

Effect of the Kaizen Costing Approach on the Reduced Costs, Competitive Advantage, and Rationalising Strategic Cost Management of Industrial Companies Listed on the Amman Stock Exchange in Jordan

Sonia Baker Al-Barghuthi^a, Harcharanjit Singh^b, Zaid Dannoun^c, Nedaa Baker Al-Barghuthi^d, ^{a,b}University Teknologi Malaysia, Malaysia, ^cAemco Jordan, Jordan, ^dHigher Colleges of Technology, United Arab Emirates, Email: ^abjsonia@graduate.utm.my, ^bHarcharanjit@utm.my.my, ^czaed_aa@yahoo.com, ^dnedaa.albarghuthi@hct.ac.ae

This research examines the effect of using the Kaizen costing approach to reduce company costs and achieve a competitive advantage for the industrial companies listed on the Amman Stock Exchange (ASE). The study utilised a deductive approach, and the data was collected from the Jordanian industrial companies through 130 managers, and employees. We found that reducing costs will enable achievement of a competitive advantage and rationalise strategic cost management. If the listed industrial ASE companies want to improve their performance effectively, and efficiently, we recommend that they focus and work on developing Kaizen costs and hold training courses for their employees.

Keywords: *Kaizen costing, Reduced costs, Competitive advantage, Rationalising strategic cost management, Modern method in managerial accounting.*

Introduction

Many modern cost systems have adopted developments in the industry, and information technology. These changes were significant for industrial companies at both local, and international levels by taking the current approaches to cost management, which can reduce costs, after traditional cost management systems were unable to manage it (Kumar et al., 2018). Continuous improvement technology, also known as Kaizen costing, is one of the critical modern technologies that is based on the progressive and continuous improvement in production, which helps in reducing costs, achieving a competitive advantage, and rationalising strategic cost management (Alvarado-Ramírez et al., 2018; Al-Bishtawi & Jarirah, 2015; Gonzalez-Aleu et al., 2018). Continuous improvement technology is defined as “Continuous improvement aims to reduce costs to the lowest possible level without compromising quality and rationalize strategic cost management, in the short term in line with the short product life cycle, to satisfy the consumers so that competitive advantage achieved for the company” (Janjić et al., 2019). With the emergence of free trade organisations, companies have been competing locally and internationally to be able to maintain market share, growth, and continuity. Many large companies have adopted new approaches to cost management and abandoned traditional systems (Monden & Hamada, 1991). Kaizen costing focusses towards the customer and meeting their needs, and desires (Alvarado-Ramírez et al., 2018). However, this approach focusses on the product design and planning process, without relying on the production process to reduce costs, achieve a competitive advantage, and rationalise strategic cost management. Therefore, work on this gap must be filled in with the kaizen cost continuous improvement approach (Chan et al., 2018). On the other hand, a lack of research upon the technique of continuous improvement in reducing costs, achieving a competitive advantage, and rationalising strategic cost management, made the research problem more evident, as cost reduction became necessary in light of the intense competition in the market (Chung, C., 2018).

Consequently, the research problem is the extent of the impact of the use of the Kaizen costing approach on cost reduction, achieving a competitive advantage, and rationalising the management of strategic costs for industrial companies listed on the Amman Stock Exchange in Jordan. This represents the most critical sector listed on the Amman Stock Exchange, and the role of this sector in developing and supporting the local economy. Moreover, this study assesses the development of the industrial sector to improve the local economy, and through the application of a continuous improvement approach, the ability to provide high-quality, and low-cost products. Therefore, in this paper, the researchers seek to discuss the impact of the Kaizen costing approach on reducing the costs, achieving a competitive advantage, and rationalising the strategic cost management of industrial companies listed on the Amman Stock Exchange (ASE) in Jordan.

Kaizen Costing

The Kaizen costing philosophy first appeared among the Japanese, and developed as a result of the perception that they often have superiority over others in global markets, such as being the first in this field (Kale et al., 2015). The Kaizen costing method has been adopted by companies such as Toyota, Mitsubishi, and Toshiba, and many economists believe that these Japanese companies' successes are due to the use of this approach (Todorova et al., 2015). The Kaizen method looks at the improvement process as a process that is achieved gradually, and in small steps (Alvarado-Ramírez et al., 2018). Moreover, Japanese managers prefer to achieve improvement through the entrance of Kaizen with several enhancements aimed at increasing performance continuously, and without interruption, as the Japanese believe that the best improvement should be continuous and through progressive improvements with small jumps (Kale et al., 2015). Accordingly, the Kaizen approach considers that the economic unit is continuously striving to provide the best performance through learning and solving problems, and adopting continuous improvement measures (Vento et al., 2016).

Kaizen Costing Definition

The method of Kaizen costing was created by Dr. Masaaki Imai, the President and owner of the Kaizen Institute in Tokyo. Several branches of his institute have opened in different countries around the world (Ezzat & Sheikh Muhammad, 2010).

The word, 'Kaizen', which is rooted in a Japanese word, consists of two syllables. The first syllable, 'kai', in English means 'change', while the second syllable, 'zen', in English means 'good'. Accordingly, the word, 'kaizen', means 'good change' and is synonymous with the process of continuous improvement (Carnerud et al., 2018).

Hilton et al. (2000) defined kaizen as a process to reduce costs during the manufacturing process and in the product life cycle through small and continuous improvements made to the manufacturing process, instead of the significant root improvements and developments generated by innovations, and massive investments.

Reducing Costs by Using the Kaizen Approach

Kaizen's entrance focusses on reducing costs. This improvement will be made to the current production process or through the product design process, ensuring these improvements a form of process development, improving performance, and then, developing the quality cost performance (Iwao, S., 2017).

Achieving the goal of reducing costs through the use of the Kaizen approach is achieved by excluding activities that do not add value to the product from the consumers' point of view, and reducing damage, taking into account all suggestions made by employees for improvement (Kalpan & Atkinson, 1998; Vento et al., 2016). The Kaizen entry cost helps in the disposal of waste in the operations, as much as possible, thus improving the processing time, cost, and quality (Samadov, 2003; Al-Hyari et al., 2019).

According to Samadov (2003), and Carnerud et al. (2018), wastage or waste types can be categorised as follows:

1. Waste of excess production
2. Waste of time
3. Waste of transportation
4. Waste of operating
5. Waste of storage
6. Waste of movement
7. Waste of fix

Nevertheless, by arriving at cost reduction through the Kaizen entrance, actual costs are used at the end of the previous year, as the reference basis for determining the Kaizen entrance. For example, when the economic unit determines its goal to reduce the cost. To decide Kaizen's entry in 2020, you must rely on the actual costs for 2019. Moreover, the cost reduction at the Kaizen entrance is also linked to the manufacturing stage, and it is essential to rationalise the cost at every stage of production continuously (Iwao, S., 2017).

The actual cost is tracked over time, and compared with the Kaizen entrance goal, and according to what production operations, the competitive environment, and the responsibility to achieve this goal lie with the workers in the economic unit. This includes from the manager to the worker, in every activity, every day, and every time (Hilton et al., 2005). A reduction in costs includes the elements of costs associated with the economic activity of its primary business, represented by the variable of industrial costs from the total manufacturing cost, and related to the work of industrial operation from the beginning of obtaining raw materials and until the commodity becomes saleable as a complete product (Zamil, 2007).

Additionally, the targeted reduction rate by the Kaizen portal applies to all variable costs, and it is produced in the form of cost reduction for direct materials, and direct work. In terms of the rest of the other variable costs, as when the comparison is made, management focusses on the actual reduction amounts via the variable costs, and the targeted reduction amounts (Al-Fadl & Al-Taei, 2004).

Competitive Advantage Using the Kaizen Approach

The strongest global economies consider that competitive advantage is the central pillar upon which the economy must be built, so many different organisations and companies in various fields (industrial, service, commercial, technology, etc.) strive to achieve this advantage in line with their strategic plans and future aspirations.

Al-Bishtawi and Jarirah (2015) studied the importance of applying strategic cost management tools in improving production processes, and developing them in order to obtain competitiveness within the Jordanian general industrial companies, especially in light of the variables brought about by the new economic environment. Al-Bishtawi and Jarirah (2015) found that the strategic cost management, with its multiple methods, plays an essential role in providing the information necessary to implement vital competitive steps for the industries in Jordan.

Moreover, industrial companies may apply strategic cost management tools to achieve a competitive advantage. Nevertheless, Al-Bishtawi and Jarirah (2015) suggested that more research is needed on the relationship between the Kaizen cost advantage to strengthen the current body of knowledge.

Rationalising Strategic Cost Management by Using the Kaizen Approach

Companies seek to provide products and services to customers that meet their demand, so companies in general, and especially industrial, seek to provide the best products and services with the best quality, and the lowest costs. For this purpose, companies sought to achieve the best modern administrative methods in reducing the cost, and from these methods arose the kaizen costing.

According to the process of rationalising, strategic cost management needs to apply an appropriate and robust approach to its application, and thus reduce costs. From the viewpoint of many researchers, the Kaizen approach is one of the best methods to rationalise strategic cost management. De Faria et al. (2013), and Omotayo et al. (2018) found a positive effect of the Kaizen approach and cost management activity based on the value chain analysis.

found that the system of continuous cost improvement (Kaizen costing) leads to maintaining the current cost levels of product production, without occurring an increase while working in a constant and systematic way to reduce costs to lower levels, which is also a cost management system. De Melo and Granja (2012) suggested that future research should investigate further upon cost management by using the Kaizen approach.

Previous Studies

Previous studies were chosen based on the scientific significance of the studies that focussed on the application of the Kaizen approach.

1. *Taher et al. (2018): "The importance of modern management accounting methods in the cost strategy: an applied study on industrial companies listed on the stock market"*.

The study highlighted the importance of using modern management accounting methods in the cost strategy and clarifying the essential techniques used; and identifying the mechanism of work of these advanced methods, and the requirements of their work with an indication of the most critical items that these systems achieve in the strategic cost, and benefit in the work of economic units. The results showed that there is a strong relationship between modern accounting methods, including kaizen's approach and cost strategy.

One of the most critical recommendations in the study is to focus on the modern accounting methods mentioned in the research and their use in economic units. Furthermore, to choose the appropriate method for each industrial unit, with the possibility of merging more than one method to develop a cost management strategy, as it represents the basic element of any economic unit, and is reflected in reducing costs while maintaining quality. In addition, to draw the cost management strategies before starting production or activity, in an effort to choose the appropriate method that fits with the nature of the company or facility.

2. *Al-Bishtawi et al. (2015): "The importance of applying competition strategies and strategic cost management to achieve the competitive advantage of Jordanian industrial companies"*.

The study aimed to demonstrate the importance of applying strategic cost management tools in developing and improving production processes to achieve a competitive advantage for Jordanian public industrial companies. This was especially considering the variables brought about by the new economic environment. To achieve the goals of the study, the researchers designed a questionnaire, which was distributed to the directors of financial departments, production, and sales, via three surveys for each company. The number of approved reviews for analysis reached 135. The study concluded that strategic cost management, with its multiple methods, plays an essential role in providing the information necessary to implement competitive strategic steps for Jordanian public industrial companies, and that industrial companies apply strategic cost management tools to achieve competitiveness.

Moreover, the researchers presented a set of suggestions and recommendations, including that there is a possibility to apply strategic cost management tools in these companies due to

the existence of necessary ingredients, including the availability of basic skills to use strategic cost management techniques, the spread of the automation phenomenon, and the presence of specialised training programs to qualify and train workers. However, in return, the study showed that there are several difficulties with the application.

3. *The study entitled: “Kaizen Entrance as a Tool for Rationalizing Strategic Cost Management”.*

The study aimed to shed light on the positive effects of integration between the Kaizen approach, and cost management, and was based on activity through a value chain analysis. Furthermore, the researcher used the descriptive analytical approach to achieve the goals of this study. The results of the study showed that the system of continuous cost improvement leads to maintaining the current cost levels of product production, without occurring an increase, while working continuously and systematically to reduce costs to lower levels, which is also a cost management system. Furthermore, the study recommended the necessity of paying attention to simplified product design, attention to human capital, continuous concern for improving quality, introducing new and innovative products to markets that meet customer needs as quickly as possible, and attention to flexible production systems and continuous improvement.

4. *Shimizu (2013): “Transforming Kaizen at Toyota”.*

This study dealt with the application of the Kaizen entrance in the Japanese company, Toyota, and aimed to clarify the importance of using the Kaizen entrance for continuous improvement. The researcher used the analytical method and the results of the study showed that the implementation of the Kaizen entrance in the company began a year ago (1990) in office work, and was followed by the engineering departments of the company, and later, in cost management activities. The company benefited from the application of the Kaizen entrance in reducing costs, and led to an increase in the efficiency of production management in the company. The use of the Kaizen entrance in the company led to increasing the quality of products, and one of its most important recommendations was to take all proposals of employees in the company at the design stage, study them, and then choose the most appropriate in terms of quality, and cost.

Research Hypothesis

The present research sought to examine the following hypotheses:

H1: Kaizen costing has a positive impact on reducing product costs for industrial companies listed on the ASE.

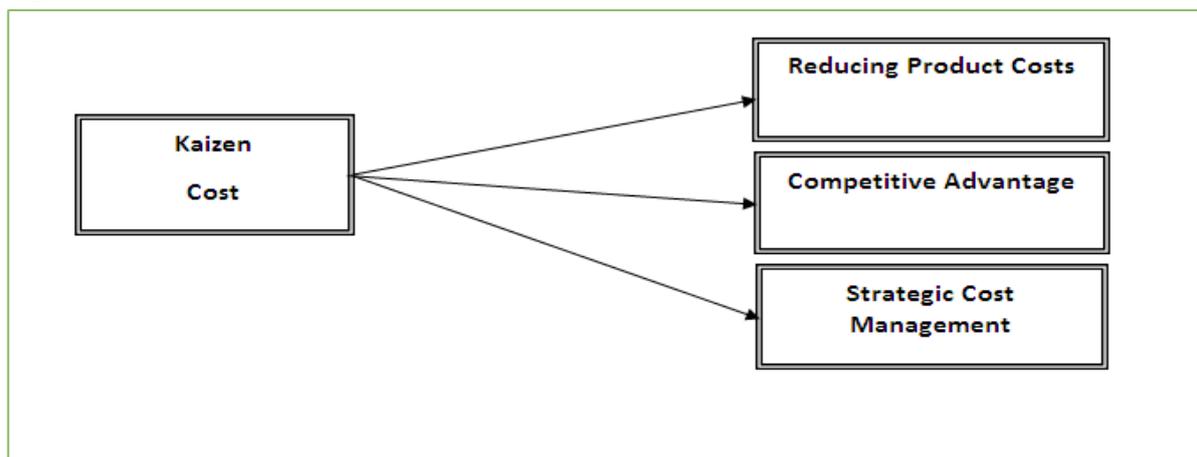
H2: Kaizen costing has a positive impact on the achievement of competitive advantage for industrial companies listed on the ASE.

H3: Kaizen costing has a positive impact on strategic cost management for industrial companies listed on the ASE.

Research Model

Based on the literature review, and the gaps of the study, the research proposed a theoretical framework, as displayed in Figure 1. Specifically, the research examines the relationship of how Kaizen costing can reduce product costs, achieve a competitive advantage, and improve strategic cost management.

Figure 1. Theoretical Framework



Research Methodology

The quantitative method intends to confirm a theoretical model rather than discover or verify an existing conceptual model (Denzin, 2017). Hence, the quantitative method was found suitable for measuring, and validating the theoretical framework. The quantitative approach of this research helped to analyse the data through statistical techniques, and present information by using charts and tables to measure the relationship between the variables (Clark & Creswell, 2015).

Unit of Analysis

Sekaran (2003) defined that a unit of analysis is who or what is being read in devoted research. Evidence via social science research has confirmed a unit of study as an arrangement, an individual, social interaction or a group of organisation individuals. The unit of depth psychology in this subject is the establishment. The unit of analysis for this present

study is comprised of the managers, and employees in industrial companies in Jordan who know the Kaizen cost method.

Population and Sampling

Moreover, the majority of the Jordanian industrial companies are located in Amman. Hence, the population of the study is based on industrial companies listed on the ASE in Jordan. The sample considered of a subset of people. According to Kumar (2005), the sampling frame can be used for selecting the samples. The Table 1 shows the industrial sectors listed on the ASE, the number of companies in each industry, and the number of managers or staff in each company.

Table 1: Distribution of the Sample

No	Sector	Number of Companies in ASE	Number of Managers or Staff	Population-Managers or Staff
1	Medicines and medical industries	4	3	12
2	Chemical industries	7	3	21
3	Paper and Cardboard	1	2	2
4	Printing and packaging	1	2	2
5	Food and drinks	9	3	27
6	Tobacco & cigarettes	2	2	4
7	Extractive Industries and Mining	10	3	30
8	Engineering construction industries	6	3	18
9	Electrical Industries	3	2	6
10	Textiles, leather and textile industries	4	2	8
Total		47	---	130

However, due to the small sample size representativeness of the population, the entire population of 130 from 47 industrial companies listed in ASE, as of December 2019, was used for the data analysis.

Sampling Method

The probability sampling method is appropriate for generalisation and is built up of mere random sampling, and complex probability sampling. However, for this research, a stratified random sample was found suitable, as all the examples were listed on the ASE and found in the directory.

Measurement Scale

This study assigned an interval Likert scale, which is typically used in questionnaires and is the most established scale in survey research. When giving responses to a Likert questionnaire item, the respondent will make a specific assessment of their level of agreement, rated from ‘strongly disagree’ to ‘agree strongly’. Therefore, this study used a five-point Likert type scale ranging from one ‘1’ or ‘strongly disagree’ to ‘5’ or ‘strongly agree’. Moreover, the five-point itemised rating scale is easy to construct, administer, and produces a more positive rating (Churchill et al., 2004).

Table 2: Measurements

No.	Measurement	Source
1	Reducing Product Costs	Taher A., Jabr A., Sharif N. (2018) Akter et al. (2015) Monden, Y., & Hamada, K. (1991) Akter (2015)
2	Competitive Advantage	Bishtawi S. & Jarrarah T. (2015) Lotfi, M. A. (2010) Chase R. B. et al. (2004)
3	Strategic Cost Management	Bishtawi S. & Jarrarah T. (2015) De Melo et al. (2012) Ezzat & Sheikh Muhammad (2010) Hilton et al. (2000)
4	Kaizen Costing	Al-Hyar et al. (2019) Khan et al. (2019) Alvarado-Ramirez et al. (2018) Álvarez-García et al. (2018)

Data Collection Procedures

According to Sekaran (2003), a structured questionnaire is a method for gathering the data, where the researcher has the exact knowledge of the requirement. Besides, how the interest variables of interest are to be measured. Similarly, Sekaran (2003) suggested that a questionnaire can be an efficient mechanism of data gathering, particularly in the situation where there is a need to safeguard the respondents' privacy, and the responses are expected to be in a standardised way. Furthermore, a questionnaire is usually easy to analyse, low-cost to administer, familiar to most people, and can help to reduce bias, as the researcher's influence on the respondents' answers is minimised. Nevertheless, questionnaires for the present research were distributed to the companies by e-mail, and by hand inside the companies. Likewise, data was collected at the convenience of the respondents.

Results and Discussion

Response Rates

In line with the decision to use the entire population, the questionnaires were distributed to 130 respondent citizens in Jordan, who are currently working in industrial companies. Based on Table 2, out of 130 distributed questionnaires, only 118 questionnaires were returned at a response rate of 91 per cent. Hair et al. (2010) argue that researchers should discard any cases of collected questionnaires where more than 50 per cent of the data is missing. Before the data analysis is performed, it is essential to take into account the data accuracy, which was fed into the data file, as well as the output that would produce non-distorted correlations (Tabachnick & Fidell, 2001). This section discusses the necessary data screening procedures before data analysis, which is the detection of missing data, and outliers.

Table 2: Summary of Response Rates

Questionnaire administered	N	Percentage
Undelivered	0	0
Uncompleted	12	9.2%
Number of responses	118	90.8%
Response rate (118/130)	130	90.8%

Demographic Statistic

Based on Table 3, the statistical description of the study sample is subject to analysis, which was 118 questionnaires, where the highest mean value is 4.4970 for professional certification, and the lowest mean value is 1.3885, specific to gender. The above table also shows the standard deviation of the study sample, as the highest cost was 1.72047, which is specific to the position. Meanwhile, the lowest value was 0.48863, which is specific to gender.

Furthermore, Table 3 also shows the skewness of the study sample, where the highest statistic value of 0.456 is for gender, with a standard deviation of 0.153; and where the lowest statistic value is -2.151, and is for pro certification, with a standard deviation of 0.153. Table 3 also displayed the Kurtosis of the study sample, where the highest statistic value reached 3.073, which is for professional certification, with a standard deviation of 0.306; and while the lowest statistic value is -1.807, which is specific to gender, with a standard deviation of 0.306.

Table 3: Descriptive Statistics

Demographic Item	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Gender	118	1.3885	.48863	.456	.153	-1.807	.306
Age	118	3.71	.821	.316	.153	-.999	.306
Education	118	2.2450	.71295	.412	.153	.205	.306
Professional Certification	118	4.4970	1.17818	-2.151	.153	3.073	.306
Experience	118	3.3896	.86419	.062	.153	-.657	.306
Position	118	3.4739	1.72047	.035	.153	-1.286	.306

Multiple Correlations

To estimate how much the predictors explain the percentage of the variance of the dependent variables, squared multiple correlations were computed, as shown in Table 4.

Table 4: Squared Multiple Correlation

R ²	Estimated
Kaizen cost	.327
Reduce costs	.256
Competitive advantage	.416
Rationalizing strategic cost management	.572

The Table 4 shows the results of the squared multiple correlations. It is estimated that the predictors of 'Kaizen costing' explain 32.7 per cent of its variance. In other words, the error variance of 'Kaizen costing' is approximately 67.3 per cent of the variance of Kaizen costing itself. It is estimated that the predictors of 'reduce costs' explain 25.6 per cent of its variance. In other words, the error variance of 'reduce costs' is approximately 75.4 per cent of the variance of 'reduce costs' itself. In addition, it is estimated that the predictors of 'competitive advantage' explain 41.6 per cent of its variance. In other words, the error variance of

‘competitive advantage’ is approximately 58.4 per cent of the variance of ‘competitive advantage’ itself. Finally, it is estimated that the predictors of ‘rationalising strategic cost management’ explain 57.2 per cent of its difference. In other words, the error variance of ‘rationalising strategic cost management’ is approximately 42.8 per cent of the variance of ‘rationalising strategic cost management’ itself.

Computations of Effects on Variables

Direct Effect

The standardised direct effects are displayed in Table 5.

Table 5: Standardised direct Effects

	Reduce costs	Competitive advantage	Rationalising strategic cost management
Kaizen costing	0.299	0.305	0.441

The Table 5 shows the results of the standardised direct effects. The standardised direct effect of ‘Kaizen costing’ on ‘reduce costs’ is 0.299. This means that when the ‘Kaizen costing’ goes up by one standard deviation, the ‘reduce costs’ go up by 0.299 standard deviations. Also, the standardised direct effect of ‘Kaizen costing’ on ‘competitive advantage’ is 0.305. This means that when the ‘Kaizen costing’ goes up by one standard deviation, the ‘competitive advantage’ goes up by 0.305 standard deviations. Finally, the standardised direct effect of the ‘Kaizen costing’ on ‘rationalising strategic cost management’ is 0.441. This means that when the ‘Kaizen cost’ goes up by one standard deviation, the ‘rationalising strategic cost management’ goes up by 0.441 standard deviations.

The standardised direct effects are displayed in Table 6.

Table 6: Standardised Direct Effects - Two-Tailed Significance (BC)

	Reduce costs	Competitive advantage	Rationalising strategic cost management
Kaizen costing	0.002	0.016	0.039

The above are a bootstrap approximation obtained by constructing two-sided, bias-corrected confidence intervals. The standardised direct effect of the ‘Kaizen costing’ on ‘reduce costs’ is significantly different from zero at the 0.01 level ($p = 0.002$ two-tailed). Furthermore, the standardised direct effect of the ‘Kaizen costing’ on ‘competitive advantage’ is significantly different from zero at the 0.01 level ($p = 0.016$ two-tailed). Finally, the standardised direct

effect of the 'Kaizen costing' on 'rationalising strategic cost management' is significantly different from zero at the 0.01 level ($p = 0.039$ two-tailed).

Testing the Hypotheses

Testing the Hypotheses between 'Kaizen Costing' and 'Reduce Costs'

H1: Kaizen costing has a positive impact on reducing cost products for industrial companies listed on the Amman Stock Exchange in Jordan.

As shown in Table 5, Kaizen costing has a positive impact on reducing cost products, with a value of 0.299. However, this impact is significantly different from zero at the 0.05 level, as p is 0.002, which is less than 0.05, as shown in Table 6. Therefore, this hypothesis (H1) is accepted.

Testing the Hypotheses between 'Kaizen Costing' and 'Achieve the Competitive Advantage'

H2: Kaizen costing has a positive impact on achieving the competitive advantage for industrial companies listed on the Amman Stock Exchange in Jordan.

As shown in Table 5, Kaizen costing has a positive impact on achieving a competitive advantage, with a value of 0.305. However, this impact is significantly different from zero at the 0.05 level, as p is 0.016, which is less than 0.05, as shown in Table 6. Therefore, this hypothesis (H2) is accepted.

Testing the Hypotheses between 'Kaizen Cost' and 'Rationalising Strategic Cost Management'

H3: Kaizen costing has a positive impact on rationalising strategic cost management for industrial companies listed on the Amman Stock Exchange in Jordan.

As shown in Table 5, Kaizen costing has a positive impact on rationalising strategic cost management, with a value of 0.441. However, this impact is significantly different from zero at the 0.05 level, as p is 0.039, which is less than 0.05, as shown in Table 6. Therefore, this hypothesis (H3) is accepted.



Conclusion and Recommendations

Conclusion

The study concluded that by applying the Kaizen approach correctly, and at an appropriate time, this would contribute to reducing the cost of products and improving their quality, and thus providing them to customers at a reasonable price and less than the price of competitors. This contributes to strengthening the company's position among competitors, and achieving a competitive advantage. Furthermore, the weak application of modern managerial accounting methods will contribute to the decline in the performance of the company, and thus its exit from the market. Hence, the study focussed on adopting current practices in managerial accounting by industrial companies in Jordan, in an effort to be able to raise its performance and achieve a competitive advantage, especially in light of the modern business environment that is witnessing competition intensity.

Recommendations

According to the results reached from the theoretical framework for the study, statistical analysis, and effects, the most prominent recommendations are that the industrial companies listed on the Amman Stock Exchange should work on developing the entrance application (Kaizen), as this has an impact on reducing costs, and achieving the competitive advantage of these companies. Moreover, among the recommendations is to hold training courses for employees in companies on the entrance (Kaizen), and to clarify the importance of companies to raise the efficiency, and effectiveness of performance, as well as encourage researchers to undertake further research on this aspect.

REFERENCES

- Akili O. W. (2000), *The integrated methodology for total quality management*, 1st Floor, Dar Al-Wael Printing and Publishing, Amman, Jordan.
- Akter, S., Yasmin, R., & Ferdous, M. A. (2015). Implementation of kaizen for continuous improvement of productivity in garment industry in Bangladesh. *American Academic & Scholarly Research Journal*, 7(3), 229–243.
- Al-Fadl M., Nour A. N., Al-Rawi A. K. (2007), *Management accounting*. 2nd Edition, Al-Masirah House for Publishing and Distribution, Amman, Jordan.
- Al-Fadl, M. & Al-Taei, Y. (2004), *Total quality management from consumer to consumer - a quantitative approach*, 1st Floor, Al-Warraaq Institution for Distribution and Distribution, Amman, Jordan.
- Al-Hyari, K. A., Abu Zaid, M. K., Arabeyyat, O. S., Al-Qwasmeh, L., & Haffar, M. (2019). The applications of Kaizen methods in project settings: applied study in Jordan. *TQM Journal*, 31(5), 831–849.
- Al-sayyed, S. M. (2015). The impact of the use of Modern Management Accounting Techniques to Streamline Decision-Making in the Jordanian Industrial Companies. *European Journal of Business and Management*, 7(10), 260–271.
- Alvarado-Ramírez, K. M., Pumisacho-Álvaro, V. H., Miguel-Davila, J. Á., & Suárez Barraza, M. F. (2018). Kaizen, a continuous improvement practice in organizations: A comparative study in companies from Mexico and Ecuador. *TQM Journal*, 30(4), 255–268.
- Álvarez-García, J., Durán-Sánchez, A., & del Río-Rama, M. de la C. (2018). Systematic bibliometric analysis on Kaizen in scientific journals. *TQM Journal*, 30(4), 356–370.
- Arya, A. K., & Choudhary, S. (2015). Assessing the application of Kaizen principles in Indian small-scale industry. *International Journal of Lean Six Sigma*, 6(4), 369–396.
- Belhadi, A., Touriki, F. E., & Elfezazi, S. (2019). Evaluation of critical success factors (CSFs) to lean implementation in SMEs using AHP: A case study. *International Journal of Lean Six Sigma*, 10(3), 803–829.
- Bishtawi S. & Jarrarah T. (2015). The importance of applying strategic cost management and competition strategies to achieve a competitive advantage for Jordanian public industrial companies. *Dirasat: Administrative Sciences*, 161 (2360), 1-27.



- Carnerud, D., Jaca, C., & Bäckström, I. (2018). Kaizen and continuous improvement – trends and patterns over 30 years. *TQM Journal*, 30(4), 371–390.
- Chan, C. O., & Tay, H. L. (2018). Combining lean tools application in kaizen: a field study on the printing industry. *International Journal of Productivity and Performance Management*, 67(1), 45–65.
- Chase R. B., Jacobs R. F., Aquilano N. J. (2004), *Operation Management for Competitive advantage*. 10th ed, MC Graw-Hill Companies, Ince. USA.
- Chung, C. H. (2018). The Kaizen Wheel – an integrated philosophical foundation for total continuous improvement. *TQM Journal*, 30(4), 409–424.
- Danreid, R., Sunders, Nada R. (2002) *Operation management*. John-Wiley & Sons, Inc USA.
- De Faria, A. C., Soares, I. C., Rocha, W., & Rossi, G. B. (2013). A prática da gestão de custos interorganizacionais em uma montadora de veículos na Região do Grande ABC. *Revista Brasileira de Gestao de Negocios*, 15(49), 617–638.
- De Melo, R. S. S., & Granja, A. D. (2012). Interorganizational cost management and its implications for target costing in construction. *IGLC 2012 - 20th Conference of the International Group for Lean Construction*, January.
- Dresch, A., Veit, D. R., Lima, P. N. de, Lacerda, D. P., & Collatto, D. C. (2019). Inducing Brazilian manufacturing SMEs productivity with Lean tools. *International Journal of Productivity and Performance Management*, 68(1), 69–87.
- Drotz, E., & Poksinska, B. (2014). Lean in healthcare from employees' perspectives. *Journal of Health, Organisation and Management*, 28(2), 177–195.
- Evans J. R. (1997), *Production & operations management quality performance & value*, 5th ed. N. Y, West publishing Co.
- Ezzat & Sheikh Muhammad (2010). Kaizen's method and its relationship to cost reduction. *Journal of Accounting and Financial Studies*, 5 (10). 158-163.
- Fonseca, L. M., & Domingues, J. P. (2018). The best of both worlds? Use of Kaizen and other continuous improvement methodologies within Portuguese ISO 9001 certified organizations. *TQM Journal*, 30(4), 321–334.
- Gonzalez-Aleu, F., Van Aken, E. M., Cross, J., & Glover, W. J. (2018). Continuous improvement project within kaizen: critical success factors in hospitals. *TQM Journal*, 30(4), 335–355.



- Goossens, R. H. M. (2018). Preface. *Advances in intelligent systems and computing*, 605, 7–8.
- Haider, A., & Mirza, J. (2015). An implementation of lean scheduling in a job shop environment. *Advances in Production Engineering and Management*, 10(1), 5–17.
- Hair, J. F., Anderson, R. E., Babin, B. J., Black, W. C. (2010). *Multivariate Data Analysis: A global perspective*. Upper Saddle River (7th ed.).
- Hill T. (2000), *Operation Management Strategic, Context & Management analysis*, Macmillan Press LTD London.
- Hilton., Ronald M. W., Michael H., Frank, (2000),"cost Management for strategy Business ", Irwin, McGraw Hill CO.
- Iwao, S. (2017). Revisiting the existing notion of continuous improvement (Kaizen): literature review and field research of Toyota from a perspective of innovation. *Evolutionary and Institutional Economics Review*, 14(1), 29–59.
- Jawad, S. M. (2012). The possibility of benefiting from the continuous improvement technology in improving the product value of economic units (an applied study in the General Company for Electrical Industries) - Fans Factory -. *Iraqi Journal of Administrative Sciences*, 8 (33), 78-100.
- Jbarah, S. S. (2017). the impact of strategic management accounting techniques in taking investment decisions in the Jordanian industrial companies. *International Business Research*, 11(1), 145-149.
- Jurburg, D., Viles, E., Tanco, M., Mateo, R., & Lleó, Á. (2019). Understanding the main organisational antecedents of employee participation in continuous improvement. *TQM Journal*, 31(3), 359–376.
- Kale, R. P., Raut, L. P., & Talmale, P. (2015). Kaizen & its applications – A Japanese terminology referred to continuous improvement. *International Journal for Scientific Research & Development*, 3(02), 1772–1775.
- Khan, S. A., Kaviani, M. A., J. Galli, B., & Ishtiaq, P. (2019). Application of continuous improvement techniques to improve organization performance: A case study. *International Journal of Lean Six Sigma*, 10(2), 542–565.
- Kumar, S., Dhingra, A., & Singh, B. (2018). Lean-Kaizen implementation: A roadmap for identifying continuous improvement opportunities in Indian small and medium sized enterprise. *Journal of Engineering, Design and Technology*, 16(1), 143–160.



- Lotfi, M. A. (2010), Using the methods of reducing the product life cycle to improve the performance of industrial organizations and increase their competitiveness: A study of applied. *Accounting Thought* 14 (1), 107-167.
- Monden, Y., & Hamada, K. (1991). Target costing and kaizen costing in Japanese automobile companies. *Journal of Management Accounting Research*, 3(1), 16-34.
- Omotayo, T. S., Kulatunga, U., & Bjeirmi, B. (2018). Critical success factors for Kaizen implementation in the Nigerian construction industry. *International Journal of Productivity and Performance Management*, 67(9), 1816–1836.
- Papic, L., Mladjenovic, M., Garcia, A. C., & Aggrawal, D. (2017). Significant factors of the successful lean six-sigma implementation. *International Journal of Mathematical, Engineering and Management Sciences*, 2(2), 85–109.
- Realyvásquez-Vargas, A., Arredondo-Soto, K. C., Carrillo-Gutiérrez, T., & Ravelo, G. (2018). Applying the Plan-Do-Check-Act (PDCA) cycle to reduce the defects in the manufacturing industry. A case study. *Applied Sciences (Switzerland)*, 8(11). 147-152.
- Samadov M. (2003). *Quality Control Assignment Implementation of TQM: CROSS-Cultural Standpoint: Ball State University.*
- Sekaran U. (2003). *Research methods for business (4th ed.)*. Hoboken, NJ: John Wiley & Sons.
- Sekaran, U., & Bougie, R. (2011). *Research Methods for Business: A Skill-Building Approach*, 6th Edition.
- Shimizu, K. (2000). *Transforming Kaizen at Toyota*. WorNing Paper, ONayama University.
- Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics*. Allyn and Bacon. Needham Heights, MA.
- Taher A., Jabr A., Sharif N. (2018) The importance of modern management accounting methods in the cost strategy: an applied study on industrial companies listed on the stock market ", 2nd issue (Part 1) 50-66.
- Todorova, D., & Dugger, J. (2015). Lean Manufacturing Tools In Job Shop, Batch Shop and Assembly Line Manufacturing Settings. *Journal of Technology, Management & Applied Engineering*, 31(1), 1–19.



- Vento, M. O., Alcaraz, J. L. G., Macías, A. A. M., & Loya, V. M. (2016). The impact of managerial commitment and kaizen benefits on companies. *Journal of Manufacturing Technology Management*, 27(5), 692–712.
- Watts, D., Senarath Yapa, P. W., & Dellaportas, S. (2014). The case of a newly implemented modern management accounting system in a multinational manufacturing company. *Australasian Accounting, Business and Finance Journal*, 8(2), 121–137.
- Yadav, V., Jain, R., Mittal, M. L., Panwar, A., & Sharma, M. K. (2019). An appraisal on barriers to implement lean in SMEs. *Journal of Manufacturing Technology Management*, 30(1), 195–212.
- Zamil A. (2007), management accounting with computer applications, 2nd floor, Institute of Public Administration. Riyadh, Saudi Arabia.