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Empirical Investigation of Relationship between Kaizen Philosophy and Organizational Performance: A Case of Ethiopian Manufacturing Industries

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Abstract

The purpose of this research is empirically investigating the effect of Kaizen on organizational performance in Ethiopian manufacturing industries. Developing research framework, experimental analysis of the empirical study and developing new model are the research approaches used in this study. Moreover, the primary data was collected through self-administered questionnaire and was analyzed using statistical package for social science (SPSS) 20. The findings were triangulated to relate with the existing literature. Based on this, the findings discovered that Kaizen practices relating social and technical factors have a highly positive effect on organizational performance. It was also found that people, process and partnership factors were apparent as the foremost Kaizen practices in achieving organizational performance. However, strategy does not have significant impact on achieving society results. The study showed that effective implementation of Kaizen philosophy results in enhancing organizational performance. The study was limited with small number of companies in Ethiopia with little respondents on each company and it may not be adequate to generalize the results for the entire Ethiopian manufacturing companies. The findings of this study emphasized that Kaizen philosophy with 2 social and 4 technical factors as a total of 36 items practice holistically rather than on a piecemeal basis able to get the full potential of the identified Kaizen practices with improving the operational and financial performance of companies. Since there is lack of literature on Kaizen empirical evidence, the study has contributed to the Kaizen philosophy literature with a better understanding of its practices and their association with performance measures that will provide valuable knowledge to Ethiopian manufacturing company managers, academicians, practitioners and Ethiopian Kaizen Institute on improving Kaizen philosophy current practices.

Keywords: Kaizen, Performance, Empirical, Factor, Correlation, Regressions, Ethiopia

Introduction

Background of the research

At the moment, the international business marketplace has turn out to be extremely aggressive. Due to this reason, organizations are facing different challenges on improving customer service, making operation faster, more operation and reduction in costs. To congregate these challenges, to survive and successfully compete in a market, companies have to use the best management practices, strategies and tools (Abate & Mengesha, 2020; Suárez-Barraza & Miguel-Davila, 2020; Abebe & Singh, 2019). Kaizen philosophy has long been viewed as a policy and strategy instrument to attain business excellence by enhancing organizational performance and competitive-

ness (Kumar, 2019; Janjić et al., 2019; Lina & Ullah, 2019; Goyal et al., 2019; Bellgran, et al., 2019; Hailu et al., 2018). In the existing literature, few empirical case studies examined the existing link with organizational performance, particularly, in Ethiopia context almost none.

Kaizen philosophy is aggressively implemented in whole regions of Ethiopia including Diredawa and Addis Ababa city administration. Till now, more than 700 organizations (manufacturing, service and capacity building institutions) are practiced Kaizen for continuously manage and improve their operations to enhance organizational performance. The main point here is application of Kaizen philosophy should be empirically investigated to address if there are opportunities for the improvement of government policies and strategies relating to Kaizen adoption and implementation. Of course, there are very few studies conducted by Hosono et al. (2020); Lina & Ullah (2019); Jalu (2015) and Desta (2014) on Ethiopia with target of assessment of Kaizen practice's effect on manufacturing and service organizations. Largely, the studies are qualitative, reviewed secondary data of annual company reports and identified tangible and intangible results. Even, a study conducted by Jalu (2015) used only descriptive statistical analysis of mean and standard deviation values to examine the extent of Kaizen implementation and to look at either the company benefited from it or not with empirical investigation of the existing true link between Kaizen practice and organizational performance. Moreover, these studies also do not use corresponding measuring instrument of Kaizen practices of social and technical factors and also, organizational performance measuring instruments relating to operational and financial performance. For this reason, it was difficult to get research works similar to this study in Ethiopian organizations context and this demonstrates that there is empirical evidence deficiency that showed the existing true link between practice of Kaizen and organizational performance. Owing to a lack of current empirical studies, it is difficult for Ethiopian manufacturing industries to obtain and capture up-to-date sufficient information to look for rooms for improvement and support on Kaizen implementation process. This study identified the research questions which must be addressed at the end of this research work are: is there any positive and significant relationship existing between the practice of Kaizen and organization performance? And which Kaizen practices are more associated with the organizations performance? Therefore, to answer these questions, the present study aims to empirically investigate the existing true link between Kaizen practices and organizational performance. Specifically, the study sets the following objectives: to identify a set of Kaizen practices relating to social and technical factors and used performance measuring instrument in Ethiopian manufacturing industries, to investigate the extent of implementation and achieved results, and to make comparisons among the case manufacturing companies with regard to social and technical factors of Kaizen practices and operational and financial measures of organizational performance. Therefore, by looking at this research area and conducting a research has an opportunity for contribution more to industries and institutions undoubtedly.

The Relationship between Kaizen and Organizational Performance

Here, the first question is whether Kaizen really helps the organizations in improving their performance in terms of operational and financial performance. To answer this question, the study should focus on examining research works which disclosed the practice of Kaizen has an impact on organizational performance globally. Based on this, the study conducted at Ethiopian private companies by Lina and Ullah (2019); Hailu et al. (2017); Jalu (2015) and Desta (2014); at Saudi Arabia companies by Abdulmouti (2018) remarked that companies have been benefited more from the Kaizen practice by achieving operational and financial results. Moreover, many studies also identified the success factors during Kaizen practice that enable manufacturing industries to be competitive. These are: effective leadership (Janjić et al., 2019; Hailu et al., 2017); Top management policy, commitment, support (Kumar, 2019; Lina & Ullah, 2019; Todorovic et al., 2019; Abdulmouti, 2018;

Hailu et al., 2017); process control (Hailu et al., 2017); Culture of effective and flexible suggestion system (Kumar, 2019; Shah & Naik, 2018; Abdulmouti, 2018; Hailu et al., 2017); the use of problem solving techniques (Kumar, 2019; Abdulmouti, 2018; Khanna et al., 2017a; Khanna et al., 2017b; Amrutkar & Kamalja, 2017) and Supportive organization structure (Kumar, 2019; Janjić et al., 2019); employee's attitude (Hailu et al., 2017); employee's and management involvement, team dynamics (good presentation and communication skills), recognition (Janjić et al., 2019; Abdulmouti, 2018; Hailu et al., 2017); good management-employee relationship and train employees (Todorovic et al., 2019; Lina & Ullah, 2019; Janjić et al., 2019; Hailu et al., 2017); continual evaluation system and cultivating internal communication system (Todorovic et al., 2019; Hailu et al., 2017); strategic orientation (Todorovic et al., 2019). These all studies are only focusing on assessment and identifying critical success factors. Even the identified factors are items not practices which are included in the variables and lacking experimental investigation of the true relationship existing between Kaizen practice and organizational performance. Therefore, common variables which contain items and used by studies listed on Table 1 below were identified.

From the above literature review, this study identified six common Kaizen practices (leadership, people, process; strategy; partnership including supplier; resource) and six organizational performance measures (results of quality; productivity (labor and machine); people result; customer and society result as operational measures, and size of sales, profit level, market share as financial performance measures). Moreover, Bou-Llusar et al. (2008) and Calvo-Mora et al. (2014) categorized these practices: leadership, and people as social, and process, strategy, partnership and resources as technical factors. Hence, some of the studies are conducted in the context of Ethiopia. Still these studies have deficient in empirical evidence on exploring the true association of Kaizen practices with different levels of organizational performance in Ethiopia. Therefore, there is an opportunity to contribute to the body of knowledge by providing empirical evidence from Ethiopia relating to empirical evidence on the link between Kaizen practice and organizational performance.

The Rational of this Research

Based on the above stated theoretical framework and statistical evidence that relate Kaizen and organizational performance in Ethiopia manufacturing industries perspective is almost very few. But, the practice of Kaizen has an effect on manufacturing companies by securing both quantitative and qualitative results as stated on the above. This point out that still quantitative experimental empirical study is needed to completely understand the practice of Kaizen and its existing relationship with organizational performance.

Table 1.Variables used for showing link between Kaizen and organizational performance

Author / **Independent variable**	**Aderaw (2019)**	**Shafiq et al. (2019)**	**Jong et al. (2019)**	**Rawashdeh (2018)**	**Baye & Raju (2016)**	**Jalu (2015)**	**Beshah & Kitaw (2014)**	**Author** / **Dependent variable**
Leadership (TMS)	* / *	*	* / *	* / *	*	* / *	*	Quality
Customer focus	* / *		* / *	*	*		*	Delivery
People management	* / *	*	* / *	*	*			Cost
Process management	* / *	*	*	*	*		*	Flexibility

Author / Independent variable	Aderaw (2019)	Shafiq et al. (2019)	Jong et al. (2019)	Rawashdeh (2018)	Baye & Raju (2016)	Jalu (2015)	Beshah & Kitaw (2014)	Author / Dependent variable
Continuous improvement	*	*		* *	*			Non-financial (people result)
Product design	*	*		*				Size of sales
Supplier quality management	*	*		* *	*	*		Profit level
Strategy (policy, strategic planning)		*	*	*		*	* *	Productivity
Resources (& partnership)		*					* *	Customer focus
Measurement, analysis & knowledge management			*	*			*	Market share
Kaizen tools and techniques						*	*	Impact on society

Materials and Methods

The research was done using different materials and methods. The research approach, framework, design and hypothesis formulation are the main tasks performed on this section. The detail of each task is presented as follows:

Research Approach

The approach of this research follows three ways in addressing the link between practice of Kaizen and organizational performance (Figure 1). The first approach is extensively reviewed literature; developed research framework; proposed hypotheses and developing questionnaire. The second approach is analyzed the questionnaires using reliability, descriptive, factor, Pearson's correlation, and multiple regression analyses by encoded in statistical package for social science (SPSS 20). At the end, analyzed hypothesis result, developed new model and drawn conclusion and implication based on the findings from the empirical evidence to emphasize the relationship between Kaizen and organizational performance.

Research Framework

As stated in the introduction, this study interests on adapting and using independent variables of Kaizen practices relating to social factors of leadership and people; technical factors of strategy, process, resource and partnership. Moreover, adaptation of dependent variables of organizational performance measures relating to operational and financial performance measures were also interests of this study. For this reason and based on the above literature review, this study adapted 2 so-

cial and 4 technical factors (Shafiq et al., 2019) of Kaizen practices (independent variables), and 5 operational and 1 financial (Jong et al., 2019; Rawashdeh, 2018; Beshah & Kitaw, 2014) measures (dependent variables). In perspective of the above adaptation, the research framework (Figure 2) and hypotheses are developed linking Kaizen practices with organizational performance.

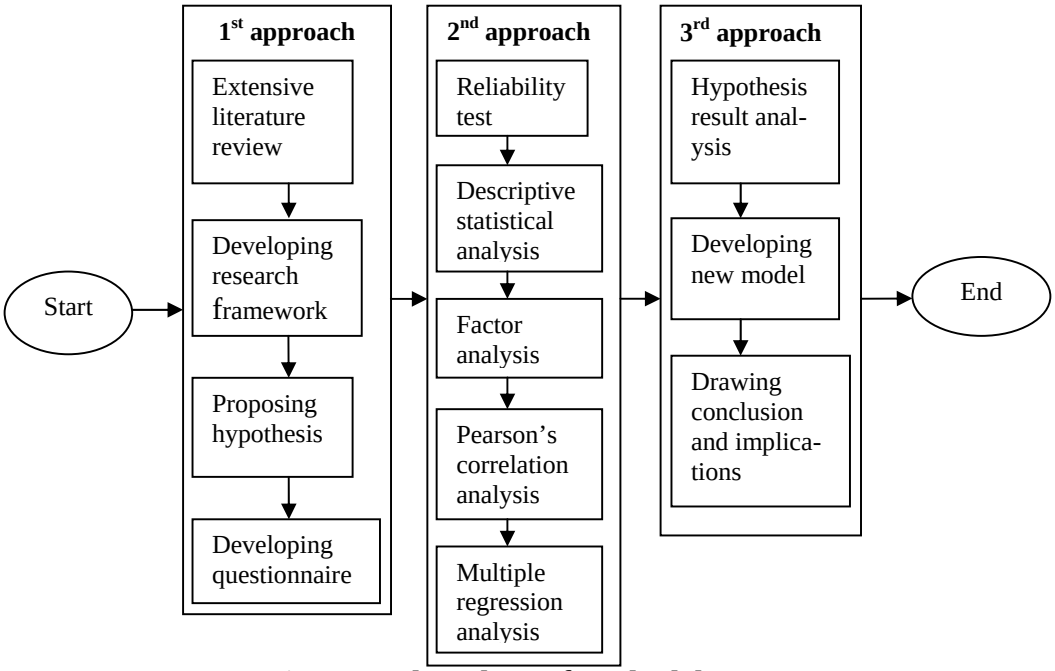

Figure 1. Flow chart of methodology

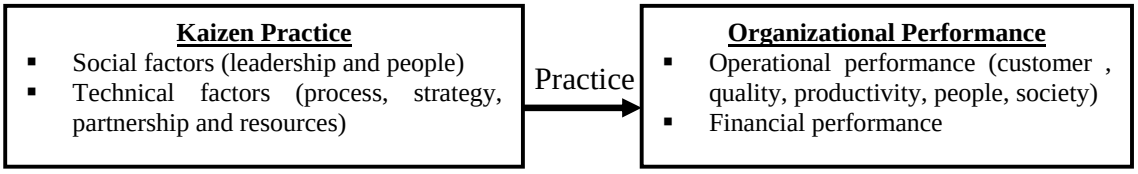

Figure 2. Conceptual framework

Research Design

The study employed is quantitative and experimental in nature where the focus is on fact finding investigation with adequate interpretation. The total sample size (n) is calculated by using the formula discovered by Jalu (2015) (Eq.1):

$$\boldsymbol{n} = \frac{\boldsymbol{N}}{\boldsymbol{1+N(e)^2}} = 4 \quad \ldots\ldots(1)$$

Where, n = sample size, N= the size of the population, e = the margin of error or the maximum error and for this study is 5% with confidence level (95%). But, to get more valid sample size, 8 manufacturing companies from Textile & Garment (ATF), Leather & Shoe (SLF & ASF), Metal (KMF), Chemical (NCF, BPF & APF) and Agro-processing (MSF) were selected. 10 respondents from each company were considered. Since the study is targeted on examining relationship, then collection of primary data were mandatory. Accordingly, data were collected through self-administered questionnaire which contains 6 Kaizen practices with a total of 36 items and 6 organizational performance variables with 18 items.

Hypotheses Formulation

To understand the relationship of each Kaizen practice on each organizational performance indicators, proposing hypotheses based on the extensive literature review is mandatory. Therefore, by considering the independent variables as mentioned in conceptual framework, their supporting literature review and lastly proposed hypothesis is presented.

Leadership

Sadikoglu & Oclay (2014); Talib & Rahman (2013); Bou-Llusar, et al. (2008); Kaynak (2003) disclosed that management leadership is fundamental for improving organizational performance through commitment, involvement, open communication, cooperation, performance evaluation to create effective organizational culture. Leaders should develop the mission, vision and should be role models for a culture of Excellence (Aderaw, 2019; Bou-Llusar, et al., 2008). The top management should support employees by allocating resources and creates a work environment conducive to employee involvement in the process of change (Aderaw, 2019; Kaynak, 2003). In general, this factor is fundamental in Ethiopian manufacturing industries where business environment is very dynamic and & manufacturers face with fierce competition globally. Thus, the literature discussed above leads to the following hypothesis:

H1a: Leadership social factor is positively associated with operational and financial performance.

Strategy

Beshah & Kitaw (2014) recommended for Ethiopian industries to improve their performance, they should have relevant policies, procedures, strategies that are sound, focused and deploy to employees through framework. Similarly, Bou-Llusar, et al. (2008) also strongly-minded policy and strategy should be based on the present, future needs and expectations of stakeholders that is based on information from performance measurement, research, learning and external related activities. Moreover, the policies and strategies must be developed, reviewed and updated. Thus, the literature discussed above leads to the following hypothesis:

H1b: Policy and strategy technical factor is positively associated with operational and financial performance.

People

Many studies disclose, there is a positive link between people and performance (Talib et al., 2013; Sit et al., 2009; Deros et al., 2006; Sanchez-Rodriguez et al., 2006; Yang, 2006). Aderaw (2019) also reveal people factor is key for Ethiopian manufacturing industries performance. Aderaw (2019); Kaynak (2003) and Bou-Llusar, et al. (2008) agreed on people's knowledge and competences should be identified, developed and sustained for improving organizational performance. Bou-Llusar, et al., (2008) also stated that people should be involved, empowered, rewarded, planned, managed, improved and have a dialogue with the organization. However, Shafiq et al., (2019) disclose people do not have any significant relationship with financial and non-financial (operational) results. Thus, the literature discussed above leads to the following hypothesis:

H1c: People social factor is positively associated with operational and financial performance.

Partnership

There are studies that confirmed organizations competitiveness is achieved through developing supplier partnership and long-term relationships by means of cooperation (Shafiq et al., 2019; Zakuan et al., 2010; Bou-Llusar, et al., 2008; Zineldin & Fonsson, 2000). Besides, preference to quality while making purchase agreements (Shafiq et al., 2019; Aderaw, 2019) and periodic evaluation of supplier's performance are also solutions for improving performance (Shafiq et al., 2019). Suppliers should also participate in quality improvement and new product development (Aderaw, 2019). Hailu et al. (2018) also explained creation of external linkage with universities, institutions is

important for achieving organizational excellence. However, Talib et al. (2013) stated, there is no significant relationship between supplier management and quality performance. Beshah & Kitaw (2014) also did not consider this factor on Ethiopian Quality Award's criteria. But, the researcher argues on this and agrees with Aderaw (2019). Thus, the literature discussed above leads to the following hypothesis:

H1d: Partnership technical factor is positively associated with operational and financial performance.

Resource

There are supportive studies on successful practice of resource factors for enhancing excellence. Beshah & Kitaw (2014) disclosed basic issues: optimizing material, effective financial, efficient on facilities and following knowledge-based information management (Bou-Llusar, et al., 2008). Updated technology and information should also be provided to all employees to perform their jobs and the organization should try to reduce the harmful effect of its activities on the environment as stated by Shafiq et al., (2019). Based on the above review of the relationship between resource management and organizational performance, the following hypothesis is developed:

H1e: Resource technical factor is positively associated with operational and financial performance.

Process

Here also there are supportive empirical studies that proved there is a positive correlation between the two process factor and quality performance (Shafiq et al., 2019; Talib et al., 2013). Shafiq et al. (2019) explained proper procedures should establish to perform different jobs. Beshah and Kitaw (2014) also make clear that product/service processes should be optimized, planned, controlled, reviewed and improved. Similarly, Shafiq et al. (2019) also confirmed that product/service design, development, production and delivering based on customers' needs are issues for enhancing organization's performance. Therefore, the above review of the link between process and organizational performance leads to developing the following hypothesis:

H1f: Process management technical factor is positively associated with operational and financial performance.

Results and Discussion

Preliminary Analysis of Manufacturing Companies

Only 42 valid questionnaires were returned from 5 companies (ATF, SLF, ASF, BPF and APF), yielding a response rate of 52.50% percent. The extent of Kaizen practices and performance measures on each company was checked before proceeding to general factor analysis. This was done by using the calculated interval breaking range found in Suon (2005) and Hailu et al. (2017): 6.14-7.00 = excellent; 5.28-6.14 = highly practiced; 4.42-5.28 = above average; 3.56-4.42 = average; 2.7-3.56 = below average; 1.84-2.7 = poorly practiced; 0.98-1.84 = very poorly practiced; 0.12-0.98 = almost no practice. Based on this, the descriptive statistical analysis of each Kaizen practices and performance measures relating to mean value for each company is presented in Table 2 below.

Table 2. Descriptive statistical analysis of factors and performance measures (mean)

Company / Practice/result	AT Factory	SL Factory	BP Factory	AS Factory	AP Factory
L	4.0333	3.6666	4.7333	4.5666	5.0333
S	4.6833	3.6666	4.8166	4.6833	5.2833
Pe	3.9666	3.7500	4.2333	4.5333	5.3166

Company / Practice/result	AT Factory	SL Factory	BP Factory	AS Factory	AP Factory
Pa	3.9500	4.1666	3.8666	4.0833	3.7166
R	3.8333	3.4166	4.1333	4.1833	4.6500
Pr	3.9666	4.0000	4.6666	4.6000	4.8500
CR	3.9666	4.0000	4.6333	4.4666	4.7333
QR	3.8666	3.7200	4.4666	5.1666	5.3333
PrR	3.7000	4.2700	3.8750	5.2750	5.6750
PeR	3.7000	4.1250	5.2333	5.2000	5.2000
SR	3.7000	3.9700	5.2000	5.6500	5.3000
FR	3.6333	3.7400	5.1000	5.8000	5.5000

Table 2 illustrates all companies are practiced Kaizen average and above. From all companies, comparatively APF highly practiced people and strategy Kaizen practices. Leadership and process are practiced above average in BP and AS and AP factories. Strategy is practiced above average in AT, BP and AS factories. People only practiced above average in AS factory. Resource is also practiced above average in AP factory. Partnership was practiced averagely in SL factory. On the other hand, respondents also agreed on achievement of results by the companies. Both AS and AP factories are above average on achieving all performance measures. AT and SL factories achieved all performance measures in average. Highly financial result achieved in BP, AS and AP factories. People result is also above average achieved in all companies except AT factory. Society result is highly achieved in AS and AP factories. Hence, the above preliminary analysis demonstrated that manufacturing companies were able to benefit from Kaizen practice. However, the extent of the practice and achieved result was varied company to company. Another crucial issue conducted was checking the reliability of data's internal consistency (Hailu et al., 2017; Talib et al., 2013) before proceeding to factorial analysis. In this study Cronbach's alpha coefficient is calculated for 54 items, 36 Kaizen practice items and 18 organizational performance measures of each company. Accordingly, AT, SL, BP, AS, AP are calculated 0.994, 0.925, 0.957, 0.944 respectively for 54 items; 0.995, 0.743, 0.970, 0.971, 0.973 for 36 items; 0.990, 0.926, 0.895, 0.907, 0.817 for 18 items. Moreover, the calculated Cronbach's alpha values for 54, 36 and 18 items in general perspective are 0.956, 0.969 and 0.857 respectively. The result illustrates the Cronbach's alpha coefficient value of all companies is above the minimum acceptable level of 0.6 according to Hailu et al. (2017). Based on the test, the results for the items are reliable and acceptable.

Descriptive Statistics Analysis

The importance of each Kaizen practice item should be checked before proceeding to factor analysis. This was done by calculating the interval breaking range. The interval for breaking range is calculated by adopting the equation found in Suon (2005) and Hailu et al. (2017) study. With 7 point Likert scales, the interval for breaking range in measuring each variable is calculated by Eq. (2):

$$R = (N - 1)/N \quad \ldots\ldots (2)$$

Where R is the interval for breaking the range; N is the maximum applied Likert scale. The following criteria are used for level importance of Kaizen practice items: 6.14-7.00 = excellent; 5.28-6.14 = very important; 4.42-5.28 = above average; 3.56-4.42 = important; 2.7-3.56 = below average; 1.84-2.7 = poor; 0.98-1.84 = very Poor; 0.12-0.98 = extremely poor. According to this analytical study, 26 items recorded minimum 4.46 and maximum 5.17 falling on the interval breaking range 4.42 to 5.28 above average important items; 8 items are also recorded minimum 3.75 and maximum 4.39 falling on the interval breaking range 3.56-4.42 average (important) items; 2 items

fall in the interval breaking range 2.7-3.56 below average. Hence, respondents agree on the importance of all items.

Factor Analysis

This analytical study measured the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy for the 36 items and had a value of 0.813 which is above allowable measure of sampling adequacy value 0.7 and acceptable (Hailu et al., 2017). The Bartlett's Sphericity test gave a chi-square value of 5024.018 with 582 degrees of freedom that represents a significance value of 0.000 which is less than a 95% level of Significance, = 0.05. The determinant value of the correlation matrix was estimated in 0.000. With this feasibility indexes, the conclusion was that the factor analysis could be applied. In factor analysis, only those factors with an eigenvalue greater than unity were considered. For this reason, this analytical study measured the initial eigenvalues and percent of variance as shown in Table 3 below.

Table 3. Total variance explained relating to initial eigenvalues and percent of variance

Total Variance Explained									
Component	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**			**Rotation Sums of Squared Loadings**		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	22.785	63.293	63.293	22.785	63.293	63.293	17.787	49.408	49.408
2	7.197	19.992	83.285	7.197	19.992	83.285	7.039	19.553	68.961
3	2.485	6.903	90.188	2.485	6.903	90.188	4.945	13.735	82.696
4	1.636	4.545	94.733	1.636	4.545	94.733	3.233	8.982	91.678
5	1.210	3.361	98.095	1.210	3.361	98.095	2.310	6.417	**98.095**

Table 3 illustrates only 5 components meet the requirement defined above, which together accounts for 98.095 % of all eigenvalues. The total variance explained – rotation sum of square loadings output showed that percent of variance of component 1, 2, 3, 4 and 5 are 49.41%, 19.55%, 13.73%, 8.98% and 6.42% respectively. This study also used scree plot (Figure 3) for showing the relationship between eigenvalues and factors.

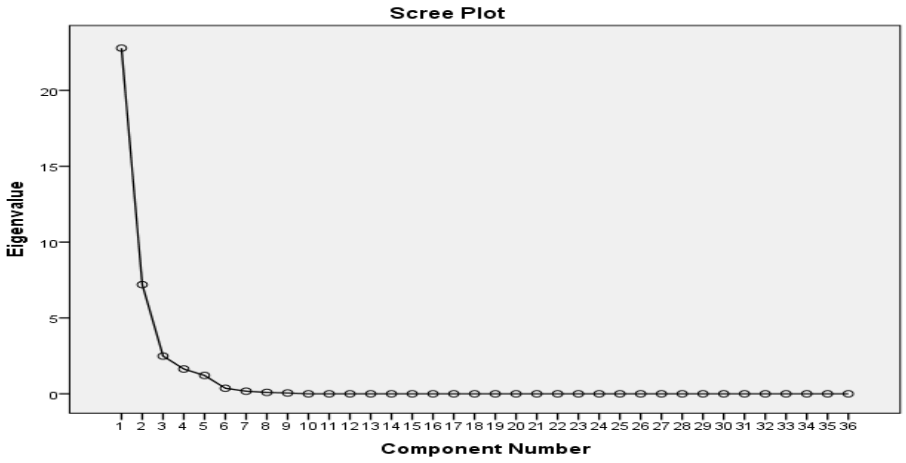

Figure 3. Scree plot for 36 Kaizen practice items

Figure 3 illustrates the scree plot graphs the eigenvalues against each factor. After factor five there is a sharp change in the curvature of the scree plot. This shows that after factor five the total variance accounts for smaller and smaller amounts. Moreover, the key step in factor analysis is loading of items properly on the components. Different authors agreed that, the greater the loading, the more the variable is a pure measure of the component. To identify the variables, included in each component, the variable with the value maximum in each row is selected to be part of the respective component. For this reason, after rotated component matrix, each component is comprised of items that have factor loadings greater than the minimum limit 0.50 (Hailu et al., 2015). Accordingly, 36 items were merged into four components with the descending order of loadings: Pa3 (0.975), L5 (0.967), L6 (0.955), Pe1 (0.955), L4 (0.948), Pr2 (0.943), Pe3 (0.938), Pr1 (0.925), Pa4 (0.921), Pa1 (0.914), S6 (0.913), Pa2 (0.890), R3 (0.886), R6 (0.884), Pr5 (0.877), S5 (0.857), Pe6 (0.844), L2 (0.838), R2 (0.838), R1 (0.829), Pa5 (0.823), Pa6 (0.793), R4 (0.791), R5 (0.791), Pr3 (0.762), Pe5 (0.750), S3 (0.725), S1 (0.700), S2 (0.700), Pe4 (0.696), S4 (0.688), L1 (0.661), Pe2 (653), L3 (0.638), Pr6 (0.601), Pr4 (0.582). As shown here, all the items of factor loading value are greater than the minimum limit (0.5). Therefore, there is no item that will be deleted and all are important items.

Correlation Analysis

Aderaw (2019) explained the most basic and most useful measure of association between two or more variables is correlation. Accordingly, this study conducted correlation analysis and presented the summarized output as shown in (Table 4) below to explore the strength and direction of the linear relationship between independent variables with each other; independent variables with dependent variables; dependent variables with each other. In addition, this correlation analysis result also intended for conducting further hypotheses testing using regression analysis.

Table 4. Correlation coefficient values for Kaizen practices and organizational performance

	Correlations											
	L	S	Pe	Pa	R	Pr	CR	QR	PrR	PeR	SR	FR
L	1											
S	.719**	1										
Pe	.689**	.461**	1									
Pa	.581**	.709**	.642**	1								
R	.673**	.520**	.327**	.723**	1							
Pr	.751**	.506**	.783**	.669**	.732**	1						
CR	.637**	.707**	.619**	.729**	.461**	.396**	1					
QR	.513**	.539**	.716**	.548**	.383*	.365*	.689**	1				
PrR	.327*	.427**	.529**	.299*	.273*	.590**	.557**	.760**	1			
PeR	.684**	.507**	.739*	.302**	.328*	.319*	.432**	.457**	.323*	1		
SR	.261*	.418**	.319*	.542**	.239*	.742**	.702**	.727**	.502**	.376**	1	
FR	.703**	.459**	.776**	.273*	.439**	.317*	.669**	.552**	.748**	.583**	.728**	1

**. Correlation is significant at the 0.01 level (2-tailed). *. Correlation is significant at the 0.05 level (2-tailed).

Table 4 illustrates all 66 correlation coefficient are larger than 0.230. The highest coefficient of correlation in this research however, is 0.783 which is below the cut-off of 0.900 for the co linearity problem (Talib et al., 2013). Additional, the correlation coefficient between Kaizen practices and organizational performance were less than 0.900, indicating that the data was not affected by a co

linearity problem (Talib et al., 2013). Table 4 also revealed that there was a strong positive relationship between individual Kaizen practices and each organizational performance measures at $p < 0.01$ for most of the variables. The correlations between the Kaizen practices and organizational performance measures range from 0.239 to 0.776. This is also similar with Aderaw (2019) finding, 0.317 to 0.780. Moreover, the results indicated that the most important Kaizen practice with highest coefficient of correlation affecting organizational performance relating to each measures: customer result with partnership (r = 0.729); quality result with people (r = 0.716); productivity result with process (r = 0.590); people result with leadership (r = 0.684); society result with process (r = 0.742) and financial result with people (r = .776). However, the weakest correlation was for resource and society result (r = 0.239, $p<0.05$). 64% of Kaizen practices are positively and significantly correlated with organizational performance measures (dependent variables). Highest correlation was observed between people and financial result (r = 0.776). Hence, the above analysis directed that it is possible for conducting hypotheses testing using regression analysis.

Regression Analysis

Regression Results of Kaizen Practice and Organizational Performance

Multiple regression analysis is one of the most commonly used multivariate procedures and is used to build models for predicting scores on one dependent variable, from scores on a number of other independent variables (Hailu et al., 2017; Talib et al., 2013; Terre Blanche, et al., 2006). As such the contribution of each of social and technical factors on each of organization performance variables was tested using multiple regression technique. In order to judge the magnitude of effects in this study, Cohen's rules for effects sizes can be used. According to Talib et al. (2013), R square above 13.8 percent is large. Based on this, the effect of independent variable on each dependent variable is presented below.

Table 5. Regression model summary of Kaizen practice effect on organizational performance

Model Summary									
Dependent variable	**R**	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**	**Change Statistics**				
					R Square Change	**F Change**	**df1**	**df2**	**Sig. F Change**
Customer	.997[a]	.993	.992	.08510	.993	1829.017	6	77	.000
Quality	.930[a]	.865	.855	.34041	.865	82.557	6	77	.000
Productivity	.954[a]	.911	.904	.34408	.911	130.758	6	77	.000
People	.978[a]	.957	.954	.25531	.957	288.252	6	77	.000
Society	.902[a]	.813	.799	.25531	.813	55.931	6	77	.000
Financial	.980[a]	.961	.958	.17020	.961	315.100	6	77	.000

Table 5 illustrates companies were experienced on attaining operational and financial results by practice of Kaizen. Moreover, the contribution of social and technical factors on achieving customer satisfaction was 99.30%, quality 86.50%, productivity 91.10%, people satisfaction 95.70%, society satisfaction 81.30% and financial improvement 96.10 %. These results showed Kaizen practices positively and significantly link with organizational performance (Talib et al., 2013). But, to examine each practice with performance measures Table 6 below is developed.

Table 6. Regression model summary output of each Kaizen practices effect on each organizational performance indicators

Dependant variable / Independent variable		Customer satisfaction			Quality			Productivity			People			Society			Financial		
		Beta	T	Sig.	Beta	T	Sig.	Beta	T	Sig.	Beta	t	Sig.	Beta	t	Sig.	Beta	t	Sig.
Social factors	Leadership	-1.263	-42.411	.000	-.451	-3.447	.001	-.537	-5.037	.000	.872	11.839	.000	-1.316	-8.542	.000	-.243	-3.447	.001
	People	-.478	-15.785	.000	.998	7.493	.000	.545	5.016	.000	.355	4.729	.000	.742	4.729	.000	2.325	32.370	.000
Technical factors	Strategy	1.626	46.138	.000	-.808	-5.221	.000	-.683	-5.412	.000	-.625	-7.170	.000	.114	.624	.535	-.924	-11.067	.000
	Process	2.338	56.260	.000	.910	4.984	.000	1.205	8.093	.000	-2.185	-21.263	.000	1.699	7.901	.000	-.371	-3.765	.000
	Resource	-1.202	-32.583	.000	-.851	-5.248	.000	-.536	-4.055	.000	1.132	12.406	.000	-1.483	-7.770	.000	-1.120	-12.814	.000
	Partnership	-.906	-45.489	.000	-.904	-10.327	.000	-.819	-11.482	.000	1.324	26.883	.000	-1.064	-10.327	.000	-.487	-10.327	.000

Note: Significance value of alpha either 0.05 or less.

Table 6 illustrates 5 Kaizen practices of 2 social factors (leadership and people) and 3 technical factors (process, resource and partner) are significant and have strong relation with customer, quality, productivity, people, society and financial results. However, one technical factor (strategy), with p-value of 0.535 ($P > \alpha = 0.05$), does not have relation and contribution on achieving society results. It only has relation with customer, quality, productivity, people and financial results. However, this result is opposite to Beshah & Kitaw (2014) study, strategy and policy has an impact on society. Hence, the researcher also agrees with them and believes further survey and analysis is required to confirm the existing true relationship between strategy and society satisfaction. But, in response to RQ1, the findings presented empirical evidence of Kaizen practices relating social and technical factors have a highly positive effect on organizational performance. It was also found that almost all factors were perceived as the leading Kaizen practices in achieving organizational performance. However, strategy does not have significant impact on achieving society results. In response to RQ2, the findings indicated that people has high effect on financial, people and quality results; process on productivity and society results; partnership on customer satisfaction. Therefore, people, process and partnership were perceived as a dominant Kaizen practices, it has strong association with company's operational and financial performance.

Hypothesis Test Result Analysis

Based on the research framework of this study, 4 theoretical hypotheses were proposed. These hypotheses were empirically tested. Social and technical factors of Kaizen practices with significant values (p) less than alpha ($\alpha = 0.05$) are accepted and greater than alpha ($\alpha = 0.05$) are rejected as shown in Figure 4 below.

Table 7. Hypothesis test result for each Kaizen practices – organizational performance

Dependant / Independent		Customer satisfaction		Quality		Productivity		People		Society		Financial	
		Sig.	Hypo result	Sig.	Hypo result	Sig.	Hypo result	Sig.	Hypo result	Sig.	Hypo result	Sig.	Hypo result
Social factors	Leadership	.000	Accepted	.001	Accepted	.000	Accepted	.000	Accepted	.000	Accepted	.001	Accepted
	People	.000	Accepted	.000	Accepted	.000	Accepted	.000	Accepted	.000	Accepted	.000	Accepted
Technical factors	Strategy	.000	Accepted	.000	Accepted	.000	Accepted	.000	Accepted	.535	Rejected	.000	Accepted
	Process	.000	Accepted	.000	Accepted	.000	Accepted	.000	Accepted	.000	Accepted	.000	Accepted
	Resource	.000	Accepted	.000	Accepted	.000	Accepted	.000	Accepted	.000	Accepted	.000	Accepted
	Partnership	.000	Accepted	.000	Accepted	.000	Accepted	.000	Accepted	.000	Accepted	.000	Accepted

Table 7 illustrates 97% of the hypotheses (H1, H2, H3, H4) are accepted except (H3 – strategy relating to society result). These results are similar with the study conducted by Aderaw (2019); Shafiq et al. (2019); Jong et al. (2019); Rawashdeh (2018); Baye & Raju (2016); Jalu (2015); Beshah and Kitaw (2014). However, 3% (H3 – strategy relating to society result) is rejected. Hence, based on the above hypotheses test result, new model is developed (Figure 4). This model described the existing true relationship between practice of Kaizen and organization performance based on this study‘s conceptual framework.

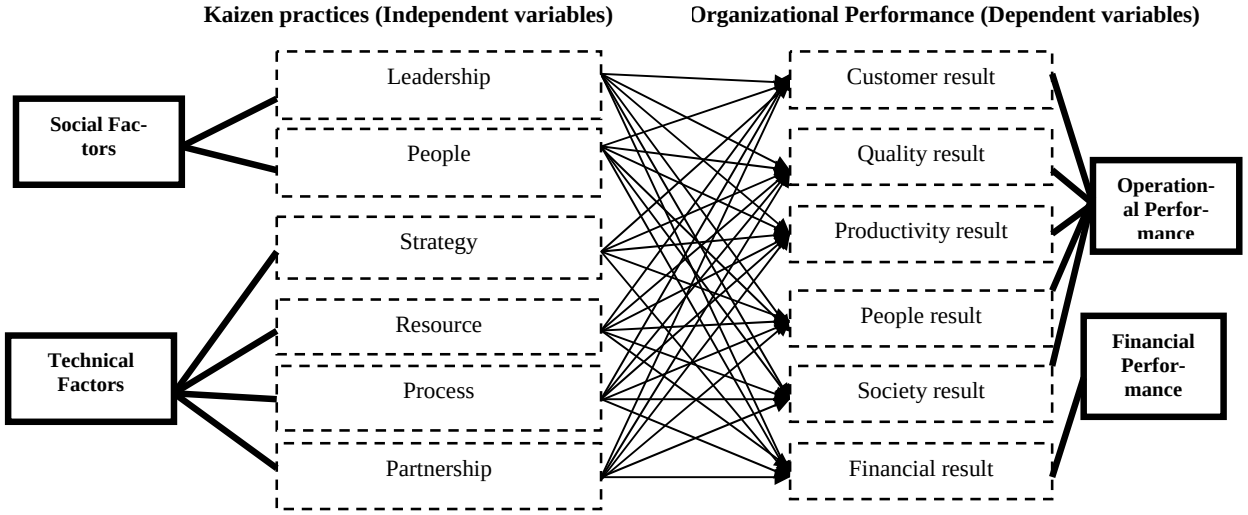

Figure 4. Developed new model after hypothetical testing

Figure 4 illustrates the new developed model which showed the existed true relationship between Kaizen practice organizational performances. The model described all social factors of Kaizen practices have true relationship with all operational and financial performance measures of the organizations. When companies successfully practiced the leadership and people factors of independent variables, definitely the companies achieved the required results relating to customer satisfac-

tion, people satisfaction, improved quality, improved productivity (labor and machine), society satisfaction and financial gains. Moreover, similar to social factors, technical factors of Kaizen practices like resource, process and partnership have true link with all operational and financial performance measures. These results also illustrates when the companies successfully practiced the identified technical factors (resource, process and partnership), the companies gained necessary results relating to customer satisfaction, people satisfaction, improved quality, improved productivity (labor and machine), society satisfaction and financial gains. At the end, the model also depicted that technical factor of strategy have link with all organizational performance measures except society result. However, further analysis is required to investigate the existing true relationship between strategy and society satisfaction.

Conclusion

The investigation conducted on Ethiopian manufacturing companies with the area of empirical investigation of the link between practices of Kaizen and organization performance has come about with major findings by accomplished the stated objectives of the study successfully. The study found Kaizen practices of social factors: leadership and people; technical factors of process, partnership, resource and strategy to be all most have effect on Ethiopian manufacturing companies on achieving operational results (customer, quality, productivity, people and society) and financial results. The findings presented empirical evidence of Kaizen practices relating social and technical factors have a highly positive effect on organizational performance. It was also found that almost all factors were perceived as the leading Kaizen practices in achieving organizational performance. However, strategy does not have significant impact on achieving society results. But, the result showed, strategy has a positive relationship with results of customer, quality, productivity, people and finance. The findings also indicated that people, process and partnership were noticeable as governing Kaizen practices; it has strong association with company's operational and financial performance. Furthermore, the study provided a useful recent measuring instrument for evaluation of Kaizen practice in Ethiopian manufacturing companies as measured by the survey instrument and identified six practices for its successful implementation. However, the research paper was limited by including only 5 manufacturing companies in Ethiopia with little number of respondents, making this a possibly biased selection and it may not be adequate to generalize the results for the entire Ethiopian manufacturing companies. The study has contributed to the Kaizen literature with a better understanding of the six Kaizen practices and their association with a company's six operational and financial performance measures that will provide valuable knowledge in Kaizen from Ethiopian manufacturing company's perspective. The findings can help Ethiopian Kaizen Institute, academicians, practitioners, policy makers, company managers and employees that would like to support and promote Kaizen in Ethiopia and subsequently improve operational and financial performance.

The study has important implications for the manufacturing industry. In order to improve the operational and financial performance of companies, it is highly recommended that Ethiopian respective government and owner of companies should able to practice the social and technical factors of Kaizen practices holistically rather than on a piecemeal basis to get the full potential of the identified Kaizen practices. A similar study may be undertaken to other manufacturing sectors (textile, garment, leather, metal, agro processing) and service sectors with big data. Also, application of exploratory study on these manufacturing companies to identify the circumstance of Kaizen practice, achievements and develop theories based on the findings also recommended for future study. Moreover, application of advanced statistical analysis can be another area to develop relationship between integrated management system and innovation performance by testing the hypotheses.

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