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Microfinance Training Services and Financial Sustainability of Small and Medium Enterprises in Kampala Central Division, Uganda

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Abstract

The study investigated the effect of microfinance training services on the financial sustainability of Small and Medium Enterprises (SMEs) in Kampala Central Division. A correlational cross-sectional survey design was employed. Data were collected using semi-structured questionnaires and interview guides from a sample of microfinance employees and SMEs entrepreneurs and employees. Data was analyzed using the narrative, descriptive, Pearson correlation, and linear regression analyses. Results indicate that microfinance training services affect financial sustainability of SMEs in Kampala Central Division. As the generator of new knowledge, training services must be placed within a broader strategic context of human resources management and must cover all areas of the business.

Keywords: Microfinance, microfinance training services, financial sustainability, small and medium enterprises.

INTRODUCTION

Small and Medium Enterprises (SMEs) in Uganda are in Business such as farming, buying produce, market vending, catering and confectionery, shop keeping, health services, stationary, manufacturing, among other service businesses. Many of these businesses start operations before acquiring licenses. They employ a minimum of 5 people and a maximum of over 100 people with relatively small working capital and income turnover. They are components of the informal sector that make up the national economy, since they operate with a low level of organization, low capital, low technology, and often temporary premises. Small and Medium Enterprises, are

however, the drivers of economic development and job creation. This is because 90 percent of the economy is comprised of the private sector (Otago, 2014).

In Uganda, Small and Medium Enterprises contribute about 20% to GDP and employ about 90% of the non-farm economically active population (BoU, 2016; MFPED 2017). Approximately, there are **160000** Small and Medium Enterprises in Uganda employing about 2.5 million people (Mweheire 2018). Mweheire strongly believes that if we can enable each of the Small and Medium Enterprises to create additional four jobs, it would go a long way in solving the unemployment problem in Uganda. The Small and Medium Enterprises sector in Uganda is the most important area of the economy and economic growth will come from this area. If Small and Medium Enterprises are to continue employing the majority of Ugandans and contribute to GDP, they need to be financially sustainable.

Financial sustainability is a key dimension for Small and Medium Enterprises. It refers to the ability of Small and Medium Enterprises to cover their costs from their own generated income from operations. Financial sustainability centers on the ability of a Small and Medium Enterprise to depend on self-operations and imply the possibility of making a profit out of its operations. Financial sustainability implies that a loss-making Small and Medium Enterprise with poor financial performance cannot be classified as financially sustainable (Bukirwa, 2017). Unsustainable Small and Medium Enterprises will not contribute to the nation's GDP and ultimately will not create jobs. All the above factors show how indispensable the sustainability of Small and Medium Enterprises becomes imperative. Although many prior studies exist on Small and Medium Enterprises (e.g. Mulungi 2014), they were on other dimensions of performance and not financial sustainability. Therefore, the factors responsible for the financial sustainability of Small and Medium Enterprises in Uganda are not well known. Other studies were on other organizations that are listed on the exchange market with possibly extra regulations and on other variables.

Since Small and Medium Enterprises in Uganda are small businesses and whereas access to financing is one of the key issues faced by Ugandan businesses, there is a worry about the attrition rate of Uganda Small's and Medium Enterprises and the fact that less than 30 percent of them make it past their third birthday (Mweheire, 2018). This study was therefore, designed to investigate the influence of training services on the financial sustainability of Small and Medium Enterprises in Kampala Central Division, where most of these institutions are continuously formed and only survive for a short period (BoU, 2016)

THEORETICAL FRAMEWORK

The theory that underpinned this study is agency theory. Agency theory is concerned with resolving problems that can exist in agency relationships. That is, between principals (such as the owners) and agents of the principals, for example, managers (Bukirwa, 2017). The main objective of the agency theory is to structure the contractual relationship between the conflicting groups so that agents take actions to maximize the interests of the principals (Tiessen & Water house, 1983).

In Small and Medium Enterprises, the principals (owners/ entrepreneurs) who have not involved in the day-to-day management of their businesses, delegate the management to agents (managers). The managers are supposed to run the Small and Medium Enterprises effectively and efficiently. However, due to the individualistic tendencies of the agents, the overall performance of these institutions may run down, which affects the Small and Medium Enterprises' performance and survival in the long run. The reasoning behind the agency theory is that, there exists a conflict of interest between the owners and management due to the existing gap between them and that, the extent of agency conflicts varies across the firms depending on the level of discretionary power applied by management (Mohiuddin & Yusuf, 2010). For

accountability purposes, management decisions and other organizational activities, there is a need to have close monitoring in Small and Medium Enterprises. The main issue in the agency theory is that, with close monitoring, the expert team (i.e. the employees of Small and Medium Enterprises) must exercise their expertise in the best interest of the Small and Medium Enterprises operational success. They must properly maximize the services of MFIs and other financial institutions from where they get financial services. We can, therefore, use agency theory to describe, explain, and predict financial sustainability of Small and Medium Enterprises.

LITERATURE REVIEW

Financial Sustainability

Small and Medium Enterprises need to operate sustainably if they are to achieve their objectives and produce impact. Sustainability necessitates profitability, financial prudence, purpose-driven management, and strategic governance. Financial sustainability is a key dimension of Small and Medium Enterprises. It refers to the ability of a Small and Medium Enterprise to cover all its costs from its own generated income from operations. All the definitions of financial sustainability center on the ability of a Small and Medium Enterprise to depend on self-operations and imply the possibility of making a profit out of its operations (Ganka, 2010). In this study, financial sustainability is initiated as operational sustainability and financial self-sufficiency. According to (Meyer 2002), operational sustainability refers to the ability of the Small and Medium Enterprise to cover its operational costs from its operating income. Small and Medium Enterprises are financially self-sufficient when; they are able to cover from their own generated income, both operating and financing costs. Financial sustainability implies that a loss-making small and Medium Enterprise with poor financial performance cannot be classified as financially sustainable.

Financial sustainability measures must focus their attention on what makes, identifies, and communicates the drivers of success. Financial performance measures are those which enable organizations to direct their actions towards achieving their strategic objectives because a firm's financial sustainability is central to the future well-being and prosperity of any enterprise (Kloot, 1999, Balunywa, 1999 and Dixon, Ritchie & Siwale, 2006). Financial sustainability should be looked at in terms of the economy, efficiency, and effectiveness. Economy and efficiency are usually measured by financial terms like working capital, costs, volume of sales, and productivity. The economy is acquiring resources in appropriate quantities. Efficiency is maximizing inputs for a required output. Effectiveness is the extent at which the defined task has been accomplished which may be partly measured in terms of quality service, customers' satisfaction, and achievement of goals such as profitability (Bukirwa, 2017; Pandey, 1996; and Drucker, 1999). Firms cannot survive and prosper through their efforts. Each firm's sustainability depends upon the activities and performance of others, hence, the nature and quality of the direct and indirect relationship that a firm develops with its counterparts are fundamental (Hamel, 1991).

Microfinance Institutions

Microfinance is the provision of small scale financial services to low income or unbanked people (Hartarsaka, 2005). It is about the provision of a broad range of financial services such as savings, loans, payment services, money transfer, and insurance to the active poor and low-income households and their micro-enterprises. Microfinance Institutions are considered as tools for poverty alleviation that improve access to finance and financial services. They complement greatly the formal banking sector in providing financial services to the active poor (Basu Blavy & Yulek, 2004). Microfinance Institutions (MFIs) have expanded the frontiers of institutional finance

and have brought the poor into the formal systems by enabling them to access credit in order to fight poverty. Microfinance is seen to be an anti-poverty tool (Ahlin and Jiang, 2008).

Bank of Uganda defines MFIs as non-government institutions, Savings and Credit Cooperatives that provide savings and microloans to poor individuals, enterprises or groups for purpose of engaging in viable economic activities where there are difficulties in accessing financial services from the formal banking sector. Most formal financial institutions do not offer financial services to SMEs and poor households which justifies the existence of MFIs.

Far back in the 1970s, most developing countries including Uganda considered a capital investment to be a key factor in determining economic growth and rising incomes. This gave rise to MFIs becoming an important component of strategies designed to reduce poverty through the promotion of SMEs development.

Although large & small enterprises have played a big role in Uganda's development and occupy an important place in promoting economic activities, their access to finance from financial institutions especially banks is still limited. This is because they lack collateral and they are vulnerable to economic changes amongst other reasons. (Michael, 2010).

The basic objectives of most MFIs established in developing countries are to alleviate poverty and promote self-empowerment of vulnerable and marginalized groups in the society such as small scale entrepreneurs by providing them access to financial services.

Small and Medium Enterprises in Uganda

Small and Medium Enterprises (SMEs) are the backbone of economies worldwide and Uganda is not an exception. They are key contributors to GDP, taxes, and employment. In Uganda, they employ about 2.5 million people, and the majority of who are youth. The government of Uganda supports SMEs through the Uganda Investment Authority (UIA) and the Ministry of Science, Technology, and Innovation. SMEs can help leverage and tap into the underutilized intra-regional markets and trade.

As a nation, Uganda is a highly entrepreneurial country. The country has experienced a rise in the number of SMEs in different sectors. According to Uganda Investment Authority, SME Division, small enterprises are businesses that employ between 5 and 49 people and have total assets between shs 10 but not exceeding shs 100 million. The medium enterprise employs between 50 and 100 people with total assets more than shs 100 million but not exceeding shs 360 million. Statistics from Ministry of Finance indicates that SMEs employ 2.5 million people where they account for approximately 90 percent of the entire private sector, generating more than 80 percent of manufactured outputs that contribute 20 percent of the Gross Domestic Product (GDP) (Ninsiima, 2019).

However, the statistics indicate that some SMEs fail to make five years in business and wither off. According to business experts, a number of mistakes attributed among others are; failure to handle customers properly; failure to create checks in managing human resource; poor handling of production processes; financing decisions, the ability to calculate the net profits and working capital; high appetite for artificial expansion, acquiring loans at the beginning of the business; high-interest rates on loans (the higher the interest rate, the lower the returns on capital employed); and lavish lifestyles (Murungi,2019). SMEs should know how to access different financing options and be able to ensure their business for better growth, learn how to file their taxes, and even get tax incentives. They should know how to keep books of accounts and corporate governance. SMEs should be able to license their businesses and enjoy government services, such as land in industrial parks and tax waivers where applicable. All these can help them get joint ventures locally and internationally (Lyatuu, 2019).

Uganda has a well regulated and highly liberalized economy in which all sectors are open for investment and, there is free movement of capital to and from the country. The government created a one-stop center for business registration and licensing at the UIA: The one-stop centre assists in tax advice and registration, immigration and work permit issues; land acquisition and verification, as well as environmental compliance and approaches. At the UIA, they hold investment conferences for technology innovations, business start-ups, and innovative SMEs. The aim is to sensitize SMEs and get into dialogue to get feedback for easing the business environment. UIA identify, nurture, mentor, and support competitive technological innovations, start-ups, and innovative SMEs in the country. They facilitate entrepreneurial and business skills training for Ugandan domestic investors to penetrate the market place.

The sustainability of SMEs depends on their ability to mobilize capital, access markets, possess the requisite business management skills and financial literacy. SMEs today are operating in an extraordinary business environment characterized by increasing globalization, heavy competition, newly empowered customers, and fast-changing technologies. To prepare for this new environment, SMEs need to transform themselves in fundamental ways by making major changes to their business models. In this respect, SMEs need their microfinance to assist in managing the uncertainties in their business; support their business expansion needs, and be there for them, not just in the good times.

In Uganda, according to report findings from the top 10 mid-sized companies study 2019, the majority of SMEs, still face slow loan payments, high taxes, and low working capital that hinders the sustainability of their business. SMEs should better their corporate governance and other aspects so that, they can be attractive for financing since microfinance and other financial institutions require certain things to be in place before they lend someone. They are operating on a global scale whereby, entities are looking at convenience and making business more efficient in the way they are growing. SMEs should access microfinance services most effectively and efficiently if they are to grow and remain sustainable. While there are several factors responsible for financial sustainability of small and Medium Enterprises in Uganda, the researchers were interested in investigating some of the microfinance services, where these institutions get financial services (e.g. credit, savings and training services) and how they influence their financial sustainability in Kampala Central Division, Uganda. This location was found to have the highest concentration of SMEs among the five divisions of Kampala. Also, the area had different types of SMEs including trading, service and manufacturing. Therefore, this made it easy for the researchers to access data in this area in terms of time and costs.

Microfinance Training Services and Financial Sustainability

Small and Medium Enterprises (SMEs) are increasingly taking the role of creating employment for the majority of Ugandans.

Microfinance is the provision of small scale financial services to low income or unbanked people (Hartarska, 2005). It is about the provision of a broad range of financial services such as deposits, loans, payment services, money transfers, etc. and other non-financial services such as training services, especially in business management. Microfinance institutions are considered as a tool for poverty alleviation through improving access to finance, financial services and other non-financial services. They complement effectively the formal banking sector in providing financial and non-financial services to the poor (Basu, Blavy&Yulek, 2004).

Microfinance reduces poverty, which is considered as the most important development objective in international development frameworks. However, the positive impact of microfinance institutions on their clients including SMEs can only be realized, if the SMEs register good

financial performance, that is, if SMEs are financially sustainable. They need to generate sufficient income to recover their operating costs and should depend on self-operations.

Small and medium enterprises continue to be formed in Kampala Central Division but survive for a short time (Bank of Uganda, 2016). While previous studies (e.g. Mulungi, 2014), documented poor performance of SMEs, especially their growth and profitability levels, none of them investigated the influence of non-financial services on the financial sustainability of SMEs. The factors affecting the financial sustainability of SMEs in Uganda are not known because; most of the previous studies were on microfinance services especially financial services and other performance measures and not financial sustainability. If SMEs are to stay in business for a long time and create employment for majority of Ugandans and also contribute to the development of the economy, then the factors affecting their financial sustainability must be identified.

Understanding the phenomenon of training and development requires an understanding of all the changes that take place as a result of improving the sources of any business. As the generator of new knowledge, training services are placed within a broader strategic context of human resources management, as planned staff education and development, both individuals and groups, within the goals to benefit both the organization and employees (Bukirwa, 2017). To preserve its obtained position and increase competitive advantage, the organization needs to be able to create new knowledge, and not only to solely rely on the utilization of the existing knowledge, thus, the continuous employee training and development have a significant role in the development of individuals and organizational performance.

One of the broad range of services that microfinance institutions offer to their clients (both individuals and businesses) is training services, especially in business management and entrepreneurial skills development, although it is not known whether these training services influence financial sustainability of businesses including SMEs. Beyond financial services, MFIs offer basic loan repayment training. Generally, the training is limited to emphasizing the importance of repaying the loan and of applying the loan to the business, rather than spending it on personal needs. These training services are believed to be strong correlates of financial sustainability of especially SMEs through the wise and successful use of savings and credit. (Bukirwa, 2017).

From the above discussion, it is evident that microfinance training services have a positive effect on financial sustainability of SMEs, because through training the SMEs on how they can save or use the credit facilities, it can help them to improve on their business growth and consequently their financial sustainability. However, most of the MFI training services center on the importance of repaying loans and of applying the loans to their businesses, rather than spending money on personal needs. Clients often face health emergencies and family crises. They also want to spend some of the loan proceeds on the education of their children which might not help their businesses to generate enough profit and grow. Microfinance needs to give SMEs more training in financial literacy and money management so that they can better meet both their business and personal needs, grow, and consequently become financially sustainable. This study was interested to investigate the influence of non-financial services (training services) on the financial sustainability of SMEs in Kampala, Central Division.

Drawing from previous studies, the independent variable in this study was microfinance training services given to SMEs, operationalized by such variables as the nature of the training and whether the training covers all the areas of business management and the breadth and depth of coverage. All these were assumed to influence the financial sustainability of SMEs. The dependent variable in this study is the financial sustainability of SMEs and was measured in terms of operational efficiency (the ability of SMEs to generate income out of their operations)

and financial self-sufficiency (when an enterprise can cover from their own generated income, both operating and financing costs).

METHODOLOGY

Research Design

The study adopted a correlational cross-sectional descriptive survey research design. The correlational design was used because: the problem in this study was mainly identifying the influence of microfinance credit services on financial sustainability of Small and Medium Enterprises. The study used a cross-sectional design also known as single-shot, because of the need to collect data at a single point in time. The cross-sectional design did not necessitate the researchers to make a follow-up on respondents. It was thus, used on account of its rapid turnaround in data collection as Creswell (2003) advises. Descriptive design was used to obtain information concerning the current status of the phenomenon to describe “what exists” with respect to variables.

The survey design enabled the collection of data from a large number of respondents. Surveys are also amenable to rapid statistical analysis and comparatively easy to administer and manage (Ahuja, 2005 & Shajahan, 2005). The study also used both qualitative and quantitative data collection methods. A Qualitative data collection method was used because it helped the researchers to study variation of complex, human behavior in context and quantitative data collection methods were used because they allow for a broader study involving a greater number of subjects and entrusting the generalization of the results.

Study Area and Population

This study was conducted in Kampala Central Division district, Uganda. The area composed of many different types of SMEs, including retail, manufacturing, restaurants, wholesalers, etc, which were beneficiaries of Pride microfinance services. It was also convenient on part of the researchers to collect data, especially in terms of costs and time involved. The study population comprised of SMEs owners and employees, pride microfinance managers, and employees. SME owners and employees were involved because they are involved in the day to day activities of SMEs which access microfinance credit services. Managers and employees of the MFI were involved because of their information about credit services that the MFI gives to the SMEs and implement a variety of MFIs activities. However, due to time, costs, and other constraints, the researchers found it more convenient to carry out the study on part of the target population which was more accessible hence became their sampled population.

Study Sample

The study sample included owners and employees of selected SMEs and managers, together with employees of pride microfinance institutions. All these groups of respondents were aware of Small and Medium Enterprises, activities, and the microfinance credit services.

Sampling Design

Since the sample had many categories, namely; owners and employees from the different SMEs and managers and employees of the MFI, the sampling design combined purposive sampling from categories and random sampling within the categories.

Sampling Procedures

To attain the respective sample size from the population, the target population was divided into categories using stratified sampling technique to ease the collection of relevant data from each category most efficiently and effectively (American statistical association, 1999), taking into consideration the heterogeneous nature of the population to be sampled (Amin, 2005). Then a number of sampling methods were utilized as follows to select the sample from each category: for owners/entrepreneurs of SMEs and managers, credit officers and other key informants of pride MFI, a purposive method was used on account of their knowledge concerning the operation of their enterprises and MFI, respectively. Employees of Small and Medium Enterprises were selected using the simple random sampling method with the aid of sampling frames at Small and Medium Enterprises. This was on account that every respondent gets an equal chance of being selected to participate in the study. Small and Medium Enterprises were randomly selected from their groups.

Sample Size

The researchers used the Table developed by Krejcie and Morgan (1970) to determine the sample size from every stratum. According to that Table, for the 10 managers, 20 credit officers, and 10 other pride MFI, key employees, and for the 160 owners and employees (80 owners and 80 employees) of Small and Medium Enterprises, the required minimum samples were 10, 19, 10 and 113, respectively.

Data Collection

Data was collected from both primary sources (by administering of questionnaires and interviewing key informants) and from secondary sources (by reviewing of relevant written documents at Small and Medium Enterprises and the MFI and others such as textbooks, journals, etc) self-administered questionnaires and the interview guide was utilized as the main data collection instruments. The validity and reliability of instruments were taken care of. Validity was determined using content validity index which was 0.813 and was above 0.7 as recommended by (Amin, 2005). The Cronbach's Alpha coefficient reliability method was applied from SPSS and was found to be 0.79. Again, according to Amin (2005), if the reliability is 0.7 and above, then the questionnaire is considered to be reliable for research.

Data Processing and Analysis

The researchers used the computer for data entry, cleaning, editing, coding and summarization to ascertain the accuracy, consistency, universality, proper arrangement and completeness of the data. After capturing the information, it was analyzed using SPSS, version 16, to summarize data into frequency tables. Descriptive statistics, Pearson correlation and regression analysis were utilized to describe the variables, to determine the associative relationship as well as the influence of MFIs training services on financial sustainability of Small and Medium Enterprises, respectively.

FINDINGS

The findings are presented in line with the objective of the study. According to the study, the independent variable is MFI training services. The dependent variable is financial sustainability of SMEs. In the next sub-sections, the summary descriptive statistics are given as well as the associative relationship and regression analysis

Descriptive Statistics

Table 1: Description of Dependent variable (financial sustainability) and microfinance training services

Variable	Mean	Standard deviation
Financial Sustainability (Overall)	2.91	0.541
Microfinance training Services	2.93	0.594

Table 1, shows that the overall on financial sustainability on a scale of 5, respondents rated themselves low (Mean = 2.91; S.D = 0.541) suggesting that financial sustainability in SMEs in Kampala Central division was low meaning that SMEs were probably not operationally sustainable. Further, descriptive statistics results in Table 1, indicate that overall respondents rated themselves low on all aspects of microfinance training services (Mean = 2.93; S.D = 0.594), suggesting that these trainings were probably not adequate to cover all areas of business management.

Correlation Results

Table 2; Correlation between microfinance training services and financial sustainability of SMEs

		Microfinance Training Services	Financial Sustainability
Microfinance Training Services	Person Correlation	1	0.227**
	Sig(2-tailed)		0.007
	N		142
Financial Sustainability	Person Correlation	0.227**	1
	Sig(2-tailed)	0.007	
	N	142	

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

Table 2, shows that there is a significant but weak positive associative relationship between microfinance training services and financial sustainability of SMEs ($r = 0.227$; $sig = 0.007$) at the 0.01 level. The positive associative relationship, if predictive, suggests that when microfinance training services increase, the financial sustainability of SMEs also increases. However, there was a need to determine whether the relationship was predictive or not. This was done by running a simple regression analysis. The results are presented in Table 3.

Regression results

Table 3; Simple regression results of microfinance training services and financial sustainability of SMEs

Model		Sum of Squares	Df	Mean Square	F	sig
1	Regression	268.304	1	268.304	7.596	0.007
	Residual	4945.112	140	35.322		
	Total	5213.415	141			

Predictors: (constant) MF training services Adjusted R Square=0.045

Dependent Variable: Financial Sustainability

Regression results in Table 3, show that MF training service aspects are collectively explanatory variables of financial sustainability of SMEs in Kampala Central Division (F = 7.596; sig = 0.007). However, MF training services only explain 4.5% of the variations in financial sustainability of SMEs (Adjusted R Square = 0.045). This is also supported by the regression value of 268.304 compared to the residual value of 4945.112, suggesting that other factors strongly influence financial sustainability of SMEs in Kampala Central Division, other than MF training services. However, the study hypothesis that MF training services do not significantly influence financial sustainability of SMEs was rejected. There is a statistically significant influence of training services on financial sustainability of SMEs in Kampala Central Division. Findings concur with Bukirwa (2017) who affirms that, to preserve its obtained position and increase competitive advantage, the organization needs to be able to create new knowledge and not only solely rely on the utilization of the existing knowledge and that the continuous training has a significant role in the development of individuals and organizational performance. Training services however only explain 4.5% to variations in financial sustainability of SMEs, suggesting that as mentioned in the literature review, MF training is generally limited to emphasizing the importance of repaying the loan and of applying the loan to the business. Although such training is believed to be correlated with the financial sustainability of SMEs, the owners of these institutions often face family crises and spend the loan money on personal needs, which might not help their businesses to generate enough profit and grow. MF training services should cover other areas of business management in addition to financial literacy and money management.

CONCLUSION AND RECOMMENDATIONS

The objective of this study centered on investigating the influence of MF training services on financial sustainability of SMEs in Kampala Central Division. The study concludes that, MF training services are statistically influential factors of financial sustainability of SMEs in Kampala Central division. As the generator of new knowledge, training services must be placed within a broader strategic context of human resources management, that is, global organizational

management, as planned structuring and development, benefit the organization and employees. This means further that MF training should cover all areas of business management.

Much as the study has contributed to the understanding of the influence of MF training services and financial sustainability of SMEs in Kampala Central Division, its findings should be used with caution due to the following limitations of the study. First, there were a few variables included in the model. It is not only MF training services that influence financial sustainability and financial sustainability but it can be measured at different levels other than operational efficiency and financial sufficiency. Secondly, the study is essentially a cross-sectional study that examined the influence of MF training services on financial sustainability of SMEs at a particular point. This may not give a complete picture of the phenomenon studied and may limit some of the conclusions obtained. Lastly, the nature of the sampling units under study cannot be generalized to a large population as only 80 SMEs and only in Kampala Central Division were examined. These were mainly urban SMEs. Majority of the SMEs including those in rural areas were not examined.

Considering the above limitations, therefore, the study opens up areas for further research. One, more variables should be included in the model; secondly, future studies may consider exploring appropriate econometric methods that improve the understanding of financial sustainability of SMEs. Thirdly, future studies should consider a large sample size for more accurate findings which are more generalizable nationwide. Lastly, future studies should extend the model to other organizations other than SMEs or other financial institutions services and how they influence financial sustainability of SMEs in Uganda and elsewhere.

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Does Prospect Theory Explain Investment Decisions: A Comparative Study

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Abstract

The aim of the study is to analyze and compare risk behaviors of different experimental groups on investment decisions by utilizing prospect theory. In this context, investment scenarios standardized by Sullivan (1997) are conducted on corporate managers and undergraduate students through the interviews. The results of the study state that both managers and students exhibited a greater tendency towards risk avoidance on profit conditioned scenarios, and they exhibited risk taking behavior, particularly when they dealt with clear financial losses, supporting the assumptions of prospect theory. However, managers exhibit greater risk taking behavior when both groups take risk, and they also exhibit greater risk avoidance behavior when both groups avoid risk, comparing to students. Furthermore, the differences of confidence level between groups indicate that managers are always more confident in contrast to students regardless of taking or avoiding risk.

Keywords: Risk behavior, Investment decisions, Prospect theory, Framing effect.

Introduction

In the traditional approach to corporate finance, it is assumed that markets are efficient and they are dominated by rational investors (Shefrin, 2001). Accordingly, rational investor is only concerned with his own well being, he is planning ahead and executes his actions as planned, he does not need heuristics to simplify his choices, his choice is based on calculus and statistics and lastly, he has a good judgment of his abilities (Baker, Ruback & Wurgler, 2005). However, global market events and financial crisis periods such as the Great Crash of 1929 have clearly provided an evidence of an irrationality on asset pricing and stock market inefficiency because of the misvaluations on the financial markets (Baker and Wurgler, 2007). Therefore, as a response to this traditional approach, behavioral finance has grown during the past two decades and placed a focus on investor psychology on financial decisions and stock market anomalies in financial markets. Accordingly, the market is not perfect and is populated by irrational investors. Irrational investor is lead by fairness considerations, he reacts to regret, he may have problems of self control, he uses many heuristics to simplify his choices, he has only limited knowledge of calculus and statistics and he can be overconfident (Baker, Ruback & Wurgler, 2005). Hence, scholars devote more attention to the implications of investor biases on trading behavior (Thaler, 2000; Hackbarth, 2009) and focus more on how managers make decisions, particularly under uncertain

and risky conditions, in recent years. As seen, decision making literature has been expanded by the development of several psychological approaches on investment decisions (Scholz, 1983).

Within this context, this study aims to evaluate the risk behavior of corporate managers and students on investment decisions. Investment scenarios are conducted to examine the effect of prospect theory which is important for decision making process, particularly under risky conditions. It is expected that while most of participants will choose the sure outcome in the gain condition, they will choose the risky alternative in the loss condition.

This study enables to compare the differences of different experimental groups in a risky decision setting. Whether the experience in a corporation influences the attitude on risky behavior or differs from students' preferences are also determined through this study. Hence, professionals can design better approaches or new regulations that will help managers to cope with the framing effect and prospect theory in decision making process. Instructors can also design programs by taking into account the preferences of the students and make ready the students to the finance world.

The rest of the study is structured as follows: the literature review on the framing effect and the prospect theory is provided, at first. Then, the methodology including investment scenarios are covered and empirical findings are presented. The findings obtained are evaluated in the conclusion part.

Literature Review

Framing Effect

Framing effect states that individuals respond differently to the same decision problem if the problem is presented in a different format (Kahneman and Tversky 1979, Ritter 2003).

Decision making literature has shown that behavioral biases can affect the decisions of the managers (Gervais, 2009) and individuals exhibit a number of biases during decision making process (Slovic, 2000). Furthermore, toward the end of 20th century, many studies have attempted to examine how the framing of a decision problem affects decision making. When the same alternative is presented in a different format, managers' risk preference might change (Kuhberger, 1998; Zheng, Wang & Zhu, 2010). In other words, changes only in the wording of a decision without a real change in the expected results might affect an individual's choice and judgment (Kuhberger, 1998; Sher & McKenzie, 2006). This phenomenon is referred to as a framing effect (Tversky and Kahneman, 1981; Kuhberger, 1998; McElroy & Seta, 2003). Hence, changes on preference of the same decision scenario presented as different (positive vs. negative) ways occur as a result of framing (Gonzalez et al., 2005; Huang & Wang, 2010).

The "Asian disease problem" described by Tversky and Kahneman (1981) is a classic example of the framing effect. Decision makers were asked to choose between two alternatives in case of an unusual disease. Firstly, an experiment conditioned on positive framing is structured for a certain or a probabilistic and risky option to save lives, on the other hand, an experiment conditioned on negative framing is structured for a certain or a probabilistic and risky option to minimize deaths. (Tversky & Kahneman, 1986: 260). Accordingly, in case of positive framing, decision makers are expected to exhibit risk avoidance behavior, and in case of negative framing, they are expected to exhibit risk taking behavior.

During the past three decades, many studies were conducted to examine the existence of framing effect. Furthermore, different task domains within framing effect were analyzed. Life-death domains (Fagley & Miller, 1997; Druckman, 2001; Huang & Wang, 2010; Zheng, Wang & Zhu,

2010), monetary domains (Fagley & Miller, 1997; Huang & Wang, 2010) and time domains (Huang & Wang, 2010) were mostly focused in framing effect researches.

Financial decisions such as investment fund choices, tax-related decisions were also evaluated within the framing effect in the literature (Fagley & Miller, 1997; Diacon & Hasseldine, 2007; Schadewald, 1989; Highhouse & Paese, 1996; Chang, Yen & Duh, 2002; Hasseldine & Hite, 2003).

On the other hand, while some researchers claimed that reactions to positively or negatively framed scenarios are affected by personal characteristics during decision making process (Levin, Schnittjer, & Thee, 1988; Lauriola & Levin, 2001), some others suggest that gender is related to risk taking behavior (Hasseldine & Hite, 2003; Huang & Wang, 2010). Prospect theory suggested by Kahneman & Tversky (1979) was utilized to evaluate framing effect for the decision making literature.

Prospect Theory

Prospect theory is an important theory for decision making process under uncertainty and risk. Thaler (2000) suggests that prospect theory is as a way of understanding human cognition. As a response to the rational-based framework of traditional approach suggested by Han & Hsu (2004), Kahneman & Tversky (1979) provide robust evidences that people do not display rational behavior, particularly under risky conditions. Under these circumstances, people exhibit risk avoidance behavior in case of gains and exhibit risk taking behavior in case of losses; this behavior is explained by prospect theory (Kahneman & Tversky, 1979; Durukan, 1999).

Prospect theory explains the framing effect suggesting a value function (Kahneman & Miller, 1986; Kahneman & Tversky, 1979; Thaler, 2000; Süer, 2007). Accordingly, value is evaluated as gains and losses based on a reference point which is the central feature of prospect theory (Cochran, 2001). Accordingly, people's preferences will differ depending on whether the domain of outcomes is gain or loss and decision alternatives with outcomes above the reference point are viewed as gains, while outcomes below that point are viewed as losses (Fischhoff, 1983; Ritter, 2003). It is expected that decision makers tend to avoid risk when choosing between alternatives above the reference point, and take risk when choosing between alternatives below that point (Kahneman & Tversky, 1984; Sullivan, 1997; Olsen, 1997; Wen, 2010).

Many authors emphasized on various applications related to prospect theory. Loughran and Ritter (2002) and Chang (2011) used prospect theory to explain the severe underpricing of initial public offering (IPO). As similar, Ljungqvist & Wilhelm (2006) investigated whether prospect theory explains IPO market behavior. Thaler (1985) suggested that individuals utilize a reference point during their decision making process. Wiseman & Gomez-Mejia (1998) developed a behavioral agency model based on risk taking behaviors of executives. Wen (2010) examined the existence of prospect theory on corporate capital investment and corporate governance. Sullivan (1997) & Süer (2007) used several scenarios to determine corporate managers' risky behavior. Earnings management (Shen & Chih, 2005), customer choice (Cochran, 2001), asset prices (Barberis, Huang & Santos, 2001), liquidation decisions (Kyle, Yang & Xiong, 2006), option prices (Gemmil & Shackleton, 2005), managerial accounting decisions (Chang, Yen & Duh, 2002), capital budgeting decisions (Harwood, Pate & Schneider, 1991; Allport, 2005) were also studied and applied within the framework of prospect theory. Moreover, while some of the studies were conducted on managers and investors, others were conducted on students.

Methodology

The aim of the study is to investigate whether the prospect theory exists in the decision making associated with investment decisions. To determine the decision behavior, the study utilizes several scenarios that examine risky behavior across decision settings. The investigation is conducted through the interviews with eighty professional corporate managers and eighty six undergraduate students who make a choice between two alternatives for each experiment associated with a managerial decision problem. To test the confidence levels of the participants on their decisions, the degree to which preferred the chosen alternative for each experiment is presented between the ranges from '1' to '5', expressing 'weakly preferred' and 'strongly preferred', respectively. Within this context, five different experiments including twelve scenarios are conducted on corporate managers of small and medium size enterprises registered to Eagean Region Chamber of Industry, in the city centre of Izmir and senior class students of departments of business administration and economics, studied in Dokuz Eylul University. The responses of participants to investment scenarios are used to test the assumptions of framing effect and prospect theory.

Empirical Findings

Table 1 provides the results of the experiment conditioned on save and loss exhibiting risk taking or risk avoiding tendencies of the participants. Based on the results, it can be concluded that while managers chose the risky alternative with the percentage of 94%, students chose risky alternative with the percentage of 81% in the loss condition, at the 1% significance level. On the other hand, a great number of managers chose the scenario A with 92% percentage, and students chose the scenario A as well with 71.4% in the save condition, even if the results are insignificant. Thus, it can be said that while both managers and students tend to exhibit greater risk taking behavior when the scenarios are presented in terms of loss, and they tend to avoid risk in the save condition, consistent with the framing effect. Furthermore, when compared the results, it is clearly seen from the table that managers are more confident than students on their decisions for both save and loss conditions.

Table 1. Experiment on Framing Effect

Save Condition		Loss Condition		
A:	Save \$200,000 for sure.	A:	Sure loss of \$400,000.	
B:	1/3 probability of saving \$600,000. 2/3 probability of saving nothing.	B:	1/3 probability of losing nothing. 2/3 probability of losing \$600,000.	
MANAGERS				
	Risk Taking	Risk Avoiding	Confidence Level	Comments
Save	0.08	0.92	4.33/5	Greater risk avoidance
Loss	0.94	0.06	4.33/5*	Greater risk taking
STUDENTS				
	Risk Taking	Risk Avoiding	Confidence Level	Comments
Save	0.286	0.714	4.05/5	Greater risk avoidance
Loss	0.81	0.19	3.67/5*	Greater risk taking

*significance at 1% level based on chi-square test.

The results of experiment including profit and loss scenarios are presented on Table 2. Accordingly, the percentage of managers exhibiting risk avoiding behavior in the two profit conditions was 94% and 96%, with the confidence level of 5.00 at the 1% significance level. On the other hand, they chose the risky alternative in both loss conditions with 90% and 78% percentages, respectively. Thus, it can be said that risk greater taking behavior is exhibited by

managers when the alternative is presented as losses, and also exhibiting greater risk avoiding behavior in case of profit.

The students also exhibited greater risk avoiding behavior in case of profit with 60% and 80% while they chose the risky alternative when the scenario was presented in terms of loss with 100% and 75% percentages. The percentage of risk averse students in the first profit condition is close to split in behavior. This may be because of the probability of high profit when they take risk. Moreover, students are more confident on the decision in the profit condition by contrast with the loss condition.

To sum up, the results, reported on Table 2, provide strong evidence of risk avoiding behavior when the experiment is exhibited in terms of profit and and risk taking behavior when the experiment is exhibited in terms of loss for both of the groups. However, managers are more risk averse in profit condition and more risk taker in loss condition than students. Furthermore, comparing the confidence level, it is seen that managers make decision with stronger confidence than students.

Table 2. Experiment on Profits and Losses

Profit Condition: Set One		Loss Condition: Set Three		
A: 60% chance of a \$520,000 profit. 40% chance of no profit.		A: 60% chance to lose \$390,000. 40% chance to lose nothing.		
B: Sure profit of \$312,000.		B: Sure loss of \$234,000.		
Profit Condition: Set Two		Loss Condition: Set Four		
A: 60% chance of a \$290,000 profit. 40% chance of a \$130,000 profit.		A: 60% chance to lose \$375,000. 40% chance to lose \$230,000.		
B: Sure profit of \$226,000.		B: Sure loss of \$317,000.		
MANAGERS				
	Risk Taking	Risk Avoiding	Confidence Level	Comments
Profit: One	0.06	0.94	5.00/5*	Greater risk avoidance
Profit: Two	0.04	0.96	5.00/5*	Greater risk avoidance
Loss: Three	0.90	0.10	4.33/5*	Greater risk taking
Loss: Four	0.78	0.22	4.33/5*	Greater risk taking
STUDENTS				
	Risk Taking	Risk Avoiding	Confidence Level	Comments
Profit: One	0.40	0.60	4.25/5*	Greater risk avoidance
Profit: Two	0.20	0.80	4.30/5*	Greater risk avoidance
Loss: Three	0.88	0.12	3.30/5*	Greater risk taking
Loss: Four	0.75	0.25	3.80/5*	Greater risk taking

*significance at 1% level based on chi-square test.

The experiment was conducted in terms of profit and expenditure and the results were presented on Table 3. In this experiment, it is concluded that managers preferred the certain option with 88% when the scenario is presented as profit, while only about 12% chose the risky alternative indicating a clear tendency for risk avoidance. On the other hand, managers exhibited a tendency of risk taking behavior. Only 12% of the managers select the certain expenditure, while 88% selecting the probabilistic expenditure. This may be because of that expenditures are viewed as a reduction from current assets and thus, induce managers to take risk.

On the other hand, students are split in their risk behavior for both profit and expenditure condition (52.4% vs. 47.6%). This can be because of similarities of profit and expenditure values in scenarios of A and B. Furthermore, students may be hesitant because of being inexperienced

in real finance world. Nevertheless, students have preferred certain alternative in the profit condition and risky alternative in the expenditure alternative, consistent with the assumptions of prospect theory, even if the values are close to each other. The confidence level of the experiments is also observed higher for the managers, consistent with the earlier results.

Table 3. Experiment on Profits and Expenditures

Profit Condition		Expenditure Condition		
A:	Sure profit of \$420,000.	A:	Certain expenditure of \$420,000.	
B:	75% chance of \$570,000 profit. 25% chance of no profit.	B:	75% chance of \$570,000 in expenditures. 25% chance of no additional expenditures.	
MANAGERS				
	Risk Taking	Risk Avoiding	Confidence Level	Comments
Profit	0.12	0.88	5.00/5*	Greater risk avoidance
Expenditure	0.88	0.12	4.67/5*	Greater risk taking
STUDENTS				
	Risk Taking	Risk Avoiding	Confidence Level	Comments
Profit	0.476	0.524	4.52/5	Split in risk behavior
Expenditure	0.524	0.476	4.05/5	Split in risk behavior

*significance at 1% level based on chi-square test.

Table 4 presents the results of the experiment conditioned on revenues and cost. In the revenue condition, 86% of the managers and 66.7% of the students selected the certain outcome, indicating clear risk avoidance behavior at the 1% significance level. As expected, the students tend to take risk in the cost condition with about 57.1%. Differently, 94% of the managers chose the certain alternative, indicating a greater risk avoidance behavior, when the experiment was conditioned on cost scenarios, not supporting the prospect theory. Chi-square test also indicate insignificance for cost condition preferences of the managers. Thus it can be concluded that while managers are greater risk averse for both of the scenarios, students exhibit greater risk avoidance behavior in the revenue condition and they take risk more compared to managers in the cost condition. On the contrary, managers avoid risk more than students and additionally, they are more confident (5.00) on their decisions.

Table 4. Experiment on Revenues and Costs

Revenue Condition		Cost Condition		
A:	\$575,000 certain revenues.	A:	\$250,000 certain costs.	
B:	30% probability of \$365,000 in revenues. 70% probability of \$665,000 in revenues.	B:	30% probability of \$460,000 in costs. 70% probability of \$160,000 in costs.	
MANAGERS				
	Risk Taking	Risk Avoiding	Confidence Level	Comments
Revenue	0.14	0.86	5.00/5*	Greater risk avoidance
Cost	0.06	0.94	5.00/5	Greater risk avoidance
STUDENTS				
	Risk Taking	Risk Avoiding	Confidence Level	Comments
Revenue	0.333	0.667	4.20/5*	Greater risk avoidance
Cost	0.571	0.429	4.20/5*	Risk taking

*significance at 1% level based on chi-square test.

The results of the profit-cost experiment conducted are presented on Table 5. In the profit condition, both managers (88%) and students (76.2%) preferred to choose low risky alternative in expected profits, exhibiting significant greater risk avoidance behavior.

Results provided from the cost conditioned experiment indicated that managers chose the high and low risk alternatives with about 84% and 16%, respectively, as expected within the prospect theory. However, the students exhibited risk avoidance behavior with about 57.1% as in the profit condition, although the experiment is conditioned on cost, against the assumptions of prospect theory. This can be because of low cost probability with about 30% when they choose risky alternative. Otherwise, they will expect at least \$344,000 costs.

To sum up, significant risk avoiding behavior was observed for both groups in the profit condition, with more than 4.00 confidence level. When the alternative is conditioned on cost, while managers prefer to take risk, students tend to avoid risk.

Table 5. Experiment on Profits and Costs

Profit Condition		Cost Condition		
A: 70% probability of \$465,000 in profits 30% probability of \$155,000 in profits	A: 70% probability of \$465,000 in costs 30% probability of \$155,000 in costs	B: 70% probability of \$384,000 in profits 30% probability of \$344,000 in profits	B: 70% probability of \$384,000 in costs 30% probability of \$344,000 in costs	
MANAGERS				
	Risk Taking	Risk Avoiding	Confidence Level	Comments
Profit	0.12	0.88	5.00/5*	Greater risk avoidance
Cost	0.84	0.16	4.33/5*	Greater risk taking
STUDENTS				
	Risk Taking	Risk Avoiding	Confidence Level	Comments
Profit	0.238	0.762	4.29/5*	Greater risk avoidance
Cost	0.429	0.571	3.95/5	Risk avoidance

*significance at 1% level based on chi-square test.

Conclusion

This study aims to investigate whether the irrational behavior of prospect theory exists in the decision making associated with the investment decisions. To determine the decision behavior, the study reports on five experiment groups including twelve scenarios that investigate risky alternatives across decision settings in which profit, loss, revenue, cost, and expenditure forms. The investigation is conducted through the interviews with eighty professional corporate managers and eighty six undergraduate students who will make a choice between two alternatives in a decision problem setting. The experiment has been applied on small and medium size enterprises registered to Eagean Region Chamber of Industry, in the city centre of Izmir and senior class students of departments of business administration and economics studied in Dokuz Eylul University. The responses of participants to managerial scenarios are used to test the assumptions of prospect theory.

Within the prospect theory, it is expected that the participants tend to avoid risk when the scenario is presented as profit conditioned, on the other hand, it is expected that they tend to be risk taker in case of losses. Accordingly, the results indicated that both managers and students exhibited a greater tendency towards risk avoidance on profit conditioned scenarios, as expected. Consistently, they exhibited risk taking behavior, particularly when they dealt with clear financial losses and expenditures. Thus, it can be said that both expenditures and losses are

considered in the same mental accounts by decision makers. In other words, participants tend to take risk in the expenditure condition, as in the loss condition, in accordance with prospect theory. However, decision making process is evaluated different for the cost conditioned experiment, as reported on Experiment 4 and 5. This may be because of that costs may be seen as a necessary to produce and have income, and thus they are perceived as integral parts of the profits and revenues.

Finally, an important different between students and managers was observed that managers are more risk takers when both groups take risk, and also they are more risk averse decision makers while both groups avoiding risk. Furthermore, confidence level differences between groups demonstrate that managers are always more confident in contrast to students regardless of taking or avoiding risk.

To sum up, this study attempts to display managerial behaviors of corporate managers and undergraduate students under risk. Risk attitudes of these two groups were compared and thus, the differences between theory and practice may be seen in terms of prospect theory. The study is important to determine whether the experience in a corporation influences the risky behaviors or differs from students' preferences. Through the differences between experimental groups, it is expected to examine that whether students represent the managers and the experiment gained in real business world affects risky behaviors. In addition, the study enables to test the assumptions of prospect theory which are developed as an alternative to traditional finance theories.

It is believed that this study will be useful for professionals to design new regulations leading to managers while making decisions and for instructors to design new programs benefiting to students while being ready to the real business world. The results can be generalized to all corporate managers and to the undergraduate students. For further research, financial crisis periods can be taken into account to test the investment behaviors of the groups under uncertain and more risky conditions. Within this context, coronavirus disease pandemic period can also be included to the study.

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TQM and Six Sigma: A Literature Review of Similarities, Dissimilarities and Criticisms

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Abstract

This paper discusses the similarity and dissimilarity between TQM and Six Sigma methodologies. Specifically, it contributes by revealing the resemblances and divergences between CSF's of TQM and Six Sigma. The discussion arises firstly based on the considerable criticisms appears in the literature concerning this controversy: Six Sigma is a repackage of TQM or Six Sigma is an extension of TQM?. As of interest to resolve this controversy, a research framework is developed preceded by a theoretical background of the basics, strategies, objectives and CSF's of each methodology. The primary proposition of this work is that the implementation of Six Sigma CSF's are based on the major part on the TQM CSF's. Firstly, this paper reveals that Six Sigma is an extension of TQM and stresses its distinguished characteristics compared to TQM.

Keywords: TQM, six sigma, similarities and dissimilarities, critical success factors (CSF's), literature review.

Introduction

The Six Sigma quality enhancement approach has obtained recognition in the previous few years as more and more corporations affirm its effectiveness in developing their bottom lines. Companies need to focus on creating Six Sigma projects that are aligned to the business needs (e.g. creating more customers and cash). Customers increasingly require on the quality of the supplied product which leads companies to strive excellence or at least to strive for perfection in order to satisfy more customers. This paper discusses the similarities and dissimilarities between TQM and Six Sigma. We consider that such discussion is essential for these subsequent reasons: to specify the distinguished characteristics of each methodology, to clarify the principal criteria of TQM presented in Six Sigma and to stress the value added of Six Sigma approach.

Firstly, from a TQM perspective, this discussion emphasizes on the importance of TQM as an evolving system of practices, tools, and training methods for managing companies to provide customer satisfaction in a rapidly changing world (Shiba, Graham, & Walden, 1993; Hellsten &

Klefsjo,2000). However, the intensification of competitiveness and the fluctuation of industrial market were pushing the companies to ameliorate their products quality and services in order to maintain their place in the market. Secondly, Six Sigma is different from other process enhancement methodologies; so it will be precious to examine its impact on performance. Nevertheless, due to its similarity with other process development approaches, such as TQM, it is important to know its particularity (Shafer & Moeller, 2012). In this respect, the particular question can thus raise: What are the similarities and dissimilarities between TQM and Six Sigma based on CSFs?. Thirdly, the positive impact of Six Sigma approach has been the subject of various perspectives and criticisms and has gained considerable attention for both scholars and practitioners (Hoerl, 1998; Rucker, 2000; Roberts, 2004; Johnson, 2005; Foster, 2007). In spite of the well reputation of Six Sigma approach, there are small theories that stress the effectiveness of Six Sigma projects on organizational performance.

Some consider Six Sigma as an old approach in the new bottles or features. It is just a repackaging of habitual quality management which leads to various criticisms of quality system (Dahlgaard & Dahlgaardark, 2006). In view of that, there is a necessity to enhance the comprehension of the organizational program and the quality management project in order to have an exact point of view that can reduce vigilance against the implementation of Six Sigma method. Reviewing the historical quality management considering the TQM actions and Six Sigma, the approach of quality management development can be separated into two steps, namely PDCA management cycle associated with TQM activities and the DMAIC technique is linked to Six Sigma project.

Finally, this discussion on the similarities and dissimilarities between TQM and Six Sigma is important because conflicting arguments appear in the literature in regard if this relationship. This paper, therefore, look for resolving this debate from a theoretical perspective, thus leading to the development of suitable research work facilitating the understood of the relationship between TQM and Six Sigma.

The reminder of this paper is structured as follows. Section 2 provides an over view of TQM and Six Sigma foundation, concepts, basic practices. Section 3 reveals the similarities and dissimilarities between TQM and Six Sigma based on CSFs. Section 4 stresses the main criticisms raised against TQM and Six Sigma and outlines the principal impediments of Six Sigma and the insufficiencies of TQM.

Literature review on TQM and Six Sigma

Historical essence of Quality Management

The competitiveness of Japanese industries in the end of the 1970s had equaled or goes beyond the American industries. Generally, this was owing to the Japanese implementation of company-wide quality control (CWQC), (Powell, 1995). In eighteen years, Japanese CWQC had been simulated in the United States, and TQM rapidly became the dominant business strategy implemented by the industries all over the world.

The success of Japanese industries in implementing the TQM offers the opportunity to benefit from the production of excellent products at poorer cost. The popularity of "total quality" term begin in the USA in the 1970s, referred to the variety of Japanese basics resolution for quality, that facilitated Japanese economy restructure after the second world war. The establishment of TQM practices started in Japan in 1950s with huge contribution of American statisticians such as:

Deming and Juran. TQM confirmed to be a very successful management program and set of techniques and tools. TQM concepts have governed the management prospect for a few decades. In worldwide, a lot of organizations have tried to exploit TQM to attain an improvement of competitiveness and enhancement of financial results.

The field of quality was marked by the emergence of various management systems; one of these is the TQM. The definition of TQM approach can be assimilated to a holistic management philosophy focalized in the preservation and the continuous improvement of all activities inside an organization (Flynn, 1994). "TQM has become a core competency for firms that strive to achieve long-term business success. Consequently, firms have conferred an increasing importance on management practices based on quality, since these aim to eliminate sources of error and inefficiencies, which, in turn, can improve a firm's performance in terms of meeting customer requirements, and increasing organizational performance and employee job satisfaction". (Hackman & Wageman, 1995).

Total Quality Management Concept

TQM has embodied several definitions which have existed during the years. Dahlgaard, Kristensen, & Kanji, (1998) consider TQM as a corporate culture characterized by increased customer satisfaction through continuous improvement, in which all employees in the firm actively participate. Shiba et al. (1993), on the other hand, argue that TQM is an evolving system of practices, tools, and training methods for managing companies to provide customer satisfaction in a rapidly changing world. Hellsten & Klefsjo (2000) maintain the vision that TQM is an evolving system... as a continuously evolving management system consisting of values, methodologies and tools, the aim of which is to increase external and internal customer satisfaction with a reduced amount of resources.

Essential Basics of TQM Practices

Many research works have studied and investigated the essential basics and practices of TQM and have studied their link with innovation, performance (Roffe, 1999; Sila & Ebrahimpour 2002; Yang 2003a; Lakhal, Pasin, & Limam, 2006; Srinivasu, Sreenivasarao, & Rikkula, 2010).

Sila & Ebrahimpour (2002) and Yang (2003a) consider these list of principles elements of TQM: customer meeting and satisfaction; learning and training; top management support, commitment, involvement; teamwork; cooperation, employee participation; quality guarantee; quality information system and application; unremitting improvement; suppleness, benchmarking and tactic arrangement; process management; design of product, service and quality control; worker management and ability, and business quality culture.

Agus & Hassan (2011) investigated four essential basics of TQM practices that are: supplier relationships, benchmarking, quality measurement, and uninterrupted process development. Additional explanations on the four TQM elements are as follows:

- Supplier relations: producers should work strictly and helpfully with providers over the extended period to remove imperfections entirely.
- Benchmarking: Benchmarking return to investigate the best competitive practices to provide a road for lucid and rational performance objectives and to facilitate the identification of prospect for cost, product reliability and extra factors. As a result, efficiency, performance, and effectiveness can be improved (Kotler, 1994; Tillery & Rutledge, 1991; Zairi, 1998).
- Quality measurement: Quality measurement is an objective direction with steady performance measurement, frequently with the use of statistical analysis.

- Continuous process improvement: process improvement developed into a practice that maximizes effectiveness and efficiency while improving process control and strengthening internal mechanisms for answering to altering customer requirements (Mann, 1992; Shetty, 1987).

Historic of six sigma

The launch of Six Sigma method began in Motorola by Smith in the late 1980s in the aim to deal with the company's continued problems of responding to the customer's expectations in a cost-effective manner (Srinivasu et al., 2010). Motorola is the pioneer in the implementation of Six Sigma methodology and the application of Six Sigma becomes widespread and integrated in other companies such as: General Electric (GE), Toyota, IBM, SONY and Nokia.

We can summarize the evolution of Six Sigma in three generations. The first generation focused on the reduction of process variability and the famous example is of Motorola company. The second generation focalized in developing the concept of the defect elimination in order to upgrade the performance of company by the diversities of tools and methods which are brought out in reduction of costs and improving product design. General electric is the suitable example that can be cited in this case regarding the perfect success realized in this decade. The third generation emphasized to create value for all the partners: employees' commodity, customers' satisfaction, suppliers' relationship, and the society in general. Caterpillar and Bank of America are excellent examples of Generation III of Six Sigma companies, for the reason that their implementations are focused on creating value for all stakeholders in the broad (Montgomery & Woodall, 2008).

Six Sigma Concept

According to Pande (2002) and Eckes (2001) Six Sigma is considered as a 'breakthrough strategy' and more as a holistic quality philosophy. After in-depth studies, there are different manners to define Six Sigma methodology used by the practitioners and researchers. Three distinctive concepts facilitate the understanding of Six Sigma term. A measure (e.g. it measures a gap between process and perfection). A target (e.g. aims to achieve a level of 3.4 defects per million opportunities). A philosophy (e.g. it based on reducing costs strategy through the decrease of process variability).

The term Six Sigma is descriptive

The Greek letter sigma (σ) is the standard deviation, it's an important measure of variation, employed to describe the variability of the processes. The variation of a process refers to the degree of concentration of all results around the average. Six Sigma refers to the existence of six gap types between the average of the centre of process and the specification limit or nearest service level. Six Sigma is one of the most known mature approaches in industrial organization improvement. It is created to develop the process quality through some indicators which are based on the customer satisfaction. It delivers a business excellence value to customers through its strategic method.

There are several definitions proposed by many authors to underline the concept of six sigma. Some consider it as a strategy that focuses on reducing the variation in process, cutting costs and ameliorating customer satisfaction (Bendell, 2006). Others define it as a business strategy used to improve business profitability, to improve the effectiveness and efficiency of all operations to meet or exceed customer needs and expectations (Kwak & Anbari, 2006). Andersson, Eriksson, & Torstensson, (2006) consider it as an improvement program for reducing variation, which focuses

on continuous and breakthrough improvements. Lucas (2002) asserts that Six Sigma is essentially a methodology for disciplined quality improvement because this quality improvement is a prime ingredient of TQM. Many firms have found that adding a Six Sigma program to their current business system gives them all, or almost all, of the elements of TQM program. Lucas (2002) has thus concluded that: current business system plus Six Sigma are equal to total quality management. In current years, the Six Sigma method became the focus of academic researches. It is considered as a strategic issue of quality improvement based on the increase of process capability and the development of company performance (Dasgupta, 2003; Linderman, Schroeder, Zaheer, & Choo, 2003; Raisinghani, Ette, Pierce, Cannon & Daripaly, 2005; Schroeder, Linderman, Liedtke, & Choo, 2008). In the beginning, Six Sigma was qualified as methodology of quality measurement. In the last few years it was changed to become a sophisticated discipline focused on the improving of the process by the use of various techniques and statistical tools (Knowles, 2011). After a thorough reading of the literature we can classify the Six Sigma process in two complimented perspectives: statistical and business point of view. From statistical point of view, Six Sigma methods immerge from statistical tools and statisticians. From the business point of view, Six Sigma can be treated as business strategy focused in the achievement of a great effectiveness and efficiency to realize a suitable profitability and to respond to the customer's needs or to expect them (Antony & Banuelas, 2001).

Six Sigma Core Practices

The review of both research studies and practitioner literature on six sigma (Henderson, 2000; Antony & Banuelas 2002; Zu, Fredendall, & Douglas, 2008; Choo, Linderman, Schroeder 2007a,b; Kwak & Anbari, 2006; Harry & Schroeder, 2000; Srinivasu et al., 2010) allow the identification of three critical practices linked to Six Sigma implementation. These practices are: Six Sigma structured improvement procedure (*DMAIC and DMADV*), Six Sigma role structure, and Six Sigma focus on metrics.

Six Sigma Structure Improvement Procedure

The Six Sigma DMAIC (Define, Measure, Analyze, Improve, and Control) method is applied for improving existing processes and looking for incremental improvement, while the Six Sigma DMADV (Define, Measure, Analyze, Design, and Verify) is used for improving new processes or products (Srinivasu et al. (2010)).

Six Sigma Role Structure

The work of (Linderman et al., 2003; Antony & Banuelas, 2002; Sinha & Van de Ven, 2005; Zu et al., 2008) offers a detailed explanations of the Six Sigma experts role and functions from the highest level to lowest level. This classification is as follows: Champions, Master Black belt, Black belt, Green belt and Yellow belt.

Six Sigma Focus on Metrics

The Six Sigma metrics are helpful tools to measure the process variability and to evaluate the company's performance. They allow the conduction of solutions for each DMAIC or DMADV step which is the distinguished characteristics of Six Sigma method compared to other quality management. Based on the work of (Natarajan, Senthil, Devadasan, & Mohan, 2011), we selected these principal tools of Six Sigma such as: FMEA (Failure mode and effects analysis), Control charts, DoE (design of experiments), process mapping, flow chart, SIPOC model, correlation studies, and measure of capability.

Comparison between TQM and Six Sigma

Which distinguish Six Sigma approach to other programs TQM is linked to the specificity of Six Sigma which is a global approach of management structured with advanced statistical tools, its impact in cultural change, the implication and the training of all employees, it is distinguished by the quantifiable and measured tools, organized structure (Dahlgaard & Dahlgaard-Park, 2006) and the planning in selecting projects to attain zero defects.

Six Sigma approach emphasizes, at first, the critical criteria to the existing customers (Harry, 1998; Dasgupta, 2003; Linderman et al., 2003; Evans & Lindsay, 2005). Six Sigma provides to the organizations the ability to develop into extra ambidextrous by switching two structures (organic and mechanic). The first structure is used to develop new idea; in this case the company realizes an innovation. The second structure used when the company is interested by the efficiency (Schroeder, Linderman, Liedtke, & Choo, 2008). It is concerned as a challenge, that the double structures offer the advantage of switching both exploitation and exploration, to profit from both efficiency and innovation (March, 1991).

Choo, Linderman, & Schroeder (2007a) argue the ability of Six Sigma of maintaining equilibrium between the effective accomplishment and arranged methodology (e.g. technical tools such as quality control) and context (e.g. top management, organizational culture). The other programs of quality management such as: TQM, Business Process Reengineering are concentrated likely to Six Sigma approach in boosting rationality and developing organizational process (Hammer & Champy, 1993; Powel, 1995; Harry & Schroeder, 2000). However, the Six Sigma method is more oriented to reduce the process variability through sophisticated and advanced statistical tools and organizational challenge which provide a cultural change.

Anbari (2002) avows that Six Sigma methodology is more wide-ranging compared to their previous quality methods such as (TQM) and Continuous Quality Improvement (CQI). Six Sigma is more distinctive by the use of advanced statistical tools and it is a structured method that can be implemented in different sectors and not restricted to the manufacturing sector. He treats Six Sigma method as follows:

Six Sigma = TQM (or CQI) + Additional Data Analysis Tools + Stronger Customer Focus + Project Management + Financial Results

Similarities between TQM and Six Sigma

In the case of similarities between Six Sigma and TQM, Schroeder et al. (2008) propose these subsequent points:

- Generally TQM and Six Sigma accentuate the importance of attaining customer input and the employment of quality function exploitation in product/service design.
- Generally Six Sigma and TQM call attention to process ownership and have visibly identified processes.
- Generally programs identify the value of top management guidance and sustain.
- Concerning workers, they are stressed by the two approaches. But, the approaches differ in the staff involved. Especially, Six Sigma is inclined to resort on process enhancement experts, whereas TQM accentuates the involvement of every workers, particularly shop floor workers.
- Generally methodologies identifying the significance of gathering and treating quality data.

Table 1. Reveal of the authors' vision about the similarities and dissimilarities between TQM and Six Sigma

TQM	Six sigma
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Concepts	The quality evolution in Japan	The quality evolution in Japan and Motorola
Theory	Focus on customers	No defects
Process view	Improve and uniform processes	Reduce variation and improve processes
Approach	Let everybody be committed	Project management
Methodologies	PDSA (Plan, do, study, act)	Define, measure, analyze, improve (or Design), control (or verify)
Tools	Analytical and statistical tools	Advanced statistical and analytical tools
Primary effects	Increase customer satisfaction	Save money
Secondary	Achieves customer loyalty and improves	Achieves business goals and improves
Effects	Performance	Financial performance
Criticism	No tangible improvements, re-demanding, unclear notion	Does not involve everybody, does not improve customer satisfaction, does not have a system view

Source: Andersson et al. (2006)

- Substantial accent is agreed to meeting the requirements of the customer also in Six Sigma and TQM. Added details concerning the authors' visions about the similarities and dissimilarities between TQM and Six Sigma are given in Table 1.

Similarities between CSFs of TQM and CSFs of Six Sigma

In order to assess and to sustain the existence of similarities between the CSFs of TQM and six sigma, the identification of some research works that have been raised in this subject is precious. The questions that can be asked in this field are: What is the difference between the CSFs of TQM and Six Sigma? An outline of the main literature review of CSFs of TQM (Table 2) and Six Sigma (Table 3) is under-mentioned in the aim of assessing the similarities and dissimilarities between the research works focused on the CSFs of TQM and Six Sigma in different period. Many details are illustrated in Table 4 which outlines a literature review of rather general CSFs for Six Sigma and TQM.

Table2. Literature review of TQM CSFs

Title of paper	Journal	Authors	Year
CSFs of TQM			
Critical success factors for total quality management implementation for in small and medium enterprises	Total quality management	Yusof & Aspinwall	2000
Critical success factors for TQM implementation and their impact on performance of SMEs	International Journal of Productivity and Performance Management	Salaheldin	2009
An investigation on the influence of total quality management on financial performance the case of Boutan industrial corporation	International Journal of Business and Social Science	Shahin	2011
TQM and company's performance			
An analysis of the relationship between total quality management implementation and organizational performance	Journal of Manufacturing Technology Management	Demirbag et al.	2006

Impact of TQM on company's performance	International journal of quality & reliability management	Kumar et al.	2009
Critical success factors of total quality management in the Indian automotive industry (NCR)	International Journal of Economy, Management and Social Sciences	Kalra & Pant	2013
Methodology A study of measuring the critical factors of quality management	International Journal of Quality & Reliability Management	Badri et al.	1995
Causation or covariation: An empirical re-examination of the link between TQM and financial performance	Journal of Operations Management	York & Miree	2004
Pareto analysis of critical success factors of total quality management A literature review and analysis	The TQM Magazine	Karuppusami & Gandhithan	2006
Measuring critical success factors of TQM implementation successfully – a systematic literature review	International Journal of Production Research.	Hietschold et al.	2014
Rank of TQM Identifying and ranking critical success factors for implementation of total quality management in the Indian manufacturing industry using TOPSIS	Asian Journal on Quality	Khanna & Sharma	2011
Analysis of critical success factors of world-class manufacturing practices: an application of interpretative structural modelling and interpretative ranking process.	Production Planning & Control	Haleema et al.	2012
Classification of CSF of TQM Soft total quality management, hard total quality management, and Organizational performance relationship	The International Journal of Management Science	Rahman & Bullock	2005
Exploring soft versus hard factors for total quality management implementation in SMEs	International Journal of Productivity and Performance Management	Lewis & Lalla	2006
The relationship of performance with soft factors and quality Improvement	Total Quality Management & Business Excellence.	Abdullahan d Tari	2009
Meta-Analysis Essentials of total quality management: a meta-analysis.	International Journal of Health Care Quality Assurance	Mosadeghrad	2014

Table 3. Literature review of Six Sigma CSFs

Title of paper	Journal	Author	Year
CSFs of Six sigma			
Key ingredients for the effective implementation of six sigma program	Measuring Business Excellence	Antony & Banuelas	2002
Factors critical to the success of a Six Sigma quality program in an Australian hospital	Total Quality Management & Business Excellence	Hilton et al.	2008
Critical success factors for Six Sigma implementation	Journal of Contemporary Research in Management	Swami & Prasad	2010
Critical success factors of Six Sigma implementations in Italian companies	Int. J. Production Economics	Brun	2011
Critical success factors of Six Sigma in original equipment manufacturer company in Malaysia	International Journal of Synergy and Research	Leong & Teh	2012
An assessment of the critical success factors for Six Sigma implementation in Indian industries	International Journal of Productivity and Performance Management	Desai et al.	2012
Critical success factors for Six Sigma implementation by SMEs	International Journal of Scientific & Engineering Research	Raghunath & Jayathirtha	2013
Six Sigma and company's performance			
Six sigma strategy for organizational excellence	Total Quality Management & Business Excellence	Thawani	2004
Six sigma, organizational learning and innovation: An integration and empirical examination	International Journal of Quality & Reliability Management	Sony & Naik	2012
Diagnosing of sustainable competitive advantage using Six Sigma methodology	International Journal of Business and Management	Mahdi & Almsafir	2012
Six Sigma adoption: Operating performance impacts and contextual drivers of success	Journal of Operations Management	Swink & Jacobs	2012
The effects of Six Sigma on corporate performance: An empirical investigation	Journal of Operations Management	Shafer & Moeller	2012
Linking Six Sigma to business strategy: an empirical study in Taiwan	Measuring Business Excellence	Cheng	2013
Investigation of Six Sigma practices and process innovation	International Journal of Innovation and Applied Studies	Khaidir et al.	2014
METHODOLOGY			
Developing an instrument for measuring Six Sigma implementation	Int. J. Services and Operations Management	Jones et al.	2011

On some aspects of developing an effective model for the implementation of Six Sigma concept in small and medium sized manufacturing enterprises in India.	International Journal of Management Science and Engineering Management	Hiregoudar & Soragao	2011
Rank of CSF of six sigma			
Fuzzy AHP approach to prioritization of critical success factors for six sigma implementation: evidence from the electronics industry in Thailand	International Journal of Modeling and Optimization	Somsuk & Simcharoen	2011
Prioritizing critical success factors for Six Sigma implementation using interpretive structural modeling	American Journal of Industrial and Business Management	Alidrisi	2014
Classification of CSF of six sigma			
Six Sigma's critical success factors and toolbox	International Journal of Lean Six Sigma	Ismyrlis & Moschidis	2013
Six Sigma implementation framework for mid-sized Indian automotive enterprises	Int. J. of Business Excellence	Sambhe & Dalu	2013
Meta-analysis			
Six sigma's success factors: A meta-analytic review	International Conference on Industrial Engineering	Tlapa et al.	2010
An exploration of six sigma's tools and techniques	International Conference on Industrial Engineering	Tlapa et al.	2010
Comparative Studies TQM/six sigma			
Six Sigma and total quality management: Different day, same soup?	Int. J. Six Sigma and Competitive Advantage	Klefsjö & Bergquist	2006
Similarities and differences between TQM, Six Sigma and Lean	The TQM Magazine	Andersson et al.	2006
Mapping the critical links between organizational culture and TQM/ Six Sigma practices	International Journal of Production Economics	Zu et al.	2010
Total quality management and six sigma: the integration of TQM and six-sigma	Open Access Chapter 9	Yang	2012
Quality management in heavy duty manufacturing industry: TQM vs. Six Sigma	Total Quality Management & Business Excellence	Sabet et al.	2014

Table 4. Literature review of the CSF's of Six Sigma and TQM

CSF's	Six Sigma/TQM
Business plan and vision	Coronado and Antony (2002) Dalton et al. (1996) Deming (1986) Henderson and Evans (2000) Juran (1989) Tari' (2005)
Top-management support (including funding)	Coronado and Antony (2002) Dalton et al. (1996) Deming (1986) Juran (1989) Tari' (2005)
Project management (including project champion and teamwork and composition)	Coronado and Antony (2002) Tari' (2005) Spector (2006)
Change management	Coronado and Antony (2002)
Organizational culture	Deming (1986) Dalton et al. (1996) Juran (1989) Spector (2006) Tari' (2005) Winter (1994)
Effective communication	Coronado and Antony (2002)
Education and training	Deming (1986)
knowledge transfer	Dalton et al. (1996)
knowledge management (including skills and expertise)	Juran (1989) Tari' (2005) Winter (1994)
Organizational structure	Coronado and Antony (2002) Garvin (1995) Keen and Knapp (1996) Tari' (2005)
Monitoring and evaluation of performance: performance measurements	Deming (1986) Juran (1989) Na'slund (1996)

Source: Näslund (2008)

Initially, we assess the resemblance of the studies developed to investigate the impact of the CSFs of TQM or of Six Sigma on the company organizational performance, on cultural change, the role of management commitment and support, the importance of training to enhance the employees skills, the impact TQM on financial performance, innovation (Salaheldin, 2009; Shahin, 2011; Kumar, Choisine, Grosbois, & Kumar, 2009; Demirbag et al., 2006; Kanji & Yui, 1997). Similarly, Six Sigma studies focused on the literature review of Six Sigma and its link with the company strategy (Thawani, 2004; Cheng, 2013) link with learning and innovation Sony and Naik (2012); Khaidir et al., (2014)), and how it brings competitive advantage (Mahdi & Almsafir, 2012), its impact on the corporate performance (Shafer & Moeller, 2012). As well, many studies have reviewed and investigated the Six Sigma CSF (Raghunath & Jayathirtha, 2013; Swink & Jacobs,

2012) and its impact on the company performance in different levels such as: cultural, financial, innovation, and training (Antony & Banuelas, 2002; Brun, 2011; Ismyrlis & Moschidis, 2013). Others focused on the prioritization of the CSF of six sigma (Somsuk & Simcharoen, 2011; Alidrisi, 2014). Previously, various studies investigated the CSF of TQM using fuzzy method (for example Kutlu & Kadaifci, 2014; Rezazadeh et al., 2012) focused on the evaluation and prioritization of the critical success factors of TQM implementation based on fuzzy AHP. Similarly, a fuzzy method has been adopted on Six Sigma by Somsuk & Simcharoen (2011) whose developed a fuzzy AHP approach to prioritization of critical success factors for Six Sigma implementation.

Some studies emphasized on the rank of CSF of TQM like the work of (Khanna, 2011) who stressed the importance of ranking CSFs for implementation of TQM to increase success rate, reduce costs and prevent failure. Others are interested to the adoption of meta-analysis for the essential of total quality management (Mosadeghrad, 2014). Correspondingly, Tlapa, Leal, Amaya, Limón, & Báez, (2010) developed a meta-analytic review of CSF of six sigma. Various researches developed constructive studies focused on the categorization of TQM practices in to soft and hard and their relationship with organizational performance, such as (Rahman & Bullock, 2005; Lewis & Lalla, 2006; Abdullah & Tari, 2009). In the same way, some studies investigated the soft and hard CSF of six sigma (Kundi, 2005; Ismyrlis & Moschidis, 2013).

The examination of these studies allows us to conclude that exist a similarities between the CSF of TQM employed and the CSF six sigma. Six Sigma is considered as an extension of TQM in the sense that is based on the CSF of TQM but it is distinguished by its three practices which are: Six Sigma procedure structure, Six Sigma structure improvement procedure and Six Sigma focuses on metrics. Subsequently, the value added of Six Sigma consists on a well structured method, advanced statistical tools and certified experts.

Dissimilarities between TQM and six sigma

In this part we are interested to reveal the dissimilarities between TQM and Six Sigma in term of strategy, methodology, tools based on SCFs. Many studies of comparison between different quality management approaches have been raised. Andersson et al. (2006) focused on similarities and differences between TQM, Six Sigma and lean. Na'slund (2008) purpose is to explore if the Six Sigma and lean are new methods or just a repackaging of previous methods. The study is based on a comparative literature review of lean with JIT and Six Sigma with TQM, and a review of critical success factors (CSF) for change efforts. The value of this research work resides on illuminating the difference between these four methods and it analyzed the lessons that can be learnt from organizational change and improvement efforts. Our objective is to stress only the distinctive aspects of Six Sigma and TQM. Chinvigai, Dafaoui, & EL Mhamedi, (2007) offers more details about the distinctive characteristic of each approach which are listed below in Table 5.

Table 5. The differences between TQM and Six Sigma

	TQM	Six Sigma
Origin	Japan	Japan - USA – Motorola
Focus on	Increase the customer satisfaction	- concentrate on reducing variability in process or product - process improvement
Leadership	Kaizen team and QCC group	Leadership (BB,GB)
Participation in an organization	the commitment and involvement of all employees	Employee and innovation (project teams)
Process orientation	Process Approach	Business process
Methodology	Continuous improvement (PDSA)	Product and process improvement (DMADV and DMAIC)
Techniques and tools	Analytical and Quality tools	Advance statistical and analytical tools
Limitation	- Unclear notion of TQM - Need to implement in the whole company together	cannot dramatically improve process speed or reduce invested capital

Source: Chinvigai et al. (2007)

TQM CSFs VS Six SigmaCSFs

Kalra & Pant (2013) investigated the critical success factors of total quality management in the Indian automotive industry and offered a literature review of the critical features of TQM based on the work of Black & Porter (1996) that highlighted eight critical success factors which are : policy and strategic planning, process management and control, suppliers focus and satisfaction, customer focus and satisfaction, human resource focus and satisfaction, information management, quality leadership and organizations specific business results. Additionally, based on literature review of various studies on TQM and six sigma, an outline of key CSFs of TQM (Table 6) and six sigma (Table 7) is shown below.

Table 6.Literature review of the CSFs of TQM implementation

CSFs for TQM implementation	Literature review
Management leadership	Yusof &Aspinwall (2000)
Continuous improvement system	
Measurement and feedback	
Improvement tools and techniques	
Supplier quality assurance	
Human resource development	
Systems and processes	
Resources	
Education and training	
Work environment	
Culture	Rahman’s (2001)
Leadership	
Strategy and planning	

Employee empowerment and employee involvement	
employee	
Training and development	
Information and analysis and customer management	
Strategic quality management	Dayton (2003)
Quality data and reporting	Demirbag et al. (2006)
Role of top management	
Employee Relations	
Supplier quality management	
Training	
Quality policy	
Process Management	
Top management commitment	Das et al. (2008)
Process quality management	
Education and training	
Supplier quality management	
Employee empowerment and involvement	
Benchmarking	
Top management commitment	Gaddene & Sharma (2009)
Education and training;	
Supplier quality management	
Employee empowerment and involvement	
Benchmarking	
Top management commitment	Koh & Low (2010)
Process quality management	
Supplier quality management	
Customer	
Information	

Table 7.Literature review of Six Sigma CSFs

Six Sigma CSFs	Literature review
Management commitment and involvement	Antony & Banuelas (2002)
Understanding of Six Sigma methodology	
Tools and techniques	
Linking Six Sigma to business strategy	
Linking Six Sigma strategy	
Project selection	
Review and tracking	

Linking Six Sigma to business strategy	Antony (2004)
Customer focus	
Project management skills	
Executive leadership and senior management commitment	
Organizational infrastructure	
Project selection and prioritization	
Management of cultural change	
Integration of Six Sigma with financial accountability	
Understanding the DMAIC methodology	
Training and education	
Project tracking and reviews	
Incentive program	
Company-wide commitment	
Management involvement and participation	Antony & Kumar (2005)
Linking Six Sigma to customers	
Linking Six Sigma to business strategy	
Top management support	Fredendall, et al. (2006)
Customer relationship	
Supplier relationship	
Workforce management	
Quality information	
Product/service design	
Process management	
Six-sigma role structure	
Structured improvement procedure	
DMAIC	Schroeder et al. (2008)
Training	
Employee involvement and participation	
Team	
Customers	
Financial performance metrics	
Suppliers	
Communication	
Solving problems methods	
Top five ranks of CSFs as follows:	Dileep et al. (2009)
Top management	
Leadership and commitment	
Well implemented the system of customer satisfaction	
Education and training	
Well-organized information and analysis system	
Well-implemented process management system	
Top management commitment	Rohani et al. (2010)
Teamwork	
Training and education	
Control charts	
Identification of process/product parameter	
Process prioritization and identification	
Measurement systems analysis	

Pilot project
Use of facilitator
Cultural change and deployment

The most inclusive list of success factors of TQM and Six Sigma

Based on the literature review of (Zairi, 2005; Deming, 1986; Juran, 1993; Lloréns-Montes & Molina, 2006) the most inclusive list of success factors and further researchers in TQM and Six Sigma are as follows: top management factor, inclusive of corporate strategy, management leadership, fact-based decision-making, cross-functional project teamwork, reward schemes and explicit and challenging goals; and organizational characteristics factor, inclusive of customer focus, firm internal constraints, organizational culture, continuous training and learning, Six Sigma role structure and company size.

Criticisms of Six Sigma and total quality management

The recent paragraph gives a global idea of the main criticisms developed against Six Sigma and TQM by stressing the key characteristics of TQM presented in six sigma, the reason of Six Sigma success and the obstacles and insufficiencies of the two approaches (Rahman, 2007; Goh, 2010; Jun, Cai, & Peterson, (2010); Cândido & Santos, 2011; Grima, Marco-Almagro, Santiago, & Tort-Martorell, 2014).

The main Characteristics of TQM presented in Six Sigma

According to the point of view of Antony (2009), it exists some of the characters of TQM that are imitated in Six Sigma program, "A customer-centric approach; process view of work; a continuous improvement mindset; improving all aspects and functions of the organization; data-based decision making; and the use of statistical tools on a broad basis". Kedar, Lakhe, Deshpande, Washimkar, & Wakhare, (2008) consider that Six Sigma provides obvious change of structure and is greatly extra orientated on quick and concrete results compared to TQM and Lean. Näslund (2008) highlights that Six Sigma is an advance improvement of TQM. He discovers similarities in the problem solving process (Deming wheel and DMAIC cycle), the value of top management engagement, the crucial worker implication, and in statistical methods.

The dual aspect of Six Sigma includes both the "deployment" and "methods and tools" which distinguishes the Six Sigma approach from other management projects such as TQM. However the majority of techniques and tools of Six Sigma were previously employed in TQM program which leads to conclude that are not in fact newness in this case. The addition of Six Sigma consists in the well organized structure which focuses on strong difficulties solving techniques and tools based in the DMAIC support (Antony, 2009).

Six Sigma is considered as an Extension of the Total Quality Management

Six Sigma is a helpful management philosophy and problem-solving method, and it is considered as an extension of TQM which is founded on the principles and knowledge of the PDCA management cycle. Lucas (2002) discovers that Six Sigma utilizes a modified PDCA management cycle. In effect, DMAIC is at heart of the Six Sigma strategy, and intimately look like Deming's PDCA cycle for permanent improvement (Voehl, 2004). Cheng (2008) focused on the relationship between TQM and Six Sigma based on an empirical study of company in Taiwan implementing Six Sigma via TQM improvement. In order to attain the study goal, a conceptual framework has

been conducted with six improvement factors “system”, “product”, “control”, “training”, “technical”, and “assessment”. The principal finding of this study is that TQM is a prime component and fundamental basis of Six Sigma.

The work highlights the principals' points of Six Sigma integration using TQM activities. In fact, the use of TQM context factors to execute Six Sigma programs stressed as follows:

- (1) System. The PDCA management cycle is a basic activity for Six Sigma and DMAIC method is a higher improvement activity. The PDCA management cycle embraces usually improvement activities such as QA and the ISO system. These activities correspond to the vital mechanisms of TQM that cannot be neglected and must be protected when establishing the integration of six sigma.
- (2) Product. TQM highlights the accurate actions to decrease defect rates, while Six Sigma is founded on Cpk to diminish the special-cause variation.
- (3) Control. The single distinction between TQM and Six Sigma is that TQM is categorized as “inter-organization of quality improvement team” and Six Sigma is as “intra-organization of cross function team”. (Cheng, 2008).
- (4) Training. The contents of TQM and Six Sigma training include basic and advanced courses. TQM teaches basic quality control skills, and Six Sigma may also use basic quality control skills to integrate DMAIC methodology.
- (5) “Technical. TQM and Six Sigma have intercommunity quality improvement skills; however if TQM technical skills are not completely solid it is impossible to implement the 6- σ ”. (Cheng, 2008).
- (6) Assessment. TQM and Six Sigma have approximately the similar quality development indexes for evaluation, such as: yield Cp, Cpk.

Implementation of Six Sigma via TQM

Many criticisms have been raised against Six Sigma and consider it as just a methodology that based on TQM practices and don't create a new practices in field on management. Our objective is to demonstrate the degree of justice. Green (2006) considers the revival of TQM under new name which is six sigma. The work stressed the importance of six sigma structured method (DMAIC) in improving the company's process as well as approved that the features of TQM are found in the correct application of six-sigma. Zu et al. (2010) reviewed both the traditional quality management and Six Sigma literatures and identified three new practices that are critical for implementing six sigma's concept and method in an organization which are Six Sigma role structures, Six Sigma structured improvement procedure, and Six Sigma focus on metrics and investigate their positive impact in improving the business performance. This research work illuminate that Six Sigma isn't only a repackages of TQM traditional practices but it complement it.

Yang (2012) focused on the integration of TQM and six-sigma. An over view of TQM principals' elements and Six Sigma critical particles and tools is offered. Also, it reveal the possibility of the integration of both TQM and Six Sigma practices and this based on the evidence of the existence of congruence between the quality principles, techniques, and cultural aspects of TQM and Six Sigma and sustain that exist only a little dissimilarity between their management principles. “As a result, the integration of TQM and Six Sigma is not as difficult as it might seem. The critical task is to combine the best aspects of TQM's continuous improvement with those of Six Sigma re-engineering”. (Yang, 2004). Sabet (2014) challenge the debate concerning Six Sigma VS TQM empirically in a heavy duty machinery production industry. The results shows that Six Sigma foundation is based on TQM, as well as the finding stress the complementary between the two approaches and not their substitutability.

The reasons of Six Sigma Success compared to TQM

Globally, Six Sigma approach has gained more success compared to TQM. There are many reasons for this; the major one is the focus on projects which have a positive impact on business financial performance (Montgomery & Woodall, 2008). Additionally, Prajogo & Sohal (2001) said "The level of technical training in Six Sigma is generally deeper and more extensive than in the typical TQM programs of the 1980s. Also, because the training is project-oriented, it is much more likely that the techniques will actually be used". Hu, Barth, & Sears, (2005) asserted that Six Sigma methodology is preferred to TQM approach for these subsequent reasons: While the TQM approach was run by "Quality techies", Six Sigma approach implicates the top managers by commitment and involvement. It facilitates the success of organizations through the understandable roadmap for integration and exploitation. To guarantee the success in implementing Six Sigma tools and methods, Six Sigma offers an appropriate organizational culture and well organized infrastructure. This character was entirely absent in TQM philosophy (Antony, 2009).

Despite the difference in defining the TQM and Six Sigma, the goal of the different concepts appears similar. The aim concerns the improvements and the reduction of waste while increasing customer satisfaction and financial results (Anderson et al., 2006). We conclude by stressing that the strength of Six Sigma consists in the well-ordered structure and the efficiency in integrating projects and tools coupled with training for every member of the organization.

Obstacles and Challenges of Six Sigma method

Six Sigma programs challenge the development of the processes and focus on decreasing organizational process variability (Linderman et al., 2003; Schroeder et al., 2008). Six Sigma doesn't change the integrity and interconnectedness of organizational processes; rather, it improves them.

- *Problems with strategy*

Six Sigma has attracted many criticisms. One of the central criticisms is that it is considered as doesn't prove a newness and it is a simple repackaging of principles and quality tools (Catherwood, 2002).

- *Problems with organizational culture*

McClusky (2000) considers that the concepts of quality designated to be fixed in process designing more than the control of quality in manufacturing step. The main idea is to move to integrate quality in the planning step. Organizations that not include a full comprehension of the concrete obstacles of Six Sigma projects or a switching in planning management faced with a risk of loss. To success a cultural change it is recommended at the first the great implementation of time and commitment.

- *Problems with training (Belt Program)*

Kwaka & Anbari (2006) affirm that "training is a key success factor in implementing Six Sigma projects successfully and should be part of an integrated approach". Participants want to be aware of the up to day tools and techniques of Six Sigma than to exchange the new data analysis.

The impediment of six sigma

The weakness of six sigma implementation have been severally discussed in diverges research works (e.i. Douglas and Erwin (2000); Klefsjo et al. (2001); Magnusson et al. (2003); Antony, 2004; Pepper and Spedding, 2010; Brun (2011); Ericsson and Lilliesköld (2014); Aldowaisana et al. (2015). Magnusson et al. (2003) asserted that the impediment of six sigma resides in the difficulty of the six sigma project to go beyond the customer's requirements and thus increase the customer satisfaction. To avoid this problem a number of firms employ voice of the customer technique when the definition of their step. Klefsjo, Wiklund, & Edgeman, (2001) avowed that Six

Sigma project not success the generation of conditions in the aim of engaging everybody, which is more appeared in the TQM literature. According to Douglas and Erwin (2000) six sigma is focalized to respond to customer needs more than the product. Chakravorty (2009) stressed the need of a an effective model of six sigma implementation and the lack of this guide is one of the reason of the program fail. Brun (2011) interested to study the critical success factors of six sigma in Italian companies. The aim was to reveal if the Italian companies implementing six sigma recognize the same set of critical success factors singled out in the international literature. The analysis showed a lack of literature about six sigma integration in Italian companies. Aldowaisana et al. (2015) analyzed the six sigma performance for non-normal processes. The result reveal some limits of six sigma: reporting the sigma level as an indication of the quality can be misleading. When systematically assuming normality, wrong six sigma projects can be selected which consequently lead to erroneous solutions. Further, Ericsson and Lilliesköld (2014) examined the DFSS implementation strategy in four organizations to find out which parts of the DFSS concept are being used by companies. The finding underlines the shortage of concrete support in DFSS for the activities of product development.

The reasons of Six Sigma failures

The fall of Six Sigma project can be explained by various reasons. The most remarkable one is the lack of guidelines of effective model implementation of projects (Knowles, 2011). Moosa & Sajid (2010) are interested in their work to explore and to analyze the critical success and failure factors of implementing Six Sigma in organizations based on lessons learned in practices and case studies, as well as available literature. The Six Sigma Academy suggests the subsequent lists of failed projects reasons which are: the need of the top management engagement, the use of part-time trainers, incorporation of projects attached to irrelevant criteria, the wrong objective, maybe founded on the number of groups educated and licensed rather than bottom-line results; weak project management, treatment of six sigma "quality" project. This list may be extended. (Glibert, 2002). Eckes (2001) argue that 60 percent of projects are unsuccessful due to the negligence of people question, principally the dynamism of group (motivating and driving forces that propel a team toward its goal or mission). He precise numerous difficulties that classically happen even as developing 6- σ : problems of recognizing a leader, problems when enhancing policy and schedule for meetings and problems with identifying goals and responsibilities of all associates.

The Shortcomings of Total Quality Management Implementation

The major criticism emerged in opposition to TQM is that there is an extensive confusion relating to what TQM really means, notice (Boaden, 1997; Hellsten & Klefsjo, 2000). Deming (1994) has avowed that: "...the trouble with TQM, the failure of TQM, you can call it, is that there is no such thing. It is a buzz word". I have never used the term, as it carries no meaning, perceive Romano (1994). Both TQM and Six Sigma are concentrated on processes. Bergman & Klefsjo (2003) notice that: while Six Sigma focalizes on performing enhancements, TQM stress the engagement and contribution of all workers.

Kekale & Kekale (1995) suggest that perceiving TQM only just as a whole of tools and techniques (e.g. hard aspects) has confirmed to be one of the firstly failures of TQM implementation. The difficulty with TQM doesn't concern only the problem in defining the meaning of the term TQM, but more basically the confusion in defining quality (Watson & Korukonda, 1995). The unsuccessful execution of TQM cannot be neglected but in contrast it has been well documented, perceive (for example Brown, Hitchcock, & Willard 1994; Eskildson, 1994; Harari, 1997; Cao, Clarke, & Lehaney, 2000; Nwabueze, 2001; Foley, 2004). In further specificity, Harari (1997) affirms that, subsequent to the examination of the entire independent research conducted by

consulting companies, the finding is that just about one-fifth, or at best one-third, of the TQM programs in the US and Europe have attained important or even concrete enhance. Furthermore, the fall of the organizations number which have attempted the integration of TQM program have been documented. With extra specificity, a number of organizations have set a huge quantity of resources on executing TQM, however with no concrete development attained, perceive, among others (Harari, 1997). The TQM concept has been blamed for being vague.

In this work, we have stressed the decrease in adopting TQM and the increase of Six Sigmatrend. Thus, the fail in integrating TQM can be explained by many factors: TQM has been rather a diffused concept, with a lot of fuzzy descriptions but few more understandable definitions, and the management does not have an absolute image of what TQM in reality means (Hellsten & Klefsjö, 2000). Pande,Neuman, & Cavanagh, (2000) stated that TQM is less noticeable in several business. It was in the early 1990s, pointing to numerous major TQM mistakes as causes forthis decline. These problems contain a lack of integration, leadership apathy, a fuzzy concept, an ambiguous quality goal, failure to break down internal barriers, inadequate improvements in performance, and so on. However, many criticisms have attacked the Six Sigmamethodology. Frequently, it isn't considered as the newest in the field of quality management projects because large numbers of Six Sigmatechniques have been used and existed for a lot of years with TQM program.

The short attention to the behavioral and the change processes, reduce the chance of Six Sigma projects to attempt radical and sustainable process improvement. Six Sigma programs have not been designed to integrate all processes (work processes, behavioral processes, and change processes) in their process improvement efforts(Parast, 2011). The inability of Six Sigma programs to assure sustainable competitive advantage for the company because they are based on existing processes, products, and customers. This view point can be explained by the fact that it hasn't been constructed to attend radical enhancement in organizational processes and routines. (Parast, 2011).The integration of Six Sigma projects in a highly dynamic and evolving environment with high rate of innovation and change is extremely precarious due to the incapability of Six Sigma projects to achieve radical change. Thus, in defining and improving Six Sigma projects organizations should take caution when selecting projects that gratify the above conditions.

Conclusion

The Six Sigma and the TQM approaches have been the subject of extensive researches and surveys for several years which provide a vital knowledge about their specific criteria. In fact, the Six Sigmamethodology focalized on reducing the process variation, and optimizing the process, while TQM is a method that aims to develop competitiveness, effectiveness and flexibility of an organization for the profit of each stakeholder (Srinivasu et al.,2010). The ambiguous aspect of TQM consists in the absence of a clear infrastructure to implement TQM in organization.

The TQM purpose as well as Six Sigma is the improvement of organizational performance. TQM emphasizes more on the satisfaction of the customer requirements in term of delivery, reliability, maintenance, and cost effectiveness (Al-Mashari & Zairi, 2000a,b). However, a Six Sigma aim is to satisfy and to expect its needs. It focused specially to reduce the process variability in order to decrease the cost of reworks and the loss of time which lead to reduce the cost of non-quality translated into gain of saving, improvement of the product quality and service, reduction of customer's complaints and amelioration of the customer relationship and enhancement of the company trade.

This paper focuses in the first part on the various definitions about the meaning of CSFs than specify besides its principal features for both Six Sigma and TQM. The objective is to offer a clear vision about the similarities and dissimilarities between CSFs of Six Sigma and TQM.

Antony & Desai (2009) stress the existence of some characters of TQM that are imitated in Six Sigma program and this is supported by "A customer-centric approach; process view of work; a continuous improvement mindset; improving all aspects and functions of the organization; data-based decision making ; and the use of statistical tools on a broad basis".

Kedar, Lakhe, Deshpande, Washimkar, & Wakhare, (2008) consider that Six Sigma provides obvious change of structure and is greatly extra orientated on quick and concrete results compared to TQM and Lean. Näslund (2008) highlights that Six Sigma is an advance improvement of TQM. He discovers similarities in the problem solving process (Deming wheel and DMAIC cycle), the value of top management engagement, the crucial worker implication, and in statistical methods. The value added of Six Sigma consists in the well organized structure which focuses on strong difficulties solving techniques and tools based in the DMAIC support (Antony, 2009).

Furthermore, to sustain the results of previous studies considering Six Sigma as an extension of TQM; we have outlined various studies of CSFs of Six Sigma and TQM in different periods to prove their similar points and also to stress the distinctive aspects of Six Sigma which are: Six Sigma structure procedure, Six Sigma structure improvement procedure and Six Sigma focus metrics, and to emphasize the studies stressing the possibility of integrating Six Sigma via TQM.

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