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The impact of applying the target cost and continuous improvement (Kaizen) on achieving the sustainable competitive advantage of Palestinian industrial companies

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Abstract

Purpose – This study aims to examine the impact of implementing target costing and continuous improvement techniques in industrial companies operating in southern Palestine on achieving sustainable competitive advantage (SCA). The study mainly assesses the level of application of these techniques by Palestinian industrial companies (PICs). Furthermore, it evaluates the extent to which the integration of these two methods can impact SCA, by producing cost-effective and innovative products that meet customer demands and needs, while simultaneously achieving continuous development of the company and an SCA.

Design/methodology/approach – A descriptive analytical approach was used to study the target costing and continuous improvement techniques employed by industrial companies in southern Palestine. A questionnaire was administered to 415 companies in the southern West Bank to collect data on the application of target cost and continuous improvement and their impact on SCA, measured through market share, differentiation and cost reduction. Control variables, such as company age, size (measured by the number of employees) and industrial sector classification were also included in the study model.

Findings – The findings of the study revealed that the PICs apply target costing and continuous improvement at a high level. Furthermore, all dimensions of achieving SCA were found to be achieved at a high level, with market share being the most prominent. The study also found that the integration of the target costing and continuous improvement had a positive impact on achieving SCA in the PICs. However, the study found no impact on company size, age or industrial sector on achieving a competitive advantage in terms of market share or other results.

Research limitations/implications – The current study was limited to the application of strategic management methods to companies within the industrial sector only. This may constitute a limitation because it neglected other sectors. Likely, another limitation was the difficulty of obtaining the quantitative numbers needed for some quantitative variables that pertain to that type of industrial companies, which are mostly family companies that could not be regulated by the local companies' law to disclose their financial statement.

Practical implications – If industrial companies have ambitions to reduce production costs from the planning and design stage to set the target selling price. It is based on the understanding and awareness of customers' desires while maintaining the quality of products according to the best methods of improvement and innovation; therefore, this can be achieved by using the target costing and the continuous improvement techniques through reviewing the current study and its results.

Social implications – The current study sought to link two methods, simultaneously and complementary, with each other of the strategic methods of managerial accounting, which helps the companies to offer their best to attract customers, develop the product or service and maintain their continuity in a changing labor market that enables it to achieve sustainable and competitive advantage.

JEL Classification — J3, J32, L16, M11, M41, Q01

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Originality/value – This study is unique in that it explores the impact of the integration of target costing or continuous improvement techniques (Kaizen) on achieving SCA in Palestine industrial companies. While previous studies have examined either target costing or continuous improvement techniques separately, this study enhances the integration of these two methods to achieve SCA.

Keywords Target costing, Continuous improvement, Kaizen, Sustainable competitive advantage, Modern strategic management, Palestinian industrial companies

Paper type Research paper

Introduction

The economic systems that have emerged as a result of globalization are characterized by successive and accelerating developments, influenced by various economic and financial factors, such as intense competition between companies, scarcity of economic resources, open global markets, difficulty in inventorying and distributing indirect costs, multiplicity of consumer tastes and preferences, and advancement in information technology.

Accurate, relevant and reliable information is crucial for adapting to these economic systems and withstanding the challenges faced by companies and organizations (Abate and Mengesha, 2020; Hailu *et al.*, 2020; Suarez and Miguel, 2020; Alkababji, 2015). Nowadays, modern management practices go beyond traditional functions, encompassing strategic planning, fund regulation and control, and decision-making to achieve the desired and planned goals of relevant parties (Malo-Alain and Alazzam, 2018).

Undoubtedly, advancements in administrative thought, production systems and technology have evolved alongside changes in accounting thought, especially in information systems supporting administrative decisions (Alkababji, 2014). In response to these economic, environmental and technological changes, various modern strategic management accounting methods have emerged, with the most important being target costing and continuous improvement (Kaizen) techniques.

Target costing, coined in the early sixties of the last century, aims to reduce the total cost of the entire product's life cycle or develop and improve existing products' quality to meet customer requirements (Ansari *et al.*, 2006; Antari, 2020). Kaizen, on the other hand, is linked to many organizational developments and promotes total quality management, lean production methods and customer service initiatives. It aims to reduce production costs by enabling employees to express their opinions and suggest appropriate recommendations for company development (Carnerud *et al.*, 2018).

Therefore, to achieve their goals and maintain a sustainable competitive advantage (SCA), industrial companies must adopt new philosophies and procedures and collaborate seamlessly with each other to achieve control and stability (Al-Khateeb *et al.*, 2019; Paulson *et al.*, 2021).

This competitive advantage enables industrial companies to survive and compete with other companies offering similar products by providing quality services to current and prospective customers at lower costs and attempting to increase market share. Therefore, industrial companies in Palestine seek to improve productivity, achieve better performance by increasing profits and improve the services and products provided by these companies. The current study focuses on the industrial sector in Palestine, which is considered one of the most important economic pillars. This sector contributes approximately 36% of the gross national product and employs a large number of manpower (12,1763 workers), as indicated by the statistics of the Central Agency for the year (2021) (Palestinian Central Bureau of Statistics-PCBS, 2022).

Research problem

The research problem arises from the competitive environment created by developments in the business world. Companies strive to produce quality products to compete and remain

ahead in the market while considering profitability closely related to product costs. This consideration has been established among the administrations of industrial companies, highlighting the need to adopt modern strategic management methods, such as target costing. Target costing recognizes the impact of competition and determines the selling price based on the expected selling price accepted by the market rather than on the cost of the product.

To improve their various processes, companies should make continuous adjustments and improvements. Therefore, this approach to continuous improvement contributes to the overall development of the facility, leading to greater customer satisfaction, goal achievement and enhancement of the company's sustainable competitive advantage (SCA). Therefore, the present study aims to answer the following main question.

(1) What is the impact of applying target costing and continuous improvement (Kaizen) techniques on achieving SCA in Palestinian industrial companies?

Conceptual and theoretical framework

Currently, the modern business environment surrounding industrial companies has undergone significant developments, becoming notably different from the traditional one. These changes have had a significant impact on industrial facilities' production and cost systems, including increased production capacity, global competition, a focus on customer service and technological advancements. As a result, there has been a need to search for new manufacturing techniques that add new product characteristics that traditional production systems cannot provide.

Concept and objectives: target costing, continuous improvement and sustainable competitive advantage

The literature on target costing varies, with no unified concept. Abu Afifa (2018) defined target costing as a reduction in product costs while achieving target profits without compromising the quality factor, by understanding customer needs and desires. Similarly, Antari (2020) affirmed that target costing is the process of calculating a product's cost by estimating the required profit given the product's market price. If the company can produce the product at or below the target cost, then it becomes feasible to achieve the target profit.

Furthermore, Alkababji (2014) stated that target costing is a cost management approach that aims to reduce costs during the product life cycle to improve the provision of a product that meets the target consumer's needs. It sets a deliberate price based on a desirable profit margin and ends with the maximum allowable cost that can be tolerated.

Khechai and Abdelkader (2021) also highlighted that target costing combines customer requirements, product quality and cost reduction, making it an entry point for reducing costs and managing them during the planning and product design stages. However, most institutions' administrations lack the capability to apply this method, as noted by Shallah (2021).

The study stated that industrial facilities use a cost accounting system that coincides with their activity, and they have a reliable system for estimating costs based on historical costs and market studies. The study suggested that industrial companies should adopt target costing as a criterion for planning their sales, costs and profits. This is consistent with Hamoud's (2019) study, which claimed that the application of target costing raises the company's competitiveness by reducing and controlling costs while maintaining the quality required by customers. It requires companies to adapt to market and product requirements by controlling product costs and prices to achieve target profits.

The role of target costing technique in cost reduction

Target cost reduction is the difference between the initial cost of the product and the target cost reduction that an organization aims to achieve to enhance its profitability and competitiveness. It is important to ensure that the target cost reduction is real and achieved through a set of activities that concentrate on breaking and challenging existing standards to reduce overall product costs through all available means. This should be differentiated from unreal cost reduction, which involves focusing solely on maximizing profits to reduce the cost of the product without considering the total cost, through activities such as increasing sales or sales price, which cannot be controlled in the face of intense competition (Cescon *et al.*, 2019). To achieve real cost reduction, organizations can employ value engineering technology, which involves the use of so-called functional analysis. According to Seddeq and Yousef (2018), the process of target costing is continuous and iterative, with a production design team working to establish planned costs (target cost) for that product. Value engineering technology is then used to make modifications to product specifications and design in order to improve product value and reduce costs to meet target costing. Once the product has been approved and implemented through value engineering based on target costing, the focus turns to continuous improvement techniques (Cooper, 2017).

Kaizen events

A Kaizen event is a "focused and structured improvement project, using a dedicated cross-functional team to improve a targeted work area, with specific goals, in an accelerated timeframe" (Farris *et al.*, 2008, p. 10). They are often implemented alongside lean management and are also referred to as "rapid improvement events," "accelerated improvement workshops," "Gemba Kaizen" and "Kaizen blitz" (Glover *et al.*, 2014). Kaizen events represent swift and radical implementations of Kaizen at the team level (Van Dun and Wilderom, 2016; Hirzel *et al.*, 2017).

Kaizen offers several benefits, including improved productivity, waste reduction, increased profit, client satisfaction, quality enhancement and competitive advantage (Jin and Doolen, 2014).

Kaizen is a continuous improvement technique or tool used by many industries in Palestine and worldwide. With the increase in market competitiveness, most organizations continuously work and make efforts to make changes to their business (Macpherson *et al.*, 2015). This competitive market demands superiority, making it challenging for industries or organizations to identify and fulfill the required needs of customers. In such situations, Kaizen is the most suitable tool for continuous improvement and survival in the business world (Verma *et al.*, 2023; Hamdamen *et al.*, 2018).

Business establishments strive to achieve a sustainable advantage as their main goal. This advantage enables them to survive for the longest possible period in the face of intense competition. Therefore, these establishments are prompted to channel their efforts and resources toward attaining this advantage. Likely, Hamad (2020) defined sustainable advantage as the facility's ability to formulate and implement strategies that place it in a better position compared to its competitors, by leveraging its competencies and capabilities optimally.

The current study distinguishes itself by linking two complementary strategic methods of managerial accounting. Moreover, this study detects the impact of these methods on SCA through modern industrial environmental changes.

In the same vein, this study applies to industrial companies in the southern West Bank of Palestine, which is a significant economic contributor, accounting for 36% of the gross domestic product in 2021 (Palestinian Central Bureau of Statistics-PCBS, 2022).

Methods

Research population and sample

The study includes all the private industrial companies (PICs) in the southern region of the West Bank during the year 2022. In total, 415 companies were identified, spread across two economically important governorates – Bethlehem (191 companies) and Hebron (224 companies) – according to the records of the chambers of commerce in both governorates (Bethlehem-chamber, 2022; Hebron-chamber, 2002). The sample consisted of 54% companies from Bethlehem and 46% from Hebron Governorate. The size of the research sample was calculated based on the main objective of the study. A stratified random sampling technique was employed from each governorate in proportion to the number of companies in the original community, using Stephen Thompson's equation (Thompson, 2012, pp. 59).

Instrument

The questionnaire was used as a tool to collect data on the application of target costing and continuous improvement to achieve SCA in industrial companies in southern Palestine. After determining the appropriate sample size to test the research hypotheses, 200 questionnaires were distributed and 163 questionnaires were returned, representing 81.5% of the total number distributed. Furthermore, 18 responses were excluded due to a lack of serious answers, resulting in a valid number of 145 questionnaires, or 72.5% of the total questionnaires distributed.

Inferential statistics

Inferential statistics were used to test the following hypotheses based on the literature review using multiple linear regression analysis. A total of six models were developed as follows:

H1. Examines the effect of applying the target costing technique on the competitive advantage of industrial companies in southern Palestine, using the following model:

$$\boldsymbol{CA_i = B_0^1 + B_1^1\, TC_i + u_i^1}$$

H2. Investigates the impact of applying the continuous improvement technique on the competitive advantage of industrial companies in southern Palestine, using the following model:

$$\boldsymbol{CA_i = B_0^2 + B_1^2\, CI_i + u_i^2}$$

H3. Explores the effect of applying the target costing technique and continuous improvement techniques on SCA of industrial companies in southern Palestine, using the following model:

$$\boldsymbol{CA_i = B_0^3 + +B_1^3 TC_i + B_2^3\, CI_i + u_i^3}$$

$$\boldsymbol{CA_i = B_0^3 + +B_1^3 TC_i + B_2^3\, CI_i + B_3^3 Size_i + B_4^3\, Age_i + B_5^3\, SE1_i + B_6^3\, SE2_i + B_7^3\, SE3_i + B_8^3\, SE4_i + B_9^3\, SE5_i + u_i^3}\ (4.1)$$

H4. Examines the impact of applying the target costing and continuous improvement techniques on SCA in terms of the market share of industrial companies in southern Palestine, using the following model:

$$MS_i = B_0^4 + B_1^4 TC_i + B_2^4 CI_i + B_3^4 Size_i + B_4^4 Age_i + B_5^4 SE1_i + B_6^4 SE2_i + B_7^4 SE3_i + B_8^4 SE4_i + B_9^4 SE5_i + u_i^4$$

H5. Studies the impact of applying the target costing and continuous improvement techniques on SCA in terms of the excellency of industrial companies in southern Palestine, using the following model:

$$E_i = B_0^5 + B_1^5 TC_i + B_2^5 CI_i + B_3^5 Size_i + B_4^5 Age_i + B_5^5 SE1_i + B_6^5 SE2_i + B_7^5 SE3_i + B_8^5 SE4_i + B_9^5 SE5_i + u_i^5$$

H6. Investigates the impact of applying the target costing and continuous improvement techniques on SCA in terms of reducing costs of industrial companies in southern Palestine, using the following model:

$$RC_i = B_0^6 + B_1^6 TC_i + B_2^6 CI_i + B_3^6 Size_i + B_4^6 Age_i + B_5^6 SE1_i + B_6^6 SE2_i + B_7^6 SE3_i + B_8^6 SE4_i + B_9^6 SE5_i + u_i^6$$

To ensure accurate and more objective results when testing hypotheses using multiple linear regression analysis, certain conditions must be fulfilled and verified beforehand. These conditions include testing for the normal distribution of study variables using the Kolmogorov–Smirnov test. Table 1 indicates that the data distribution of the study variables is not normal, which affects the variables under study.

Results and discussion

The study aims to answer three main research questions:

RQ1. What is the level of target costing implementation in PICs?

RQ2. What is the level of continuous improvement (Kaizen) technique implementation in PICs?

RQ3. What is the level of competitive advantage achieved by PICs?

The means scores (M), standard deviations (Std) and relative weights (Rw) of questionnaire responses were used to measure the level of application of target costing and continuous improvement technique in the PICs. Six items were used to measure the level of application for each technique. Furthermore, the study evaluated the level of achieving SCA in the PICs, through three dimensions, namely market share, differentiation and cost reduction, using 18 items. The results of the analysis are presented in the table below.

PICs exhibit a high level of application of target costing, with a rate of 80.4%. Such a high application of target costing (TC) determines the target selling price to achieve a certain part of the target profit. This finding indicates that the facility depends on specialized teams based on innovation and creativity to achieve the target cost at the lowest possible cost while maintaining good product quality and a selling price that aligns with the market to achieve the target profits. Thus, it should not harm the establishment, but it should achieve the target profit it seeks, consistent with Hamoud's (2019) study.

Furthermore, the results in Table 2 indicate a high level of application of the continuous improvement technique among the PICs, with an application rate of 81.2%. Companies seek to continuously improve their product quality to achieve customer satisfaction and address

Dimensions	Number of statements	*Z* value	Sig
Target costing	6	0.279	**0.000
Continuous improvement	6	0.212	**0.000
Competitive advantage in terms of market share	6	0.249	**0.000
Competitive advantage in terms of differentiation	6	0.275	**0.000
Competitive advantage in terms of cost reduction	6	0.267	**0.000
SCA	18	0.195	**0.000

Note(s): **It indicates that there is a statistical significance at 5%

Independent variables	
Target cost	TC
Continuous improvement	CI
Dependent variables	
Sustainable competitive advantage	CA
Competitive advantage in terms of market share	MS
Competitive advantage in terms of differentiation	E
Competitive advantage in terms of cost reduction	RC
Control variables	
-The size of the company (measured through the number of employees)	Size
-The age of the company	Age
-The nature of the industrial sector classified into	Sectors
The construction and metallurgical sector	SE1
Paper and plastic sector	SE2
Food and beverage sector	SE3
The handicraft and textile sector	SE4
Other industrial sector	SE5

Source(s): Author work

Table 1.
Kolmogorov–Smirnov test for testing normal distribution and the study variables

Item	Mean	Standard deviation	Relative weight	Descriptive equivalent
Application of the target costing (TC)	4.02	0.56	80.4	High
Application of the continuous improvement (CI)	4.06	0.49	81.2	High

Dimension symbol	Dimensions of SCA	Mean	Standard deviation	Relative weight	Descriptive equivalent
MS	Market share	4.10	0.47	82.0	High
E	Differentiation	4.09	0.53	81.8	High
RC	Cost reduction	4.04	0.50	80.8	High
(SCA) (CA)		4.07	0.30	81.4	High

Source(s): Author work

Table 2.
The level of application of the study variables

any arising defects. Companies aim to achieve product quality that satisfies customers while also meeting the target profit.

Additionally, the results also show that the PICs achieve a high level of SCA in all three dimensions, with a percentage of 81.4%, an average score of 4.07 and a standard deviation of 0.30. The market share was the most prominent dimension, achieved with an application rate of 82.0%, followed by differentiation (81.8%) and cost reduction (80.4%).

This can be attributed to the fact that SCA helps companies achieve desired profits by paying attention to market share, building a good reputation in the market while maintaining stability in the local market with excellent products, and reducing costs. The more the facility tries to reduce the product cost, the more it affects the target selling price and its market share, and vice versa. This finding is consistent with Hamdamen *et al.*'s (2018) study that used the axis of competitive advantage for industrial companies.

Results of the study hypotheses

This section includes the results of six main hypotheses, which are presented below in order:

The first hypothesis asserts that "there is no statistically significant effect at the significance level ($\alpha \geq 0.05$) of applying target costing technique on achieving SCA among the PICs." To test this hypothesis, a multiple linear regression (MLR) model was used.

However, using the MLR test requires that certain conditions are met and verified. Table 3 shows that the model suffers from heteroskedasticity and autocorrelation, as indicated by the results of the Breusch–Pagan and the Durbin–Watson tests, respectively. Moreover, the Kolmogorov–Smirnov test indicates that the model's residuals are not normally distributed. These problems are resolved by applying the Huber–White robust standard error, as suggested by Rogers (1993).

Table 3 also indicates that the use of target costing has a statistically significant effect on achieving a competitive advantage among the PICs, as indicated by a significant value of 0.00, which is lower than the significance level ($\alpha = 0.05$). As a result, the first hypothesis is rejected. Notably, the application of the target costing technique accounts for 12.52% of the variation in achieving a competitive advantage among the PICs. Likely, the findings suggest that as PICs increase the targeting cost by one unit, their degree of achieving a competitive advantage increases by 0.194°.

Variables	Factors B	*T*-statistic	Sig
The impact of applying target costing on achieving competitive advantage among the PICs			
Regression constant B_0	3.289	9.27	**0.000
(TC) Target costing	*0.194*	*2.26*	***0.025*
Study model test			
Tests of statistical significance	$F(1,143) = 7.19$, (Sig. = 0.025**)		
Coefficient of determination (R^2)	$R^2 = 0.1252$		
Lagrange coefficient test	$\chi^2(1) = 53.41, Sig. = 0.000$ **		
Durbin Watson test	*1.48*		
Kolmogorov–Smirnov error estimation test	Test-statistic = *0.164*, Sig. = *0.000*		
The impact of applying continuous improvement techniques on achieving competitive advantage among the PICs			
Regression constant B_0	3.092	8.62	**0.000
(CI) Continuous improvement	*0.240*	*2.79*	***0.006*
Study model test			
Tests of statistical significance	$F(1,143) = 7.79$, (Sig. = 0.001**)		
Coefficient of determination (R^2)	$R^2 = 0.1470$		
Lagrange coefficient test	$\chi^2(1) = 30.32, Sig. = 0.000$ **		
Durbin Watson test	*1.50*		
Kolmogorov–Smirnov error estimation test	Test-statistic = *0.192*, Sig. = *0.000*		

Note(s): The dependent variable is achieving a competitive advantage. **Indicates a statistical significance at the 5% level, χ^2 value of chi-square test, *F*-value of "P" test

Source(s): Author's work based on Rogers (1993)

Table 3. The impact of applying target costing and the continuous improvement on achieving competitive advantage among the PICs

The use of target costing helps to reduce costs and thus, lower the selling price, while maintaining the required product quality, leading to increased demand. This contributes to raising the competitive advantage among establishments. This study's findings are consistent with previous studies by Al-Khateeb *et al.* (2019), Alkababji (2014), and Hamoud (2019), which also found that applying the target cost variable leads to a competitive advantage.

The second hypothesis states that "there is no statistically significant effect at the significance level ($\alpha \geq 0.05$) of applying the continuous improvement technique on achieving SCA among the PICs." The MLR was applied to study that effect.

Using this test requires the fulfillment and verification of a set of conditions. Table 3 shows that the Durbin–Watson test value is 1.50, indicating no autocorrelation problem in the model. However, Table 3 indicates that the study model is affected by nonconstant variance of random errors, according to the results of the Breusch–Pagan test. Furthermore, the Kolmogorov–Smirnov test indicates that the model's estimation error is not normally distributed. Therefore, these problems are addressed using the Huber–White robust standard error, as suggested by Rogers (1993).

Table 3 indicates that there is a statistically significant effect of applying the continuous improvement technique on achieving a competitive advantage among the PICs. The statistical significance (Sig. = 0.00) is less than the level of significance ($\alpha = 0.05$), rejecting the second hypothesis. Besides, the application of continuous improvement techniques can explain 14.70% of the variance in achieving competitive advantage among the PICs. Furthermore, increasing the application of continuous improvement techniques by one degree leads to a 0.240-degree increase in achieving competitive advantage.

This can be justified by the fact that the more the company's management adopts continuous improvement, the more effectively it can address defects, leading to development and creativity and ultimately achieving SCA for the establishment. This finding is in line with the results of Hirzel *et al.* (2017) and Alencar (2019), which showed that the application of continuous improvement techniques contributes to achieving competitive advantage for enterprises by enhancing their ability to innovate more than their competitors.

The third hypothesis states that "there is no statistically significant effect at the significance level ($\alpha \geq 0.05$) for applying target costing and continuous improvement on achieving SCA among the PICs." MLR was used to analyze the third hypothesis.

Before applying the MLR model and answering the third main study hypothesis, the correlation coefficients between the variables included in the third hypothesis were calculated. The results show a direct and statistically significant relationship between the application of target costing and continuous improvement technique on one hand, and SCA on the other hand, with a Pearson correlation coefficient of 0.355 and 0.384, respectively.

All the correlation coefficients between independent variables do not exceed 0.80 and all values of VIF are less than 5, indicating no problem of multicollinearity. The results indicate that the value of the Durbin–Watson test exceeds 1.5, which means that the model does not suffer from an autocorrelation problem. However, the results show the presence of a non-constant variance of random errors according to the results of the Breusch–Pagan test. The estimation error of the model is not distributed normally as indicated by the results of the Kolmogorov–Smirnov test. Therefore, to overcome these problems, we use the Huber–White robust standard error, as suggested by Rogers (1993).

Table 4 presents evidence of a statistically significant effect of target costing and continuous improvement techniques on achieving SCA among the PICs. The statistical significance value of 0.00 is less than the predetermined level of significance ($\alpha = 0.05$), leading to the rejection of the third hypothesis. Moreover, the results show a positive and statistically significant effect of applying the target costing on achieving SCA, with a p-value of 0.039, which is less than 0.05. Similarly the application of the continuous improvement technique has a positive and statistically significant impact on achieving SCA, with a

Variables	Regression model 2 B	Regression model 2 *T*-statistic	Regression model 2 Sig	Regression model 3 B	Regression model 3 *T*-statistic	Regression model 3 Sig
Regression constant B_0	1.747	4.17	**0.000	1.800	4.430	0.000
Target costing (TC)	0.124	2.09	**0.039	0.081	1.560	0.120
Continuous improvement (CI)	0.161	2.14	0.034**	0.135	2.100	0.037
Company size				0.003	2.390	0.018
Age of the company				−0.002	−0.750	0.456
Construction and metal				0.058	0.950	0.345
Paper and plastic				0.117	1.540	0.125
Food and beverage				0.002	0.010	0.989
Handicrafts and textile				0.091	1.070	0.287
Other industrial				0.039	0.660	0.509
Model test	$F(12,130) = 6.07$					
Statistical significance	Sig. = 0.000					
Coefficient of determination (R^2)	$R^2 = 0.3591$					
Lagrange coefficient test	$\chi^2(1) = 9.29, Sig. = 0.002$					
Kolmogorov–Smirnov test	Test-statistic = 0.133, Sig. = 0.00					

Note(s): Dependent variable: Achieving competitive advantage, **Indicates a statistical significance at the 5% level, χ^2 value of chi-square test, *F*-value of "P" test
Source(s): Author's work based on Rogers (1993)

Table 4.
The impact of applying target costing method and continuous improvement on achieving SCA among the PICs

statistical significance value of 0.034. A one-degree increase in the level of application to target costing and continuous improvement will increase the achievement of SCA by 0.124° and 0.161°, respectively. The findings also suggest that the application of modern management accounting techniques (target costing and continuous improvement) can explain 29.22% of the variance in achieving competitive advantage in the PICs. This suggests that other factors not included in the model may also contribute to the variance. Therefore, a second linear regression model (regression model 3) is applied, which includes control variables such as the age and size of the company measured by the number of employees, and the nature of the industrial sector which is classified into six types, (i.e. stone and marble sector, construction and metal sector, paper and plastic sector, food and beverage sector, handicrafts and textile sector, and other industrial sectors) (Bethlehem-chamber, 2022; Hebron-chamber, 2002). The stone and marble sector is selected as a control variable to explain the variance in achieving competitive advantage in the PICs.

The results of regression model 3 indicate a statistically significant effect of applying target costing and continuous improvement on achieving SCA among the PICs in the presence of control variables. The significance level is 0.00, which is lower than the predetermined level of significance ($\alpha = 0.05$). The application of modern management accounting methods, in the presence of control variables, can explain 35.91% of the variance in achieving competitive advantage.

By comparing the explanatory power of target costing and continuous improvement in accounting for the variance in SCA to that of the first model (29.22%), we can conclude that studying control variables is crucial in verifying the impact of applying target costing and continuous improvement on achieving competitive advantage.

The results indicate that company size has a positive and statistically significant effect on achieving a competitive advantage. Specifically, a one-unit increase in the size of the company results in a 0.003-degree increase in the achievement of competitive advantage. However, there is no relationship between company age and competitive advantage achievement among the PICs. Moreover, there is no statistically significant difference in the level of the competitive advantage application between companies in the stone and marble sector and those in the other industrial sectors included in this study, when considered separately.

This can be explained by the fact that the application of modern management accounting methods in industrial establishments facilitates more efficient enterprise development, thereby enabling them to achieve SCA in the local market and outperform their competitors. This study is consistent with the results of Hamdamen *et al.* (2018) and Cescon *et al.* (2019), which also found that the application of modern management accounting techniques in industrial establishments contributes to achieving a competitive advantage.

The fourth hypothesis states that "there is no statistically significant effect at the significance level ($\alpha \geq 0.05$) for the application of target costing and continuous improvement on achieving SCA in terms of market share among the PICs." The MLR test was applied to study this effect.

Using the MLR test requires the verification and fulfillment of a set of conditions. Table 5 shows that all values of VIF are less than (5), indicating no problem of linear interference between the independent variables. The results in Table 5 also indicate that the value of the Durbin–Watson test exceeds 1.5, indicating no autocorrelation. However, the results show that the study is affected by the instability of the variance of random errors, according to the Breusch–Pagan test, and that the estimation error of the model is not normally distributed, as indicated by the results of the Kolmogorov–Smirnov test. Therefore, these problems are addressed by using the Huber–White robust standard error, as suggested by Rogers (1993).

Table 5 shows that there is a statistically significant effect of applying target costing and continuous improvement on achieving SCA in terms of market share among the PICs. The significant value is 0.00, which is less than the level of significance ($\alpha = 0.05$), leading to the rejection of the fourth hypothesis. We note that the application of techniques, such as target costing and continuous improvement, in the presence of control variables (the age and size of

	Regression model 4 Market share			Regression model 5 Differentiation			Regression model 6 Cost reduction		
	B	Sig	VIF	B	Sig	VIF	B	Sig	VIF
B_0	1.776	**0.015		1.645	**0.000		1.363	0.087	
TC	0.096	0.127	1.18	0.092	0.068	1.18	0.049	0.595	1.18
CI	*0.241*	***0.022*	*1.25*	0.002	0.978	1.25	0.086	0.376	1.25
Size	0.002	0.101	1.33	*0.006*	*0.002***	*1.33*	0.000	0.945	1.33
Age	−0.001	0.886	1.27	−0.001	0.728	1.27	−0.004	0.386	1.27
SE1	0.041	0.707	1.53	0.166	0.100	1.53	−0.125	0.236	1.53
SE2	0.181	0.198	1.46	0.110	0.561	1.46	−0.037	0.825	1.46
SE3	−0.057	0.726	1.14	0.040	0.754	1.14	−0.019	0.554	1.14
SE4	0.207	0.238	1.3	0.195	0.122	1.3	0.032	0.740	1.3
SE5	0.094	0.438		0.053	0.645	1.38	−0.098	0.281	1.38
Model test									
$F(12,130)$		2.34			11.09			4.57	
Sig		0.010			0.000			0.000	
R^2		0.2016			0.2368			0.1422	
Lagrange multiplier (LM)		$\chi^2(1) = 10.04$, Sig. = 0.002**			$\chi^2(1) = 40.34$, *Sig.* = 0.0000**			$\chi^2(1) = 25.05$, *Sig.* = 0.0000**	
Durbin Watson		*1.90*			*2.153*			*1.973*	
Kolmogorov–Smirnov test (KS)		Test-statistic = 0.83, Sig. = 0.000			Test-statistic = 0.201, Sig. = 0.000			Test-statistic = 0.210, Sig. = 0.000	

Table 5.
Results of the analysis of the multiple linear regression model

Note(s): **Statistically significant at 5% significance level, TC: Target cost, CI: Continuous improvement
Source(s): Author's work based on Rogers (1993)

the company measured by the number of employees, and the nature of the industrial sector), can explain 20.16% of the discrepancy in achieving competitive advantage in terms of market share in the PICs.

In addition, the results show a statistically significant positive impact of applying the continuous improvement technique on achieving SCA in terms of market share. The statistically significant value is 0.022, which is less than the level of significance ($\alpha = 0.05$). Therefore, increasing the application level of the continuous improvement technique by one degree in the PICs will lead to an increase in achieving competitive advantage in terms of market share by 0.241 degree. However, the results show that there was no statistically significant effect of the application of target costing on SCA in terms of market share.

Regarding the effect of the control variables, the results indicate that size and age have no statistically significant effect on achieving competitive advantage in terms of market share. Likewise, the results indicate no statistically significant difference in the level of application of competitive advantage between the companies of the stone and marble sector and those of other industrial sectors covered by the study when considered separately.

These findings demonstrate that the application of management accounting techniques, such as target costing and continuous improvement techniques, contributes to achieving SCA through increased market share among establishments. In other words, the more accurate accounting methods companies use, the more competitive they become. This study is supported by the results of Abu Maria (2018), Seddeq and Yousef (2018) and Safi (2017), who all showed that applying modern management accounting methods leads to a competitive advantage in terms of market share.

The fifth hypothesis states that "there is no statistically significant effect ($\alpha \geq 0.05$) for the application of the target costing and continuous improvement on achieving SCA in terms of differentiation among the PICs." To study this effect, MLR was applied.

However, since the required conditions for applying MLR are not met, the Huber–White robust standard error, as suggested by Rogers (1993), is used. Table 5 indicates that applying management accounting (target costing and continuous improvement) has a statistically significant effect on achieving SCA in terms of differentiation among the PICs (p-value = 0.000), which rejects the fifth hypothesis. Besides, the application of modern management accounting, along with the control variables (company age, size and the nature of the industrial sector) can explain 23.68% of the variation in achieving SCA in terms of differentiation among the PICs.

Furthermore, the results indicate that company size, as a control variable, has a significant effect on achieving SCA in terms of differentiation. Increasing the size of the company by one factor will increase the achievement of the competitive advantage in terms of differentiation by 0.006°. Nevertheless, the results also reveal that there is no statistically significant difference in the level of application of competitive advantage between companies in the stone and marble sector and those in the other industrial sectors included in this study when considered separately.

Applying modern management accounting methods to achieve a competitive advantage through differentiation helps companies develop and innovate, and distinguishes their product quality from other competing establishments, regardless of the industrial sector in which they operate.

The sixth hypothesis states that "there is no statistically significant effect (at $\alpha \geq 0.05$) for the application of target costing and continuous improvement techniques on achieving SCA in terms of cost reduction among the PICs." The MLR was applied to study this effect.

Because some conditions needed to apply MLR are not met (i.e. the variance of random errors is not stable and the errors are not normally distributed, as shown in the Breusch–Pagan and Kolmogorov–Smirnov tests, respectively), the Huber–White robust standard error, as suggested by Rogers (1993), is used instead.

Table 5 shows that applying management accounting methods (i.e. target costing and continuous improvement) has a statistically significant effect on achieving SCA in terms of cost reduction in the PICs (Sig. = 0.000). Therefore, we reject the sixth hypothesis. Overall, the application of modern management accounting methods, while controlling for some variables (company age and size and the nature of the industrial sector), can explain 14.22% of the variation in achieving competitive advantage in terms of reducing costs among the PICs.

Moreover, the results show that the control variables have no statistically significant difference in the level of application of SCA between companies in the stone and marble sector and companies in the other industrial sectors included in this study.

The finding can be justified that the application of modern management accounting techniques can help reduce raw material costs while maintaining product quality, which contributes to achieving a competitive advantage in cost reduction. This study is in line with the results of Abu Maria (2018), Seddeq and Yousef (2018), Verma *et al.* (2023) and Safi (2017), which all confirmed that the application of modern management accounting methods can contribute to achieving a competitive advantage by reducing costs.

Conclusion

This study aimed to measure the impact of applying target costing and continuous improvement (Kaizen) on achieving SCA among the PICs. SCA was measured through market share, differentiation and cost reduction. Control variables were included in the study model including company age, size (measured by the number of employees) and nature of the industrial sector (classified into six sectors: stone and marble sector, construction and metal sector, paper and plastic sector, food and beverage sector, handicrafts and textile sector and other industrial sectors). The study yielded the following results.

(1) The level of target cost implementation among PICs was high with a positive impact on achieving SCA. Companies aimed to reduce product costs from the planning and design stage to the determination of the selling price. Such management is based on understanding customer needs and desires to ensure that the target profits are met without violating quality factors.

(2) The application of the continuous improvement techniques among the PICs was high with a positive impact on achieving SCA. Companies worked to reduce defects in all steps and procedures to be able to continue competing effectively.

(3) The PICs achieved a high level of SCA in all three dimensions, with market share being the most prominent. SCA achieves desired profits for the company by focusing on market share and building a good reputation that helps to main company stability in the local market.

(4) Applying target costing and continuous improvement has a positive impact on achieving SCA in terms of market share, differentiation and cost reduction, even in the presence of control variables. The most prominent impact of applying modern management accounting techniques was on achieving SCA in terms of differentiation, followed by market share and then cost reduction.

(5) Company age, size and type of industrial sector had no effect on achieving SCA in terms of market share and cost reduction. However, company size had an impact on achieving SCA in terms of differentiation. This indicates the ability and willingness of management to apply modern strategic management methods to enhance SCA in

terms of market share and cost reduction, regardless of company size, age and the industrial sector to which the industrial company belongs.

(6) This study recommends developing full awareness among facility managers of modern strategic managerial accounting concepts and applying them to reduce costs while achieving quality and customer satisfaction, which ultimately leads to SCA. Workers should also be involved in decision-making processes in establishments at all levels to stimulate teamwork and the creative energies of workers, which will have a positive impact on the production process and product quality.

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