

# The Impact of Strategic Costing Techniques on the Performance of Jordanian Listed Manufacturing Companies

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## Abstract

This study provides an effort to present strategic costing techniques as a group in the context of SMA literature, where these techniques were primarily studied separately in the past. The study examines the impact of using strategic costing techniques on Jordanian Listed Manufacturing Companies (JLMC) and to examine the impact of these techniques on the performance of these companies. A survey on JLMC was conducted for data collection. A total of 91 questionnaires were distributed to these companies. Out of this number, only 60 were returned. The response rate was about 65.9%. Descriptive statistics studies showed that JLMC achieved better performance compared to the period before adopting strategic costing techniques. One-sample t-test showed that all of strategic costing techniques were used by JLMC. The results of multiple regressions showed that these techniques contribute significantly and explain a high percentage of variation of JLMCs' performance. Three of explanatory variables were ABC, TC, and COQ have a statistically significant positive effect on JLMC's overall performance, financial performance, and market performance. The rest of explanatory variables which were attribute costing, LCC, and VCC did not have a statistically significant effect on the mentioned categories of performance of JLMC. Regarding the production performance of JLMC, it has been found that all of explanatory variables except attribute costing technique have a statistically significant positive effect on this category of performance. In respect to the limited studies about the relationship between strategic costing techniques as group and firm performance, this study recommends researchers conduct more studies on this subject. The study also recommends JLMC continue adopting all of SMA techniques in the future.

**Keywords:** Strategic management accounting, strategic costing techniques, ABC, TC, attribute costing, LCC, COQ, VCC, firm performance.

## 1. Introduction

Traditional managerial and cost accounting has been historically introduced to many of systems and techniques. The objectives of these systems and techniques were to aid firms' management in achieving their goals. In general, the information gathered by these systems and techniques were used in internal operations of firms.

By the end of the last century, the business environment has been affected by many important variables such as empowerment of customers, level of competition, and the evolution of technology. These changes have led to the development of managerial and costing systems in firms.

The main focus of managerial accounting has always been to improve the organizational performance and profitability by providing relevant information for planning, controlling and decision making. Over past three decades, strategic management accounting (SMA) has emerged as one of advanced issues in accounting that concerns the pursuit of shareholder value and aiding management in achieving organizational goals.

SMA has many advanced managerial and costing techniques that have achieved huge improvement in determining and measuring costs, which lead to significant savings and reductions in the costs, and some of these strategic costing systems may have led to the changing of traditional cost structures which impacts decision-making as well. In context of SMA, the strategic costing systems contain six items which are activity based costing (ABC), target costing (TC), attribute costing, life cycle costing (LCC), cost of quality (COQ), and value chain costing (VCC).

This study aims to examine the extent of strategic costing techniques used by Jordanian Listed Manufacturing Companies (JLMC). It also aims to examine the impact of these techniques on the performance of these companies.

## 2. Literature review

Recent years have seen increased growth in academic studies about the concept and the use of SMA techniques. In general, there are contradictory results about usage of SMA techniques. Cinquini and Tenucci, 2006; Santini, 2013 pointed out that it is greater than the expected. Cadez and Guilding, 2008; Fowzia, 2011; Yap et al, 2013; found that SMA techniques have not been widely adopted. Chenhall and Langfield-Smith, 1998; Guilding et al, 2000; Ramljak and Rogosic, 2012; found that some SMA techniques such as ABC, competitor accounting, strategic pricing, COQ, were widely adopted.

The relationship between SMA techniques and firms' performance has also been tested. Rosli et al.

(2014) found that SMA usage had a significant relationship with firm performance. Chai-Amonphaisal and Ussahawanitchakit (2010) also found that SMA implementation is positively associated with corporate performance. Egbunike et al (2014) referred that the sustainability performance measurement is a multi-faceted activity, requiring managers to implement strategic techniques capable of capturing information from diverse areas. Santini (2013) found that the SMEs which operate in high-complexity environment use SMA tools more extensively to achieve higher financial performance. Gatandi (2014) found that 95.26% of the commercial banks in Kenya under consideration use at least one of the strategic initiatives. In addition, strong evidence emerges that the use of strategic initiatives leads to improvement in financial performance of samples.

In respect to the relationship between strategic costing techniques as group and firm performance, no study was ever conducted on this subject. Many studies examined the same techniques at an individual level.

Regarding to the effect of ABC system on firms' performance, Kennedy and Affleck-Graves (2001) pointed out that ABC adds to firm value through better cost controls and asset utilization, coupled with greater use of financial leverage. Zaman (2009) referred that the perception of ABC in terms of strategic cost allocation method, increased efficiency and increased effectiveness has significant effect on firms' performance. Rattanaphaphtham and Ussahawanitchakit (2010) referred that ABC effectiveness is significantly and positively related to production process efficiency, cost advantage, product planning proficiency. Production process efficiency, cost advantage, and product planning proficiency are significantly and positively related to financial performance. Moreover, Abdullah et al (2014) referred that ABC has had a positive influence on improvement of financial performance.

Relating to the target costing (TC), Huang et al. (2012) found that the implementation of TC was positively associated with both business model innovations and firm performance. It is also found that higher achievement of TC is associated with higher firm performance (Rattray et al., 2007; Juhmani, 2010). Imeokparia and Adebisi (2014) found a strong positive relationship between adoption of TC and of improvement in return on investment and reduction of cost. Associated with other contemporary cost management techniques including ABC system, Saaydah and Khatatneh (2014) and Mijoc et al. (2014) found that an influence of TC on accounting and market performance. Omar et al. (2015) proposed a framework which indicates that dynamic capabilities factors are a key to the right balance across the crucial elements of TC: cost reduction, quality, functionality, and lead time. Some other studies also related TC with other important issues in the firm such as Reducing and improving costs (Talha and Raja, 2010), quality improvement and cost reduction (Terdpaopong and Visedsun, 2014), enhancing cost advantage and quality advantage in competitive manufacturing industry (Idowu, 2014), and improving profitability, cost competitiveness, feasibility analysis, and optimizing product design and production set-up (Slater, 2010).

Regarding the attribute costing, McNair et al. (2001) stated that understanding of the relationship between the costs of the firm and the value the firm provides to its customers is the key to the ability of the firm to reach its profit potential. They developed the value creation model which seeks to understand the trade-off between what the customer is willing to pay for a product/service bundle (value) and the cost the firm bears to provide what the customer desires. Randall and Ulrich (2001) analyzed product variety at the product attribute level, where they noting that the relative impact of variety on production and market mediation costs depends to a large extent on the attribute underlying the variety. In their study, Randall and Ulrich (2001) found no evidence to suggest that offering more variety through strategies of mass customization or variety postponement results in higher firm performance. Despite the attribute costing technique is one of the most compelling developments within SMA (Roslender and Hart, 2003), there is a lack of direct studies about this disciplines.

In context of relationship between life cycle costing (LCC) and firm performance, no direct studies were found with exception of the study conducted by Tekavcic and Sink (2002) who found that the average financial performance is dependent on the use of life cycle costing in addition to other techniques including ABC and target costing. Tutterow et al. (2001) referred that LCC analysis is a tool that can help companies minimize costs and maximize energy efficiency for many types of systems. Lindholm and Suomala (2005) pointed that LCC is actually more a way of thinking than merely a costing tool because in addition to the management of costs, it focuses on the long-term performance of products by employing a variety of management accounting methods.

With respect to cost of quality, Uyar (2008) referred that the most important three objectives behind COQ measuring and reporting are: overall quality improvement; setting cost reduction targets and measuring progress; and improving control of quality activities. (Sailaja et al (2013) presented an application of activity based cost management of cost of quality in a manufacturing industry and compared the results with the traditional P-A-F model. The results highlight the weak points of traditional cost of quality model. From other side, Sower et al (2007) found that Sales and profit growth were not significantly correlated with the presence of a quality cost system or with the level of maturity of the quality system. Furthermore, Lin and Johnson (2004) referred that the traditional nonfinancial measures of quality performance are currently preferred under the business environment in China, while the COQ reporting has not yet received sufficient support in practice in the

country.

Regarding value chain costing (VCC), Firm performance is considered a comprise for both the financial performance of the firm and intra-firm supply chain performance which is further divided into cost performance in the form of logistics costs, service performance and asset utilization, as suggested by the research literature (Solakivi, 2014). Randall and Ulrich (2001) found evidence that firm performance is positively associated with correctly matching supply chain strategies to product variety strategy. Solakivi (2014) found a higher level of supply chain collaboration associated with lower logistics costs and better financial performance

### 3. Strategic costing techniques

As it mentioned earlier, the contemporary business environment has been affected by many important variables such as empowerment of customers, level of competition, and the evolution of technology. These changes led to the development of costing systems in firms. These systems achieved a huge improvement in determining and measuring costs, which lead to significant savings and reductions in costs, better decision-making, and improvements in performance. In the context of SMA, the strategic costing systems include the following techniques:

#### 3-1 Activity based costing (ABC)

ABC has become a well known system since it was initially introduced in the mid- 80's. Blocher et al. (2012) defined ABC as a costing approach that assigns resource costs to cost objects such as products, services, or customers based on activities performed for the cost object. The core idea in this system is that the products consume activities and activities consume resources. Based on this idea, the activities should be analyzed based on the cause-and-effect relationship with cost. So, Cooper and Kaplan (1991) stated that ABC can give managers a clear picture of how products, brands, customers, facilities, regions, or distribution channels both generate revenues and consume resources. Furthermore, Firms using ABC can obtain more accurate information of how specific products, customers, or supply chains affect costs and contribute to overall profitability (Pohlen and LaLonde, 1994).

Several benefits could be achieved using ABC system including: increasing the accuracy of cost allocation to products (Ittner et al., 2002), improving the ability of an analyst to estimate the cash flow (Hilton, 2011), and enhancing its usefulness to strategic decision-making (Gupta and Galloway, 2003). The benefits of ABC cannot be overemphasized and these include among others greater accuracy in product costing, greater involvement of production managers, improved management information and improved profitability (Adamu, A. and Olotu, 2009). ABC also can be used to influence how strategy is formulated. The uses of ABC during strategy formulation include pricing decisions, supplier selection, customer profitability analysis, product design and development, and cost reduction (Blocher et al., 2005).

#### 3-2 Target costing (TC)

Target costing can be defined as a cost management tool for reducing the overall cost of a product over its entire life cycle with the help of the production, engineering, research and design, marketing, and accounting departments (Sakurai, 1989). So it is a comprehensive cost planning, cost management, and cost control concept. The target costing process requires the cost-oriented coordination of all product-related organizational functions (Horváth, 1993). Target costing usually starts with strategic analysis of the competitive environment and the customer needs beginning from quality requirements and functionality of product, which are mostly determined by the customers.

#### 3-3 Attribute costing

This technique depends mainly on the idea that products are desirable because of the features they provide to the customers (Lancaster, 1979). The attribute costing require accountants to embrace strategic information as well as cost information. This would entail costing the attributes or characteristics provided by products and monitoring and reporting these costs regularly (Šoljaková, 2012). Attributes that may be costed include: operating performance variables, reliability, warranty arrangements, the degree of finish and trim, assurance of supply and after sales service (Guilding et al., 2000).

#### 3-4 Life cycle costing (LCC)

LCC is a means of estimating all the costs involved in procuring, operating, maintaining and ultimately disposing a product throughout its life (Jagtap, 2013). This is done with the objective to find out whether the revenues, which are earned during the manufacturing stage, will be sufficient to cover the pre and post-manufacturing costs. Woodward (1997) pointed that LCC is concerned with optimizing the total costs in the long run by both estimating the costs prospectively and monitoring them retrospectively. Thus, the life cycle costing is a way to enhance the control of manufacturing costs through better planning and designing of the product right

from the idea generation stage (Vechalekar, 2009).

### 3-5 *Cost of quality (COQ)*

COQ measurement and analysis is one of the most powerful management tools for ascertaining the performance of a firm (Sailaja et al, 2013). It is usually understood as the sum of the price paid for prevention of poor quality and the cost incurred due to product and service failure. It is a significant cost driver that firms need to control effectively in order to sustain competitive advantage (Narasimhan, 2013). The cost of quality helps organizations to develop quality conformance as a useful strategic business tool that lead to improve their product's services and brand image (Bottorff, 1997). From other side, COQ represents a financial measure of the quality performance of an organization (Dale and Plunkett, 1999). The total of the quality costs includes prevention costs of non-conformance to requirements, appraising costs of product or service for conformance to requirements, and failure costs of products not meeting requirements (Campanella, 2003). Regardless of the COQ model employed, companies that use COQ programs tend to reduce overall COQ and improve quality for the customer (Schiffauerova and Thomson, 2006).

### 3-6 *Value chain costing (VCC)*

The idea of value chain was introduced by Porter (1985) to depict how customer value accumulates along chain of activities that lead to an end product or service. The value chain was described as the internal processes or activities a company performs to design, produce, market, deliver and support its product; including after-sales services. VCC is a technique that allocates cost to those activities. VCC technique helps a company in assessing, developing strategic position; evaluate competitive cost position, reducing time, and costs (Yang and Shang 2007), it is also acts as a useful extension of conventional cost analysis, taking into account benefits and cost savings embedded in the firm's links with suppliers and customers (Cullen, 2009). Supply chain costing is a technique that could be embedded in value chain (Kauffman and Crimi, 2004). It provides a mechanism for developing cost-based performance measures for the activities comprising the key processes within the whole chain in the firm.

## 4. **Organizational performance**

Performance measurement system is an essential tool that enables organizations to achieve and control their desired objectives. Griffin (2003) described organizational performance as the extent to which the organization is able to meet the needs of its stakeholders and its own needs for survival. So, improving business performance has been one of the central tenets of management and remains fundamental to organizational success (Neely 1999). Kaplan and Norton (1992) highlighted that financial management alone is not sufficient in assessing an organization's competitive position or explaining an organization's trends. In addition, Falshaw et al. (2006) have noted that financial measures of performance can capture only one part of the company's profitability. Therefore, organization performance is seen as a multi-dimensional concept that cannot be sufficiently reflected in a single performance dimension (Randolph and Dess, 1984; Baker and Sinkula, 2005).

Reviewing the related literature indicates that different approaches and methods have been utilized to measure and conceptualize organization's performance (Kaplan and Norton, 1992; Harris and Mongiello, 2001; Phillips and Parry, 2006; Ottenbacher, 2007; San Ong and Teh, 2009). Sink and Tuttle (1993) argue that the performance of an organizational system is made up of a complex of various interrelated criteria including effectiveness, efficiency, quality, productivity, quality of life on job, innovation, and profitability. Neely et al (2005) concluded that performance could be divided into four dimensions of quality, time, cost and flexibility. From the supply chain perspective many dimensions could be addressed such as resource-related, output-related and flexibility-related (Beamon, 1999), strategic, tactical and operational (Gunasekaran et al., 2004). Akyuz and Erkan (2010) referred that performance measurement in the new supply era is still an open area of research. However, there is a rich variety of performance initiatives within the manufacturing sector. These initiatives cover financial and nonfinancial indicators that could be used to operationalize performance systems in manufacturing sector. The most popular indicators in this regard include return on investment (ROI), return on asset (ROA), sales growth, earnings per share, market share, financial ratios, profitability, cost efficiencies, production's quality & flexibility, customer lifetime value, customer satisfaction, employee and shareholders satisfaction.

## 5. **Methodology**

The aim of this study was to explore the extent of usage of strategic costing techniques in JLMC. A total of 91 questionnaires were distributed to company managers or financial managers in these companies. Out of this number, only 60 were returned and used. The response rate was about 65.9%, which is considered high. The questionnaire consisted of two main parts. The first part contained 34 items aimed at examining the extent of usage of strategic costing techniques implemented by JLMC over the past three years. The Likert scale was used

to measure the usage of variables, ranging from minimum of 1="not used at all" to the maximum of 5= "greatly used".

The second part of questionnaire was devoted to measuring firm performance on a 14-item scale adopted primarily by Gunday et al. (2011) with some modification. This scale adopted for this study because of the diversity of strategic costing systems, and to provide a holistic conceptualization of firm performance. So it is considered a multifaceted structure that covers three areas, namely financial performance, market performance, and production performance. The general managers or financial managers were asked to rate the level of achievement of performance items in their organization in the last three years compared to the previous years on a five-point Likert scale ranging from 1= "very unsuccessful" to 5= "very successful".

The methods of analysis employed in the study were descriptive statistics, test of homogeneity of variance, the variance inflation factor test (VIF), one sample t-test, and multiple regressions. In addition, Cronbach's alpha test of internal consistency of strategic costing techniques was used to test reliability of instrument and the variables related to it

## 6. Reliability of the Study Instrument

Cronbach's alpha was used to test stability of the measuring instrument. The values exceeded the level of 70%, which is an acceptable ratio (See Table 1).

**Table 1. Cronbach's alpha reliability coefficients for variables**

variables	dimensions	alpha
<b>The instrument</b>	<b>34</b>	<b>.90</b>
ABC	8	.82
TC	5	.82
Attribute costing	4	.72
LCC	4	.74
COQ	7	.73
VCC	6	.76
<b>JLMC's Performance</b>	<b>14</b>	<b>.92</b>
Financial performance	6	.87
Market performance	4	.80
Production Performance	4	.87

## 7. JLMC's Performance

As mentioned earlier, the respondents were requested to indicate their performance comparing to the prior years before adopting strategic costing techniques on the fourteen items listed in Table 2 by using the 5-point Likert score. In this study, performance was analyzed as overall performance (14 items) or either separately, mainly financial performance (6 items), market performance (4 items), and production performance (4 items). In general, successful performance was evidenced in all the fourteen items but the top (mean scores=4.03) is for both "improvement in earnings per share" and "shareholders' satisfaction", followed by (mean scores=4.02) for "total sales" and (mean scores=4.00) for "Production cost".

**Table 2. Descriptive Statistics for JLMC's Performance Indicators comparing to the prior years before adopting strategic costing techniques.**

Performance variables		Mean	SD
<b>Overall performance</b>		<b>3.87</b>	<b>.77</b>
<b>Financial performance</b>		<b>3.83</b>	<b>.87</b>
1-	Return on Investment (ROI)	3.90	1.22
2-	Improvement in earnings per share	4.03	.94
3-	Return on assets (profit/total assets).	3.83	1.15
4-	General profitability of the firm.	3.82	1.20
5-	Return on sales (profit/total sales)	3.83	1.12
6-	Cash flow excluding investments.	3.57	1.05
<b>Market performance</b>		<b>3.93</b>	<b>.82</b>
7-	Total sales.	4.02	.89
8-	Market share.	3.85	1.10
9-	Customer satisfaction.	3.80	1.10
10-	Shareholders' satisfaction	4.03	1.06
<b>Production Performance</b>		<b>3.87</b>	<b>.97</b>
11-	Production (volume) flexibility.	3.78	1.18
12-	Production and delivery speed.	3.90	1.08
13-	Production cost.	4.00	1.04
14-	Conformance quality.	3.78	1.26

performance: 1= very unsuccessful; 2- unsuccessful' 3= Neither successful nor unsuccessful; 4= successful'; 5= very successful

### 8. Hypotheses testing

In this study, one-sample t-test was conducted for testing hypothesis  $H_01$  to find out whether strategic costing techniques were used by JLMC or not. Multiple regression analysis was conducted for testing hypotheses  $H_02$ - $H_05$  to find out whether the impact of strategic costing techniques on JLMC's performance exists or not. The basic assumptions of regression tests for all four hypotheses have been met. For normality test, the scatter plot scheme showed that 95% of the errors (standardized residuals) fall within the range (2, -2), indicating that these errors are distributed normally (Anderson et al., 2008). Variance Inflation Factor (VIF) test was used to test multicollinearity between independent variables. VIF for all variables were less than 10, which indicates no real problem in this study (Kohler, 2000).

#### $H_01$ : The strategic costing techniques are not used by JLMC.

In Table 3, one-sample t-test show that all of strategic costing techniques were used by JLMC; where the values for these variables were as follow: ABC  $t(59)=8.04, P<0.001$ ; TC  $t(59)=8.14, P<0.001$ ; Attribute costing  $t(59)=4.52, P<0.001$ ; LCC  $t(59)=5.61, P<0.001$ ; COQ  $t(59)=8.45, P<0.001$ ; and VCC  $t(59)=8.27, P<0.001$ . Taking together all these techniques as a group, it can be seen that there is a significant usage of strategic costing techniques,  $t(59) = 10.02, p<0.001$ . In addition, as it appears in Table 3, the descriptive statistics support one-sample t-test results show that using strategic costing techniques achieved a mean score of more than the general mean in this study, which is moderately used (mean=3). Using TC and VCC (mean score=3.80) achieved the highest mean score, followed by ABC and COQ (mean score=3.79), LCC achieved (mean score =3.69), whereas attribute costing technique achieved the lowest mean score (mean score=3.56). Overall, these results indicate that the usage of strategic costing techniques was evident in all the six variables.

**Table 3.  $H_01$ ; descriptive statistics and one-sample t-test for strategic costing techniques**

Variables	Descriptive statistics		One-sample t-test	
	Mean	SD	T	Sig.
ABC	3.79	.76	8.04	.000
TC	3.80	.76	8.14	.000
Attribute costing	3.56	.96	4.52	.000
LCC	3.69	.95	5.61	.000
COQ	3.79	.72	8.45	.000
VCC	3.80	.75	8.27	.000
<b>The group</b>	<b>3.74</b>	<b>.57</b>	<b>10.02</b>	<b>.000</b>

Extent of use: 1=not used at all; 2=slightly used; 3=moderately used; 4=frequently used; 5=greatly used.

#### $H_02$ : There is no impact of strategic costing techniques on JLMC's overall performance.

The results of regression analysis in Table 4 show that all of strategic costing techniques contribute significantly ( $F(6, 53) = 15.03; P < .001$ ) and explain ( $R^2 = .63$ ) of the variation in the JLMC's overall performance.

**Table 4.  $H_02$ ; Regression results**

Independent variables	Coefficients <sup>a</sup>			
	B	t	P	VIF
ABC	.312	3.219	.002	1.33
TC	.270	3.525	.001	1.27
Attribute costing	-.121-	-1.329-	.190	1.83
LCC	-.137-	-1.261-	.213	1.63
COQ	.678	3.655	.001	4.38
VCC	-.107-	-.694-	.491	3.26
<b><math>R^2 = .63; F = 15.03, P &lt; .001</math></b>				
<i>a. Dependent variable: overall performance</i>				

The regression results in Table 4 show that three of explanatory variables which are ABC, TC, and COQ have a statistically significant positive effect on JLMC's overall performance, where P-value for these variables .002, .001,  $p = .001$  respectively. Accordingly, the null hypothesis was rejected with regard to these variables. The other three explanatory variables which are attribute costing, LCC, and VCC did not have a statistically significant effect on JLMC's overall performance, where P-value for these variables .19, .21,  $p = .49$  respectively. Therefore, the null hypothesis was accepted with regard to these variables.

**$H_03$ : There is no impact of strategic costing techniques on JLMC's financial performance.**

The results of regression analysis in Table 5 show that all of strategic costing techniques contribute significantly ( $F(6, 53) = 16.42; P < .001$ ) and explain ( $R^2 = .65$ ) of the variation in the JLMC's financial performance. The regression results in Table 5 also show that the three explanatory variables which are ABC, TC, and COQ have a statistically significant positive effect on JLMC's financial performance, where P-value for these variables .007, .011,  $p = .006$  respectively. Therefore, the null hypothesis was rejected with regard to these variables. On the other hand, the rest of explanatory variables; attribute costing, LCC, and VCC did not have a statistically significant effect on JLMC's financial performance, where P-value for these variables .067, .408,  $p = 0.123$  respectively. Consequently, the null hypothesis was accepted with regard to these variables.

**Table 5.  $H_03$ ; Regression results**

Independent variables	Coefficients <sup>a</sup>			
	B	t	P	VIF
ABC	.302	2.82	.007	1.33
TC	.223	2.64	.011	1.27
Attribute costing	.187	1.87	.067	1.83
LCC	.100	.83	.408	1.63
COQ	.591	2.89	.006	4.38
VCC	.267	1.57	.123	3.26
<b><math>R^2 = .65; F = 16.42, P &lt; .001</math></b>				
<i>a. Dependent variable: financial performance</i>				

**$H_04$ : There is no impact of strategic costing techniques on JLMC's market performance.**

The results of regression analysis in Table 6 show that all of strategic costing techniques contribute significantly ( $F(6, 53) = 11.93; P < .001$ ) and explain ( $R^2 = .58$ ) of the variation in the JLMC's market performance. The regression results in Table 6 also show that three explanatory variables which are ABC, TC, and COQ have a statistically significant positive effect on JLMC's market performance, where P-value for these variables .006, .003,  $p = .009$  respectively. Therefore, the null hypothesis was rejected with regard to these variables. The other three explanatory variables; attribute costing, LCC, and VCC did not have a statistically significant effect on JLMC's market performance, where P-value for these variables .275, .495,  $p = 0.480$  respectively. Consequently, the null hypothesis was accepted with regard to these variables.

**Table 6.  $H_04$ ; Regression results**

<i>Independent variables</i>	<i>Coefficients<sup>a</sup></i>			
	<i>B</i>	<i>t</i>	<i>P</i>	<i>VIF</i>
ABC	.315	2.84	.006	1.33
TC	.279	3.17	.003	1.27
Attribute costing	-.115	-1.10	.275	1.83
LCC	.085	.69	.495	1.63
COQ	.576	2.71	.009	4.38
VCC	-.126	-.711	.480	3.26
<b><math>R^2=.58</math>; <math>F=11.93</math>, <math>P&lt;.001</math></b>				
<i>a. Dependent variable: market performance</i>				

**$H_05$ : There is no impact of strategic costing techniques on JLMC's production performance.**

The results of regression analysis in Table 7 show that all of strategic costing techniques contribute significantly (F (6, 53) =6.57;  $P<.001$ ) and explain ( $R^2= .43$ ) of the variation in the JLMC's production performance. The regression results in Table7, with exception of attribute costing technique, show that the explanatory variables; ABC, TC, LCC, COQ, and VCC have a statistically significant positive effect on JLMC's production performance, where P-value for these variables .039, .008, .019, .003,  $p=.010$  respectively. Therefore, the null hypothesis was rejected with regard to these variables. On the other hand, the attribute costing technique does not have a statistically significant effect on JLMC's production performance ( $P=0.854$ ).Therefore, the null hypothesis was accepted with regard to this variable.

**Table 7.  $H_03$ ; Regression results**

<i>Independent variables</i>	<i>Coefficients<sup>a</sup></i>			
	<i>B</i>	<i>t</i>	<i>P</i>	<i>VIF</i>
ABC	.324	2.12	.039	1.33
TC	.331	2.74	.008	1.27
Attribute costing	-.026-	-.19	.854	1.83
LCC	.415	2.43	.019	1.63
COQ	.912	3.12	.003	4.38
VCC	.649	2.67	.010	3.26
<b><math>R^2=.43</math>; <math>F=6.57</math>, <math>P&lt;.001</math></b>				
<i>a. Dependent variable: production performance</i>				

**9. Findings**

Based on the descriptive statistics for JLMC' performance indicators presented in table 2, it is clear that JLMC achieved successful performance compared to the years prior to adopting strategic costing techniques. In this study, the strategic costing techniques represent the independent variables which are ABC, TC, attribute costing, LCC, COQ, and VCC. The results presented in Table 3 show that the usage of strategic costing techniques by JLMC was evident. The overall descriptive results in Table 3 show that using TC and VCC achieved the highest mean score, followed by ABC, COQ, and LCC, while attribute costing achieved the lowest mean score. When strategic costing techniques were analyzed separately, the findings were consistent with many previous studies that adopted these same techniques.

The results in Tables 4-7 have shown that strategic costing techniques contribute significantly and explain high levels of variation in the performance of JLMC, whether it was overall performance, financial performance, market performance, or production performance. Furthermore, three of explanatory variables which are ABC, TC, and COQ have a statistically significant positive effect on JLMC's overall performance, while the other three variables which are attribute costing, LCC, and VCC did not have a statistically significant effect on JLMC's overall performance. In respect to the relationship between strategic costing techniques as group and firm performance, no one study found a connection between these variables, but at the individual level, the result were consistent with studies by Zaman (2009) who found that ABC has significant effect on firms' performance, and Huang et al. (2012) Huang et al. (2012) found that the implementation of TC was positively associated with both business model innovations and firm performance.

Regarding the impact of strategic costing techniques on JLMC's financial performance, table 5 has shown similar results to what these techniques achieved on overall performance of JLMC. ABC, TC, and COQ have a statistically significant positive effect on JLMC's financial performance, where attribute costing, LCC, and VCC did not have a statistically significant effect on JLMC's financial and market performance. These findings are consistent with study by Abdullah et al (2014) who found that ABC has had a positive influence on improvement of financial performance, and consistent with study by Imeokparia and Adebisi (2014) found a



strong positive relationship between adoption of TC and of improvement in return on investment and reduction of cost. On the flip side, these findings are inconsistent with some of the study by Tekavcic and Sink (2002) who found that the average financial performance is dependent on the use of LCC.

Regarding the JLMC's market performance, three of explanatory variables which are ABC, TC, and COQ have a statistically significant positive effect on JLMC's market performance, while the other three variables which are attribute costing, LCC, and VCC did not have a statistically significant effect on JLMC's market performance. Consistent with this result, Mijoc et al. (2014) and Saaydah and Khatatneh (2014) found that TC has an influence on accounting and market performance.

Lastly, the results presented in tables 7 reveal that all of explanatory variables, except of attribute costing technique, have a statistically significant positive effect on JLMC's production performance. Consistent with this result, Rattanaphaphtham and Ussahawanitchakit (2010) referred that ABC effectiveness is significantly and positively related to production process efficiency, cost advantage, product planning proficiency. From other side, Randall and Ulrich (2001) analyzed product variety at the product attribute level. They found no evidence to suggest that offering more variety through strategies of mass customization or variety postponement results in higher firm performance. Therefore, the above results were consistent with findings of this study.

## 10. Conclusion

Given the limited empirical research about strategic costing techniques, this study presents these techniques as a group in the context of SMA literature. However, this study also aims to examine the extent of usage of strategic costing techniques in Jordanian Listed Manufacturing Companies and to examine the impact of these techniques on performance in these companies.

The study reveals that JLMC achieved successful performance compared to the years prior to adopting strategic costing techniques. It is also found that strategic costing techniques were used by JLMC. The results also reveal that these techniques contribute significantly and explain high percentage of variation of JLMCs' performance. The findings show that three of explanatory variables which are ABC, TC, and COQ have a statistically significant positive effect on JLMC's overall performance, financial performance, and market performance. The rest of explanatory variables which are attribute costing, LCC, and VCC did not have a statistically significant effect on these categories of performance of JLMC. Regarding the production performance of JLMC, It has been found that all of explanatory variables, except of attribute costing technique, have a statistically significant positive effect on this category of performance.

However, many prior studies revealed that SMA techniques have positive effect on firm performance, but no one study found the relationship between strategic costing techniques as group and firm performance. This was regardless of whether it was overall performance, financial performance, market performance, or production performance. In the light of lack of direct studies about this relationship especially in disciplines such as LCC and attribute costing, this study recommends researchers conduct more studies in the future regarding this relationship. In context of cost-benefit approach, this study also recommends JLMC to continue adopting all of SMA techniques in the future.

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