	Percent
University	144	39.78%
Professional training	120	33.15%
Seminars or conference	50	13.81%

through self-reading	48	13.26%
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Use of ABC

ABC users are the significant target of the current study, 217 or 57.41% of respondents regarded themselves as ABC users, and 161 or 42.59% of respondents regarded themselves as non-users of ABC, as indicated in Table 3.

Table 3 : Use of ABC

Use of ABC	Frequency	Percent
ABC non-users	161	42.59%
ABC users	217	57.41%

The Purposes of ABC Implementation

The participants who had implemented ABC were required to mention the purpose of the implementation of ABC system. The participants were given a list of ten major purposes of ABC implementation, based on a 5 -point scale rating from 1="strongly disagree" to "5=strongly agree.

As presented in Table 4 users of ABC greatly showed that main purposes of applying ABC were: product design (mean scores=4.31), budgeting and planning (mean scores= 4.31), outsourcing decisions (mean scores =4.28), stock valuation (mean scores =4.15), pricing decisions (mean scores= 4.04), performance measurement (mean scores= 3.81), cost reduction (mean scores= 3.80), customer service (mean scores =3.63), profitability analysis (mean scores=3.44), and product mix decisions (mean scores =3.3 6). It can be seen from Table 4.6 that the highest used application is for determining the product design and budget preparation with a mean value 4.31 for each one.

These purposes of the implementation of ABC system in the present research however seem different to Aldukhil (2012) results. He reported that the product costing, pricing decisions, performance measurement, and process improvement were the main purposes of the implementation of ABC system. Overall, the purposes of the implementation of ABC system are almost the same of those reported in other studies of other countries such as Al-Omiri (2003); Leftesi (2008) and Abugalia (2011).

Table 4: Purposes of ABC Implementation

	Descriptive Statistics			
	Min	Max	Mean	Std.D
1. Product Design	3	5	4.31	0.683
2. Stock valuation	3	5	4.15	0.811
3. Outsourcing decisions	3	5	4.28	0.877
4. Performance measurement	2	5	3.81	1.025
5. Pricing decisions	2	5	4.04	1.251
6. Budgeting and planning	3	5	4.31	0.740
7. Product mix decisions	1	5	3.36	1.478
8. Profitability analysis	1	5	3.44	1.409
9. Cost reduction	2	5	3.80	0.906

10. Customer Service	2	5	3.63	0.966
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The Reasons that Motivate to Implement ABC

The participants who had implemented ABC were required to judge the significance of factors in motivating the choice to implement ABC system. The participants were given a list of six major motivations of ABC implementation, based on a 5-point scale rating from 1=strongly disagree to “5=strongly agree”.

As presented in Table 5, users of ABC greatly showed that inability of traditional cost system to provide relevant information for management (mean scores =3.95); increasing proportion of overhead costs (mean scores =3.91); the inaccuracies of product cost of the traditional cost system (meanscores =3.85); productionprocessis complexand have multiple stages (mean scores =3.64); and inability of the traditional cost system to adopt to increased automation in production process (mean scores =3.48) were widely mentioned reasons that motivate to implement ABC. Moreover, these results show the different trend compared with Booth and Giacobbe’s study (1997). They reported that the awareness of ABC literature, high number of product lines, and the awareness of significance of indirect costs were the key reasons that motivate the implementation of ABC. Overall, the reasons for motivating the ABC implementation are almost the same of those reported in other studies of other countries such as Chung *et al.* (1997); Al- Omiri (2003) and Abusalama, (2008).

Table 5: Reasons that Motivate to Implement ABC

Descriptive Statistics				
	Min	Max	Mean	Std.D
1- Increasing proportion of overhead costs	2	5	3.91	0.776
2- Increased competition	1	5	2.23	1.013
3- Inability of traditional cost system to provide relevant information for management	3	5	3.95	0.714
4- Production process is complex and have multiple Stages	2	5	3.64	1.001
5- The inaccuracies of product cost of the traditional cost system	2	5	3.85	1.148
6- Inability of the traditional cost system to adopt to increased automation in production process	3	5	3.48	0.625

The Reasons for Not Implementing ABC

This study also seeks to identify the barriers for ABC implementation in the Chinese manufacturing sector. To shed light on this, the participants who had not implemented ABC were asked to judge the significance of factors in describing their decisions for not implementing ABC system. The participants were provided a list of 19 possible reasons that could describe why their firms had not implemented ABC. The participants were required to rate the items according to a five-point scale in which 1 presents (strongly disagree) while 5 (strongly agree). The findings are presented in Table 6.

The widely mentioned reasons for preventing the ABC system implementation were higher execution cost (mean scores= 4.09); higher priorities of other changes or projects (mean scores= 4.04); higher cost of recruiting experts (mean scores =4.03); difficulties in collecting data relates to cost drivers (mean scores =4.00); difficulties in designing system (mean scores= 3.99); lack of awareness of the ABC system (mean scores =3.98); no significant problems with current costing system (mean scores =3.96); not clear on the ABC system advantages (mean scores =3.95); difficulties in determining cost drivers (mean scores= 3.94); lack of top management support (mean scores =3.89); lackof cooperationamongdepartments (mean scores= 3.83); satisfactionwith the current costing system (mean scores=3.79); difficulties in identifying activities (mean scores =3.64); auditors do not provide information to the company about the ABC system (mean scores =3.53); and unavailability of computerized systems that help in application (me an scores= 3.53).

These results are consistent with findings of other prior studies (Nguyen and Brooks, 1997; Askarany and Smith, 2000; Al-Omiri, 2003; Abusalama, 2008). The satisfaction of the used cost system is clear to be a popular reason for encouraging them to maintain the existing costing systems in developing countries (Chen *et al.*, 2001) including Jordan. It is surprising to report that the lack in ABC system experts (mean scores =2.27) was found to be the lower essential obstacle in Chinese manufacturing companies while some findings in other studies found that this problem was a main obstacle in applying ABC (Chen *et al.*, 2001; Al-Omiri, 2003). On the other side, there was great disagreement with the statements of resistance to change (mean scores =2.51), lack of resources (mean scores =2.47), integration with current accounting systems (mean scores =2.39). This finding contrasts with the result by Abusalama, (2008) who concluded that these obstacles seem to be essential reasons for not applying ABC.

Overall, the reasons for preventing ABC implementation are almost the same as those reported in other studies of other countries (Innes and Mitchell, 1995; Nguyen and Brooks, 1997; Askarany and Smith, 2000; Chen *et al.*, 2001; Al-Omiri, 2003; Abusalama, 2008; Aldukhil, 2012).

Table 6: Reasons for Not Implementing ABC

Descriptive Statistics				
	Min	Max	Mean	Std.D
1. Satisfaction with the current costing system	3	5	3.79	0.554
2. No significant problems with current costing system	2	5	3.96	0.819
3. Lack of awareness of the ABC system	2	5	3.98	0.805
4. Lack of top management support	2	5	3.89	0.798
5. Auditors do not provide information to the company about the ABC system	3	5	3.53	0.613
6. The lack in the ABC system experts	1	5	2.27	1.109
7. No clarity of the ABC system advantages	2	5	3.95	0.807
8. Higher priorities of other changes or projects	2	5	4.04	0.808
9. Resistance to change	1	5	2.51	1.127
10. Lack of resources	1	5	2.47	1.110
11. Higher execution cost	3	5	4.09	0.648
12. Unavailability of computerized systems that help in application	3	5	3.53	0.560
13. Lack of cooperation among departments	2	5	3.83	0.797
14. Higher cost of recruiting experts	2	5	4.03	0.827
15. Difficulties in collecting data relates to cost drivers	2	5	4.00	0.809
16. Difficulties in determining cost drivers	3	5	3.94	0.750
17. Difficulties in designing system	3	5	3.99	0.824
18. Difficulties in identifying activities	3	5	3.64	0.587
	1	5	2.39	1.070

19. Integration with current accounting systems

Conclusion, limitations and further research

The study hopes that this study serves as a foundation for an effort to sharpen the understanding of the implementation of ABC. Another possibility could be taken under consideration for future researcher is to study other factors which could play a vital role to boost and open a certain avenue to increase the success of the ABC implementation. In addition, the present study also examined the reasons behind implementing and into implementing ABC in the companies. The current study confirms that ABC is not suitable for all companies. Examining companies that have not implemented ABC shows essential views for reasons behind not implementing ABC. The participants express some reasons such as the companies have a good level of satisfaction with the current system and the cost system such as ABC is not much more important compared with other innovations. So, according to the survey, the managers in this case do not encounter significant problems in the function of the current costing system, such managers therefore do not see that ABC will achieve a greater accuracy. Given that this study was carried out in Jordan, it would be interesting for future research to test and discover the factors for this study in other cultural settings, like other Asian or western countries. This would be valuable in providing evidence concerning the robustness of research variables across different cultural settings.

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