

WORLD RESEARCH OF BUSINESS ADMINISTRATION JOURNAL

Vol.1, No.1, November 2021

Print ISSN 2771-1161
Online ISSN 2771-1153



THE SCIENCE
PUBLISHING HOUSE

THE SCIENCE PUBLISHING HOUSE
LLC, USA

© 2021 The Science Publishing House

WRBA Journal is aiming at reaching out to a large numbers of world scholars in the field of Business Administration, marketing, human resources, public relations, organizational behavior, logistics and supply chain, global business, project management, finance and accounting and is an International double blind peer-reviewed academic journal. WRBA Journal published in both print and online versions, our publisher is **The Science Publishing House in the USA** www.scipubhouse.com. TSPH is an academic publisher of prestigiously peer-reviewed journals, covering many of academic disciplines.

Editor in Chief

Professor Wael Kortam

Professor of Marketing, Cairo University

Editorial Board

Nadeem Malik

Professor, University of Balochistan – Pakistan

Ahmed Fathy Agwa

Professor, Mansoura University- Egypt

Abdelnasser Taha Ibrahim

Associate professor, Applied Science University – Bahrain

Hesham Elbihairy

Associate Professor, Cairo University - Egypt

Adel Al Samman

Assistant professor, Applied Science University – Bahrain

Mohamed Awad

Assistant Professor, Sadat Academy for Management Science – Egypt

Contents

The Effect of Working Capital Management on Firm Performance

Applied study on Egyptian stock market

Heba Srour & Marwa El Maghawry1-25

Tracing the Impact of Cash conversion cycle on firm's Profitability

Applied study on Egyptian stock market

Heba Srour & Ahmed Azmy 26-44

Inventory management and its impact on the firm performance

Heba Mohamed & Ahmed Azmy 45-65

The Relation between Affirmative Action Behavior and Employee Wellness

Zeinab Amin Khayal66-92

Using Altman Z-Score Model in Comparing firms' financial performance

Applied research on Egyptian stock market

Heba Mohamed & Marwa El Maghawry93- 118

The Effect of Working Capital Management on Firm Performance Applied study on Egyptian stock market

Heba Srour*

heba.srour@fue.edu.eg

Marwa El Maghawry†

marwa.elmaghawry@fue.edu.eg

Abstract

The primary purpose of working capital management is to enable the company to maintain sufficient cash flow to meet its short-term operating costs and short-term debt obligations. This is achieved by the effective management of accounts payable, accounts receivable, inventory and cash. The major aim of this study is to examine the effect of working capital management which will be measured by the efficiency of cash management, efficiency of receivables management, and efficiency of inventory management, on firm's performance that will be measured using the growth in total assets, growth in total sales, as well as the growth in net profit. The data was collected from 6 companies that were listed in the Egyptian stock exchange market from year 2016 to 2020. The analysis of this study was done using (EViews 12) for both descriptive statistics and multiple regressions. The study found that there is a negative correlation between the efficiency of receivables management and the inventory management. While the results of this study indicated that there is an overall positive correlation between working capital management and firm's financial performance at the 5% level with a probability of 0.0000.

Keywords: Working Capital Management - Receivables Management - Inventory Management - Cash Management - Firm Performance and profitability.

** Assistance Professor, Faculty of Commerce and Business Administration - Future University in Egypt

Introduction

Management of working capital which aims at maintaining an optimal balance between each of the working capital components, that is, cash, receivables, inventory and payables is a fundamental part of the overall corporate strategy to create value and is an important source of competitive advantage in businesses (Deloof, 2003). In practice, it has become one of the most important issues in organizations with many financial executives struggling to identify the basic working capital drivers and the appropriate level of working capital to hold so as to minimize risk, effectively prepare for uncertainty and improve the overall performance of their businesses (Lamberson, 1995). Efficient WCM increases firms' free cash flow, which in turn increases the firms' growth opportunities and return to shareholders (Ganeshan, 2007) Working capital management is a very important component of corporate finance because it directly affects the liquidity and profitability of the company. A firm may be very profitable if it can transform cash from operations within the same cycle, otherwise the firm would have to borrow, to support its continued working capital needs. Thus, the twin objectives of profitability must be synchronized (Joel F. Houston & Eugene F. Brigham, 2004). The efficient management of working capital is a fundamental part of the overall corporate strategy to create shareholders' value (Afza & M.S, 2007) . Major time of the financial managers is consumed in identification of optimal level of current assets and liabilities in accordance with operations (Lamberson, 1995) .

As established by (Padachi, 2006), efficient management of working capital is vital for the success and survival of the SSEs which needs to be embraced to enhance performance and contribution to economic growth. However, as observed by (Atrill P, 2006), there is evidence that many small-scale enterprises are not very good at managing their working capital despite their high investments in current assets in proportion to their total assets and this has been a major cause of their high failure rates as compared to large businesses. According to him, majority of the small-scale enterprises operate without credit control department implying that both the expertise and the information required to make sound judgments concerning terms of sales may not be available.

They also lack proper debt collection procedures; hence, they tend to experience increased risks of late payment and default by debtors who tend to increase where there is an exclusive concern for growth. According to the Economic Survey of 2006, small scale enterprises contributed over 50% of new jobs created in the year 2005 and over 20% to the GDP of the country. Also, a study by (Bowen M et al., 2009) established that up to 50% of the small businesses in operation have a deteriorating performance and are said to stagnate at 'small' level hence do not progressively grow into medium or even large enterprises as envisaged in their

conceptual plans. In a study by (Bowen M et al., 2009), up to 53% of the respondents identified lack of working capital caused by the inability of the owners to manage their working capital efficiently as one of the greatest challenges that SSEs face. As observed by (Mead DC, 1998), the health of the economy has a strong relationship with the health and nature of small enterprise sector and given their importance to a nation's economic growth and the role that they play in poverty reduction, an understanding of the problems negatively affecting small businesses (ILO, 2010). The overall aim of this research is to furthermore understand the effect of working capital management on a firm's performance.

Research Problems and Question

The role of working capital management cannot be over emphasized in a firm's operations and must be efficiently managed. Maintaining sufficient and appropriate level of working capital is necessary in dealing with liquidity challenges in a firm. (Yakubu et al., 2017) concluded that the impact of working capital management on the performance of non-financial companies in Ghana. The results established that average collection period has a negative significant impact on firm's performance. This implies that for non-financial firms to enhance their performance there is the need to minimize the number of days use in retrieving debts from their customers. The positive and significant relationship between average payment period and firm's performance indicates that non-financial companies will perform better by using longer periods to meet their debt obligations. The study also established a negative and significant impact of cash conversion cycle on firms' performance. This implies that non-financial firms can enhance their performance if they are able to convert their resources to cash within the shortest possible time. Furthermore, the positive and significant relationship between current ratio and firm performance suggests that maintaining sufficient current assets will aid firms to meet their debt obligations.

In relation, according to (Nadeem et al., 2020) the working capital management and the working capital policies provide significant relationship to the firms' performance. Different results occurred due to the different working capital practices among companies which has been supported by (Weinraub & Visscher, 1998), (Afza & Nazir, 2007). Most companies found that the working capital components (ACP, APP, ICP and CCC) and the firms' performance are negatively related. This relationship was supported by the previous studies done by (Charitou et al., 2010), (Deloof, 2003), (García-Teruel & Martínez-Solano, 2010), (Karaduman et al., 2011), (Mansoori & Muhammad, 2012), (Napompech, 2012), (Raheel Mumtaz et al., 2013) and (Ukaegbu, 2014).

In contrast, (Tarek & Rafik, 2020) found from previous studies, using panel data

regression to assess the effect of managing working capital efficiently on the firm's performance by using the cash ratio, current ratio, quick ratio and the Tobin's Q ratio, that there is positive relation between cash ratio, current ratio with the ROA and quick ratio with the Tobin's Q ratio. These results are in accordance with that of (Perera & Priyashantha, 2018) and (Pambayun & Apriani, 2019), (Emmanuel & Agyapong, 2017), (Bagh et al., 2016) and (Robert et al., 2013) while other researches like that of (Muhammad et al., 2017), (Charles et al., 2014) and (Duru et al., 2014) focused on the relation between profitability and other WCM components like account receivable, cash conversion and cycle inventory turnover. Moreover, (Nyamao et al., 2012) suggested that the small enterprise sector needs effective and dynamic management skills in order to remain successful, they also found out that efficient working capital management practices have a significant influence on the financial performance of SSEs and recommends that SSEs embrace efficient working capital management practices as a strategy to improve their financial performance and gaining competitive advantage over other competitors. The data was analyzed using both descriptive and inferential statistics. Consequently, the findings of the study were that, working capital management practices were low amongst SSEs as majority had not adopted formal working capital management routines and their financial performance was on a low average. By measuring the working capital management using (ECM, ERM, EIM) and firm's performance using (Growth in profits, sales, total assets, and market share), the study also revealed that SSE financial performance was positively related to efficiency of cash management (ECM), efficiency of receivables management (ERM) and efficiency of inventory management (EIM) at 0.01 significance level. The coefficient of determination (R²) indicated that 63.4% of the variations in financial performance (FP) could be explained by changes in ECM, ERM and EIM. Hence, the working capital management practices have influence on the financial performance of SSEs, which required SSE managers to embrace efficient working capital management practices as a strategy to improve their financial performance and survive in the uncertain business environment.

Question: Is there a positive relationship between Working capital management and firm's performance?

Research Hypothesis

Based on the contingency theory, the configurational theory, the risk and return theory, and the asset profitability theory, the study predicts that working capital management positively affects firm's performance. The following hypothesis is:

H1: working capital management has a significant positive affect on the performance of firms listed in the Egyptian Stock Exchange

Literature Review

Working capital management plays an awfully vital role in the tradeoff between firm's performance and risk. A forceful working capital approach can create a higher return on assets. In addition, a company's level of working capital impacts value since changes in working capital impacts cash flow and valuation is intrinsically tied to cash flow. Many studies have been proposed to explain how working capital management affects firm's performance as well as its value. Most of them mainly focused on measuring working capital management using cash conversion cycle, return on assets, and return on equity, while hardly any have taken growth in total sales, growth in total assets, growth in net income, and growth in market share into account.

(M. Zariyawati et al., 2009) examined the relationship between working capital management and firm profitability. Cash conversion cycle is used as measure of working capital management. This study is used panel data of 1628 firm-year for the period of 1996-2006 that consist of six different economic sectors which are listed in Bursa Malaysia. The coefficient results of Pooled OLS regression analysis provide a strong negative significant relationship between cash conversion cycle and firm profitability. (Abdul Raheman et al., 2010) analyzed the impact of working capital management on firm's performance in Pakistan for the period 1998 to 2007. For this purpose, balanced panel data of 204 manufacturing firms is used which are listed on Karachi Stock Exchange. The results indicate that the cash conversion cycle, net trade cycle and inventory turnover in days are significantly affecting the performance of the firms. (Charitou et al., 2010) empirically tested the impact of working capital management on firm's financial performance. They managed to gather a sample of 42 firms which are listed in the Cyprus Stock Exchange, Turkey through the period 1998-2007. Using multivariate regression analysis, the results have shown a positive effect of working capital management on firm's profitability which was measured by ROA. (Mutungi, 2010) studied the relationship between working capital management policies and financial performance of oil marketing firms in Kenya. The Author used a population which focused on the oil marketing firms who are member of the Petroleum Institute of East Africa, which analyzed their financial statement for the period 2006 to 2009 (4 years). Mary also established the working capital management policies among oil marketing firms and examined its relationship with the firms' profitability. A regression model was used with the Net Operating Income as the dependent variable, and the Average Collection Period, Inventory Period, Average Payment Period, Current ratio and debt ratio as the independent variables. The study found that those independent variables affected the performance by 56.7%, which indicated that the working capital presents a large percentage of net operating profit as shown by the regression

model. (Nyamao et al., 2012) the purpose of this study was to assess the effect of working capital management practices on the financial performance of SSEs in Kisii South District. The study adopted a cross-sectional survey research design which allowed the collection of primary quantitative data through structured questionnaires. The target population was 159 managers of 101 trading and 58 manufacturing SSEs. Stratified random sampling technique was used to obtain a sample of 113 SSEs comprising 72 trading and 41 manufacturing enterprises.

The data was analyzed using both descriptive and inferential statistics. Consequently, the findings of the study were that, working capital management practices were low amongst SSEs as majority had not adopted formal working capital management routines and their financial performance was on a low average. The study also revealed that SSE financial performance was positively related to efficiency of cash management (ECM), efficiency of receivables management (ERM) and efficiency of inventory management (EIM) at 0.01 significance level. (Asad, 2012) the author has tried to find out the impact of working capital management on the performance of textile sector companies. For the above said purpose, the data of 30 textile sector companies listed at Karachi Stock Exchange having maximum market share were analyzed. All the manufacturing firms generally face problems with their collection and payments schedule. The results have indicated that sales growth, receivables turnover, payables turnover, inventory turnover, gross working capital turnover, current assets turnover, and financial debt ratio have a significant impact on the profitability of the textile companies of Pakistan. (Abuzayed, 2012) examined the effect of working capital management on firms' performance for a sample of 52 firms in the Amman Stock Exchange for the period from 2000-2008. She used strong estimation techniques and conceptual as well as empirical analysis to examine if efficient working capital management would improve a firm's accounting profitability and firm's value. Abuzayed used two performance measures in this research; an accounting and a market measure, with the belief that wealth maximization is the shareholders' main concern. In addition, she found that a firm's profitability is positively related to the Cash Conversion Cycle, which means that the more the firm is profitable the less motivated they are to manage their working capital. (Gill & Biger, 2013) investigated the impact of corporate governance on working capital management efficiency, using a co-relation research design with a sample of 180 American manufacturing firms listed in the New York Exchange, from the period 2009 to 2011 (3 years). They found that the efficiency of the working capital management is improved by the corporate governance in the American manufacturing firms. The larger the board size the riskier it is on the firms because it will not improve the working capital management efficiency. It was also found that financial

performance improves the cash conversion efficiency management, which helps reduce the working capital requirements. The findings of the study were generalized to firms similar to those that were used in the research, which may have put some limitations on implementing their findings. (Ogundipe et al., 2012), examined the impact of working capital management on firms' performance and market value of the firms in Nigeria, using a sample of fifty- four non-financial quoted firms in Nigeria listed in the Nigerian stock exchange. They used the sampled firms to collect data from their annual reports for the period 1995-2009. Their results showed there was positive relation between Debt ratio and Market Valuation and firm's performance. In addition, the research showed that the Cash Conversion Cycle is significantly negatively related to Market Valuation and firm's performance. They also confirmed that there is a significant relationship between Market Valuation, profitability and working capital management, agreeing with previous studies. (Vural et al., 2012) inspected the association of working capital management and the performance of the firms as well as liquidity by using panel data analysis. They've gathered a sample of 75 manufacturing firms listed on Istanbul stock exchange market from the period 2002-2009 which was measured by cash conversion cycle and Tobin's Q ratio. To sum up, they concluded that working capital management has an insignificant negative effect on firm's profitability and there is a positive relationship between cash conversion cycle and firm value while there is a negative relationship between leverage and firm value. (Agarwal & Varma, 2013) inspected the association of working capital management on firm's profitability. They gathered a sample of 366 non-financial Indian corporations over a three-year period, from 2007 to 2010 listed in Bombay Stock Exchange. Firm size was measured by logarithm of sales; firm growth rate was measured by change in annual sales and financial leverage as control variable. Which lead to the conclusion the working capital management negatively affects firm's profitability. (Mobeen Ur Rehman & naveed anjum, 2013) investigated the connection between working capital management and profitability of the Pakistani cement sector listed in Karachi Stock Exchange, selecting a sample of 10 Pakistani cement companies during 2003-2008. Their calculations involved ROA, AAI, and working capital turnover to measure liquidity and profitability. All things considered; the review proved that working capital management has a negative relation on firm's profitability. (Sabunwala, 2013) examined the association between working capital management and firm's profitability by taking 100 samples of steel companies listed in Bombay Stock Exchange, India, from 2007-2011 using empirical work. She measured the relationship using by ROA as well as Cash Conversion Cycle and its components and concluded that working capital management negatively impacts firm's profitability. (Wesley et al., 2013) captured

and analyzed the relationship between Working Capital Management and Corporate Performance of manufacturing firms listed in the Nairobi Securities Exchange with a sample of 20 companies from the period 2007-2011 (5 years). The results showed that the CCC, ACP, CLTA, NSCA, and FATA are significant at a 95% confidence to the performance as measure by the ROE. This meant that the Cash Conversion Cycle and the Average Collection Period are the main determinants of the working capital, which determine the performance of manufacturing firms in the Nairobi Securities Exchange. It was also found that the performance of the firms was affected by the control variables CLTA, NSCA and FATA. (Iqbal & Zhuquan, 2014) analyzed the impact of working capital management on firm performance from Pakistani companies listed in the Karachi Stock Exchange. They used different variables such as the Average Collection Period, Sales, Cash Conversion Cycle, Inventory Turnover, Average Payment Period, and debts to analyze the effect of working capital management. They analyzed a sample of 253 non-financial firms for a period of 6 years (2008-2013). The study showed both negative and positive relationships of the working capital management and firm performance. They found that working capital management is negatively related with the Average Collection Period, while there was a positive relationship between the Cash Conversion Cycle, Inventory Turnover, Debt, Sales, and the Average Payment Period. The study found the overall there is an inefficiency in the working capital management and the profitability of the Pakistani firms, since the variables and the established models are statistically insignificant. (Mwangi et al., 2014) inspected the connection between working capital management and firm's performance by examining a sample of 42 non-financial companies listed in Nairobi Securities Exchange, Kenya for the period 2006-2012. They've applied panel data models. In summary, the study showed that investing in working capital management policy negatively affects firm's performance measured by ROA and ROE. (Tahir & Anuar, 2016) intended to determine the relationship of working capital management and the firm's profitability in the textile sector. They collected 127 samples of textile firms listed in Karachi stock exchange, Pakistan, for the period 2001-2012. The examination of this study used panel generalized methods to analyze the data. They used AAI and CCC to measure this relationship. After taking a closer look at implementing the WCM in the textile sector, the results showed that some factors such as: Current assets to sales and current assets to operating income had a negative effect on return on assets, while account payable period, inventory turnover and cash conversion cycle had a negative impact on profitability. (Bagh et al., 2016) carried out a study that was used to demonstrate the effect of working capital management on firm's performance in a list of random firms by selecting a sample of 50 Non-financial

corporations in Pakistan's stock market to perform the study on for a specific period from ranging from years 2005-2014. Taking into consideration the (WCM) as an independent variable and the Firm performance (FM) as a dependent variable, in conclusion, the study proved that (APP, ITO and CCC) have negative impact on firms performance, while ACP has a positive impact on firms performance because the results have shown a negative impact on the (ROA, ROE and EPS) by the (APP, CCC & ITO) while a positive impact has been shown on (ROA) by (ACP). (Altaf & Shah, 2017) investigated the impact of working capital management on firm's profitability and value in which they've collected 437 samples of non- financial Indian companies listed in Bombay Stock Exchange from period 2007- 2016. Firm's performance was measured by Return on Assets and Tobin's Q ratio. On the other hand, working capital management was measured by Cash Conversion Cycle and its components. Lastly, they concluded that working capital management negatively affects firm's performance because the lower the level of working capital managers and higher the firm's performance. (Hingurala Arachchi et al., 2017) explored the value effect of working capital management on firm value by collecting 44 samples of companies listed in the Colombo Stock Exchange (CSE) during the period 2011-2015. They've measured the efficiency of working capital management using Cash Conversion Cycle and its components, while the firm value was measured by Tobin's Q ratio. They've used panel data regression methodology until they reached the conclusion that the Cash Conversion Cycle is inversely proportional to Tobin's Q ratio which means that working capital management negatively affects firm value. (Nguyen, 2017) tested the link between working capital management on firm's financial performance and liquidity. This study collected a panel data analysis of 54 listed companies on Vietnam stock exchange market covering the period 2011-2016. As it depends on the sort of investment the company wants to perform thus a measure of the liquidity risk needs to be determined. Taking into consideration the accounts payable and accounts receivables that shall be affected by monitoring the cash flow of a company. So, we need to keep a trace of the cash change meanwhile observing its effect on such factors. By doing so, the author acknowledged that there is a significant negative relation between a firm's profitability and its working capital management measured by cash conversion cycle. (Ramesh et al., 2017) studied the "effect of Working Capital Management on the Financial Performance of Manufacturing Firms in Sultanate of Oman". The study period is 10 years and data have been collected from 19 manufacturing companies listed in MSM. Mean, standard deviation, correlation and regression are used in this research to analyze the effect of working capital in the profitability among the sample firms. The study concludes that the debtor management, inventory management, creditor management and cash

conversion cycle negatively effects on the financial performance of listed manufacturing firms in Sultanate of Oman over the 10 years period.

(Shajahan & Suganya, 2017) studied the consequences of working capital management on firm's performance. The methodology included an overall research design, sampling procedure, field work done, and analysis procedure by accumulating a sample of 22 manufacturing companies listed in Bombay Stock Exchange from the period 2006-2015. They've measured this study using ROA and CCC, and reached a conclusion that working capital management has a negative significant effect on the profitability of the firms. (Yakubu et al., 2017) examined the impact of working capital management on the performance of non-financial firms in Ghana. Using secondary data of five listed non-financial firms for the period 2010-2015, the Random effect model was employed to establish the relationship that exists between the various components of working capital management and firm performance and whether these WCM components impact significantly on firm performance. The study used Return on Assets and Return of Equity to measure firm's performance. The results showed that the average payment period and current ratio have a positive relationship with firm performance.

(M. A. Zariyawati et al., 2017). The purpose of this study is to investigate the effect of working capital management on performance of small and large firms in Malaysia. Balanced panel data analysis is used to achieve the purpose by using Stata 12 software. The research sample consists of small and large firms in Bursa Malaysia which cover period from 2011 to 2013. Results of random effect model demonstrate that working capital management has a significant effect on firm performance. Besides that, we also found out there are differences in a finding of large firm and small firm. (Rahman et al., 2019) analyzed the relation between working capital management and firm's performance. A random sample of 77 firms has been taken for the period 2011-2015 listed in Pakistan stock exchange. Firm's performance was measured using ROA. They ended up concluding that the effect of working capital on firm performance was negatively affected. (Nadeem et al., 2020) explored the effect of working capital management on firm's performance using the OLS method. They extracted 65 samples of non- financial firms listed in Pakistani Stock Exchange 100-index during the period 2011- 2015. By measuring the firm's profitability and value using ROE, ROA, and Tobin's Q ratio as well as working capital management's components (ACP, APP, AAI, CCC) which tend to have a negative effect on firm's performance. (Tarek & Rafik, 2020) investigated the relationship between firm's profitability and its corporate value by applying panel data analysis on a sample of 16 Companies in the Egyptian stock market during the period from 2013-2017. Tobin's Q (TQ) measured firms' value, Return on Assets (ROA) measured the profitability & Current asset ratio (CAR), Quick

ratio (QR) & Cash ratio (CR) measured the working capital management (WCM). The study concluded that working capital management positively affects firm's performance. After reviewing the past articles, most of them conclude that there's a negative effect between the working capital management and the firm's performance and value but there are only a few articles that conclude that there's a positive relation between both. Articles by (Nadeem et al., 2020) concluded that there's a negative relationship between working capital management and firm's performance while articles by (Tarek & Rafik, 2020) , (Yakubu et al., 2017) concluded that there's a positive relationship between working capital management and firm's performance. The variables used in all the articles are ROA, ROE, CCC except for the article written by (Nyamao et al., 2012) which measured the firm's growth in total sales, growth in total assets, growth in net income, growth in market share. Based on (Nyamao et al., 2012) article we will use the same variables to calculate and examine the relationship between working capital management and firm's performance in our research which will be applied on a company from EGX30 for period from 2015 to 2020.

Data Analysis

This section presents the data analysis part of this research. The analysis of this paper was done using (EViews 12) for both descriptive statistics and multiple regressions.

Descriptive statistics

Some descriptive statistics for the selected variables were calculated and reported in table (1). These statistics are the minimum (Min), maximum (Max), mean (M), standard deviation (SD), and coefficient of variation (CV).

Table (1): Descriptive statistic for the selected variables

Variable	Symb.	Min	Max	Mean	SD	CV
Net profit	Y1	-3.24E+08	6.49E+09	6.61E+08	1.10E+09	166.29%
Total Assets	Y2	1.84E+09	5.49E+10	2.37E+10	1.58E+10	66.81%
Growth in Profit	Y3	-45.680	48.658	0.362	7.966	2201.01%
Growth in Sales	Y4	-0.979	11.178	0.734	1.816	247.42%
Growth in Total Assets	Y5	-0.539	1.492	0.044	0.179	405.68%
A/R Turnover (ERM)	X1	0.022	31.430	2.351	5.062	215.26%
Inventory Turnover (EIM)	X2	0.011	79.255	4.183	10.301	246.25%
ECM	X3	-122.585	409.723	34.917	98.343	281.65%
Financial Performance	Y	2.69E+07	1.16E+10	4.83E+09	3.31E+09	68.61%
Working Capital	X	-38.260	137.060	13.817	32.381	234.35%

Management						
-------------------	--	--	--	--	--	--

The basic descriptive statistics for the dimensions of dependent variable were as follows; for “Net profit” we have ($M = 6.61E^{+8}, SD = 1.1E^{+9}, CV = 166.29\%$), for “Total Assets” we have ($M = 2.37E^{+10}, SD = 1.58E^{+10}, CV = 66.81\%$), for “Growth in Profit” we have ($M = 0.362, SD = 7.966, CV = 2201\%$), for “Growth in Sales” we have ($M = 0.734, SD = 1.816, CV = 247.42\%$), for “Growth in Total Assets” we have ($M = 0.044, SD = 0.179, CV = 405.68\%$), and for the main construct “Financial Performance” we have ($M = 4.83E^{+9}, SD = 3.31E^{+9}, CV = 68.61\%$). While for the independent variable were as follows; for “A/R Turnover (ERM)” were ($M = 2.351, SD = 5.062, CV = 215.26\%$), for “Inventory Turnover (EIM)” were ($M = 4.183, SD = 10.301, CV = 246.25\%$), for “ECM” were ($M = 34.917, SD = 98.343, CV = 281.65\%$), and finally for the main construct “Working Capital Management” we have ($M = 13.817, SD = 32.381, CV = 234.35\%$).

Regression Analysis

Researchers provided guidelines for evaluating and reporting results of hypothesis testing, including regression coefficients and coefficient of determination (R^2). Regression coefficients refer to the estimates of the relationships between the model’s constructs. Those coefficients range from +1 to -1, where +1 means a strong positive relationship, 0 means a weak or non-existence relationship, and -1 means a strong negative relationship. Coefficient of determination (R^2) refers to the effect of independent variables on the dependent variables which is one of the quality measures of the regression model. R^2 estimates vary from 0 to 1, in which 0 means low explained variance and 1 means high explained variance.

Effect of ERM, EIM, and ECM on Financial Performance

The multiple linear regression analysis was carried out to investigate the effect of ERM (X_1), EIM (X_2), and ECM (X_3) on Financial Performance (Y). The regression equation to be estimated is as follows:

$$\text{Financial Performance} = \beta_0 + \beta_1\text{ERM} + \beta_2\text{EIM} + \beta_3\text{ECM} + u_i$$

Table (2): Results of the hypotheses

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ARTURNOVER (ERM)	-1.97E+08	49471058	-3.984322	0.0001
Inventory Turnover (EIM)	-85085668	24042227	-3.539009	0.0006
ECM	12095346	2538033.	4.765638	0.0000
C	5.23E+09	3.05E+08	17.12852	0.0000
R-squared	0.367073	Mean dependent var		4.83E+09
Adjusted R-squared	0.350704	S.D. dependent var		3.31E+09
S.E. of regression	2.67E+09	Akaike info criterion		46.28210
Sum squared resid	8.28E+20	Schwarz criterion		46.37501
Log likelihood	-2772.926	Hannan-Quinn criter.		46.31983
F-statistic	22.42517	Durbin-Watson stat		0.809248
Prob (F-statistic)	0.000000			

The value of F-statistic “22.42517”, which measures the common importance of the explanatory variables, is statistically significant at the 5% level, according to the corresponding value of probability 0.000000. Results show that the coefficient “ERM” is statistically significant at the 5% level with a probability of 0.0001 and implies a negative correlation between the variables. Keeping all other coefficients constant, an increase of 1 unit in the variable “ERM” will lead to a decrease in the variable “Financial performance” by 1.97E+08 units.

Moreover, the coefficient “EIM” is statistically significant at the 5% level with a probability of 0.0006 and implies a negative correlation between the variables. Keeping all other coefficients constant, an increase of 1 unit in the variable “EIM” will lead to a decrease in the variable “Financial performance” by 85085668 units. Furthermore, the coefficient “ECM” is statistically significant at the 5% level with a probability of 0.0000 and implies a positive correlation between the variables. Keeping all other coefficients constant, an increase of 1 unit in the variable “ECM” will lead to an increase in the variable “Financial performance” by 12095346 units. Adjusted R2 0.350704 (35.07%) suggests that 35% of the total variation in “Financial performance” is explained by the variations in the independent variables. In conclusion the results of the regression analysis show that the correlation between “Financial performance” and both “ERM” and “EIM” is statistically significant, and this correlation is negative. On the contrary, the correlation between “Financial performance” and ECM is statistically significant and this correlation is positive. The estimated regression equations were as follows:

Financial Performance

$$= 5.23E^{+9} - 1.97E^{+8} \text{ ERM} - 85085668 \text{ EIM} + 12095346 \text{ ECM}$$

Effect of Working Capital Management on Financial Performance

The linear regression analysis was carried out to investigate the effect of Working Capital Management (X) on Financial Performance (Y). The regression equation to be estimated is as follows:

$$\text{Financial Performance} = \beta_0 + \beta_1 \text{Working Capital Management} + u_i$$

Table (3): Results of the main hypotheses

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Working Capital Management	39671428	8687494.	4.566498	0.0000
C	4.28E+09	3.05E+08	14.05402	0.0000
R-squared	0.150180	Mean dependent var		4.83E+09
Adjusted R-squared	0.142978	S.D. dependent var		3.31E+09
S.E. of regression	3.07E+09	Akaike info criterion		46.54343
Sum squared resid	1.11E+21	Schwarz criterion		46.58989
Log likelihood	-2790.606	Hannan-Quinn criter.		46.56230
F-statistic	20.85291	Durbin-Watson stat		0.314543
Prob (F-statistic)	0.000012			

The value of F-statistic “20.85291” is statistically significant at the 5% level, according to the corresponding value of probability 0.000012. Results show that the coefficient “Working Capital Management” is statistically significant at the 5% level with a probability of 0.0000 and implies a positive correlation between the variables. Keeping all other coefficients constant, an increase of 1 unit in the variable “Working Capital Management” will lead to an increase in the variable “Financial performance” by 39671428 units.

Adjusted R2 0.142978 (14.3%) suggests that 14% of the total variation in “Financial performance” is explained by the variations in “Working Capital Management”. The estimated regression equations were as follows:

$$\text{Financial Performance} = 4.28E^{+9} + 39671428 \text{ Working Capital Management}$$

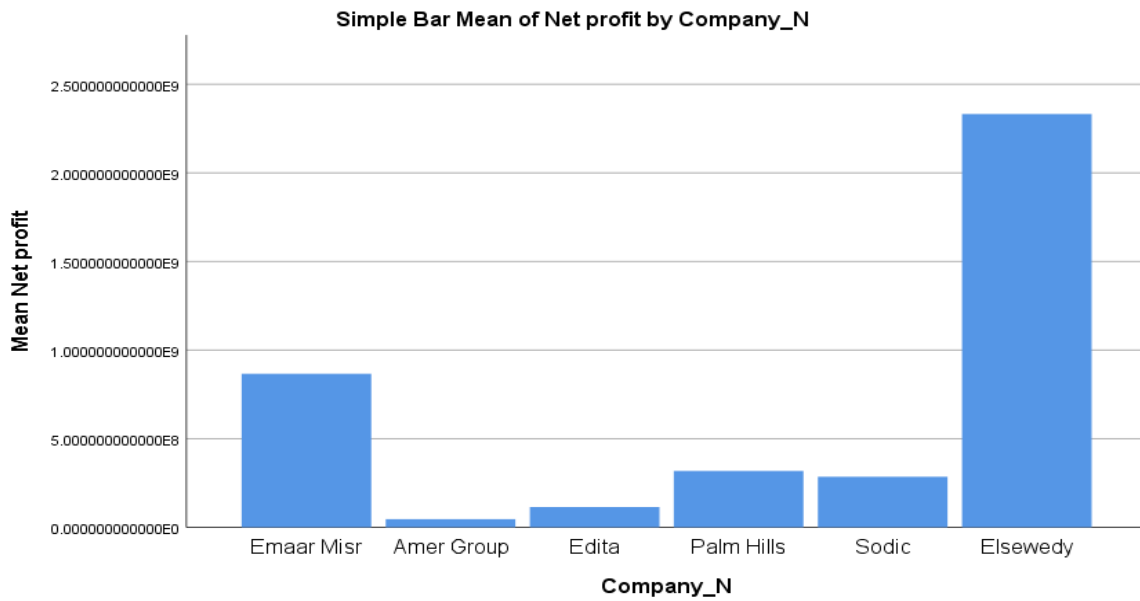


Figure (1): Bar chart for net profit for the selected companies

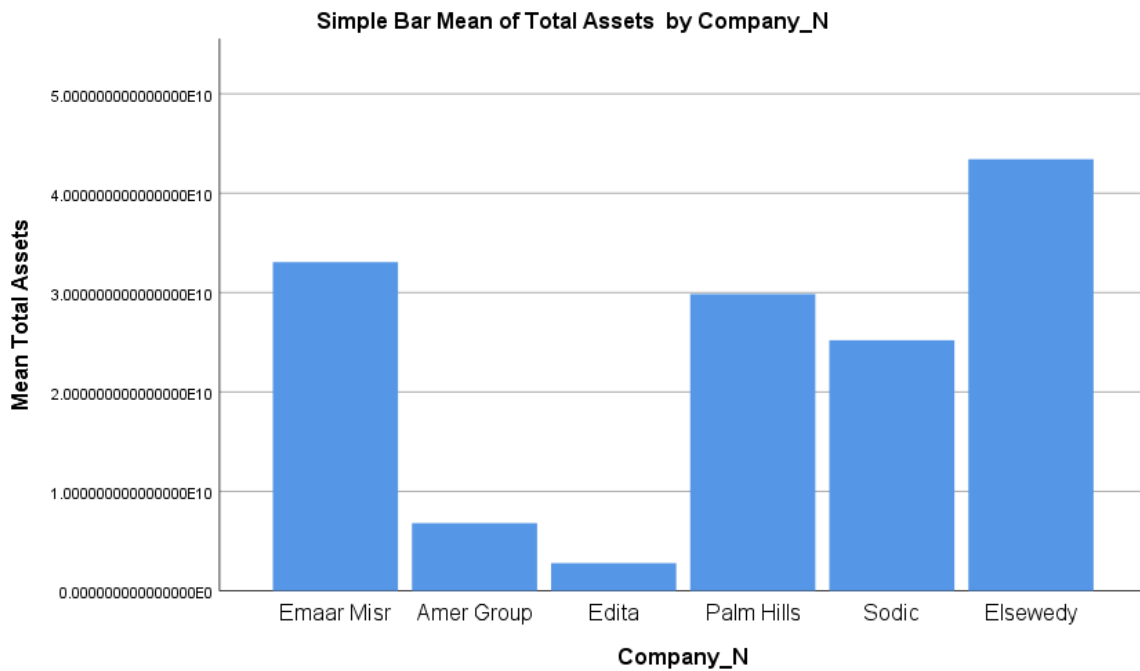


Figure (2): Bar chart for total assets for the selected companies



Figure (3): Bar chart for growth in profits for the selected companies



Figure (4): Bar chart for growth in sales for the selected companies

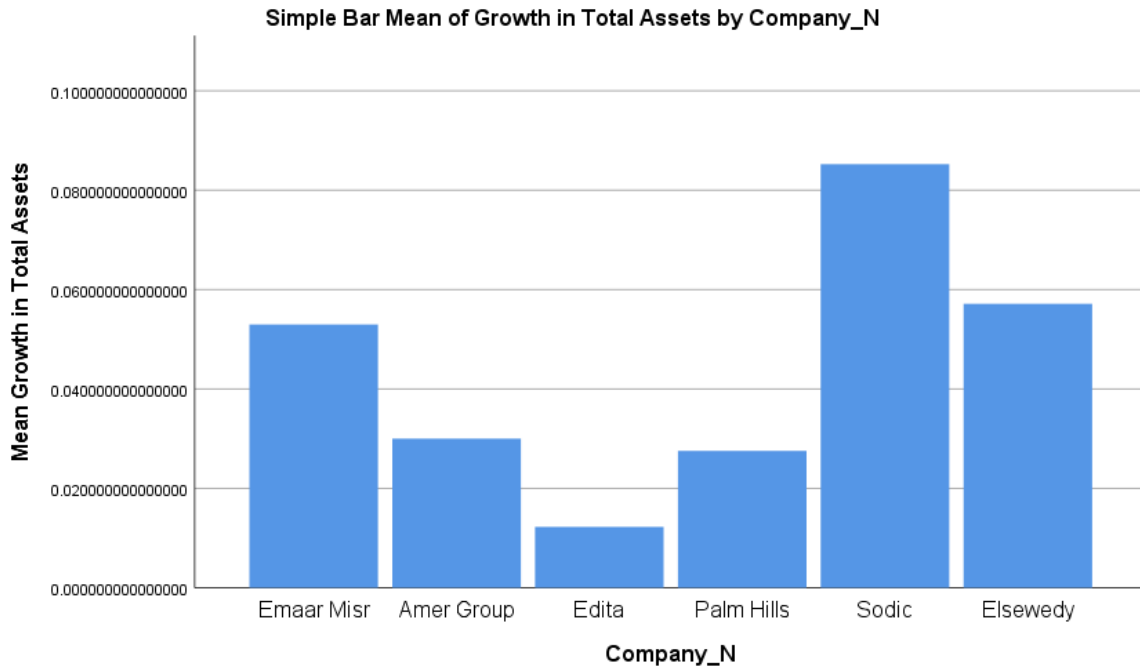


Figure (5): Bar chart for growth in total assets for the selected companies

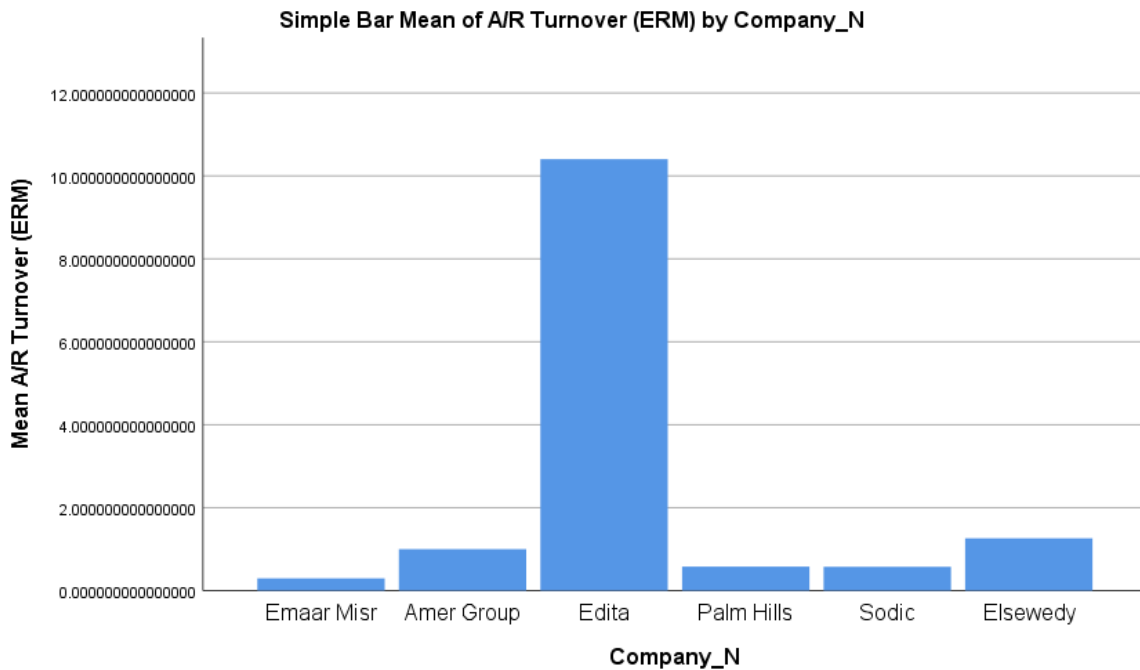


Figure (6): Bar chart for ERM for the selected companies

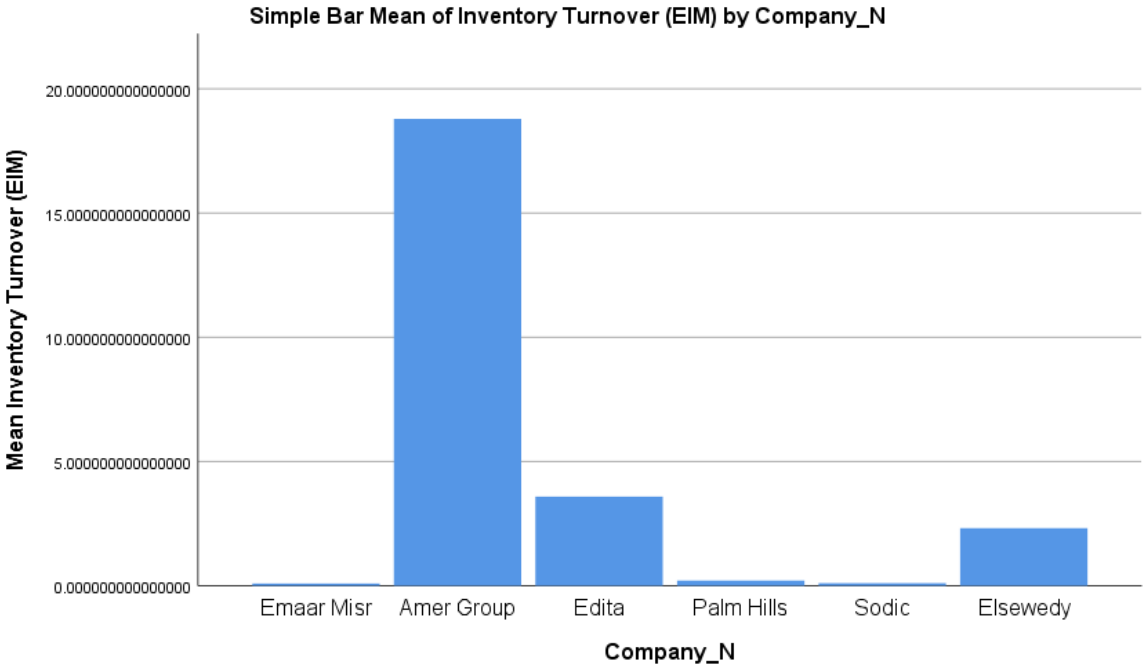


Figure (7): Bar chart for EIM for the selected companies

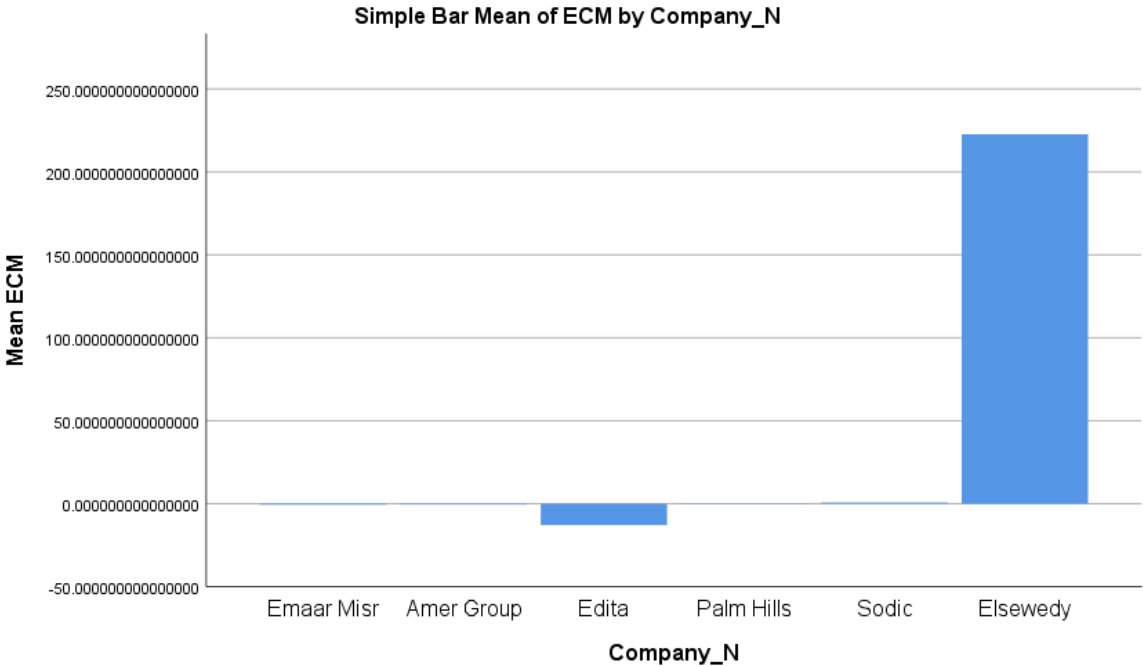


Figure (8): Bar chart for ECM for the selected companies

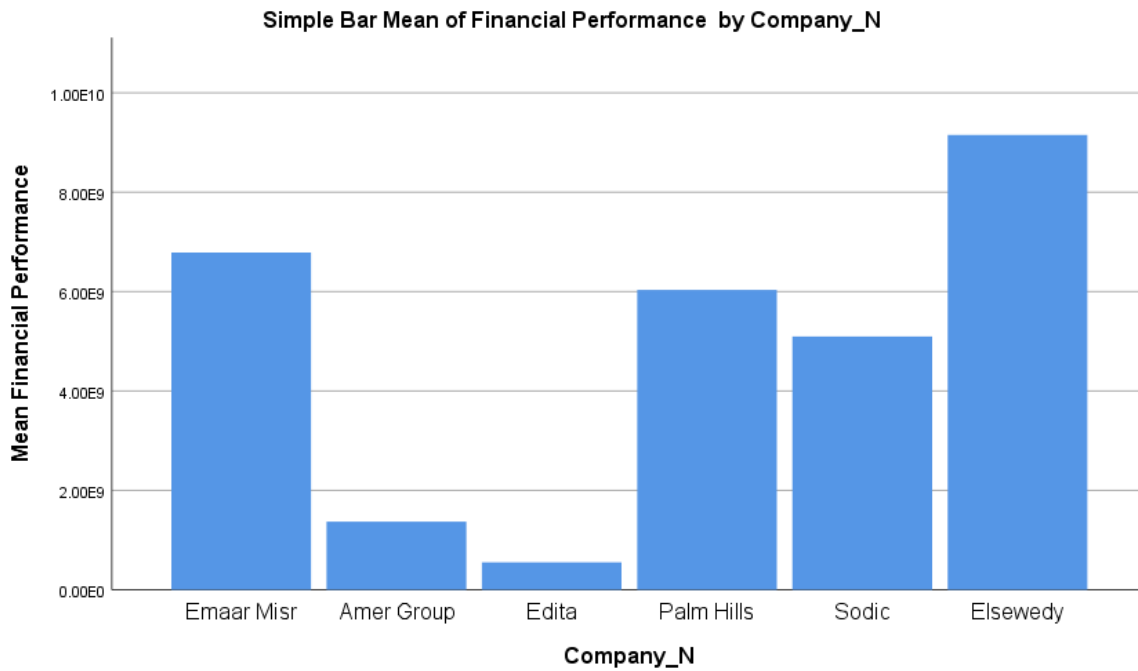


Figure (9): Bar chart for financial performance for the selected companies

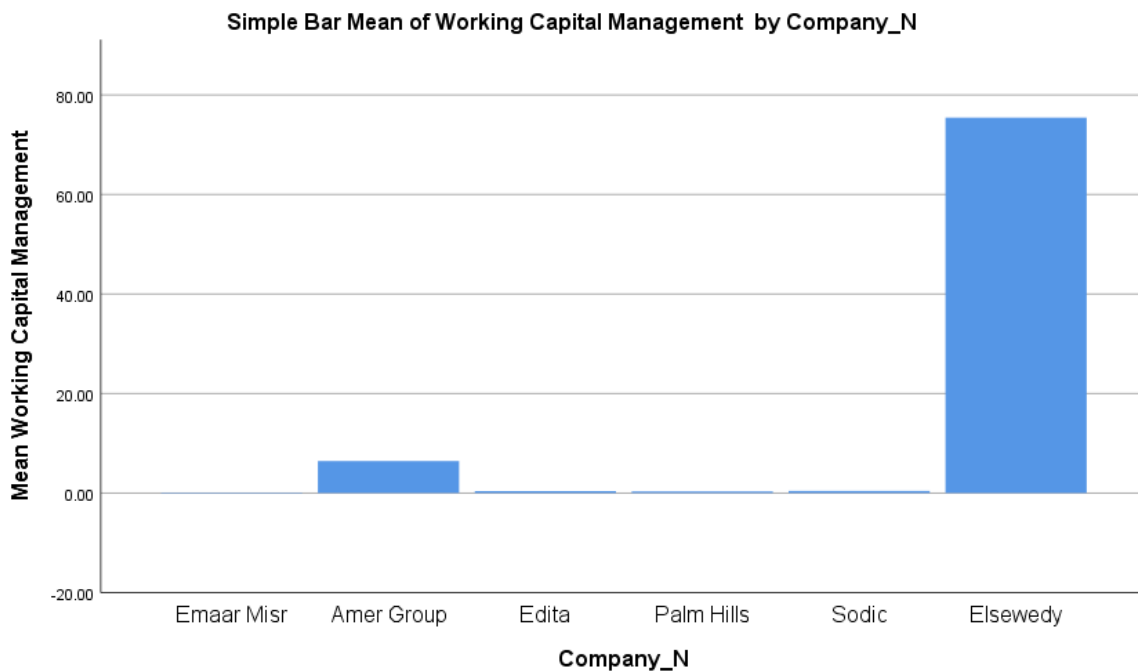


Figure (10): Bar chart for working capital management for the selected companies

Results:

According to the results of the previous chapter, there was a negative relationship between the efficiency of receivables management (ERM) and efficiency of inventory management (EIM) with firm's overall financial performance: growth in total assets, net profit, and net sales. Oppositely, there was a positive relation between the efficiency of cash management (ECM) and firm's financial performance. But according to our main hypothesis, there is a significant positive relation between the working capital management and firm's financial performance which proves that our hypothesis successfully accomplishes our estimation which were:

H1: working capital management has a significant positive affect on the performance of firms listed in the Egyptian Stock Exchange.

Sighted that we've resulted with positive relations, the answer to our research question "Is there a positive relationship between Working capital management and firm's performance?" is going to be a yes since working capital management which was measure by ERM, EIM, and ECM, has a positive effect on firm's financial performance which was measured by growth in total assets, growth in net profit, and growth in sales.

Conclusion:

In this project we analyzed the effect of working capital management on firm's performance, investigating all dimensions of the data including the research question, the hypothesis, the variables, the research model, literature review and theoretical background. The firm's working capital was measured by efficiency of cash management (ECM), efficiency of inventory management (EIM), efficiency of receivables management (ERM). We calculated firm's performance using growth in total assets, growth in net profit, and growth in sales.

Finally, by analyzing the statistical data using the descriptive and multiple regression models, we found that the regression analysis showed that the ERM and EIM have a negative correlation between variables while the ECM has a positive correlation between variables. The results of the regression analysis show that the correlation between financial performance and both ERM and EIM is statistically significant and this correlation is negative. On the contrary, the correlation between Financial performance and ECM is statistically significant and this correlation is positive. Overall, by instructing this project we reached a level of effectiveness and satisfaction with positive results.

References

- Abdul Raheman, Talat Afza, Abdul Qayyum, & Mahmood A Bodla. (2010). Working Capital Management and Corporate Performance of Manufacturing Sector in Pakistan. In *International Research Journal of Finance and Economics* (Vol. 47). https://www.researchgate.net/publication/50341524_Working_Capital_Management_and_Corporate_Performance_of_Manufacturing_Sector_in_Pakistan
- Abuzayed, B. (2012). Working Capital Management and firms' Performance in Emerging Markets: the Case of Jordan. *International Journal of Managerial Finance*.
- Afza, T., & M.S, N. (2007). Working Capital Management Policies of Firms: Empirical Evidence from Pakistan. In 9th South Asian Management Forum (SAMF) on February 24-25. North South University.
- Afza, T., & Nazir, M. (2007). Is it Better to be Aggressive or Conservative in Managing Working (P. Ltd, 3(2).
- Agarwal, P. K., & Varma, S. K. (2013). Working Capital Management and Corporate Performance: Evidence from a Study of Indian firms. *International Journal of Indian Culture and Business Management*, 7(4), 552– 571.
- Altaf, N., & Shah, F. (2017). Working Capital Management, Firm Performance and Financial Constraints. *Asia-Pacific Journal of Business Administration*.
- Asad, M. (2012). Working capital Management and corporate Performance of Textile Sector in Pakistan. *A Research Journal of Commerce, Economics and Social Sciences*, 6(1), 100–114.
- Atrill P. (2006). *Financial Management for Decision Makers*. Prentice Hall. , 4th Ed.
- Bagh, T., Nazir, M. I., Khan, M. A., Khan, M. A., & Razzaq, S. (2016a). The Impact of Working Capital Management on Firm's Financial Performance: Evidence from Pakistan. *International Journal of Economics and Financial Issues*, 6(3).
- Bagh, T., Nazir, M. I., Khan, M. A., Khan, M. A., & Razzaq, S. (2016b). The Impact of Working Capital Management on Firms Financial Performance: Evidence from Pakistan. *International Journal of Economics and Financial Issues*, 6(3), 1097–1105.
<https://www.econjournals.com/index.php/ijefi/article/view/2234>
- Bowen M, Morara M, & Mureithi S. (2009). *Management of Business*

- Challenges Among Small and Micro Enterprises in Nairobi-Kenya. *KCA Journal of Business Management (KJBM)*.
- Charitou, M. S., Elfani, M., & Lois, P. (2010). The Effect of Working Capital Management on Firms Profitability: Empirical Evidence from an Emerging market. *Journal of Business & Economics Research (JBER)*, 8(12).
- Charles, K. Y., Kirui, J. K., & Chepkutto, W. (2014). Working Capital Management and Corporate Financial Performance: Evidence from Panel Data Analysis of Selected Quoted Tea Companies in Kenya. *Research Journal of Finance and Accounting*, 5(5), 53–62.
- Deloof, M. (2003). Does Working Capital Management Affect Profitability of Belgian Firms? *Journal of Business Finance & Accounting*, 30(3–4), 573–588.
- Duru, A. N., Ekwe, M. C., & Eje, G. C. (2014). Liquidity Positioning and Firm Performance in Industrial/Domestic Product Companies: Evidence from Nigeria. *IOSR Journal of Economics and Finance*, 5(6), 25–32. <https://doi.org/10.9790/5933-05622532>
- Emmanuel, K. O., & Agyapong, G. (2017). Working Capital Management and Shareholders' Wealth Creation: Evidence from Non-Financial Firms listed on the Johannesburg Stock Exchange. *Investment Management and Financial Innovations*, 14(1), 80–81.
- Ganeshan, V. (2007). An Analysis of Working Capital Management Efficiency in Telecommunication Equipment Industry. *Rivier Academic Journal*, 3(2).
- García-Teruel, P. J., & Martínez-Solano, P. (2010). Determinants of Trade Credit: A Comparative Study of European SMEs. *International Small Business Journal*, 28(3), 215–233.
- Gill, A. S., & Biger, N. (2013). The Impact of Corporate Governance on Working Capital Management Efficiency of American manufacturing firms. *Managerial Finance*.
- Hingurala Arachchi, A., Perera, W., & Vijayakumaran, R. (2017). The Impact of Working Capital Management on Firm Value: Evidence from a Frontier market. *Asian Journal of Finance & Accounting*, 9(2).
- ILO. (2010). Voucher Program for Training and Business Development Services Kenya Micro and Small Enterprise Training and Technology Project.
- Iqbal, A., & Zhuquan, W. (2014). Working Capital Management and its Impact on Firm's Performance. *International Journal of Business and Social Science*, 5(12).

- Joel F. Houston, & Eugene F. Brigham. (2004). *Fundamentals of Financial Management* (10th ed.). Thomson/South-Western.
- Karaduman, H. A., Akbas, H. E., Ozsozgun Caliskan, A., & Durer, S. (2011). The Relationship between Working Capital Management and Profitability: Evidence from an Emerging Market. *International Research Journal of Finance and Economics*, 62, 61–67.
https://www.researchgate.net/publication/289159126_The_relationship_between_working_capital_management_and_profitability_Evidence_from_an_emerging_Market
- Lamberson, M. (1995). Changes in Working Capital of Small Firms in Relation to Changes in Economic Activity. *American Journal of Business*, 10(2), 45–50. <http://www.sciepub.com/reference/235472>
- Mansoori, D. E., & Muhammad, J. (2012). Determinants of Working Capital Management: Case of Singapore Firms.
- Mead DC. (1998, May 26). Micro and Small Businesses tackle poverty and Growth (but in different proportions). Paper Presented at the Conference on Enterprises in Africa: Between Poverty and Growth.
- Mobeen Ur Rehman, & naved anjum. (2013). Determination of The Impact of Working Capital Management on Profitability: An Empirical Study From The Cement Sector In Pakistan. *Asian Economic and Financial Review*, 3(3), 319–332.
https://www.researchgate.net/publication/293794218_DETERMINATION_OF_THE_IMPACT_OF_WORKING_CAPITAL_MANAGEMENT_ON_PROFITABILITY_AN_EMPIRICAL_STUDY_FROM_THE_CEMENT_SECTOR_IN_PAKISTAN
- Muhammad, U., Sarfarazah, M., & Shahbaz, K. (2017). Impact of Working Capital Management on Firm Profitability: Evidence from Scandinavians countries. *Journal of Business Strategies*, 11(1), 99–112.
- Mutungi, M. W. (2010). The Relationship between Working Capital Management Policies and Financial Performance of Oil Marketing Firms in Kenya.
- Mwangi, L. W., Makau, M. S., & Kosimbei, G. (2014). Effects of Working Capital Management on Performance of Non-Financial Companies listed in NSE, Kenya. *European Journal of Business and Management*, 6(11), 195–205.
- Nadeem, M., Waris, M., Asadullah, M., & Kamran, M. (2020). Impact of Working Capital Policies on Firm's Performance, Evidence from Pakistan. *Journal of International Business and Management*, 3(1), 01– 20.
- Napompech, K. (2012). Effects of Working Capital Management on the

- Profitability of Thai Listed Firms. *International Journal of Trade, Economics and Finance*, 3, 227–232.
- Nguyen, M. (2017). Effects of working capital management on firm's profitability: Vietnamese evidence. National Economic University.
- Nyamao, N. R., Patrick, O., Martin, L., Odondo, A. J., & Simeyo, O. (2012). Effect of Working Capital Management Practices on Financial Performance: A Study of Small Scale Enterprises in Kisii South District, Kenya. *African Journal of Business Management*, 6(18), 5807–5817.
- Ogundipe, S. E., Idowu, A., & Ogundipe, L. O. (2012). Working Capital Management, Firms' Performance and Market Valuation in Nigeria. *World Academy of Science, Engineering and Technology*, 61(1), 1196.
- Padachi, K. (2006). Trends in Working Capital Management and its Impact on Firm's Performance: An Analysis of Mauritian Small Manufacturing Firms. *International Review of Business Research*, 2(2), 45–58.
- Pambayun, K. Y. N., & Apriani, D. R. A. (2019). Working Capital Management and its Influence on Profitability and Sustainable Growth. *Business: Theory and Practice*, 20, 61–68.
- Perera, W., & Priyashantha, P. (2018). The Impact of Working Capital Management on Shareholders Wealth and Profitability: Evidence from Colombo Stock Exchange. *SSRN Electronic Journal*. <https://doi.org/10.2139/SSRN.3178018>
- Raheel Mumtaz, Shahnaz A. Rauf, Bashir Ahmed, & Umara Noreen. (2013). Capital Structure and Financial Performance: Evidence from Pakistan (Kse 100 Index). *Journal of Basic and Applied Scientific Research*, 3(4), 113–119.
- Rahman, S., Iqbal, K., & Nadeem, A. (2019). Effect of Working Capital Management on Firm Performance: The Role of Ownership Structure. *Global Social Sciences Review*, 4(1), 108–119.
- Ramesh, G., Al-Habsi, H., & Al-Sharji, T. (2017). Effect of Working Capital Management on the Financial Performance of Manufacturing Firms in Sultanate of Oman. *Innovative Journal of Business and Management*, 6(3), 38–42.
- Robert, K., Mark, L., & Rabih, M. (2013). Working Capital Management and Shareholders' Wealth. *Review of Finance*, 17(5), 1827–1852.
- Sabunwala, Z. Z. (2013). Impact of Working Capital Management on Firm's Performance: 2007-2011 Evidence from Steel Industry in India. *Indira Management Review*, 6(1), 4–16.
- Shajahan, U. S., & Suganya, M. (2017). The Impact of Working Capital Management on Firm's Performance of Selected Companies In Bombay

Stock Exchange.

- Tahir, M., & Anuar, M. B. A. (2016). The Determinants of Working Capital Management and Firms Performance of Textile Sector in Pakistan. *Quality & Quantity*, 50(2), 605–618.
- Tarek, Y., & Rafik, M. (2020). The Impact of Working Capital Management on Corporate's Performance: Evidence from Egypt. *The Impact of Working Capital Management on Corporate's Performance: Evidence from Egypt, 2020(1833–3850)*, 151–162, 1833–8119.
- Ukaegbu, B. (2014). The Significance of Working Capital Management in Determining Firm Profitability : Evidence from Developing Economies in Africa. *Research in International Business and Finance*.
- Vural, G., Sökmen, A. G., & Çetenak, E. H. (2012). Affects of Working Capital Management on Firm's Performance: Evidence from Turkey.
- Weinraub, H. J., & Visscher, S. (1998). Industry Practice Relating To Aggressive Conservative Working Capital Policies. *Journal of Financial and Strategic Decision*, 11(2), 11–18.
- Wesley, O. N., Musiega, M. G., Douglas, M., & Atika, M. G. (2013). Working Capital Management and Corporate Performance. Special Reference to Manufacturing firms on Nairobi Securities Exchange. *International Journal of Innovative Research and Development*, 2(9), 177–183.
- Yakubu, I. N., Alhassan, M. M., & Fuseini, A. A. (2017). The Impact of Working Capital Management on Corporate Performance: Evidence from listed non-financial firms in Ghana.
- Zariyawati, M. A., Hirnissa, M. T., & Diana-Rose, F. (2017). Working capital management and firm performance of small and large firms in Malaysia. *Journal of Global Business and Social Entrepreneurship (GBSE)*, 3(7).
- Zariyawati, M., Annuar, M. N., Taufiq, H., & Abdul Rahim, A. S. (2009). Working Capital Management and Corporate Performance: Case of Malaysia". *Journal of Modern Accounting and Auditing*, 5(11), 47–54.

Tracing The Impact of Cash Conversion Cycle on Firm's Profitability Applied Study on Egyptian Stock Market

Heba Srour*

heba.srour@fue.edu.eg

Ahmed Azmy†

Ahmed.Zaky@fue.edu.eg

Abstract

The paper is aiming at assessing the effect of cash conversion cycle on firm profitability. Three components are used to measure cash conversion cycle (CCC); average collection period (ACP), average inventory period (AIP) and average payable period (APP). Henceforth, cash conversion cycle and its determinants are taken as independent variables. The dependent variable is profitability being measured by return on asset (ROA) and return on equity (ROE). For the period 2016-2020, data was collected from companies listed on the EGX, regression models are used to test the Hypothesis with a sample of seven firms from various industries. The paper's results are consistent to those of (Telly & Ansori, 2019), and (Rizky & Mayasari, 2018) showed that, the average collection period and average inventory period have an inverse association with the firm's profitability (ROA), with the exception of the average payable period.

Keywords: Cash Conversion Cycle - Profitability - Return on Asset - Return on Equity.

* Assistance Professor, Faculty of Commerce and Business Administration - Future University in Egypt

† Associate Professor, Faculty of Commerce and Business Administration - Future University in Egypt

Introduction

The growing in business world today, and rivalry between companies, in particular between similar companies, will be stricter. Maintaining the survival of the business in the face of intense competition, well controlled management and management of resources is necessary. In addition to being necessary for the management to be able to organize the usage of resources owned by the organization effectively and efficiently is also important to be able to make decisions that will help the achievement of organizational objectives in the future. The company strives to always be one step ahead of its competitors in order to accomplish the purpose of the company, namely to achieve profitability as much as possible in order to ensure its existence.

Organizations have often considered the amount of days it would take them to turn revenues to cash. The duration can have an effect on the profitability of such organizations in terms of the return on the asset. The ability of companies to assess the days of inventory or stock sales, which is the cash management, to achieve successful profitability in terms of return on the asset. Firm has the potential to continue operating with adequate cash flow to finance both the maturation of short-term debt and the anticipated operating expenses. It therefore requires important decisions on several aspects, including the management of accounts payable and receivable, the maintenance of a certain amount of inventories and the investment of accessible cash.

The Cash Conversion Cycle is one of the measures of Working Capital Management which is the time period needed by the company as the raw material purchased is paid to the accounts receivable from the collection of collectible goods. Cash Conversion Cycled can be said to be adequate to reinforce short-term financing decisions, in particular to figure out how the company's strategy is to resolve the cash deficit, whether by holding back the debt or by accelerating the collection time of its debts. CCC is used to calculate how long a corporation will receive cash from the company's financial profits, which would eventually impact the amount of money required to deposit into its existing assets (current assets). This condition would undoubtedly have an effect on the management of assets and liabilities in the company, which depends on the profitability of the company. The profitability of the company will always have a partnership with (CCC) that will show the company how long it will take to adjust or repay the cash used for operating activities in cash.

Cash Conversion Cycle is an important method for estimating how effectively businesses handle their working capital.

Profitability is one indicator of the company's success that can be calculated in ratios to describe the company's ability to produce income across the company. The company's capabilities and resources, such as sales, cash, money, number of employees, number of branches, and so on. Profitability ratios are used to assess the efficiency of management as a whole on the basis of the amount of profit received as a result of the return on working capital, revenue and expenditures calculated as a percentage. Profitability will indicate how good the company's future prospects are in sustaining its existence or improving its business. The higher the profitability levels of a company, the more the company will be able to produce profits that indicate The Company's prospect of sustaining its existence and expanding its market is stronger. Companies with strong prospects would certainly attract investors to invest in the business as well.

Aim of this paper is to observe the impact of cash conversion cycle which is considered as an important tool used by management to measure the company's ability to perform working capital management as ccc is one of the key metrics of WC, on the firms profitability as a practical aspect, and how is compatible with the theoretical aspect.

Previous researchers on the relationship between cash conversion cycle and firm's profitability have focused on general relationships. Some observed that there is strong negative relationship between ccc and profitability (Anser & Malik, 2013) ,(Attari & Raza, 2012), (Chand et al., 2019) ,(Hashini & A.M.C, 2019), (M. Nguyen, 2017) ,(Nwude et al., 2018) ,(Olorunfemi et al., 2020), (Rafiq et al., 2019), (Rizky & Mayasari, 2018), (Shah, 2016) and (Sugathadasa, 2018) others considered that there is positive relationship (Qazi et al., 2011), (Samosir, 2018), (Sharma & Kumar, 2011), (Zakari & Saidu, 2016) and finally there are researchers considered that there is no relationship between cash conversion cycle and profitability of firms such as (Al-Abass, 2019) ,(Al-Shubiri & Aburumman, 2013), (Yilmaz & Acar, 2019), Based on these considerations the research problem could be summarized in the following question:

What is the impact of cash conversion cycle on firm's profitability?

Many studies have reported the correlations between CCC and profitability, the results have been mixed and non-conclusive. In view of these inconsistent findings,

it is crucial to test the relationship between CCC (AIP, ACP, and APP) and profitability (ROE and ROA) to see if it is positive, negative or neutral, especially for specific industries. In theory, if firms can sell their inventories, collect money from customers quickly, and delay paying their suppliers; it will save costs and as a result increase the profits. As such, the following hypothesis is proposed:

H1: Cash conversion cycle has a significant effect on firm's ROE.

H2: Cash conversion cycle has a significant effect on Firm's ROA.

Different results were provided as articles varied between there is positive, negative and no effect of CCC on Firm's profitability from the period (2011-2020). (Marisetty & Madasu, 2020), they found various aspects of the cash conversion cycle and its effect on profitability related to non-financial companies established in the SENSEX S&P BSE (Bombay Stock Exchange) Index in India during the period 2006-2020. The main purpose of their research was to explore the factors that influence the cash conversion cycle and the statistically important effect on the profitability of companies in the nature and size of the organization, they used DIT, DRO, and DPO to measure the cash conversion cycle and used ROCE, ROE, ROA, D/E Ratio and firm cycle to evaluate firm's profitability.

They used regression analysis in their studies so the result showed that there was a significant negative impact of cash conversion cycle on profitability of the firm. (Iqbal et al., 2020), they tested the impact of the cash conversion cycle on the company's profitability. The data was obtained using pooled data comprising a sample of 10 companies listed on PSX for the period 2010-2018 from two manufacturing sectors such as Oil & Gas and Engineering. For analysis, regression and correlation approaches were used. For the calculation of cash conversion periods (CCC), three components were used: average receivable period (ARP), average inventory period (AIP) and average payable period (APP).

The findings revealed that the lower the number of CCC days, the greater the profitability of the organization. A strongly negative major association exists between CCC and the profitability of the organization as ROA. (Olorunfemi et al., 2020), they observed the effect of the Cash Conversion Cycle (CCC) on the profitability of Nigeria's selected food and beverage companies. Five years from 2014 to 2018 have been included in the paper. During the paper period, there were

43 food and beverage companies listed on the Nigerian stock exchange. Based on the criteria and the sample size of ten (food and beverage firms in Nigeria), the paper used significant sampling techniques to select the sample. The paper used a panel regression and assessed the data using a 9.00 e-view statistical package. The results said that the Cash Conversion Cycle (CCC) had a significant negative relationship with profitability (as calculated by ROA). (Saraswati & Bernawati, 2020), their research had shown how the cash conversion period and firm size affects the profitability of manufacturing firms. In the period 2011-2013, the data used were 309 companies listed on the Indonesian Stock Exchange, which had positive profit and equity.

The cash conversion period and firm size, calculated by the natural logarithm (Ln) of the total assets, was the independent variable of this analysis, while profitability was the dependent variable as measured by Return on Asset and Return on Equity. The findings showed that the cash conversion period had a negative impact on the company's profitability. (Telly & Muslim Ansori, 2019), their research designed to evaluate the impact of firm size and Cash Conversion Period on profitability of manufacturing companies listed on the Indonesian Stock Exchange, during the period from 2013 to 2015. The size of the company and the Cash Conversion Period became independent variable, while the dependent variable was the profitability calculated by ROA (Return on Asset). A multiple regression analysis was used to evaluate the hypothesis in this paper.

The results of the analysis showed that the first hypothesis of firm size did not affect the profitability of the company. The second hypothesis was the effect of Cash conversion Cycle on profitability. (Rafiq et al., 2019), in their paper, they expected the effect of modified cash; the conversion cycle (CCC) on the income of companies in three separate sectors of Pakistan, including the automotive, pharmaceutical and cement industries. It used panel data from 2009 to 2018 using a panel regression model to evaluate data for 14 registered companies operating in three different industries. The dependent variable was profitability of the firm represented as earning per share. Independent variable was modified cash conversion cycle, and control variables were size, debt ratio and growth of a firm. The major results provided empirical evidence that the cash conversion cycle substantially affects profitability. (Hashini & A.M.C, 2019), aimed to identify the impact of CCC on profitability of selected corporations in Sri Lanka. The

profitability of corporations was measured in terms of Return on Equity (ROE) and Return on Assets (ROA) while CCC was measured by Inventory Conversion Period (ICP), Debtor Conversion Period (DCP), and Payable Conversion Period (PCP) considering the financial data for two years period from 2015 to 2016. By considering the results it revealed that ICP and DCP had positive strong relationship with the profitability. by using regression he had found that the PCP were negatively affected to the ROE and ROA. According to his paper CCC was negatively correlated with the profitability and CCC had a significant effect on profitability. (Yilmaz & Acar, 2019), They used the cash conversion cycle (CCC) and its components as the measure of working capital management and used different profitability ratios such as gross profit margin, EBIT margin, and return on assets (ROA) to determine the impact of ccc on firms profitability. By using the data from 66 non-financial companies for a four-year period from 2013 to 2016, dynamic panel data analysis was performed. The generalized method of moments (GMM) to test how WCM affected profitability was applied. Results showed that CCC had nonlinear significant effect on GPM and EBITM, whereas, among its components, only Accounts Payable Days (APD) had a significant effect on GPM and EBITM. However, ROA was not affected by CCC and its components. (Al-Mohareb, 2019) considered the impact of working capital management and its components on profitability as a practical aspect, and how was it compatible with the theoretical aspect.

Also, he studied other financial factors that may affect profitability by using a sample of Jordanian manufacturing firms listed in the Amman Stock Exchange for the period (2016-2018). The results showed that there was a significant relationship between the cash conversion cycle- which was considered as a proxy of working capital management- and profitability of the manufacturing firms. (Chand et al., 2019), they had observed the impact of working capital management (cash conversion cycle) on firm profitability and offered a comparison between seasonal and non-seasonal businesses of Pakistan by using the time period of 5 years (2013-2018). They recommended reducing the length of cash conversion cycle to increase profitability. (Rizky & Mayasari, 2018), purpose of their paper was to explore the impact of Cash Conversion Cycle on firm profitability of retail companies listed in the Indonesian Stock Exchange for the period of 2012-2015. Their paper used purposive sampling; therefore the data included was 76 observations covering 19

firms in 4 years period. The hypothesis testing used was the panel data regression. The results indicated that CCC had negative effect on firm profitability. The short cycle of CCC will increase firm profitability. (Samosir, 2018), aimed to provide empirical evidence about effect of cash conversion cycle, firm size, and firm age to profitability. The population in this research was manufacturing companies listed in Indonesia Stock Exchange (BEI) in the period 2012-2014.

With total sample of 101 companies and total of as many as 303 samples of whole observation. He used panel data regression in his paper. The results indicated that the variable cash conversion cycle, firm size, firm age had positive effect on the variable return on assets. (Sugathadasa, 2018) examined the relationship between the cash conversion cycle and profitability of the manufacturing sector organizations listed on the Colombo Stock Exchange. The paper collected data for a period of 5 years from 2013 to 2017 for 10 listed companies operating in the manufacture of electrical appliances using a stratified sampling process. Regression Analysis was performed to test the two-linear multiple regression model. The identified variables for this paper were inventory conversion period, receivable conversion period and payable conversion period collectively to calculate the cash conversion duration as a proxy for independent variables while asset returns and equity returns as a proxy for dependent variables. The results found that there were positive correlation between inventory conversion period and receivable conversion period while negative correlation between payable conversion periods on ROA as one measure of profitability. There was negative correlation between all the components of cash conversion cycle and ROE. (L. Nguyen & Mohanlingam, 2017) examined the relation between cash conversion cycle and firms profitability that existed in the agriculture and food industries in Thailand. They aimed to inspect the effect of production cycle, cash collection cycle, and cash payment cycle on profitability.

In addition, they also aimed to measure the influence of control variables such as size and debt ratios have on profitability. by using data of 34 listed companies in agriculture and food industry in the Stock Exchange of Thailand from 2009 to 2013, Pearson's correlation and the regression analysis approach were used to observe the relationship between cash conversion cycle and profitability. The outcomes showed that cash conversion cycle (CCC) had a significant inverse relationship with profitability in the agriculture and food companies in Thailand. (Nwude et al., 2018)

studied the impact of the CCC on the return on assets for the duration of (2000–2011) of selected Nigerian insurance companies. Data were obtained from the sampled insurance companies' annual financial reports. For testing the hypothesis, multiple regression techniques were used. The dependent variable was ROA. The explanatory variable was CCC. The current ratio, debt asset ratio, fixed financial total asset ratio, growth and size were all incorporated in the model as control variables. The results showed that CCC had negative and significant effect on profitability. (Tsagem et al., 2018), investigate the relationship between the cash conversion period and the performance of SMEs in Nigeria. They used panel data regression analysis using financial data from a sample of 311 Nigerian SMEs for the period 2007-2013. The research findings showed that cash conversion, inventory holding period and accounts payable period had a negative relationship with profitability of SMEs and that account receivables period had a statistically significant negative relationship with SMEs profitability. (Sin-Huei Ng et al. 2017), aimed to observe the impact of working capital management from the aspects of aggressive working capital policy and efficiency of working capital management. For the six years 2007 to 2012, the data were derived from the annual reports of 122 companies listed in the Industrial Goods sector of Bursa Malaysia main board for defining the relationships between working capital variables and gross operating income of companies. In order to consider, the working capital relationship and the profitability of the firm, the multiple regression analysis that uses pooled panel data over 6 years with 732 company year observations was then applied. The paper found that the period of cash conversion was positively related to gross operating income. It had shown that an improvement in the time of inventory conversion was good for the profitability of businesses. Companies may also improve profitability by reducing accounts receivables collection period. (AL-ABASS, 2019), focused on checking the length of cash conversion cycle with respect to the size of the firms and examining the length of CCC with respect to the profitability of the firm. For the purpose of research, the data was collected from the listed companies of Karachi Stock Exchange (KSE) over the period of 2012-2016. Descriptive statistics of the paper showed that all firms of the sample have satisfactory Cash conversion cycle but Tobacco sector was at number one with the lowest value of Cash conversion cycle. The Pearson correlation and regression analysis was conducted for the empirically testing of the results. The results of the paper showed that the

relationship of Cash conversion cycle with profitability and size was insignificant. It means that the Cash conversion cycle was not due to the firm size and the favorable answer was that it had not positive impact on the profitability of the firms. (Zakari & Saidu, 2016), their paper was to empirically find the influence of cash conversion cycle on corporate profitability of the ICT firms listed on the floor of the Nigerian Stock Exchange. Data were gathered from all the listed firms from 2010 to 2014. The data were analyzed using multiple linear regression analysis and the robustness check showed that the data were normal. The outcomes indicated a significant positive relationship between cash conversion cycle and corporate profitability. (Oseifuah & Gyekye, 2017) explored the Cash Conversion Cycle theory to examine the impact of working capital management efficiency and its separate components on the profitability. by using sample of 75 non-financial firms listed on the Johannesburg Stock Exchange (JSE), Panel data regression methodology was used to paper financial data obtained from I-Net Bridge and BF McGregor for the 10 year period, 2003 to 2012 to determine the nexus between working capital management and profitability (proxied by return on assets). the paper outcomes were consistent with the CCC theory that: 1) existing a negative relationship between working capital management and corporate profitability; 2) existing a negative relationship between inventory conversion period and profitability; 3) there was a negative relationship between accounts receivables conversion period and profitability; and 4) there was a positive relationship between accounts payable deferral period (PDP) and profitability. (Shah, 2016) investigated the impact of working capital management on firms' profitability under different business cycles in 65 non-financial firms listed on Karachi stock exchange of Pakistan by using the annual panel data for 10 years from the period of 2004 to 2013. They used Pedroni panel co-integration and Kao residual panel co-integration approaches to check the valid long run relationship between considered variables. The result of regression analysis showed that the significant negative relationship exists between cash conversion cycle and its components with firms' profitability. (Majanga, 2015), inspected the relation between the company's liquidity measured by the length of cash conversion cycle, and its profitability measured by return on capital, the paper used data from sample of twelve Malawian manufacturing firms from 2007 to 2015 using correlation and regression test. The paper showed that there was an inverse relationship between the cash conversion cycle and the company's return on

investment and returns on equity, and provided indication that the cash conversion cycle, a measure of business liquidity, had an impact on a firm's performance. (Yazdanfar & Öhman, 2014), the purpose was to explore the impact of cash conversion cycle (CCC) profitability in Swedish small and medium-sized enterprises (SMEs) over the period of 2008-2011. The paper used a seemingly unrelated regression (SUR) model to analyze cross-sectional panel data covering 13,797 SMEs operating in four industries. The paper provided empirical evidence that CCC significantly affects profitability. In addition, the firm-level control variables size, age, and industry affiliation significantly affect firm profitability. Results suggested that managers could increase firm profitability by improving their working capital management and those firms with longer CCCs were less profitable. (Al-Shubiri & Aburumman, 2013) paper examined the relationship between cash conversion cycle and financial characteristics. A sample of Jordanian different industrial sector of 11 was selected covering the period 2005-2011 listed on the Amman Stock Exchange (ASE). Paper used a quantitative methodology analysis. The consequences of this paper indicated that there was statistically significant and positive relationship between cash conversion cycle and independent variables, such as: debt, market, productivity, liquidity and dividends indicator at different significant level 1% and 5%, and the size indicator is weak relationship with significant level at 10% and there was no significant relationship with profitability indicator and cash conversion cycle. (Anser & Malik, 2013) was concerned about estimating how cash conversion cycle affected the profitability of manufacturing sector organizations listed at Karachi stock exchange of Pakistan. Paper took into consideration 5 years financial statements data starting from 2007 to 2011. Regression results to examine the impact of length of cash cycle management on profitability showed that cash conversion cycle was having significantly inverse association with both return on assets and equity showing that lesser the cash conversion cycle greater would be the profitability measured through return on assets and equity. (Panigrahi, 2013) was conducted with the purpose to look into the association of the cash conversion cycle with the size and profitability of the firm. Paper took into consideration top five Indian cement companies for a period of 10 years starting from 2001 to 2010. Regression results showed that there was positive relationship between cash conversion cycle and both return on assets and equity and there was a negative relationship between cash conversion cycle and firms profitability. (Murugesu,

2013), paper was an attempt to observe the effect of cash conversion cycle on profitability in ten listed plantation companies in Sri Lanka between 2008 and 2012. Results showed that there was negative relationship between return on equity and cash conversion cycle. Cash conversion cycle also had negative impact on Return on asset. Cash conversion cycle had negative impact on net profit. Therefore, the effect of cash conversion cycle on total profitability as whole contained significant value. (Attari & Raza, 2012), paper was conducted with the purpose to look into the relationship of the cash conversion cycle with the size and profitability of the firms in the four specific manufacturing sectors listed at Karachi Stock Exchange. The data was collected from the annual reports of 31 sampled firms out of the total firms in the related sectors i.e. 143 covering the period of 2006- 2010. The data analysis was conducted by using One-Way ANOVA and Pearson correlation techniques. The CCC length was measured by calculating accounts receivable, inventory and accounts payable. Firm size was measured in terms of values of total assets and total sales. Profitability was measured in terms of return on assets and return on equity. There was a significant negative correlation between the CCC and the firm size in terms of total assets, and negative correlation between CCC and profitability in terms of return on total assets. (Sharma & Kumar, 2011), the main purpose of this article was to observe the effect of working capital on profitability of Indian firms. They collected data about a sample of 263 non-financial BSE 500 firms listed at the Bombay Stock (BSE) from 2000 to 2008 and evaluated the data using OLS multiple regression. The paper further revealed that inventory of number of days and number of days accounts payable was negatively correlated with a firm's profitability, whereas number of days accounts receivables and cash conversion period showed a positive relationship with corporate profitability. (Qazi et al., 2011), they studied the relationship between working capital management and profitability of firms. Working capital was made by the three important factors, debtor, creditor and stock. When they included cash conversion cycle (CCC) to working capital then it became working capital management (WCM). Two sectors were selected as a sample size: automobile and oil and gas sector. The time period was from 2004 - 2009. Different variables affected the profitability of firms were selected. In this paper, networking capital, inventory turnover in days, average account receivable and financial asset to total assets were taken as independent variables. The outcomes indicated positive movement of working capital

management on firm's profitability.

After reviewing the previous studies, it's obvious that most of it is focusing on cash conversion cycle and its relationship with firm's profitability by taking sample of larger firms & SMES, also on different industries. There were three main debates as some researchers found there was positive relationship between cash conversion cycle and firms profitability (Qazi et al., 2011), (Samosir, 2018), (Sharma & Kumar, 2011), (Zakari & Saidu, 2016) while others found there was negative relation between cash conversion cycle and firms profitability (Anser & Malik, 2013) , (Attari & Raza, 2012), (Chand et al., 2019), (Hashini & A.M.C, 2019), (Nguyen et al. 2017), (Nwude et al., 2018), (Olorunfemi et al., 2020), (Rafiq et al., 2019), (Rizky & Mayasari, 2018) , (Shah, 2016), (Sugathadasa, 2018) and some researchers found there was no significant relation between cash conversion cycle and firms profitability as CCC had no impact on profitability of firms (AL-ABASS, 2019), (Al-Shubiri & Aburumman, 2013), (Yilmaz & Acar, 2019); There is a Gap in the Egyptian stock exchange context in exploring the impact of cash conversion cycle on firm's profitability. This paper will try to capture the impact of CCC on Egyptian firm's profitability during the period from 2013 to 2019.

Data Analysis

The analysis of this paper was done using the statistical package for social sciences (SPSS V26) for both descriptive and inferential statistics. Section one provides a presentation of some descriptive statistics for the selected variables. Section two offers the hypothesis testing through multiple regression analysis. Descriptive statistics for the selected variables were calculated and reported in table (1). These statistics are the minimum (Min), maximum (Max), mean (M), standard deviation (SD), and coefficient of variation.

Table (1): Descriptive Statistic for the Selected Variables

Variable	Symbol.	Min	Max	Mean	SD	CV
<i>AIP</i>	x11	36.6	867.6	172.036	104.6789	60.85%
<i>ACP</i>	x12	0	717.29	155.0441	141.5542	91.30%
<i>APP</i>	x13	25.22	588.77	208.6335	116.1895	55.69%
<i>CCC</i>	X1	-298	798.4	118.4466	237.7453	200.72%
<i>Firm size</i>	X2	7.48	10.6	9.278	0.74961	8.08%
<i>Leverage</i>	X3	1.1	8.5	2.62	1.43752	54.87%
<i>ROE %</i>	Y1	-7.4	18.91	3.3779	4.21359	124.74%
<i>ROA %</i>	Y2	-14	52	3.3369	7.10652	212.97%

The basic descriptive statistics for the dependent variables “*ROE*” were ($M = 3.378$, $SD = 4.214$, $CV = 124.74\%$), and for “*ROA*” were ($M = 3.337$, $SD = 7.106$, $CV = 212.97\%$), while for the independent variables “*AIP*” we have ($M = 172.036$, $SD = 104.679$, $CV = 60.85\%$), for “*ACP*” we have ($M = 155.04$, $SD = 141.55$, $CV = 91.30\%$), for “*APP*” we have ($M = 208.63$, $SD = 116.19$, $CV = 55.69\%$), for “*CCC*” we have ($M = 118.44$, $SD = 237.75$, $CV = 200.72\%$), for “*Firm size*” we have ($M = 9.278$, $SD = 0.7496$, $CV = 8.08\%$), and finally for “*Leverage*” we have ($M = 2.62$, $SD = 1.438$, $CV = 54.87\%$).

Result of first Hypothesis test: *Effect of Cash Conversion Cycle on ROE*

The linear regression analysis was carried out to investigate the effect of Cash Conversion Cycle and its components on ROE.

Table 2: Results of the First Hypothesis NS = Not Significant

Hypothesis	Dependent Variable	Independent Variables	R Square	F-value	B	t-value	Remark
H1.1	ROE	AIP	.014	1.950 ^{NS}	-	-1.396 ^{NS}	Not Supported
H1.2		ACP	.009	1.277 ^{NS}	-	-1.130 ^{NS}	
H1.3		APP	.007	.993 ^{NS}	.003	.996 ^{NS}	
H1		CCC	.023	3.189 ^{NS}	-	-1.786 ^{NS}	

The value of F-statistic, which measures the common importance of the explanatory variables, is not statistically significant at the 5% level, according to the corresponding value of probability greater than 0.05. The values of R^2 suggest that small amount of the variation in ROE is explained by joint variations in the independent variables. Results show that all coefficients were statistically insignificant since the values of t-statistics were below 1.96 and a corresponding p-value greater than 0.05. In conclusion the results of the regression analysis show that no single variable of the selected ones has a statistically significant effect on ROE.

Result of second Hypothesis: *Effect of Cash Conversion Cycle on ROA*

The linear regression analysis was carried out to investigate the effect of Cash Conversion Cycle and its components on ROA.

Table (3): Results of the Second Hypothesis

Hypothesis	Dependent Variable	Independent Variables	R Square	F-value	B	t-value	Remark
H2.1	ROA	AIP	.058	8.560** (.004)	- .016	- 2.926** (.004)	Supported
H2.2		ACP	.040	5.719* (.018)	- .010	-2.391* (.018)	Supported
H2.3		APP	.007	.919 (.339)	- .005	-.959 (.339)	Not Supported
H2		CCC	.034	4.914* (.028)	- .006	-2.217* (.028)	Supported

For sub-hypothesis “H2.1” the value of F-statistic, indicates that the model is statistically significant at the 5% level, according to the corresponding value of probability .004. Results show that the coefficient AIP is statistically significant at the 5% level with a probability of .004 and implies a negative correlation between the variables. Keeping all other coefficients constant, an increase of 1 unit in the variable AIP will lead to a reduction in the variable ROA by .016 units. The R^2 value of .058 (5.8%) suggests that 6% of the total variation in ROA is explained by the variation in AIP. With respect to sub-hypothesis “H2.2” the value of F-statistic,

indicates that the model is statistically significant at the 5% level, according to the corresponding value of probability .018. Results show that the coefficient ACP is statistically significant at the 5% level with a probability of .018 and implies a negative correlation between the variables. Keeping all other coefficients constant, an increase of 1 unit in the variable ACP will lead to a reduction in the variable ROA by .010 units. The R^2 value of .040 (4.0%) suggests that 4% of the total variation in ROA is explained by the variation in ACP. Regarding the sub-hypothesis "H2.3" the value of F-statistic, indicates that the model is statistically insignificant at the 5% level, according to the corresponding value of probability .339. Results show that the coefficient APP is statistically insignificant at the 5% level with a probability of .339. Finally, the main hypothesis "H2" the value of F-statistic, indicates that the model is statistically significant at the 5% level, according to the corresponding value of probability .028. Results show that the coefficient CCC is statistically significant at the 5% level with a probability of .028 and implies a negative correlation between the variables. Keeping all other coefficients constant, an increase of 1 unit in the variable CCC will lead to a reduction in the variable ROA by .006 units. The R^2 value of .034 (3.4%) suggests that 3.4% of the total variation in ROA is explained by the variation in CCC.

Results

The cash conversion cycle of firms was used in this paper to highlight the performance of these firms in terms of liquidity management and its impact on profitability. It also identified areas for further improvement in terms of optimizing the cash conversion cycle. Based on the findings, the first hypothesis is rejected as it was found that CCC does not affect the firm's ROE due to the results of the regression analysis showing that no single variable of the selected ones has a statistical significant effect on ROE. While the second hypothesis is accepted as it was found that CCC affect firm's ROA , because the results of regression analysis showing that there is an inverse and substantial relationship between cash conversion cycle and company's profitability, showing that cash conversion cycle has opposite effect on return on assets. This represents the firm's shorter cash conversion cycle, inventory conversion period, and receivables period are more profitable, whereas firms with a longer cash conversion cycle, inventory conversion period, and receivables period are less profitable. Furthermore, because return on assets and

return on equity are unaffected by the average payment period, making early payments to creditors will have no effect on firm's profitability. Response to the research question: does the cash conversion cycle affect a firm's profitability in Egypt? Yes, the cash conversion cycle has a significant impact on a firm's ROA, but it has no significant impact on its ROE.

The paper is limited to Egyptian firms listed on the EGX, where there has been almost few research on CCC. Future researchers should add additional businesses or test the hypothesis using a different statistical approach. In addition, researchers can further analyses per sub-sectors for more specific results.

Reference

- Al-Abass, H. S. (2019). Relationship between Cash Conversion Cycle (CCC) with Firm Size and Profitability. In *Asian Journal of Finance & Accounting* ISSN 1946-052X.
- Al-Mohareb, M. M. (2019). Cash Conversion Cycle and Profitability, Evidence from Jordan. *Asian Journal of Finance & Accounting*, 11(2), 81–95. <https://doi.org/10.5296/AJFA.V11I2.15640>
- Al-Shubiri, F. N., & Aburumman, N. M. (2013). The Relationship between Cash Conversion Cycle and Financial Characteristics of Industrial Cectors: An empirical paper. *Investment Management and Financial Innovations*, 10(4)), 95–102.
- Anser, R., & Malik, Q. A. (2013). Cash Conversion Cycle and Firms' Profitability– A Paper of Listed Manufacturing Companies of Pakistan. *IOSR Journal of Business and Management*, 8(2), 83–87.
- Attari, M. A., & Raza, K. (2012). The Optimal Relationship of Cash Conversion Cycle with Firm Size and Profitability. *International Journal of Academic Research in Business and Social Sciences*, 2(4), 189.
- Chand, A., Akram, S., Akram, H., Murad, A., & Kareem, L. (2019). the Impact of Working Capital Management on Firm Profitability: A Comparison between Seasonal and Non-Seasonal Businesses.
- Hashini, & A.M.C. (2019). Impact of Cash Conversion Cycle on Firm's Profitability: With Special Reference to Beverage Food and Tobacco Sector. *International Research Conference of UWU-2019*, Uva Wellassa University, Sri Lanka.
- Iqbal, J., Manzoor, A., Akhtar, Q., & Amin, S. (2020). The Effect of Cash Conversion Cycle on Profitability of the firm: A Paper of Oil & Gas and Engineering Sector of Pakistan. *Journal of Accounting and Finance in Emerging Economies*, 6(1), 263–272.
- Majanga, B. (2015). Cash Conversion Cycle and Firm Profitability in Malawi Manufacturing Sector. *Journal of Commerce & Accounting Research*, 4(3).
- Marisetty, N., & Madasu, P. (2020). The Impact Of Cash Conversion Cycle On Profitability Of The Firms With Respect To S&P. In *Journal of Critical Reviews* (Vol. 7, Issue 16).
- Murugesu, T. (2013). Effect of Cash Conversion Cycle on Profitability: Listed Plantation Companies in Sri Lanka. *Research Journal of Finance and Accounting*, 4(18), 132–137.
- Ng, S.-H., Ye, C., Ong, T. S., & Teh, B. H. (2017). The Impact of Working Capital

- Management on Firm's Profitability: Evidence from Malaysian Listed Manufacturing Firms. *International Journal of Economics and Financial Issues*, 7(3), 662–670. <https://www.econjournals.com/index.php/ijefi/article/view/3889>
- Nguyen, L., & Mohanlingam, S. (2017). The Effects of Cash Conversion Cycle on Profitability: An Insight into the Agriculture and Food Industries in Thailand. *Asian Journal of Business and Accounting*, 11, 97–120 10 22452 11 1 4.
- Nguyen, M. (2017). Effects of Working Capital Management on Firm's Profitability: Vietnamese evidence. National Economic University.
- Nwude, E. C., Agbo, E. I., & Ibe, C. (2018). Effect of Cash Conversion Cycle on the Profitability of Public Listed Insurance Companies. *International Journal of Economics and Financial Issues*, 8(1), 111.
- Olorunfemi, O. A., opusunju, M. I., & jiya, N. S. (2020). Effect of Cash Conversion Cycle (CCC) Period on the Profitability of Selected Food and Beverage Companies in Nigeria. In *International Journal of Management Studies and Social Science Research*.
- Oseifuah, E. K., & Gyekye, A. (2017). Cash Conversion Cycle Theory and Corporate Profitability: Evidence from Non-Financial Firms listed on the Johannesburg Stock Exchange. *The Journal of Accounting and Management*, 6(3).
- Panigrahi, C. M. A. (2013). Cash Conversion Cycle and Firms' Profitability—A Paper of Cement Manufacturing Companies of India. *International Journal of Current Research*, 5(6), 1484–1488.
- Qazi, H. A., Shah, S. M. A., Abbas, Z., & Nadeem, T. (2011). Impact of Working Capital on Firm's Profitability. *African Journal of Business Management*, 5(27), 11005–11010.
- Rafiq, A., Ahmad, R., Hassan, S. S., & Hakim, L. (2019). The Relationship between Modified Cash Conversion Cycle & Firms. Vilnius Gediminas Technical University.
- Rizky, A., & Mayasari, M. (2018). The Impact of Cash Conversion Cycle on Firm Profitability of Retail Companies. *Journal of Applied Accounting and Taxation*, 3(1), 73–78.
- Samosir, F. (2018). Effect of Cash Conversion Cycle, Firm Size, and Firm Age to Profitability. *Journal of Applied Accounting and Taxation*, 3(1), 50–55.
- Saraswatia, T., & Bernawatib, Y. (2020). The Effect of Cash Conversion Cycle and Firm Size on the Profitability of Manufacturing Companies. In *International Journal*

- of Innovation, Creativity and Change.
- Shah, N. (2016). Impact of Working Capital Management on Firm's Profitability in Different Business Cycles: Evidence from Pakistan. *Journal of Finance & Economics Research*, 1(1), 58–70.
- Sharma, A. K., & Kumar, S. (2011). Effect of Working Capital Management on Firm Profitability: Empirical evidence from India. *Global Business Review*, 12(1), 159–173.
- Sugathadasa, D. D. K. (2018). The Relationship between Cash Conversion Cycle and Firm Profitability: Special Reference to Manufacturing Companies in Colombo Stock Exchange. *Journal of Economics and Finance*, 6, 38–47.
- Telly, B. R., & Muslim Ansori. (2019). Effect of Size and Cash Conversion Cycle on Company Profitability. *Journal of Applied Managerial Accounting*, 3(1), 155–165.
- Tsagem, M. M., Aripin, N., & Ishak, R. (2018). Cash Conversion Cycle and Profitability of Nigerian Small and Medium-sized Entities: An Empirical Analysis. *International Journal of Banking and Finance*, 13(1), 49–69.
- Yazdanfar, D., & Öhman, P. (2014). The Impact of Cash Conversion Cycle on Firm Profitability. *International Journal of Managerial Finance*.
- Yilmaz, I., & Acar, G. (2019). The Effect of Cash Conversion Cycle on Profitability in Omani Companies. *International Journal of Economics, Management and Accounting*, 27(2), 269–290.
- Zakari, M., & Saidu, S. (2016). The Impact of Cash Conversion Cycle on Firm Profitability: Evidence from Nigerian listed Telecommunication Companies. *Journal of Finance and Ac*

Inventory Management and Its Impact on the Firm Performance

Heba Srour*

heba.srour@fue.edu.eg

Ahmed Azmy†

ahmed.Zaky@fue.edu.eg

Abstract:

Inventory management is a challenging area so this study will illustrate the ways of managing inventory. The main aim of this study is to examine the impact of inventory management which will be measured by inventory turnover on firm's performance which will be measured by firm's profitability using return on assets and return on equity. The data was collected from the Egyptian stock exchange market. The analysis of this study was done using (Eviews 12) for both descriptive statistics and multiple regression. The results of this study indicate that there is a positive correlation between inventory turnover and Return on assets ($R^2=0.769321$) and also with Return on Equity ($R^2=0.669593$) which were found to be statistically significant at 5% level.

Keywords: Inventory management - Inventory turnover - Firm performance - Profitability.

* Assistance Professor, Faculty of Commerce and Business Administration - Future University in Egypt

† Associate Professor, Faculty of Commerce and Business Administration - Future University in Egypt

Introduction

Inventory management is critical in the financial performance of a business since it is at the top rank in the most valuable physical assets in the balance sheet. For this reason, inventory management should be well managed and apply replenishment rules for each item such as the strategies that will be mentioned. The right stock should be available in the right place and in the right quantity, acquired at the lowest price possible. Stock-outs mostly occur when there is demand in the market and there is little stock for fast selling items, which would lead to lost sales and customer loyalty. High stock in the company than needed leads to higher storage costs, handling costs and interests from the short-term borrowings. Eventually when selling, a loss can be experienced once materials are sold at a lower price than normal. The main goal of inventory management is minimizing total inventory costs and maximizing profits in operations. Many cases have been experienced where inventory management and inventory planning decisions have been effective with the assistance also of inventory planning models developed and implemented. A balance has to be achieved between costs of acquiring and that of holding inventory as they are the ones that significantly affect the company's' profitability. The inventory management systems make specifications on the order quantity and re-order point with the intention to make profits. Economic order quantity (EOQ) should be ordered at once which then affects the inventory ordering and holding cost. This will have an effect on the profitability of the company. That is if few large orders are made, annual ordering costs tend to be lower, but the annual holding costs are high. Conversely, frequent small orders increase the ordering costs, but holding costs tend to be lower. Hence for a company to be profitable there is needed to increase the order size and obtain volume discounts and off-set by lowering holding costs. Profitability of a company would be achieved at optimum level of relevant costs which are holding and ordering costs.

Inventory is a vital part of current assets mainly in manufacturing concerns. Huge funds are committed to inventories as to ensure smooth flow of production and to meet consumer demand. However, maintaining inventory also involves holding or carrying costs along with opportunity cost. Therefore, Inventory management plays a crucial role in balancing the benefits and disadvantages associated with holding inventory. Efficient and effective inventory management goes a long way in successful running and survival of a business firm, when organizations fail to manage their inventory effectively they are bound to experience, stock out, the decline in productivity and profitability, customer dissatisfaction. Thus the study seeks to investigate the effect of inventory management on the organizational performance of the selected manufacturing firms. The main aim of this research

is to examine empirically the relation between inventory management and financial performance in Egypt companies for the period ranging from 2013 to 2021.

Research problem and question:

The paramount matter of the operation management literature for last two decades has to seek the operations excellence in the organizations.

The firms who applied all the techniques which will be mentioned later to enhance the efficiency and effectiveness of their operations achieved better market share, profitability and products of better and superior quality. This study is inspired to seek support for this hypothesis to visualize results of enhancing the inventory management. Plethora of research has been perpetrated to estimate the influence of performance of inventory management over financial performance has been carried out in developed markets and developed economies. Our study aims to augment the evidence of inventory management on firm performance in a developing market environment. (Nawaz et al., 2016) proved that the profit is one of the main goals of the establishment of every business entity. Without profit, the company cannot fulfill other objectives, namely concerning corporate social responsibility.

Profit which is the company's main goal can be achieved by selling goods or services. The greater the sales volume of goods and services, the greater the profit generated by the company. The business that is often carried out by companies to increase profitability is to increase inventory sales so that inventory turnover also increases. Inventory is one of the most important asset posts because inventory is a post of current assets which is of considerable value. The higher the turnover of the inventory, the higher the cost which can be suppressed so that the greater the profitability of a company. Conversely, if the slower turnover of the inventory, the smaller the profit gain. (Nasution, 2020). However, Inventory that is well managed can have some great impact on the profits of a company due to the ability of the company to recognize areas for reducing the cost of storage of stock and ensure that there is a smooth flow in production activities (Cheung et al., 2004). Bourne and (Walter, 2005) state that there is a direct relationship between proper management of inventory and the performance of a company (Abrams et al., 2005; Marota, 2017). When companies practice inadequate inventory management techniques it is obvious that the result there is an increase in waste due to the increase in the cost of storing inventory and the pronounced risk of exposing the inventory to damages or losses (Lwiki et al., 2013).

Therefore, effective performance can be achieved if companies can develop strategies for attaining the maximum possible revenue within the minimum cost.

(Aljaaidi & Bagais, 2020). Effective inventory management allows an organization to meet or exceed customer expectations by creating stocks of each product that maximize net income. Corporate policy that promotes efficient inventory management is the first component of successful inventory management (Waddock & Graves, 1997). A study conducted in Kenya by (V.W. & Namusonge, 2015) identified that inventory management affects competitive advantage of manufacturing firms. The same study further concludes that the firm is able to compete based on quality and delivery of customer orders on time. Competitive advantage comprises capabilities that allow an organization to differentiate itself from its competitors and is an outcome of critical management decisions (Li et al., 2006).

The relation between inventory management and firm performance affect the inventory management decision. Most previously Researches were held in developed countries. However, limited Research was held in emerging firms. Emerging firms have different characteristics such as different political, economic and institutional conditions in general in Egyptian setting in specific to investigate the effect of Inventory management on firm performance in financial sector, although research problem can be summarized in the following question: Does inventory management has an impact on firm performance?

Research Hypotheses:

It's based on traditional method theory. The study predicts that inventory turnover negatively affects return on equity (ROE) and return on assets (ROA).

The following hypothesis is:

H1. Inventory Turnover has positive effect on ROE.

H2. Inventory Turnover has positive effect on ROA.

Literature review:

(Liu et al., 2020) this paper investigated the effect of firm-level operating flexibility on stock performance during the COVID-19 outbreak in China. The researchers used all the Chinese A-share listed companies on the Shanghai and Shenzhen stock exchanges as initial samples. All data and variables are obtained from the China Stock Market & Accounting Research database. The relevant financial data are calculated using the reports for the third quarter of 2019. The firm level operating flexibility was measured by firm level inflexibility and the stock performance was measured by ROS. Coming up that the sudden outbreak of COVID-19 has seriously affected the normal production and operating activities of firms and has induced a massive shock on financial markets, finding that firms with high operating flexibility have better stock performance than those with lower operating flexibility because of the risk hedge value of contraction

options embedded in firm operating flexibility. (Karki, 2020) examined the effect of inventory management on profitability in Nepal. Listed in Kathmandu from 2071 fiscal year to 2075 fiscal year. The secondary data had been collected from the annual financial statements using regression technique considering statistical patterns Minitab 16 version to analyze the data and also finished goods inventory values were identified and employed as independent variables while net income was employed as proxy of profitability. Concluded that there is a positive impact of inventory management upon the profitability of uniliver Nepal. (Nasution, 2020) determined the effect of inventory turnover on profitability in automotive companies listed on Indonesia stock Exchange from 2015-2017. Profitability is measured by Return on Assets (ROA) which was the dependent variable. The data used are the financial statements of each sample company, which are obtained through ICMD (Indonesia Capital Market Directory) The analytical method used in this study is a quantitative method The variables of this study are inventory turnover, and Return On Assets with a total sample per year of 18 companies. The results of this study are inventory turnover has a negative effect on Return on Assets. (Aljaaidi & Bagais, 2020) investigated the association between Days Inventory Outstanding (DIO) and firm performance of energy industry in Saudi Arabia, from 2013-2019. The sample comprises of 21 firm year observations. Firm performance was measured by 2 dependent variables ROA and ROE. The Regression results indicated that DIO was negatively associated with firm performance. (Vikas & Sandeep Malik, 2020) examined the effect of a well-managed inventory on a manufacturing company as well as to enhance the performance of inventory management in an organization and to reduce risk those are facing inventory management. Data used were collected through personal interviews, discussion with Finance-Executive and from the company for the past years since 2014-2019. This paper used ABC analysis and economic order quantity (EOQ) to test the effect. Therefore, implementing advanced inventory management always sounds good in theory, in practice, the balance of cost and benefit should be considered. (Golas & Bieniasz, 2016) determined the effect of inventory management on profitability. Listed in Poland from 2005 to 2017. The method that was used in this study is inventory-performance relationship analysis and the regression models (INVIC, RMIC, WIPC, and FGIC) were measured by ROA. As a conclusion for this study was that the day's sales of inventory for total stocks tended to become shorter due to reduction in the days in inventory ratio for materials and finished products also the improvement that was found in inventory management efficiency was positively correlated with financial performance. (Nugroho et al., 2020) investigated the association among supply chain management (SCM), just in time and quality management and also their

impact on organizational performance. 650 questionnaires have been received from the 2780 questionnaires sent to the different corporations in Indonesia. Corporations lie in the range of 100 to 2000 workforces and the median is 100 personnel. Further to check reliability analysis was conducted by making use of Cronbach's Alpha in order to make sure that components used to operationalize just-in-time, total quality management, supply chain management and performance were evaluated to check that the components are from statistical errors. Recognizing SC collaborations is not just an emphasis on quality but also a primary factor of FP. Either through cooperation and assimilation of operations across the SC or by the acknowledgement of the skills of direct manufacturers, recognizing the aspects of the SC has a positive effect on FP. Moreover, policymakers should focus on the encouragement of the firms to introduce efficient manufacturing through JIT and TQM to improve performance from all aspects. (Khan et al., 2019) investigated the effect of various inventory management factors on firm's efficiency. These factors included capacity utilization, inventory accuracy, lean inventory, and stock availability. Firm's efficiency was measured by firm performance and profitability. Data was collected by questionnaire from 250 individuals from different departmental stores in Karachi in Pakistan. Data was analyzed using structural equation modeling. The results showed inventory accuracy, lean inventory, and stock availability has positive and significant impact on efficiency. However, Capacity Utilization doesn't seem to affect efficiency. Stock availability can lead to effective inventory management. (Opoku et al., 2020) examined the effect of different inventory management practices on the operational performance of manufacturing firms. Listed in Ghana between 2019 and 2020. The methods used in the study included: research design and approach, population and sample size, data collection instrument, validity and reliability of data collection instrument and data processing and analysis. The variables that was used in the study are: SPP, ABC, VMI, EOQ, and MRP AND JIT. The study concluded that any unit increase in any of the practices would lead to significant and positive unit increase in operational performance of the firm's studied. (George, 2019) analyzed whether the inventory management has any direct impact on the net profits of the company. Inventory management was measured by inventory conversion cycle and inventory turnover ratio; net profits measured the firm performance. Five years' financial data of five selected companies were considered for the study. Tools such as ratio analysis, trend analysis and correlation analysis have been used for analyzing the data. The study showed that inventory conversion cycle is directly related to the net profits of the company. (Eveline et al., 2019) investigated the effect of SAP on inventory management which recommended using SAP appropriately in managing their procurements for an efficient

operation. Also recommended EOQ as an important technique in inventory management that firms should be ensured to order the recommended lot size of as determined by the EOQ. (Mulandi & Ismail, 2019) investigated the effect of inventory management practices on performance of commercial state corporations. Listed in Kenya between 2016 and 2019. The specific objectives were used to determine the effect of just-in-time inventory system on performance of commercial state corporations. The variables of the study included IT based system: JIT, VMI, and ERP system of managing inventories techniques of forecasting demand. Concluded from this research that MRP has positive and significant relationship with performance of commercial State Corporation. (Qu et al., 2019) investigated the effect of inventory management factors on technical universities. These factors were made up of accuracy, capacity, investment, shrinkage, performance and turnover. Data was collected by the use of Likert scale questionnaire from 399 various units in the technical universities in Ghana. The Smart PLS was employed to analyze the data. A well-organized inventory control system does not deal in the same way with all products, but it applies methods of control and analysis in agreement with the economic importance related to each of the product. Inventory management derives from the importance of stock for the company, and therefore, the need to manage and control them is essential to maintain a level of inventory that allows at a minimum cost and maximum service to customers. The basic reasons for inventory management are: protect against uncertainties, allow production and purchase under economically advantageous conditions, cover anticipated changes in demand and supply and maintain transit between production and storage points. H1: There is a direct significant relations H2: There is a direct relationship between inventory turnover and organizational performance H3: There is a direct relationship between inventory accuracy and organizational performance H4: There is a direct relationship between inventory shrinkage and organizational performance H5: There is a negative relationship between inventory investment and organizational capacity H6: There is a negative relationship between inventory turnover and organization capacity. H7: There is a negative relationship between inventory accuracy and organizational capacity. H8: There is a positive relationship between inventory shrinkage and organizational capacity. (Atnafu & Balda, 2020) aimed to examine the impact of inventory management practice on firms' competitiveness (price, quality and delivery) and organizational performance. Data for the study were collected from 188 micro and small enterprises (MSEs) operating in the manufacturing sub-sector in Ethiopia and the relationships and hypothesis proposed in the conceptual framework were tested using structural equation modeling (SEM). Inventory management was measured

by ABC, EOQ, JIT and vendor managed inventory. Firm performance was measured by profitability, level of output, cost efficiency and market share. The results indicate that higher levels of inventory management practice can lead to an enhanced competitive advantage and improved organizational performance. Also, competitive advantage can have a direct, positive impact on organizational performance. (Riza et al., 2016) tested inventory turnover (IT) as a performance measure in manufacturing processes because IT ratios are critical in the manufacturing industry and publicly available objective measures. Using the data of 421 manufacturing companies in Korea from 2010 to 2018, it conducted an extensive analysis of the factors affecting it by segment and its correlation with other financial ratios. They Compared performances between the top and bottom companies determined by Altman's Z score approach.it found that, for the overall manufacturing industry, IT ratios were negatively correlated with gross margin and debt cost, but positively correlated with capital intensity, although the results varied by segment. (Sunday & Joseph, 2017) examined the inventory management on SME's profitability. Listed in Nigeria. Descriptive research design and stratified random sampling methods were used to investigate the study and also multiple regression analysis was used to test the model established using these variables: profitability (PFT), inventory turnover (IT), inventory conversion period (ICP) and inventory leanness (ILN). They found that the inventory turnover had a positive relationship with the financial performance of SME's and also found that there was a negative relationship between inventory leanness and profitability. (Thai & Jie, 2018) investigated the influences of total quality management (TQM) and supply chain integration (SCI) practices on firm performance (FP) of container shipping industry in Singapore. Methodology used was survey it was conducted with 159 container shipping companies in Singapore to examine the interrelationships between SCI and TQM practices and FP. The results suggested that both TQM and SCI practices have positive effects on service quality and FP but at different extents, while TQM also contributes positively to SCI. (Elking et al., 2017) investigated the impact of focal firm and supplier financial dependence on focal firm financial performance using the lens of resource dependence theory. Listed in United States of America. They used an innovative supply chain structure data set provided by Bloomberg, which allows implementation of unique measures for focal firm and supplier financial dependence within a supply chain Focal firm financial dependence is calculated by identifying the percentage of the focal firm's cost of goods sold spent with each supplier in 2012. Taking a sample of 3,638 buyer-supplier relationships in the U.S. manufacturing firms that are presented in both Composted and Bloomberg's SPLC supply chain database module during 2012. Their analysis found that both buyer and supplier financial dependence impact a buyer firm's

financial performance. Specifically, they found that higher levels of buyer dependence on supply chain partners negatively affect the financial performance of the focal firm, while supplier dependence on the focal firm positively affects the financial performance of the focal firm. Interestingly, they found that the buyer's dependence has a much greater magnitude of impact than the suppliers' dependence. (Golas & Bieniasz, 2016) determined the relationships between the results of inventory management and the financial performance of enterprises. Listed in Poland between 2005 and 2010. The research was based on the econometric analysis of the influence of the length of inventory cycles on financial performance of branches measured with return on sales, assets and equity, although the effectiveness of inventory management was measured with the length of inventory cycles. Regression analysis was applied to determine the strength and direction of the influence of the results of inventory management, measured with the length of cycles. Concluding from this research that the inventory management was directly correlated with financial effectiveness of enterprises and it should be subject to optimization. (Elzamly et al., 2019) examined the relationship between inventory management and company's performance. Listed in Malaysia between 2008 and 2012. The relationship was determined based on inventory days and return on asset (ROA) analysis, and inventories days can be defined as to measure how many days on average it takes for the inventory to turnover and also they made sure that the cost of over or under stocks are always low. Concluded that the company had a few inventory problems such as unorganized inventory arrangement, large amount of inventory days / no cycle counting and no accurate records balance due to unskilled workers and also proved that there was a significant relationship between return on asset (ROA) and inventory days. (Nawaz et al., 2016) empirically evaluated the impact of inventory performance on firm performance in Pakistan for non-financial firms listed on KSE-100 index for the period 2010-2014. Correlation indicated that firm performance was measured by ROA and ROE and both have weak positive relationship with Inventory turnover ratio which measured inventory performance. ROE has a positive weak relationship with Inventory turnover, total assets and Leverage ratio. Total Asset has positive impact and Financial Leverage has significant negative impact on ROA. Inventory performance has positive impact on ROE significantly and Total Asset has positive impact and FLR has significant negative impact on ROE. (Prempeh, 2015) evaluated the impact of efficient inventory management on the profitability of manufacturing firms in Ghana. A cross sectional data from 2004 to 2014 was gathered for the analysis from the annual reports of four manufacturing firms listed on the Ghana Stock Exchange. Financial performance was measured by return on assets. And the

Measures of profitability were examined and related to proxies for efficient inventory management by manufacturers. The study revealed that the main variable raw materials inventory management designed to capture the effect of efficient management of raw material inventory by a company on its profitability is significantly strong and positive and impacts on the profitability of the manufacturing firms in Ghana. (Lwiki et al., 2013) examined the impact of inventory management practices on the financial performance of sugar manufacturing firms in Kenya. The research survey was conducted in all the eight operating sugar manufacturing firms from the period 2002- 2007. The primary data was collected using structured and semi- structured questionnaires administered to key informants in the organizations. Secondary data was obtained from annual financial performance statements available in the year Book sugar statistics. Descriptive statistics was used to test the impact of inventory management practices and Correlation analysis was used to determine the nature and magnitude of the relationship among inventory management variables. The results indicate that there exists a positive correlation between inventory management and financial performance which was measured by Return on Sales and with Return on Equity. (Panigrahi, 2013) examined the relationship between inventory conversion period & firms profitability. The dependent variable, gross operating profit is used as a measure of profitability & the relation between inventory management & profitability is investigated for a sample of five top Indian cement companies over a period from 2001-2010. This study employs regression analysis to determine the impact of inventory conversion period over gross operation profit taking current ratios. The relation between firm size & production was positive so as firm size increases profitability increases. The relative between current ratio & GOP was negative. (Sahari et al., 2012) this study empirically examined the relationship between inventory management and firm performance and capital intensity on a sample of financial data for 82 construction firms in Malaysia for the period 2006–2010. By employing regression and correlation techniques. Inventory management is measured by JIT and inventory days' techniques, firm performances measured by ROA. It was found that inventory management is positively correlated with firm performance. In addition, the results indicate that there is a positive relationship between inventory management.

According to our literature review that was constructed from the previous studies, we concluded that 56% of the articles estimated the relationship between inventory management and firm performance including only one negative relationship which was examined by (Aljaaidi & Bagais, 2020). Also we found that 28% of the articles estimated the relationship between inventory management and profitability we conducted that the ratio of negative relationships to positive

relationships is 2:4. The remaining percentage is 16% which belongs to the impact of inventory management on financial performance which was the least percentage. According to the previous percentage, the impact of inventory management on financial performance is the most suitable topic to be examined in our research.

Data Analysis:

The analysis was done for both descriptive statistics and multiple regression models using the (Eviews 12). The first section presents the descriptive statistics for some selected variables which are: the minimum (Min), maximum (Max), mean (M), standard deviation (SD), and coefficient of variation (CV). In the second section, we provided guidelines for reporting the results of hypothesis testing using the multiple linear regression analysis including regression coefficients and coefficient of determination and that was carried out by investigating the effect of Debt to Assets Ratio, Inventory Turnover, log assets on ROA, and ROE.

Descriptive Statistics

Some descriptive statistics for the selected variables were calculated and reported in table (1). These statistics are the minimum (Min), maximum (Max), mean (M), standard deviation (SD), and coefficient of variation (CV).

Table (1): Descriptive statistic for the selected variables

Variable	Symb.	Min	Max	Mean	SD	CV
<i>ROE</i>	Y1	0	0.55	0.2395	0.14397	60.11%
<i>ROA</i>	Y2	0	0.28	0.1233	0.08396	68.09%
<i>Debt To Assets Ratio</i>	X1	0.02	0.86	0.3678	0.25421	69.12%
<i>Inventory Turnover</i>	X2	0.1	9.86	4.3193	3.22836	74.74%
<i>Log Assets</i>	X3	16.47	23.78	20.7621	1.62268	8.13%

The basic descriptive statistics for the dependent variables were as follows: for “*ROE*” we have ($M = 0.2395, SD = 0.14397, CV = 60.11\%$), and for the “*ROA*” we have ($M = 0.1233, SD = 0.08396, CV = 68.09\%$). The descriptive statistics for the independent variables were as follows: for “*Debt To Assets Ratio*” we have ($M = 0.3678, SD = 0.25421, CV = 69.12\%$), for “*Inventory Turnover*” we have ($M = 4.3193, SD = 3.22836, CV = 74.74\%$), and for the “*Log Assets*” we have ($M = 20.76, SD = 1.623, CV = 8.13\%$).

Regression Analysis

Researchers provided guidelines for evaluating and reporting results of hypothesis testing, including regression coefficients and coefficient of

determination (R^2). Regression coefficients refer to the estimates of the relationships between the model's constructs. Those coefficients range from +1 to -1, where +1 means a strong positive relationship, 0 means a weak or non-existence relationship, and -1 means a strong negative relationship. Coefficient of determination (R^2) refers to the effect of independent variables on the dependent variables which is one of the quality measures of the regression model. R^2 Estimates vary from 0 to 1, in which 0 means low explained variance and 1 means high explained variance.

First Hypothesis: Effect of Debt to Assets Ratio, Inventory Turnover, and log of Assets on ROE

The multiple linear regression analysis was carried out to investigate the effect of Debt to Assets Ratio (X_1), Inventory Turnover (X_2), and log of Assets (X_3) on ROE. The regression equation to be estimated is as follows:

$$ROE = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + u_i$$

The value of F-statistic, which measures the common importance of the explanatory variables, is statistically significant at the 5% level, according to the corresponding value of probability 0.000007. Results show that the coefficient inventory turnover is statistically significant at the 5% level with a probability of 0.0000 and implies a positive correlation between the variables. Keeping all other coefficients constant, an increase of 1 unit in the variable inventory turnover will lead to an increase in the variable ROE by 0.040295 units.

Table (1): Results of the first hypothesis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DEBT TO ASSETS RATIO	0.062484	0.082965	0.4597	0.4597
INVENTORY TURNOVER	0.040295	0.006501	0.0000	0.0000
LOGASSETS	0.002799	0.024134	0.9088	0.9088
C	0.017259	0.219296	0.9380	0.9380
R-squared	0.710894	Mean dependent var		0.239520
Adjusted R-squared	0.669593	S.D. dependent var		0.143972
S.E. of regression	0.082757	Akaike info criterion		-2.000172
Sum squared resid	0.143823	Schwarz criterion		-1.805152
Log likelihood	29.00216	Hannan-Quinn criter.		-1.946082
F-statistic	17.21257	Durbin-Watson stat		1.731626
Prob (F-statistic)	0.000007			

The regression analysis shows that the probability of both debts to assets ratio coefficient and log assets is 0.4597 and 0.9088 respectively. Based on the fact that the level of significance is 5 percent, a probability greater than 5 % indicates

that the two variables are not statistically significant. *Adjusted R²* 0.669593 (66.96%) suggests that 67% of the total variation in ROE is explained by the variations in the independent variables. In conclusion the results of the regression analysis show that the correlation between ROE and both debt to assets ratio coefficient and log assets is statistically insignificant and the correlation between ROE and inventory turnover is significant statistically and this correlation is positive.

Second Hypothesis: Effect of Debt to Assets Ratio, Inventory Turnover, and log of Assets on ROA

The multiple linear regression analysis was carried out to investigate the effect of Debt to Assets Ratio (X_1), Inventory Turnover (X_2), and log of Assets (X_3) on ROA. The regression equation to be estimated is as follows:

$$ROA = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + u_i$$

The value of F-statistic, which measures the common importance of the explanatory variables, is statistically significant at the 5% level, according to the corresponding value of probability 0.000000. Results show that the coefficient inventory turnover is statistically significant at the 5% level with a probability of 0.0000 and implies a positive correlation between the variables. Keeping all other coefficients constant, an increase of 1 unit in the variable inventory turnover will lead to an increase in the variable ROA by 0.020784 units.

Table (2): Results of the second hypothesis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DEBT TO ASSETS RATIO	-0.047835	0.040426	1.183272	0.2499
INVENTORY TURNOVER	0.020784	0.003168	6.561414	0.0000
LOGASSETS	0.008142	0.011760	0.692368	0.4963
C	-0.022342	0.106855	0.209084	0.8364
R-squared	0.798156	Mean dependent var		0.123256
Adjusted R-squared	0.769321	S.D. dependent var		0.083958
S.E. of regression	0.040324	Akaike info criterion		-3.438073
Sum squared resid	0.034147	Schwarz criterion		-3.243053
Log likelihood	46.97592	Hannan-Quinn criter.		-3.383983
F-statistic	27.68029	Durbin-Watson stat		1.558140
Prob (F-statistic)	0.000000			

The regression analysis shows that the probability of both debts to assets ratio coefficient and log assets are 0.2499 and 0.4963 respectively. Based on the fact

that the level of significance is 5 percent, a probability greater than 5 % indicates that the two variables are not statistically significant. *Adjusted R²* 0.769321 (76.93%) suggests that 77% of the total variation in ROA is explained by the variations in the independent variables. In conclusion the results of the regression analysis show that the correlation between ROA and both debt to assets ratio coefficient and log assets is statistically insignificant and the correlation between ROA and inventory turnover is significant statistically and this correlation is positive.

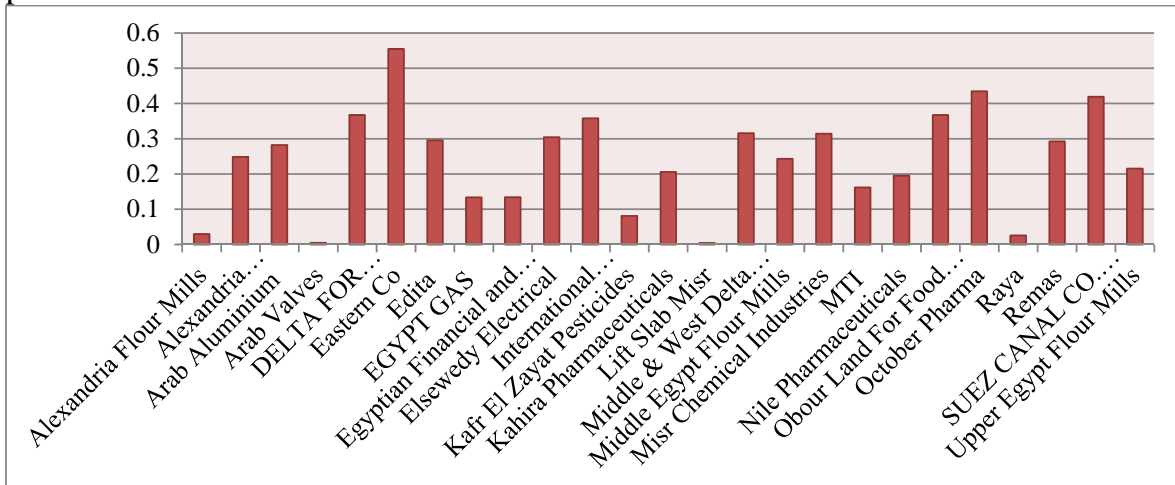


Figure (1): Bar chart for ROE for the selected companies

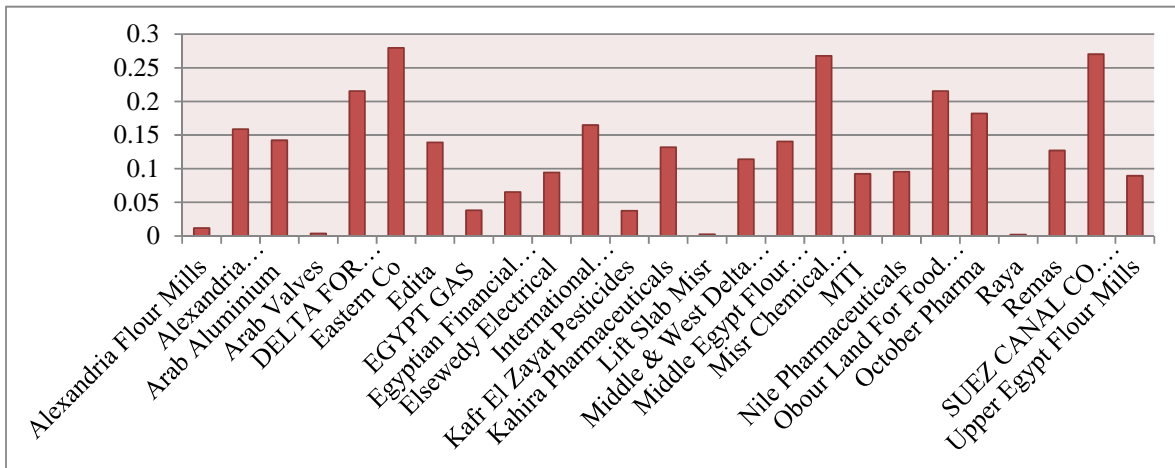


Figure (2): Bar chart for ROA for the selected companies

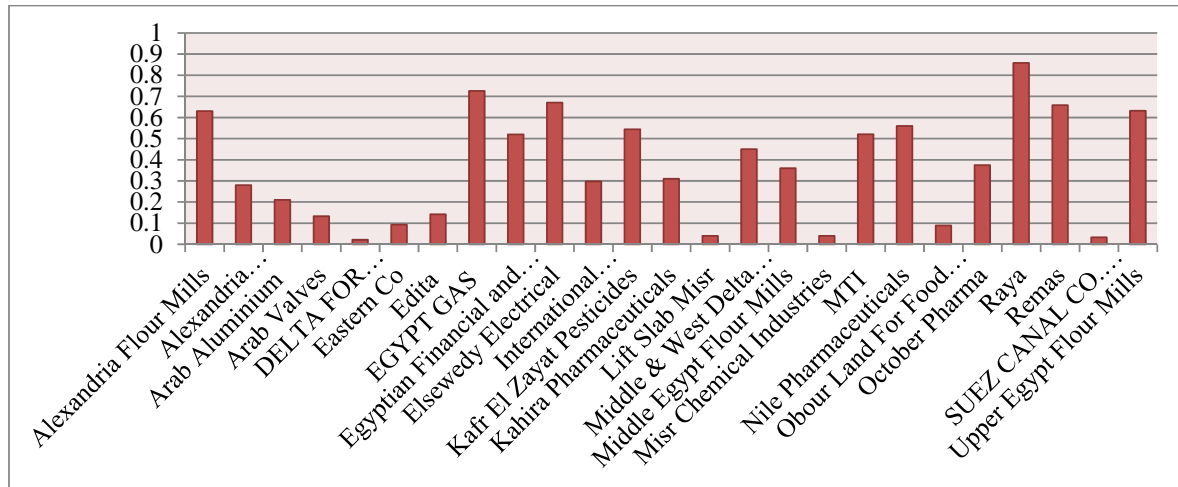


Figure (3): Bar chart for debt to assets ratio for the selected companies

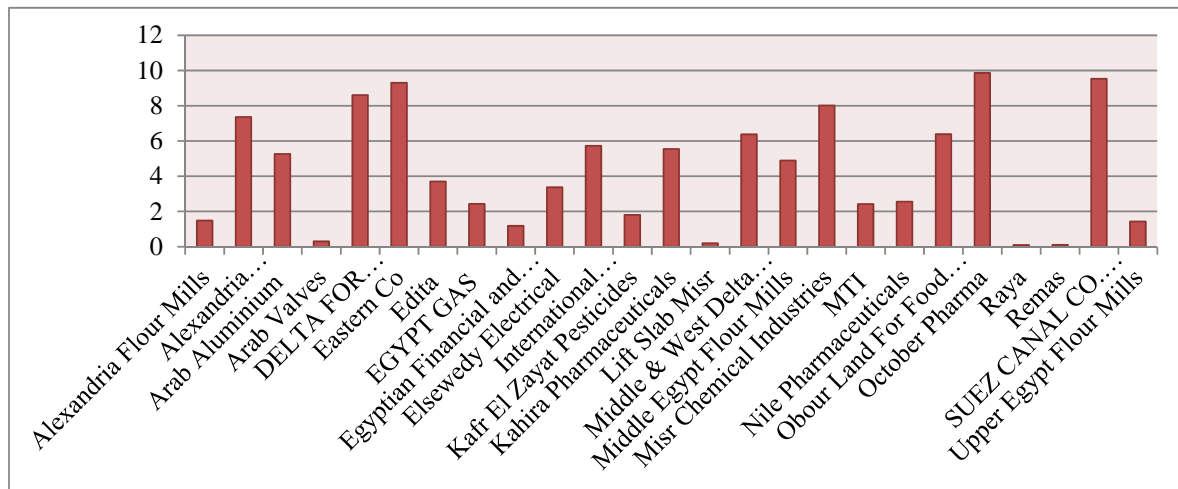


Figure (4): Bar chart for inventory turnover for the selected companies

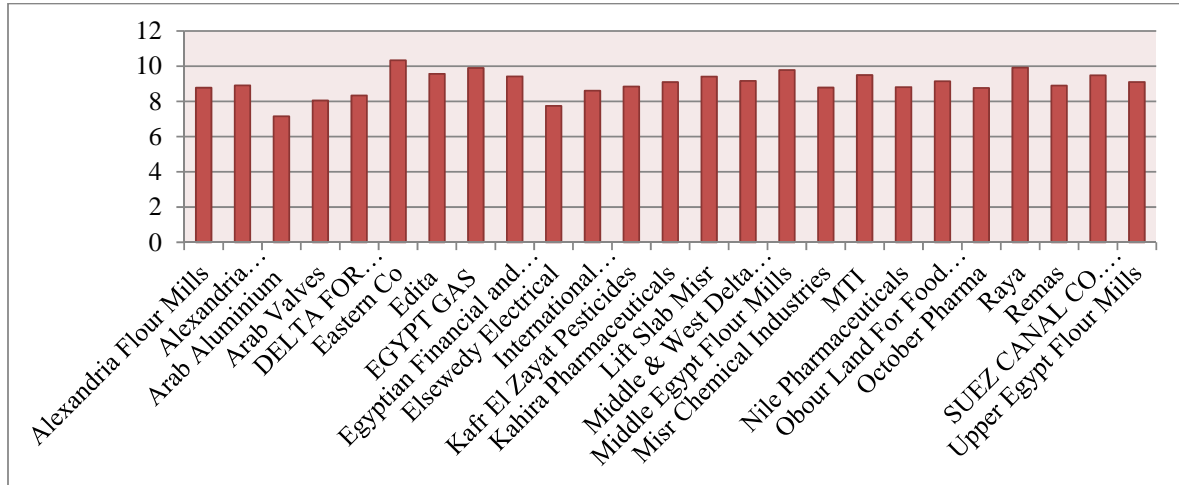


Figure (5): Bar chart for Log Assets for the selected companies

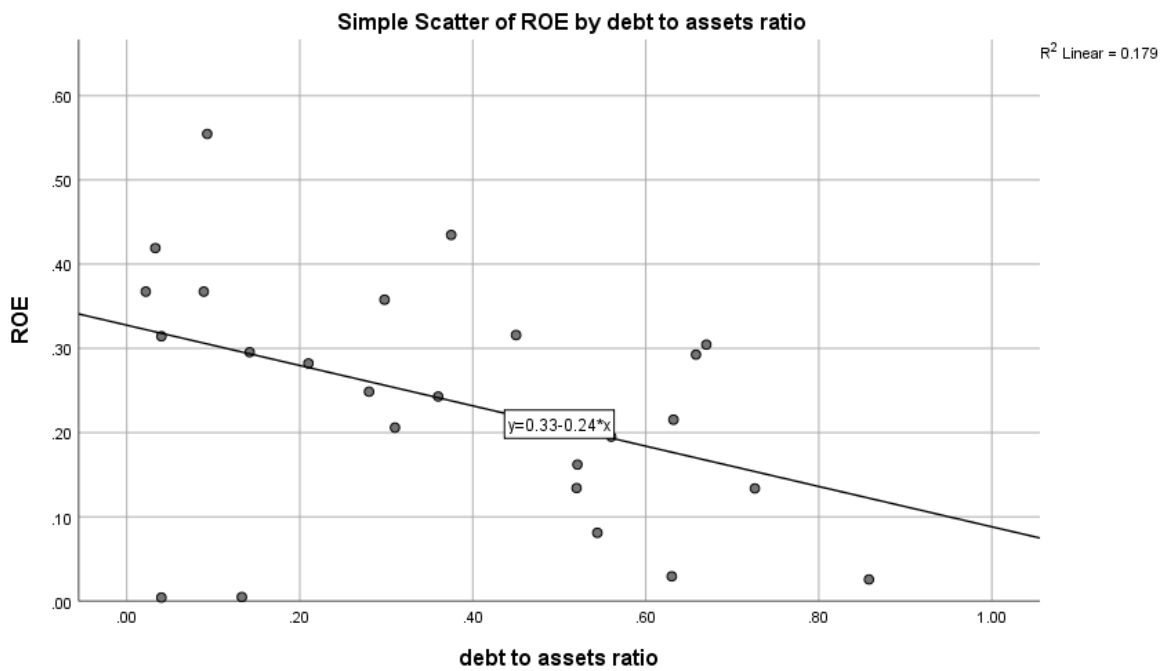


Figure (6): Scatter plot for the relationship between ROE and debt to assets ratio

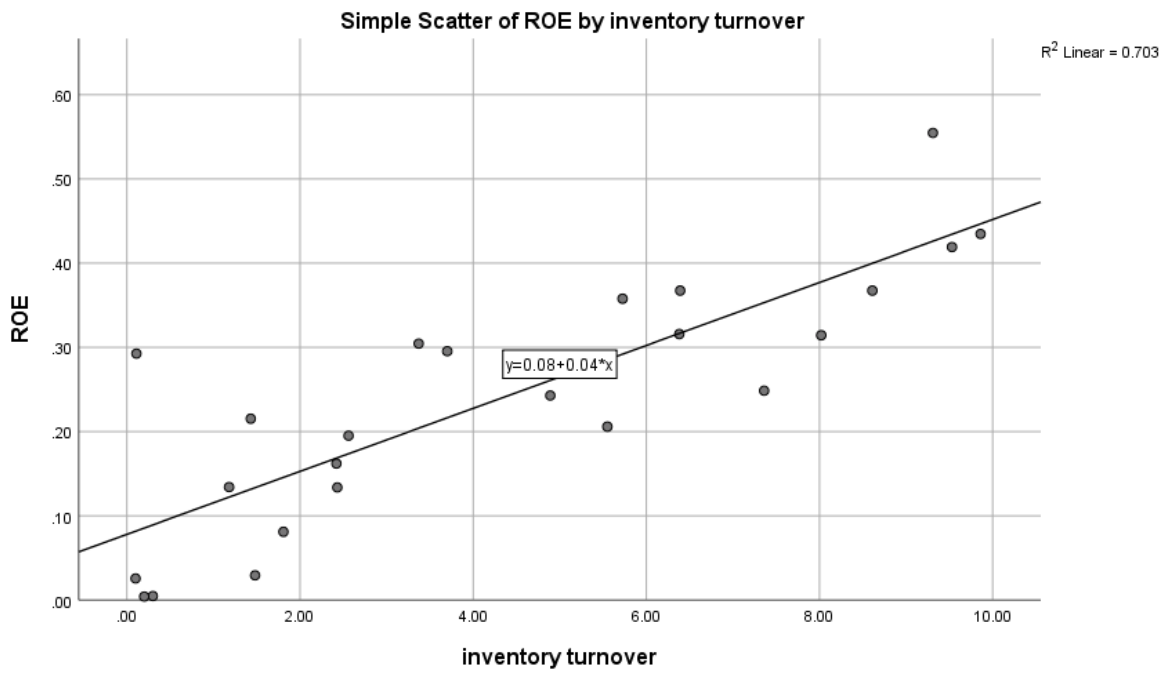


Figure (7): Scatter plot for the relationship between ROE and inventory turnover

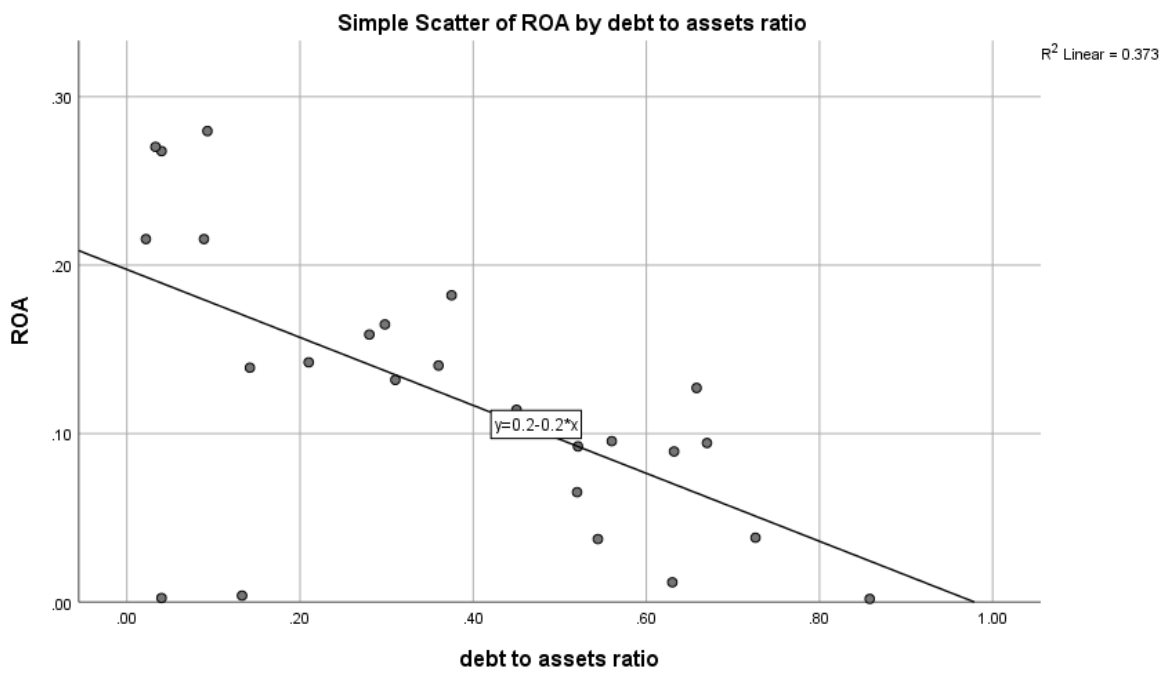


Figure (8): Scatter plot for the relationship between ROA and debt to assets ratio

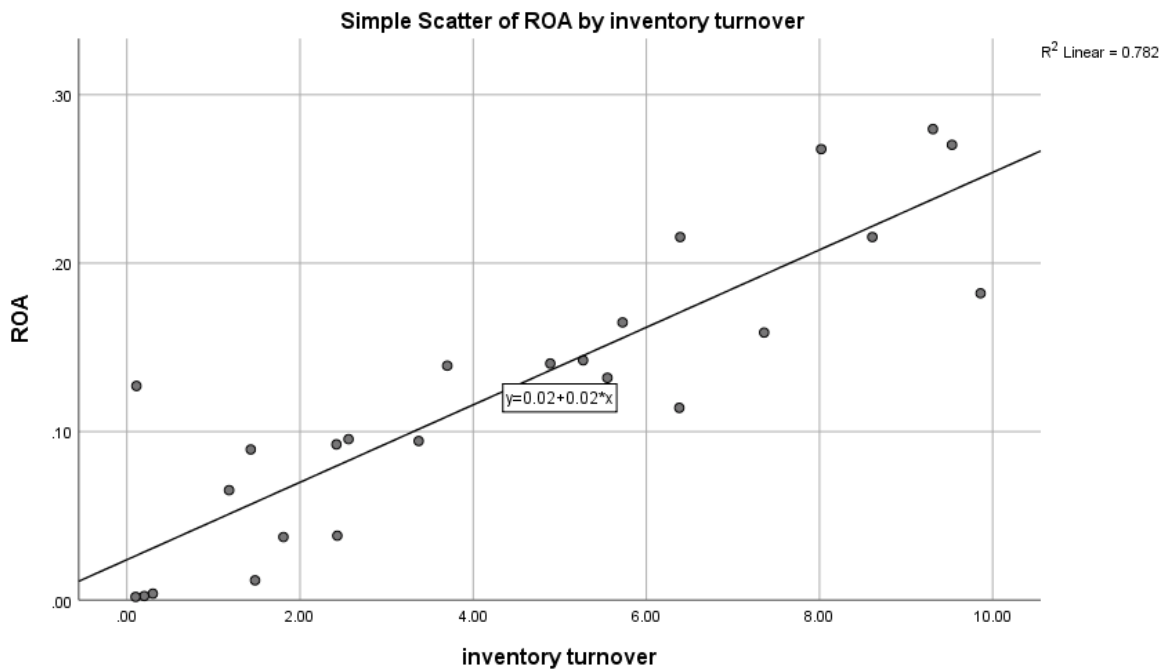


Figure (9): Scatter plot for the relationship between ROA and inventory turnover

Conclusion

After investigating the statistics of both descriptive and multiple regression models, the data analysis showed that we have two dependent variables: ROE and ROA (Y1/Y2) respectively and three independent variables: debt to assets ratio, inventory turnover and long assets (X1/X2/X3) respectively. The value of F-statistic that measures the common importance of the explanatory variables is statistically significant at the 5% level according to the corresponding value of probability 0.000007. Results show that the coefficient inventory turnover is statistically significant at the 5% level with a probability of 0.000007 and implies a positive correlation between the variables. Keeping all other coefficients constant, an increase of 1 unit in the inventory turnover variable will lead to an increase in the ROE variable by 0.040295 units and an increase in the ROA variable by 0.020784 units. Concluding that the results of the regression analysis show that the correlation of the dependent variables; ROA and ROE with both coefficient of debt to assets ratio and log assets is statistically insignificant and the correlation between these dependent variables and inventory turnover is statistically significant and correlation is positive.

According to these results, we proved that our hypothesis fully accomplishes our estimations which were:

H1. Inventory Turnover has positive effect on ROE.

H2. Inventory Turnover has positive effect on ROA.

Since we came up with these positive relations, then the answer of our question

which was “Does the inventory management have an impact on firm performance?” is yes inventory management which was measured by inventory turnover, has positive impact on firm performance which was measured by ROA and ROE using the control variables log assets and debt to assets ratio.

References

- Abrams, K. R., Gillies, C. L., & Lambert, P. C. (2005). Meta-analysis of Heterogeneously Reported Trials Assessing Change from Baseline. *Statistics in Medicine*, 24(24), 3823–3844. <https://doi.org/10.1002/SIM.2423>
- Aljaaidi, K., & Bagais, O. (2020). Days Inventory Outstanding and Firm Performance: Empirical Investigation from Manufacturers. *Accounting*, 6(6), 1111–1116.
- Atnafu, D., & Balda, A. (2020). The Impact of Inventory Management Practice on Firms’ Competitiveness and Organizational Performance: Empirical Evidence from Micro and Small Enterprises in Ethiopia. *Cogent Business & Management*, 5(1), 1503219.
- Cheung, S. O., Suen, H. C. H., & Cheung, K. K. W. (2004). PPMS: A Web-based Construction Project Performance Monitoring System. *Automation in Construction*, 13(3), 361–376. <https://doi.org/10.1016/J.AUTCON.2003.12.001>
- Elking, I., Paraskevas, J.-P., Grimm, C., Corsi, T., & Steven, A. (2017). Financial Dependence, Lean Inventory Strategy, and Firm Performance. *Journal of Supply Chain Management*, 53(2), 22–38. <https://doi.org/10.1111/JSCM.12136>
- Elzamly, abdelrafe and Messabia, Nabil and Doheir, Mohamed and Mahmoud, Ahmed and Bin Hasan Basari, Abd Samad and Abu Selmiya, N. and S. A. A., Nizar and Sayed, & Ali AlShami. (2019). Adoption of Cloud Computing Model for Managing e-Banking System in Banking Organizations. *International Journal of Advanced Science and Technology*, 22(1), 318–326.
- Eveline, C., Kithaka, S., Charles, C., James, O., & Abeid, T. (2019). Effects of Inventory Management Techniques on Procurement Performance: An Empirical Study. *International Journal of Innovative Research and Development*, 8(8). <https://doi.org/10.24940/IJIRD/2019/V8/I8/AUG19072>
- George, E. (2019). A Study on the Impact of Inventory Management on Profitability of Firms with Special Reference to Steel Industry. In *International Journal of Basic and Applied Research* (Vol. 9, Issue 5).
- Golas, Z., & Bieniasz, A. (2016). Empirical analysis of the influence of inventory management on financial performance in the food industry in Poland. *Engineering Economics*, 27(3), 264–275.
- Karki, C. B. (2020). Effect of Inventory Management on Profitability: Empirical Evidence from Uniliver Nepal Limited. *Journal of Management*, 3(1), 35–43.

- Khan, F., Siddiqui, D. A., Karachi. Khan, F., & Siddiqui, D. A. (2019). Impact of Inventory Management on Firm's Efficiency—A Quantitative Research Study on Departmental Stores Operating. *Social Science and Humanities Journal*, 3(4), 964–980.
- Li, S., Ragu-Nathan, B., Ragu-Nathan, T. S., Subba Rao, S., Li, S., Ragu-Nathan, B., Ragu-Nathan, T. S., & Subba Rao, S. (2006). The Impact of Supply Chain Management Practices on Competitive Advantage and Organizational Performance. *Omega*, 34(2), 107–124.
<https://EconPapers.repec.org/RePEc:eee:jomega:v:34:y:2006:i:2:p:107-124>
- Liu, H., Yi, X., & Yin, L. (2020). The Impact of Operating Flexibility on Firms' Performance during the COVID-19 Outbreak: Evidence from China. *Finance Research Letters*, 101808(g).
- Lwiki, T., Ojera, P. B., Mugenda, N. G., & Wachira, V. K. (2013). The Impact of Inventory Management Practices on Financial Performance of Sugar Manufacturing Firms in Kenya. *International Journal of Business, Humanities and Technology*, 3(5), 75–85.
- Marota, R. (2017). Green Concepts and Material Flow Cost Accounting Application for Company Sustainability. *Indonesian Journal of Business and Entrepreneurship*, 3(1), 43–51. <https://doi.org/10.17358/IJBE.3.1.43>
- Mulandi, C. M., & Ismail, N. (2019). Effect of Inventory Management Practices on Performance of Commercial State Corporations in Kenya. *International Academic Journal of Procurement and Supply Chain Management*, 3(1), 180–197.
- Nasution, A. A. (2020). Effect of Inventory Turnover on the Level of Profitability. *IOP Conference Series: Materials Science and Engineering*, 725(1), 12137.
- Nawaz, A., Hamid, K., Khurram, M. U., & Nawaz, M. A. (2016). Impact of Inventory Performance on Industrial Financial Performance of Pakistan. *International Journal of Multidisciplinary Approach and Studies*, 3(6), 14–32.
- Nugroho, A., Christiananta, B., Wulani, F., & Pratama, I. (2020). Exploring the Association among Just in Time, Total Quality and Supply Chain Management Influence on Firm Performance: Evidence from Indonesia. *Int. J Sup. Chain. Mgt*, 9(2), 920.
- Opoku, R. K., Fiati, H. M., Kaku, G., Ankomah, J., & Agyemang, F. O.-. (2020). Inventory Management Practices and Operational Performance of Manufacturing Firms in Ghana. *Advances in Research*, AIR(10), 1–18.
<https://doi.org/10.9734/AIR/2020/V21I1030246>
- Panigrahi, C. M. A. (2013). Cash Conversion Cycle and Firms' Profitability—A Paper of Cement Manufacturing Companies of India. *International Journal of Current Research*, 5(6), 1484–1488.
- Prempeh, K. B. (2015). The Impact of Efficient Inventory Management on

- Profitability: Evidence from Selected Manufacturing Firms in Ghana. In Munich Personal RePEc Archive (MPRA).
- Qu, Y., Obimpeh-Quayson, A., Sarpong, P. B., & Ghana, W. (2019). The Impact of Inventory Management Practices on the Performance of Ghanaian Technical Universities: A Quantitative Approach.
- Riza, S. D., Ganzach, Y., & Liu, Y. (2016). Time and Job Satisfaction: A Longitudinal Study of the Differential Roles of Age and Tenure, 44(7), 2558–2579.
- Sahari, S., Tinggi, M., & Kadri, N. (2012). Inventory Management in Malaysian Construction Firms: Impact on Performance. *SIU Journal of Management*, 2(1), 59–72.
- Sunday, O., & Joseph, E. E. (2017). Inventory Management and SMEs Profitability. A Study of Furniture Manufacturing, Wholesale and Eatery Industry in Delta State, Nigeria. *Journal of Finance and Accounting*, 5, 75–79.
- Thai, V., & Jie, F. (2018). The Impact of Total Quality Management and Supply Chain Integration on Firm Performance of Container Shipping Companies in Singapore. *Asia Pacific Journal of Marketing and Logistics*.
- Vikas, & Sandeep Malik. (2020). Investigation of Inventory Management in Manufacturing Industry. In *Mukt Shabd Journal* (Issues 2347–3150).
- V.W., N., & Namusonge, G. S. (2015). Role of Inventory Management on Competitive Advantage among Manufacturing Firms in Kenya: A Case Study of Unga Group Limited. *International Journal of Academic Research in Business and Social Sciences*, 5(5). <https://doi.org/10.6007/IJARBS/V5-I5/1595>
- Waddock, S. A., & Graves, S. B. (1997). The Corporate Social Performance–Financial Performance Link. *Strategic management journal*, 18(4), 303–319.
- Walter, S. D. (2005). Specificity. *Encyclopedia of Biostatistics*. <https://doi.org/10.1002/0470011815.B2A0405>

The Relation between Affirmative Action Behavior and Employee Wellness

Zeinab Amin Khayal*
Zeinab.khayal@miuegypt.edu.eg

Abstract:

The aim of this study is to investigate the relation between Affirmative action behavior and employee wellness, which refers to policies and programs that are designed to actively promote equal opportunity in the workplace regardless their race, gender, national origin, sexual orientation, and other factors and how this effect employee's mental health. We will prove this relation thought out some variables, which are the discrimination between the two genders and the stress in work place. Even through many researches and our questionnaire results people proved that there is a positive relationship between the two variable as they see that affirmative action is a good policy and they prefer to work in an organization that apply affirmative action as a policy which means that it improve and increase the employee's wellness in organization.

Keywords: Affirmative Action Behavior - Employee Wellness – Fairness - Managing Diversity- Equal opportunity policies.

* Assistant Professor, Faculty of Business Administration and International Trade, Misr International University

Introduction:

Affirmative action define as set of procedures designed to eliminate unlawful discrimination among applicants, remedy the results of such prior discrimination, and prevent such discrimination in the future, the proactive process of using resources to ensure that people are not discriminated against based on their group membership, such as gender or ethnicity. Affirmative action has become an inevitable aspect of the employment hiring process. It has been put into place to assist in eradicating the institutionalized discrimination that inherently exists in such practices. (Kennedy, 2015).

Employee Wellness is the act of practicing healthy habits on a daily basis to attain better physical and mental health outcomes, so that instead of just surviving, you're thriving. To understand the significance of wellness, it's important to understand how it's linked to health. Wellness programs are important interventions to protect and promote employee health. They help reduce direct and indirect health care costs, absenteeism, and presenters; avoid illness or injury; and improve the quality of work life and morale. (Rishika Bhojwani, 2016).

Employee wellness is a huge topic which is falls under it health care, mental care, increase productivity, inequality between two genders. To increase employee wellness, we need to improve their knowledge, skills, and attitudes in order to remain productive and retain their attractiveness in the job market. On the other hand, skillful employees are a company's most important competitive assets, so it is worth to up (Kata & Prasad, 2020) looking at the problems with employee wellness programs and why they're not achieving the results many hoped they would. In addition to looking at why employee wellness programs do not succeed, it attempts to give solutions and tips for better health care outcomes. (Schneck, 2016)

Literature Review

The following section of this paper will introduce the literature review for the research variables that were identified through the qualitative study and used for developing the research hypotheses.

Affirmative action behavior:

Governments worldwide aim to protect, improve and equalize the living conditions

of their citizens. Governments faced with serious issues like discrimination, have found that the law has limitations when used as a means of resolving social disputes (Rulof Burger & Rachel Jafta, 2010). Therefore, affirmative action has been introduced to address such issues. The concept of affirmative action is generally considered to have originated in the USA. It dates to 1961, when the term 'affirmative action' was introduced under an executive order by President John F. Kennedy, as a method of redressing and eliminating profound and rooted discriminatory social practices believed to be affecting the progress of equality in a society. This subsequently led to its adoption by many other countries for similar reasons. A study concluded that institutional leadership has a positive and significant relationship with performance of National Government Affirmative Action Funds in Kenya. Where board takes the responsibility of making the right decisions takes the right course of action and is provided with adequate information on the agenda items of board meeting which assist in decision making, then the performance increases. Additionally, an institution which has well-defined training needs assessment approach for staff and which provides leadership mentorship, coaching and training is seen to have a better performance. Goal setting by leaders is also a prerequisite for better performance (Wilfred Muhongo Buyema et al., 2019). Affirmative action is an effective policy that can redress prior discrimination and prevent future discrimination from Happening. Unfortunately, attitudes toward affirmative action are often negative. These attitudes are influenced by characteristics of people and by their worldviews, which are hard or even impossible to change, and by features of affirmative action policies, which usually are not intended to be changed. Based on construal-level theory and the idea that thinking abstractly about affirmative action can enhance people's focus on the desired end-state of such policies (Fleischmann & Burgmer, 2020). The findings indicate that the public formulates policy preferences on the basis of perceived deservingness of target groups (Sönmez & Yenmez, 2019). These policies aim to reach a wide range of intended objectives. The first, and most straightforward, is that through force, previously underrepresented groups will now see greater representation across these fields (Kaletski & Prakash, 2016). Voting results by treatment are shown in Figure, first pooled across all group members and then broken down by advantaged (either women or pink group members) and disadvantaged (men or green group members) members. In Gender, voting behavior is generally consistent with subjects maximizing the probability of winning the tournament in Stage when voting is costless. Men vote against affirmative action (henceforth also AA) 80.9% of the time, while women vote in favor of it 92.9% of the time. However, while approximately 80% of green members oppose the intervention in treatment Color, the behavior of the advantaged

group in this treatment is markedly different. In particular, pink group members in Color vote for AA significantly less often than women in Gender. Furthermore, there are no difference in voting behavior between men and women who are pink group members in Color. Hence, voting behavior in Color is less consistent with maximizing the probability of winning, in the sense that a substantial proportion of advantaged subjects do not support the intervention. When voting is costless, 37.8% of pink group members actually vote against the intervention and 4.44% abstain. (Balafoutas et al., 2016). Here we experimentally test whether such policies in form of gender quotas have negative spillover effects on subsequent performance within teams, as well as on the willingness to work in teams. Comparing three different types of team environment, we find no detrimental effects of the quota, neither on team performance nor on selection into teams. While this is good news for advocates of such policies, more research is needed to evaluate the overall efficacy of affirmative action programs (Felix Koelle, 2016). Affirmative action has become an inevitable aspect of the employment hiring process. Affirmative action can be a worthwhile endeavor if it is established properly. Affirmative action has its strengths and its weaknesses: it may lead to the advancement of minorities but it is ultimately dependent on employers to foster such a chain reaction. A key to affirmative action in business is qualification. Affirmative action is designed to assist members of minority groups. If affirmative action is going to be implemented, a given institution ought to ensure that its measures to achieve this goal are legitimate (Kennedy, 2015). The GCC region continues to face substantial issues related to increasing rates of unemployment among nationals, especially in Saudi Arabia, and in particular among women. In addition, the growing reliance on foreign labor is still threatening local economies. It is anticipated that this research will ultimately help to shape future policies, resulting not only in increased employment opportunities for women, but creating a more stable economy through the creation of more jobs for GCC nationals (Alothman & Mishra, n.d.). I urge all AQ readers to place Mismatch at the top of their must-read list. Everything has changed in late 2004 and early 2005 by virtue of a large article. There is a huge effect of mismatch especially blacks the mismatch theory was viewed as discredited. This was despite.

In this article, we have tried to lay out some concrete strategies for doing so. We believe that goods and resources should be targeted to exclude people. We agree with an expansive notion of diversity, but advocate that distributive justice underpin diversity efforts that will serve to assist 'dis-privileged' groups and shift goods and resources away from privileged groups. We also believe that diversity and affirmative action should be reconnected to offset historical and ongoing racial and gender discrimination, segregation and bias. By extension, the public should be

reminded that diversity is consistent with legal compliance. Finally, we believe that the institutional benefits of diversity are demonstrable to organizational members (Herring & Henderson, 2012). Found that reactions towards AAMs are related to the variables “unfairness perception” and “threat perceived to men”, and especially to the former. Also, reactions towards the generic concept of affirmative action are more positive than towards specific AA measures. Implications of these results for research and practice are discussed (Silvia et al., 2010). Were obtained in an experimental study asking university students to report emotions indicating a focus on promotion or prevention. Results further indicate that emphasizing in-group benefits enhances support for affirmative action, and that these effects are mediated by the regulatory focus adopted (Ellemers et al., 2010).

Employee wellness

Wellness as a human and societal ideal is deeply rooted in historical notions of mental and physical harmony. It has been defined as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (“World Health Organization Constitution,” 2014.). Yet, in reality, societies are increasingly being characterized by a wellness deficit that can be attributed to a lifestyle that includes high levels of stress, low levels of physical activity and psychological isolation.

Employee wellness programs, also called worksite wellness programs or corporate wellness programs, are programs developed by companies to promote and support the health, safety, and well-being of their staff. The programs are designed to encourage healthier lifestyle behavior among their employees and reduce company healthcare spending in the long term. Traditional wellness programs usually include health-promotion activities, health-risk assessments, biometric screenings, worksite clinical care, wellness interventions, and occupational health services. The wellness perks usually include health conferences and classes, walking competitions, and healthy snacks for meetings and breaks. The rewards to motivate employees can include healthy food or drinks, pedometers, and stress balls. According to the Gallup-Sharecare (Topp et al., 2015) employee programs should focus on these five aspects: purpose, social, financial, community, and physical.

This paper has only scratched the surface of the ways that employees and service organization interact with wellness and may raise more questions than answers. It has been our aim to stimulate discussion on this important issue in context of growing societal un-wellness and hope that the paper leads to further important conversations and debate about frontline service workers, contemporary challenges and societal pressures organizational needs and employee wellness (Solnet et al., 2020). There are many EWP initiatives taken by large scale industries of Aurangabad region. It can be concluded that employee wellness programs are

helpful for overall motivation, health and safety of employees thereby helping managers to retain them. The best worksite wellness programs keep the focus on the need to help employees adopt and maintain healthy behaviors. Thus EWP leads to improving employees' quality of life (Jyoti Munde et al., 2020). Results that sickness absenteeism has a significant negative impact on a firm's productivity. This impact is large. In general, an increase of 1 percentage point in the rate of sickness absenteeism is estimated to decrease productivity by as much as 0.66 percent. Passing from a zero level of short-term sickness absenteeism to the observed average level is estimated to cause productivity losses of 1.31 percent. Our results also revealed that sickness absenteeism does not impact all firm sin the same manner. We found that the impact varies substantially according to several workforce- and firm-level dimensions. First, we found that the negative impact is particularly significant when high-tenure workers are those absent. This highlights that finding adequate substitute for absent workers with high levels of firm-/task-specific (tacit) knowledge is difficult (Elena Grinza & Francois Rycx, 2020). The study affirms that there is a need to balance the interactions between the Human, Machine and Environment which plays a very prominent role for smooth and prosperous running of the organization. The study also divulged that Ergonomics has broader Perceptive as it is an amalgamation of various scientific disciplines. However, the study attempted to create awareness on the types of ergonomics and its application to workplace. This would definitely helpful for the enrichment of individual awareness on workplace ergonomics as well as organization performance by promoting the employees comfort, health, safety and well-ness (Elena Grinza & Francois Rycx, 2020). Our finding of increased percentages in the action of maintenance stages in this QI project using the social network Facebook was consistent with the literature that helping relationships are important in preparation stages and for low-SES mothers. Our use of theory-based Facebook groups and messaging to improve readiness to participate in an employee wellness program although participation and retention are different (Miller et al., 2019). Employees in this sample reported higher levels of work-related stress and poorer mental health compared to available norms, while their levels of physical health were within the normal range. Regression analyses showed that work-related stressors were important predictors of employee mental health, but mindfulness was the stronger predictor. There was a slightly stronger relationship between employee physical health and work-related stress compared to mindfulness. Furthermore, being younger and employed in a non-nursing role were associated with better physical health (Helen et al., 2019). At baseline, there were 134 patients in the cholesterol monitoring group, 129 in the weight monitoring group, 117 in the blood pressure monitoring group, 46 in the blood glucose monitoring group, and 26 in the

healthy participant monitoring group. For patients in the blood pressure monitoring group, compared with baseline, there was a significant decrease in DBP at months 12, 24, 36, and 48, and a significant increase in the proportion of patients achieving blood pressure goals at 48 months. For patients in the blood glucose monitoring group, compared with baseline, there was a significant decrease in FBG at months 12, 24, 36, and 48, and a significant increase in the proportion of patients achieving blood glucose goals at 48 months. Employees reporting higher levels of leadership support for health promotion also reported higher levels of wellness activity participation, lower job stress, and greater levels of health behavior ($P = .001$). To ascertain the amount of variance in health behaviors accounted for by the other variables in the study, a hierarchical regression analysis revealed a statistically significant model (Jennifer et al., 2018). The combination of traditional perks with technology and networking can lead to higher job satisfaction. wellness programs are an umbrella term for a wide variety of initiatives – from paying for smoking cessation, to smart phone apps to track how much you walk or how well you comply with your plan of care, and everything in between. Hospitality company owners should think about offering immediate rewards when their staff participate in health initiatives such as weight loss or walking steps competition. Jawbone UP and Nike Fuel Band are very popular among managers to motivate their staff. According to a study, people with pedometers take 2,491 more steps every day (Zhang, 2018). This study sought to amplify the place of geography in the provision and implementation of EWPs in large cities in the United States. This is an important angle from which personnel specialists may be able to design programs within more nuanced cultural and geographic contexts. Our research discusses unique factors, such as the existence of longer sunshine days, city investments in specific health-enhancing infrastructures, the uniqueness of city administrations tapping into available homegrown healthier foods and the sensitivity of personnel to regional incidences of selected diseases. The study also highlights and accounts for the relationships between obesity, demography, and poverty. While not a new idea, scholars of urban administration have always recognized that race and poverty make a difference in terms of the allocation of recreation services, which are an important variable in promoting and enhancing cultures of wellness and healthy-living lifestyles. In addition, we discussed the positive externalities brought about through municipal collaborations with large institutions such as corporations and universities. We make the assumption that those who manage EWPs invariably include robust information and outreach programs to encourage employee participation (Otenyo & Smith, 2017). The sample consisted of 292 employees who participated in the program. Their mean age was 38 years (SD 11), 83% were female, and 38% were obese. Over the 24 intervention weeks, participants engaged

in a mean of 90 min/week (SD 74) of physical activity and missed a mean of 14 hours of work (SD 38) due to illness. Unplanned absenteeism due to illness was associated with physical activity. As compared to the group meeting CDC guidelines, in multivariable analyses those in the medium physical activity group had a 2.4 (95%) fold higher rate of illness-related absenteeism and those in the lowest physical activity group had a 3.5 (95%) fold higher rate of illness-related absenteeism (Losina et al., 2017). The aggregation and analysis of health risk assessment (HRA), biometric, medical insurance claims, absence, disability, workers' compensation, and productivity data. The aggregation and analysis of health risk assessment (HRA), biometric, medical insurance claims, absence, disability, workers' compensation, and productivity data (Rishika Bhojwani, 2016). Voting results by treatment are shown in Figure 1, first pooled across all group members and then broken down by advantaged (either women or pink group members) and disadvantaged (men or green group members) members. In Gender, voting behavior is generally consistent with subjects maximizing the probability of winning the tournament in Stage 3 when voting is costless. Men vote against affirmative action (henceforth also AA) 80.9% of the time, while women vote in favor of it 92.9% of the time. However, while approximately 80% of green members oppose the intervention in treatment Color, the behavior of the advantaged group in this treatment is markedly different. In particular, pink group members in Color vote for AA significantly less often than women in Gender. Furthermore, there are no difference in voting behavior between men and women who are pink group members in Color. Hence, voting behavior in Color is less consistent with maximizing the probability of winning, in the sense that a substantial proportion of advantaged subjects do not support the intervention. When voting is costless, 37.8% of pink group members actually vote against the intervention and 4.44% abstain. (Balafoutas et al., 2016). The main responsibility for employee wellness programming depends on the human resources department (63.6%) comprehensive reform plan including legislation was put forth to correct the issues with health care of employees and US. Implementing small reform measures within organizations for decades including health and wellness programs at organizations across America (Ken Zula et al., 2013). The findings revealed that higher job satisfaction were found in the respondents who have attended wellness program than the respondents who have not attended wellness program. The findings also showed that lower employees perceived stress was found among the respondents who have attended wellness program than those who have not attended wellness program; and lower employee's absenteeism was found in the respondents who have attended wellness program than the respondents who have not attended wellness program (Abdullah & Lee, 2012).

Research Questions and Hypotheses

The general structure of our research is to show up the relation between affirmative action behavior and employee wellness though out two main problems which is stress in work place environment and differentiation between the two genders in work place , This two problems can affect employee mental health , satisfaction and increase the rate of retention , the aim of this study is to determine the impact of affirmative action behavior on all the employee in the organization and how to implement positive relation between the employee as it has a very good impact on the organization .

The research questions

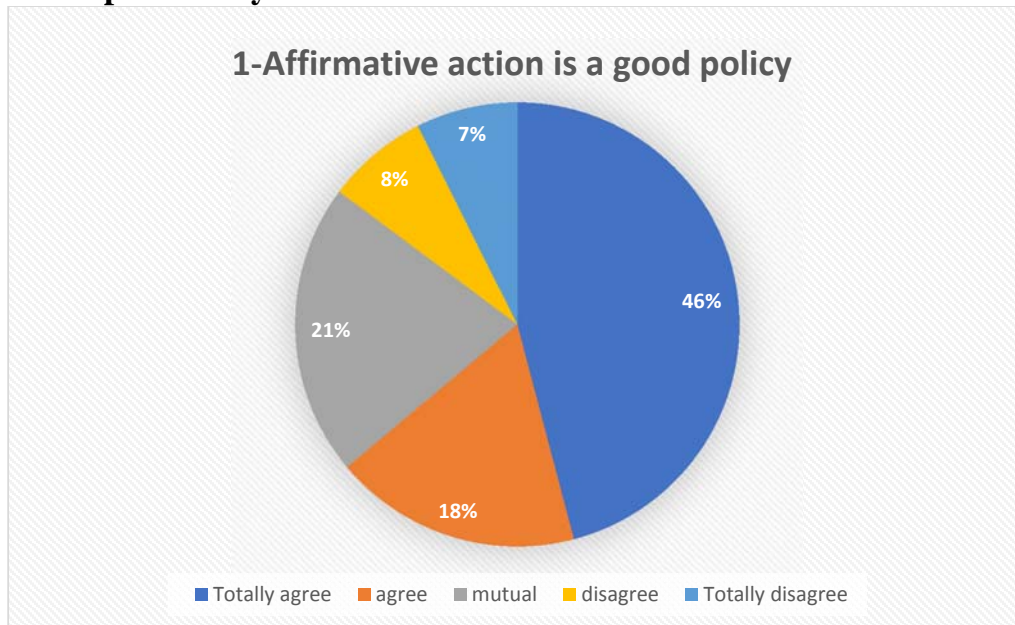
- How can affirmative action behavior have positive affect on employee wellness?
- Does stress in work place could affect employee wellness?
- How can work stress affect employee wellness?
- How can differentiation between men and women affect employee wellness?

H1: There is a positive relation between affirmative action behavior and employee wellness

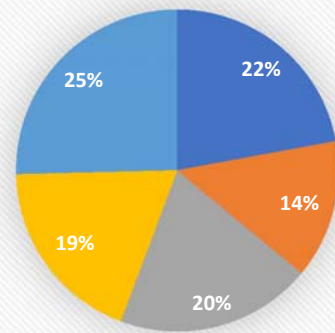
H2: Stress in work environment has a significant effect on employee wellness

H3: Inequality between men and women has a significant effect on employee wellness

Descriptive analysis:

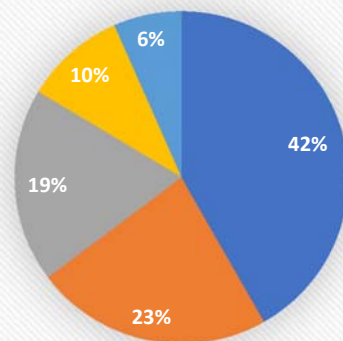


2-I would not like to work at an organization with an affirmative action behavior plan



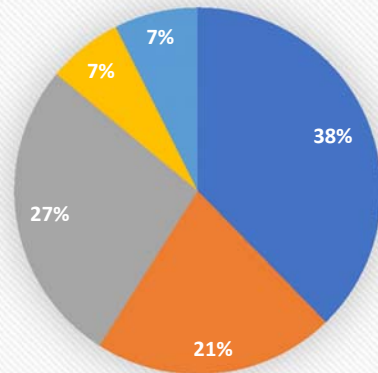
■ Totally agree ■ agree ■ mutually ■ disagree ■ Totally disagree

3- The goal of affirmative action is good



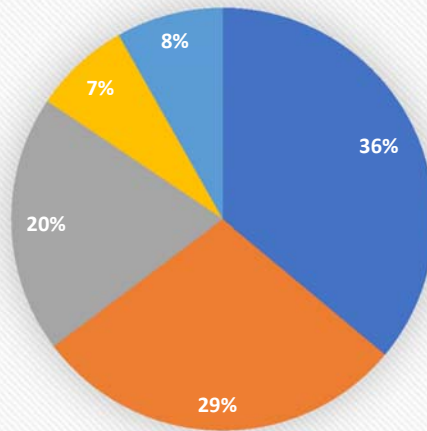
■ Totally agree ■ agree ■ mutually ■ disagree ■ Totally disagree

4- Employee should be actively involved in attempt to improve the affirmative action conditions at their place of employee



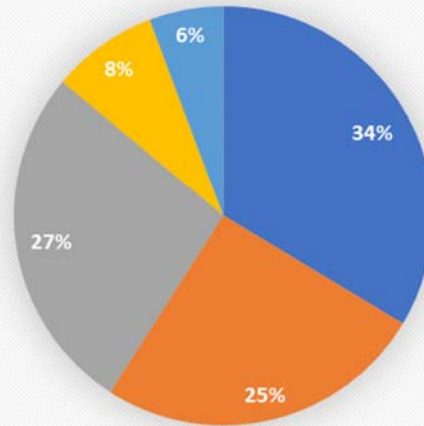
■ Totally agree ■ agree ■ mutually ■ disagree ■ Totally disagree

5- I would be willing to work at an organization with an affirmative action plan



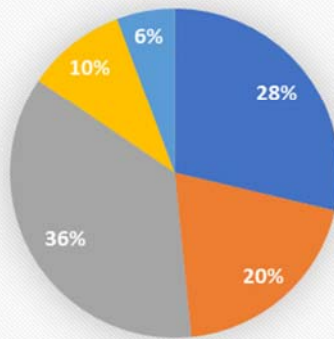
■ Totally agree ■ agree ■ mutually ■ disagree ■ Totally disagree

6- Development and implementation of creative approach to affirmative action



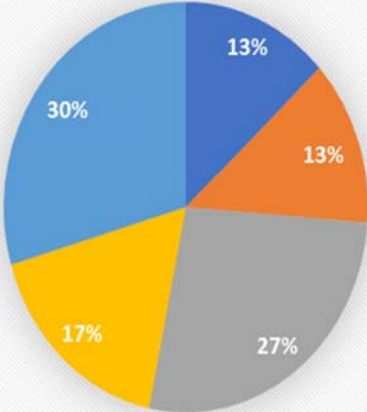
■ Totally agree ■ Agree ■ Mutually ■ disagree ■ Totally disagree

7-Affirmative action plan would require that the proportion of MEN and WOMEN hired be equal to proportion of application that is qualified for the position proportion



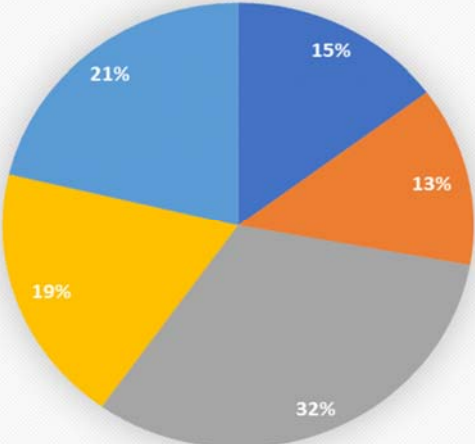
■ Totally agree ■ Agree ■ Mutually ■ Disagree ■ Totally disagree

8- Women require more training and supervision to become good workers



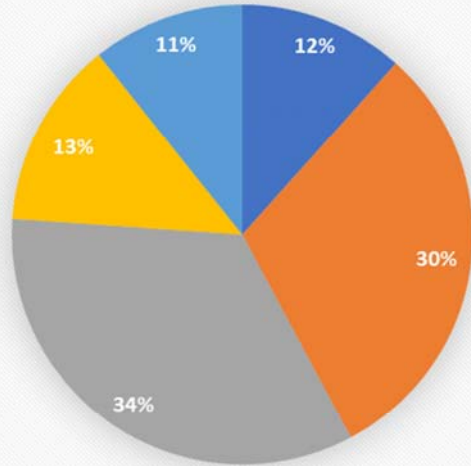
■ Totally agree ■ Agree ■ Mutually ■ Disagree ■ Totally disagree

9-It is difficult to fire employees when they are women



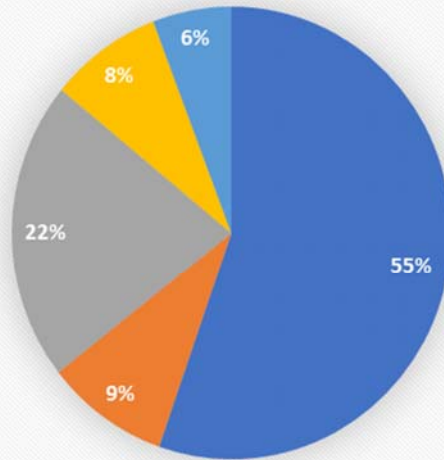
■ Totally agree ■ Agree ■ Mutually ■ Disagree ■ Totally disagree

10-An affirmative action plan would require business to hire and promote a certain number of MEN/WOMEN



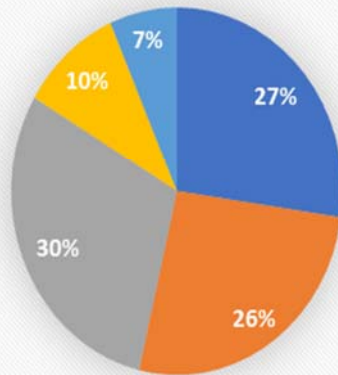
■ Totally agree ■ Agree ■ Mutually ■ Disagree ■ Totally disagree

11- Employers should always hire the most qualified candidate, regardless of sex or race



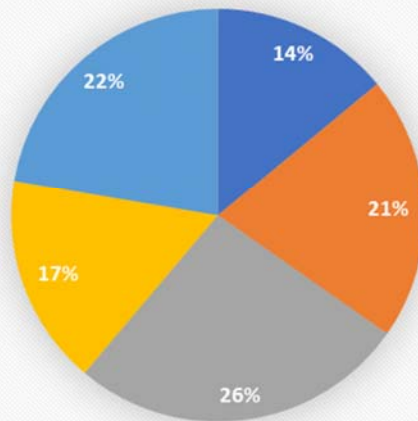
■ Totally agree ■ agree ■ Mutually ■ Disagree ■ Totally disagree

12-More women should be hired to work in jobs similar to men



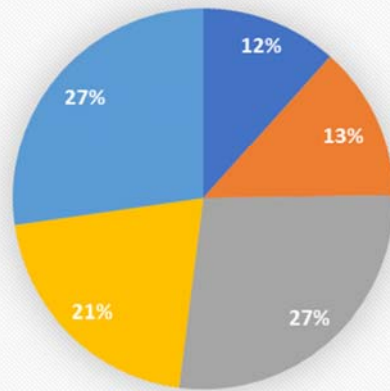
■ Totally agree ■ Agree ■ Mutually ■ Disagree ■ Totally disagree

13- An employer should have the right to know if a female employee intends to have children



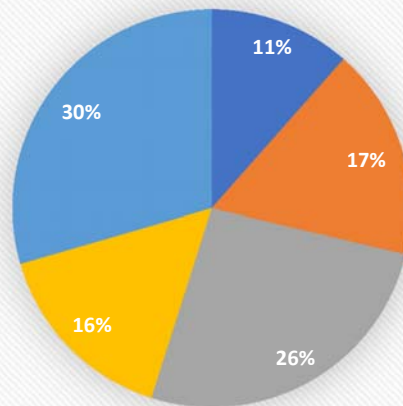
■ Totally agree ■ Agree ■ Mutually ■ Disagree ■ Totally disagree

14-An employer should be allowed to decide how much to pay each employee, even if this means women are paid less than men



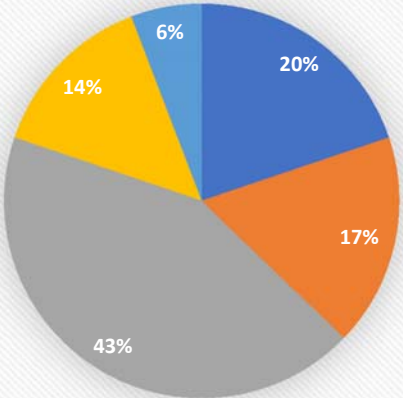
■ Totally agree ■ Agree ■ Mutually ■ Disagree ■ Totally disagree

15. At work, I feel that others exclude me from their activities because of my gender



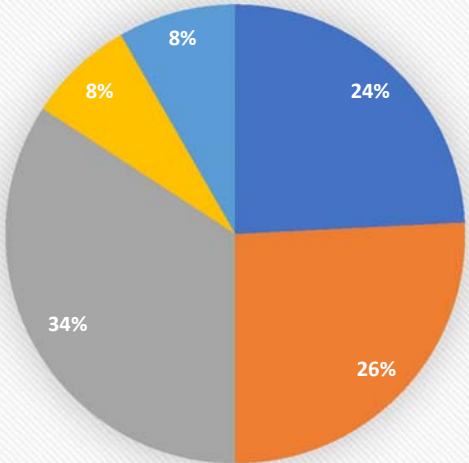
■ Totally agree ■ Agree ■ Mutually ■ Disagree ■ Totally disagree

16-Most days I am enthusiastic about my job



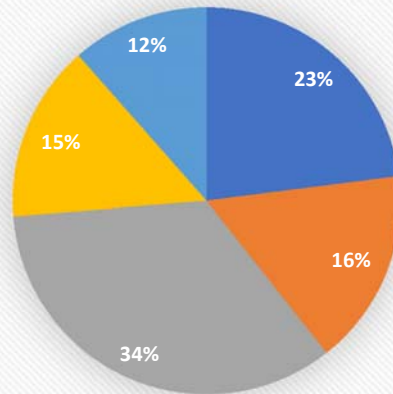
■ Totally agree ■ Agree ■ Mutually ■ Disagree ■ Totally disagree

17- Overall speaking, I feel well satisfied with my job



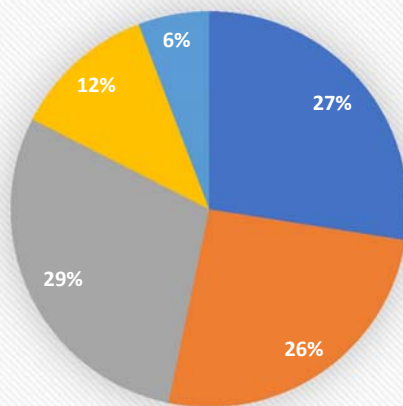
■ Totally agree ■ Agree ■ Mutually ■ Disagree ■ Totally disagree

18- I would be very happy to spend the rest of my career with this company

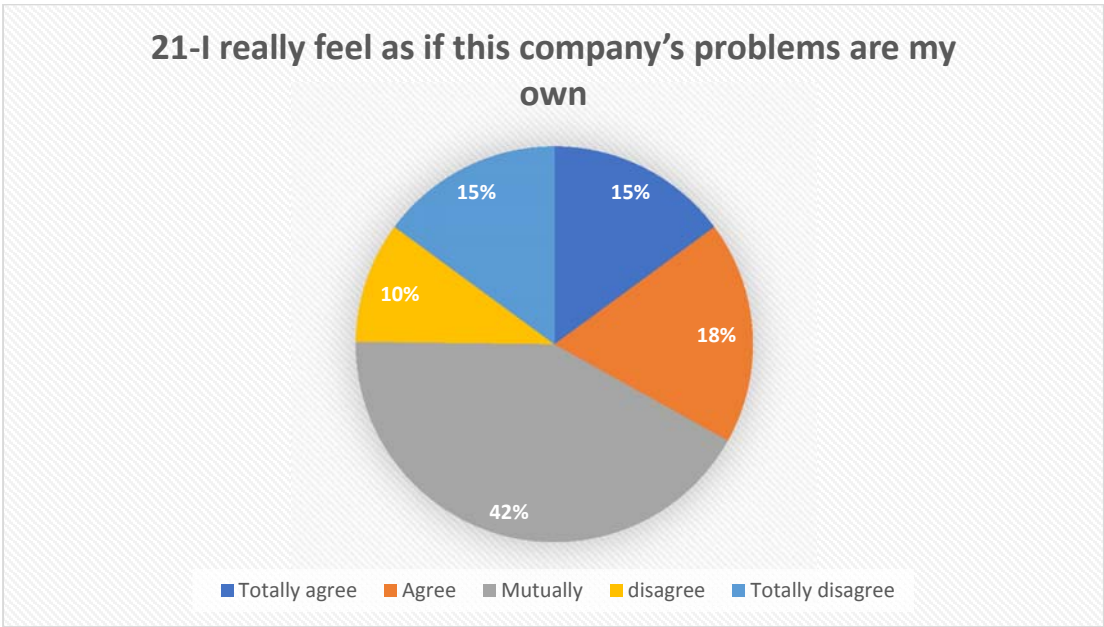
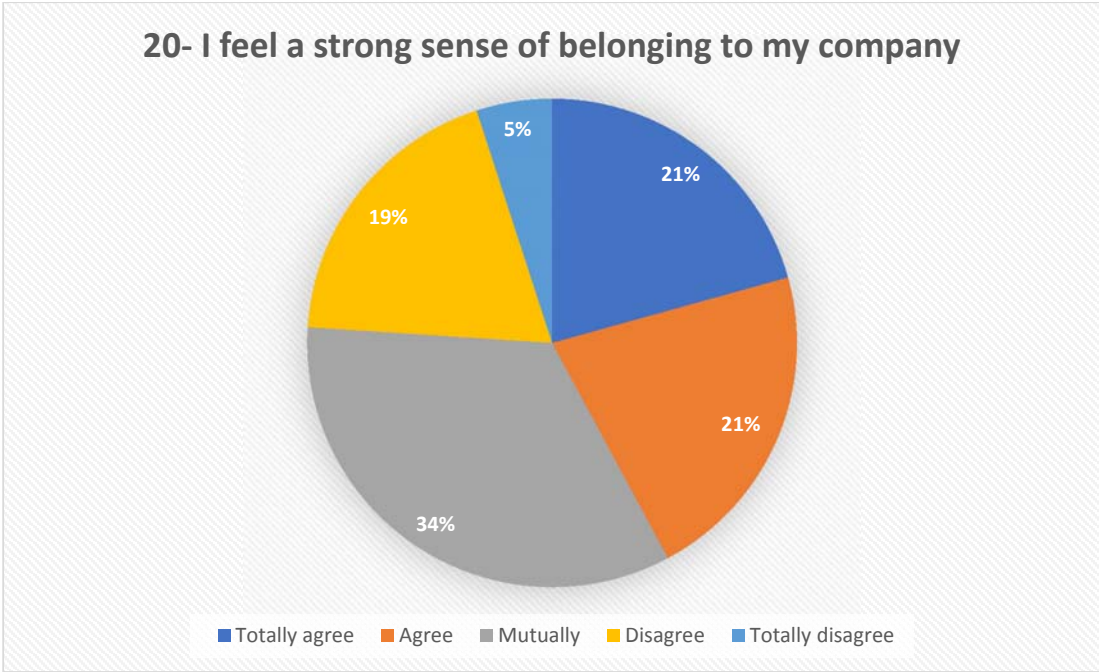


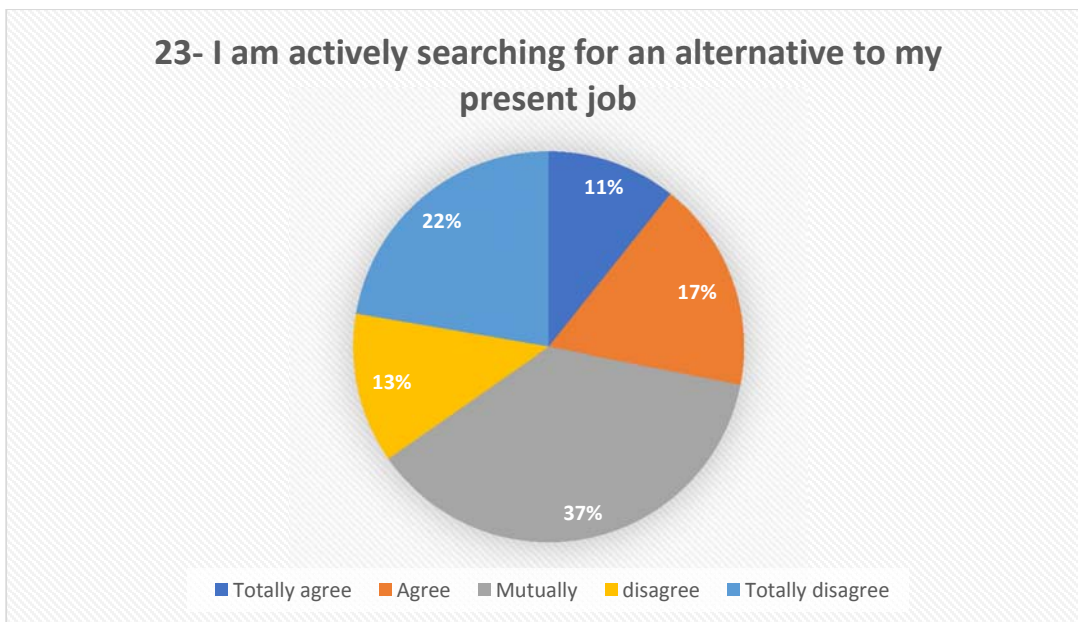
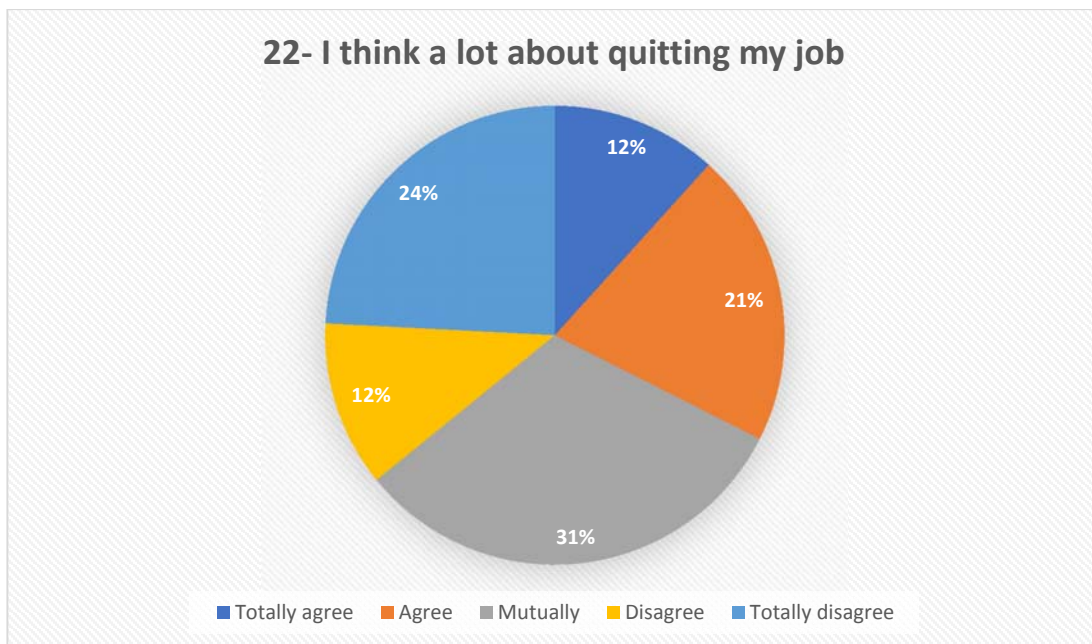
■ totally agree ■ Agree ■ Mutually ■ Disagree ■ Totally disagree

19- Workers are involved in making decisions that are related to their work

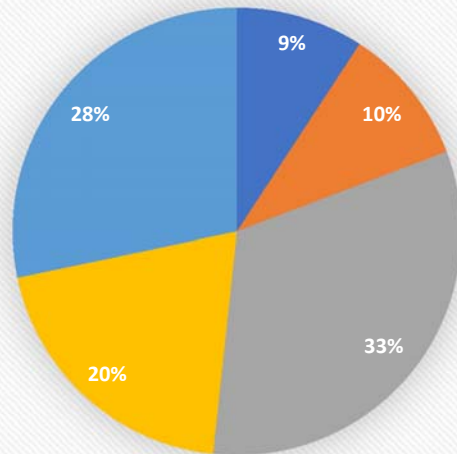


■ Totally agree ■ Agree ■ Mutually ■ Disagree ■ Totally disagree



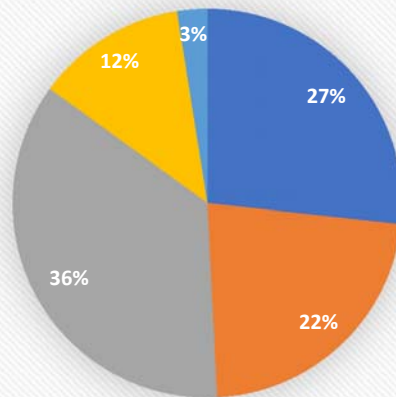


24- As soon as it is possible, I will leave my job



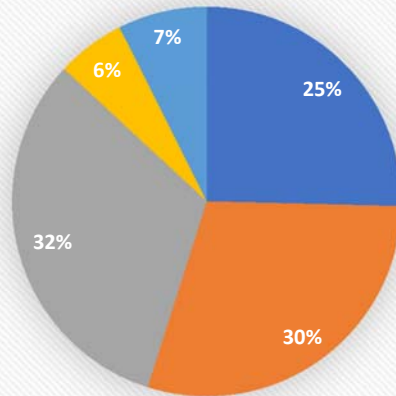
■ Totally agree ■ Agree ■ Mutually ■ disagree ■ Totally disagree

25- Does your job require a great deal of work to be done?



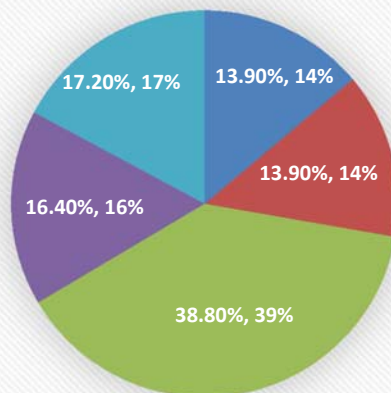
■ Totally agree ■ Agree ■ Mutually ■ Disagree ■ Totally disagree

26- My Gender has a negative influence on my career advancement

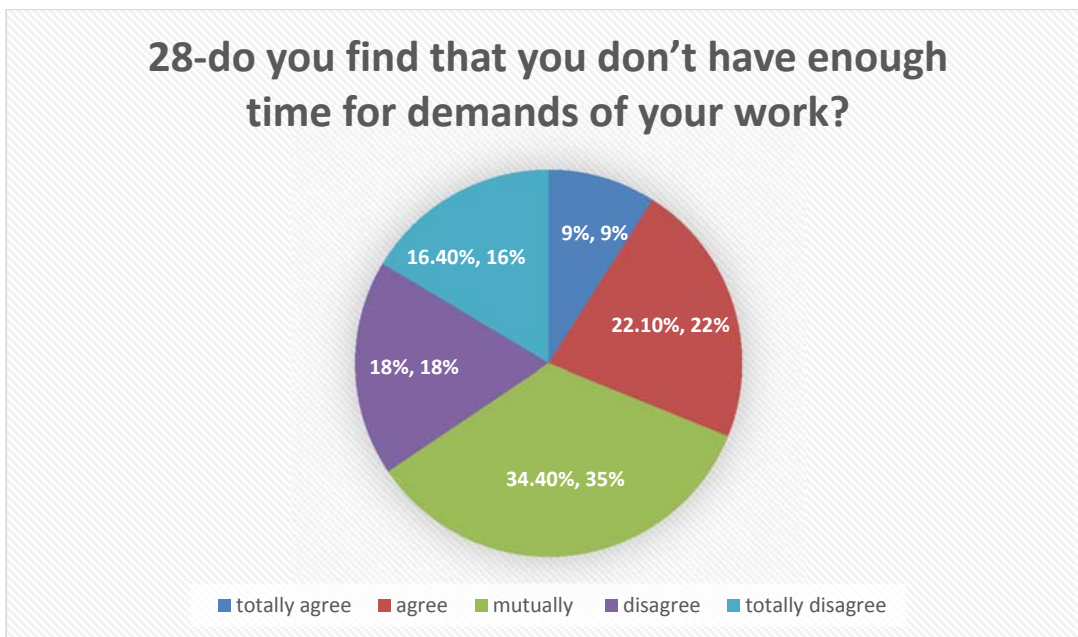


■ Totally agree ■ Agree ■ Mutually ■ Disagree ■ Totally disagree

27-do you find that there is no time to finish tasks



■ totally agree ■ agree ■ mutually ■ disagree ■ totally disagree



Conclusion:

This review concludes our purpose to improve the relation between affirmative action behavior and employee wellness in the workplace. Gender discrimination and stressful work both may lead to high turnover of employees and cause dissatisfaction. regarding the data analysis, we got from the survey, we found that most of people are self-aware of what affirmative action policy that some organization apply and while they are searching for job they put into consideration the affirmative action condition to avoid being discriminated regard their gender or having equal opportunity as candidate to get hired. On the positive side most employees can control their tasks and responsibilities related to job description they got at the beginning of the hiring, employees care about organization problems because it may affect their work.

Recommendation:

- According to our voting we found that we can apply Affirmative Action training that include training programs, outreach efforts, and other positive steps to improve equal education and employment opportunities to achieve the full and fair participation of two genders.
- Every company should provide training specially for managers to know well how to apply affirmative action policy fairly between employees
- Employers must be aware of how they can use Affirmative action policy and similar rules which every company aim to achieve equal opportunity and fairness.
- Wellness can be expressed in exercise can protect individuals by enhancing the state of resistance to any stimulus, so that the individual is less susceptible to the effects of stress
- Create a stress-free climate of mutual trust and respect. Encourage open communication with employees in the design of their work and provide them with support and recognition.
- Provide a suitable and healthy environment for the employee this will be comfortable and maintain their wellness
- Avoid and control discrimination at work though rules and consequences to enhance employee wellness.

References

- Abdullah, Dayang Nailul Munna Abg., & Lee, O. Y. (2012). Effects of Wellness Programs on Job Satisfaction, Stress and Absenteeism between Two Groups of Employees (Attended and Not Attended). *Procedia - Social and Behavioral Sciences*, 65, 479–484. <https://doi.org/10.1016/J.SBSPRO.2012.11.152>
- Alothman, A., & Mishra, A. (n.d.). The Impact of Affirmative Action Policy on the Employment of Women in the Private Sector: The Case of Saudi Arabia. Retrieved October 24, 2021, from <https://knowledgecenter.ubt-uni.net/conference/2014/all-events/48>
- Balafoutas, L., Davis, B. J., & Sutter, M. (2016). Affirmative Action or Just Discrimination? A Study on the Endogenous Emergence of Quotas. *Journal of Economic Behavior and Organization*, 127, 87–98. <https://doi.org/10.1016/J.JEBO.2016.04.015>
- Elena Grinza, & Francois Rycx. (2020). The Impact of Sickness Absenteeism on Firm Productivity : New Evidence from Belgian Matched Employer – Employee Panel Data . *Industrial Relations: A Journal of Economy and Society*, 59(1), 150–194.
- Ellemers, N., Scheepers, D., & Popa, A. M. (2010). Something to Gain or Something to lose? Affirmative Action and Regulatory Focus Emotions. *Group Processes & Intergroup Relations*, 13(2), 201–213. <https://doi.org/10.1177/1368430209343296>
- Felix Koelle. (2016). Affirmative Action and Team Performance. The Centre for Decision Research and Experimental Economics, School of Economics, University of Nottingham, 7.
- Fleischmann, A., & Burgmer, P. (2020). Abstract Thinking Increases Support for Affirmative Action. *Sex Roles*, 82(7–8), 493–511. <https://doi.org/10.1007/S11199-019-01068-2>
- Helen, D. C., Tracey, S., Brian, C., & Brian, O. (2019). Effects of Work-Related Stressors and Mindfulness on Mental and Physical Health Among Australian Nurses and Healthcare Workers. *Journal of Nursing Scholarship : An Official Publication of Sigma Theta Tau International Honor Society of Nursing*, 51(5), 580–589. <https://doi.org/10.1111/JNU.12502>
- Herring, C., & Henderson, L. (2012). From Affirmative Action to Diversity: Toward a Critical Diversity Perspective. *Critical Sociology*, 38(5), 629–643. <https://doi.org/10.1177/0896920511402701>
- Jennifer, H., AM, H., & Marion, H. (2018). The Role of Leadership Support for Health Promotion in Employee Wellness Program Participation, Perceived Job Stress, and Health Behaviors. *American Journal of Health Promotion: AJHP*, 32(4), 1054–1061. <https://doi.org/10.1177/0890117116677798>
- Jyoti Munde, Rushina Khan, Sanghamitra Samal, & Amita Mali. (2020). A Study on Employee Wellness Programs and Initiates by Selected Large Scale Manufacturing

- industries in Aurangabad, Maharashtra. *Mukt Shabd Journal*.
- Kaletski, E., & Prakash, N. (2016). Affirmative Action Policy in Developing Countries: Lessons Learned and a Way forward. WIDER Working Paper Series. <https://ideas.repec.org/p/unu/wpaper/wp-2016-52.html>
- Kata, A., & Prasad, Dr. V. S. (2020). A Study on Erconomics for Employee Wellness. *International Journal of Innovative Research in Computer Science & Technology*, 8(4). <https://doi.org/10.21276/IJIRCST.2020.8.4.12>
- Ken Zula, Karen K. Yarrish, & Sonji Lee. (2013). An Evaluation of Workplace Wellness Programs: A Perspective From Rural Organizations. *The Journal of Applied Business Research*, 29(3).
- Kennedy, J. A. (2015). An Assessment of Affirmative Action in Business. https://opencommons.uconn.edu/srhonors_theseshttps://opencommons.uconn.edu/srhonors_theses/432
- Losina, E., Yang, H. Y., Deshpande, B. R., Katz, J. N., & Collins, J. E. (2017). Physical Activity and Unplanned Illness-Related Work Absenteeism: Data from an Employee Wellness Program. *PLOS ONE*, 12(5), e0176872. <https://doi.org/10.1371/JOURNAL.PONE.0176872>
- Miller, A. S., Ailey, S. H., Buchholz, S. W., Fogg, L., & Ingram, D. (2019). Improving Stage of Change in an Employee Wellness Program: *Workplace Health & Safety*, 67(8), 381–390. <https://doi.org/10.1177/2165079919838291>
- Otenyo, E. E., & Smith, E. A. (2017). An Overview of Employee Wellness Programs (EWPs) in Large U.S. Cities: Does Geography Matter? *Public Personnel Management*, 46(1), 3–24. <https://doi.org/10.1177/0091026016689668>
- Rishika Bhojwani. (2016). Employee Wellness Programs. *International Journal of Applied and Universal Research*, 3(6).
- Rulof Burger, & Rachel Jafta. (2010). Affirmative action in South Africa: an Empirical Assessment of the Impact on Labour Market Outcomes. *CRISE (Centre for Research on Inequality, Human Security and Ethnicity) Working Paper*, 76, 09–36.
- Schneck, R. (2016). Making an Employee Wellness Program Work for You. *BU Well*, 1(1). <https://digitalcommons.butler.edu/buwell/vol1/iss1/12>
- Silvia, M., Antonio L., G.-I., & María, B. (2010). Reactions Toward Affirmative Action Measures for Women. *Revista de Psicología Del Trabajo y de Las Organizaciones*, 26(3), 211–221. <https://doi.org/10.5093/TR2010V26N3A5>
- Solnet, D., Subramony, M., Golubovskaya, M., Snyder, H., Gray, W., Liberman, O., & Verma, R. (2020). Employee Wellness on the Frontline: an Interactional Psychology Perspective. *Journal of Service Management*, 31(5), 939–952. <https://doi.org/10.1108/JOSM-12-2019-0377>
- Sönmez, T., & Yenmez, M. B. (2019). Affirmative Action in India via Vertical and Horizontal reservations. Chestnut Hill, MA, USA : Boston College.

- Topp, C. W., Østergaard, S. D., Søndergaard, S., & Bech, P. (2015). The WHO-5 Well-Being Index: A Systematic Review of the Literature. *Psychotherapy and Psychosomatics*, 84(3), 167–176. <https://doi.org/10.1159/000376585>
- Wilfred Muhongo Buyema, Gladys Chepkirui Rotich, & Kepha Ombui. (2019). Effect of Institutional Leadership on Performance of National Government Affirmative Action Funds in Kenya. *Journal of Human Resource and Leadership*, 4(2), 90–107. <https://doi.org/10.1142/S2010139216500142>
- World Health Organization Constitution. (n.d.). 2014.
- Zhang, T. (2018). Employee Wellness Innovations in Hospitality Workplaces: Learning from High-Tech Corporations. *Journal of Global Business Insights*, 3(2), 52–66. <https://doi.org/10.5038/2640-6489.3.2.1003>

Using Altman Z-Score Model in Comparing Firms' Financial Performance Applied Research on Egyptian Stock Market

Heba Srour*

Heba.srour@fue.edu.eg

Marwa El Maghawry†

Marwa.elmaghawry@fue.edu.eg

Abstract

Financial performance has been of concern to management and other stakeholders since the 2008 financial crisis. The impact of financial distress and bankruptcy on firms cannot be taken for granted. Financial distress is detrimental to big organizations and the small organizations alike. This study was conducted with the purpose testing if Altman's failure prediction model is good indicator in predicting financial distress of firm working in Egyptian stock market. The study took a sample of seven companies from firms working in Egyptian stock market during the period from 2016 to 2020. Data was extracted from secondary sources for a period of five years. Data extracted included working capital, total assets, retained earnings, market capitalization total liabilities and sales. The collected data was then analyzed using Microsoft excel software. The study established that the Altman's Z-score model was good indicator for predicting financial distress of firm working in Egyptian stock market. The study recommends the adoption of Altman's failure prediction model in predicting financial distress of firm working in Egyptian stock market by not only investors but also all other stakeholders.

Keywords: Altman Z-score - Financial Distress - Prediction Models - Egyptian Stock Markets

* Assistance Professor, Faculty of Commerce and Business Administration - Future University in Egypt

† Assistance Professor, Faculty of Commerce and Business Administration - Future University in Egypt

Introduction

When companies fail to meet their financial responsibilities due to high fixed costs, economic variations that influence revenues and don't take actions regarding this situation this will eventually lead to bankruptcy and insolvency which will negatively affect the reputation of the firm causing the investors to avoid it. The previous situation is called financial distress, and that's why it is considered a crucial topic and has been heavily examined to figure out its drivers and ways to combat it. To be able to combat financial distress, many research developed models to predict financial distress, such as the most popular model created by Altman which is called Z-score and its mission is to classify firms into financially distressed and non-financially distressed ones before the bankruptcy occurs.

The 2008 popular financial crisis resulted from changes in macro-economic factors such as high interest rates, fluctuating exchange rates, high inflation rates and changes in Gross Domestic Product which have negatively affected businesses. The previous information shows the importance of predicting financial distress, therefore using an early warning system model is critically important to make a reliable measure of any company's financial health since companies that are strong today may not be strong tomorrow. This is the need that motivated us to carry out the study. This is the gap the study has sought to address by attempting to answer the research question.

Is z-score a sufficient model to predict financial distress of firm working in Egyptian stock market?

Literature Review

(Kordestani et al., 2011) provided a model that predicts company's financial distress on the based on the operational, investment and financing components of its cash flow statement. to apply this model he choose Tehran stock exchange as a sample within the years from 1995 to 2008. Considering the information that is reflected in the cash flow statement, the viability of financial distress prediction was examined. Cash flow statement contains three parts, which are operational, investment, and financial activities. Based on the counting principle. The continuation of activity of enterprises depends on various factors, such as liquidity and cash flow which are of essential importance in all companies. In this research he investigated the ability of cash flow composition to predict future financial distress in Tehran stock exchange companies. The result of chi-square test showed that there is significant relationship between first, third, sixth and seventh cash flow compositions and future financial distress. Despite the ability of cash flow to predict the financial distress, the

reason for lack of precision in analysis is the several years of difference between the time of submission of tax proposal and the time of its payment. In other words, based on Iranian accounting standards the tax figure in cash flow statement corresponds to tax number of two years before. However, practically in many cases the tax figure relates to more than two years before. (Mu-Yen Chen, 2014) collected 100 listed companies as the initial samples, Moreover, they added the empirical experiment with a total of 37 ratios which composed of financial and other non-financial ratios and used principal component analysis (PCA) to extract suitable variables. The decision tree (DT) classification methods and logistic regression (LR) techniques were used to implement the financial distress prediction model. The result of the experiment was the more principal component analysis we use the less accuracy we obtained by the decision tree classification approach. However the logistic regression has no significant impact on principle component approach the closer we get to the actual occurrence of financial distress, the higher the accuracy we obtain in DT classification approach, with an 97.01% correct percentage for 2 seasons prior to the occurrence of financial distress their empirical result show that PCA increases the error of classifying companies that are in a financial crisis as normal companies and the DT classification approach obtains better prediction accuracy than the LR approach in short run (less one year). On the contrary, the LR approach gets better prediction accuracy in long run (above one and half year). Therefore, this paper proposes that the artificial intelligence (AI) approach could be a more suitable methodology than traditional statistics for predicting the potential financial distress of a company in short run (Hua et al., 2011), With the enforcement of the removal system for “distress firms” in China’s securities market in 2001, the development of the bankruptcy process for firms in China did create huge impacts to the community. Therefore, identification of potential business failures and offering early warnings for the impending financial crises became very important to analysts, practitioners, and regulators. In our research, we developed a model called ZChina-Score to support the identification of potential distress firms. We applied the model to China’s securities market for distress diagnosis. The study achieved 98.8 percent accuracy in classifying distress firms for the original samples and 94 percent accuracy for holdout samples. Over the past twenty years, China has achieved great success in the economic development that the annual GDP growth maintained above an astonishing average of eight percent. Studying the soundness of the traded companies in China’s stock market, we made a broad study across to 1001 traded companies that classified into 11 sectors (exclude banking, finance and

real estate). Before doing so, a slight adjustment was made to the zero cutoff point that assigned by the computer. By observing the ZChina-score distribution of both initial and holdout samples, we found that there were only two distress firms and four non-distress firms misclassified. The overlap zone is between -0.5 and 0.71 , which can be defined as the “gray area” because of the existence of misclassifications. (Habib et al., 2013), Examining empirically the managerial earnings management practices of financially distressed firms, and to consider whether these practices changed during the recent global financial crisis. Although corporate distress has been a topic of research interest for many years, earnings manipulation by distressed firms has received relatively little attention. Three measures of distress, and discretionary accruals, a popular proxy for earnings management, to investigate the impact of distress on earnings management. The managers of distressed firms engage more in income-decreasing earnings management practices compared to their healthy firm counterparts. It finds an evidence of the effect of the global financial crisis on the association between financial distress and earnings management. Finally, shows some evidence of positive market pricing of discretionary accruals in the non-crisis period, but a substantial reduction in pricing coefficients during the global financial crisis period. Financial distress experienced by firms provides incentives to managers for earnings manipulation. However, the direction of the earnings management could be income-increasing or income-decreasing. Allow investors to take a better investment decision for their firm that's experiencing financial difficulties. Recently, New Zealand experienced a spate of finance company collapses that somewhat contributes, indirectly, to financial distress experienced by firms. The New Zealand reporting environment is characterized by concentrated ownership, relaxed monitoring by regulatory authorities, and a very low litigation threat that provides an interesting setting to examine the research question (Edward Altman, 2012), the original Z''-Score Model performs well in an international context. It is possible to extract a more efficient country model for most European countries and also for non-European countries using the four original variables, accompanied with a set of additional background variables. Considering practical applications, it is obvious that while a general international model works reasonably well, for most countries the classification accuracy may be somewhat improved with country-specific estimation. In a country model, the information provided even by simple additional variables may help boost the classification accuracy to a much higher level. Also, the original Z''-Score Model and its re-estimated version, containing the four Altman study variables with coefficients re-estimated using a large European

data set, work consistently well internationally and are easy to implement and interpret. (Alifiah, 2014) was predicting the financial distress companies in the trading and services sector in Malaysia using financial distress companies as the dependent variable and macroeconomic variables and financial ratios as the independent variables. Logit Analysis was used as the analysis procedure because financial ratios do not have to be normal if it is used. It is also suitable when the dependent variable is binary in nature. Furthermore, it can also provide the probability of a company being financially distress. In addition, it can also provide us with the sign of the independent variable(s). The independent variables that can be used to predict financial distress companies in the trading and services sector in Malaysia were debt ratio, total assets turnover ratio, working capital ratio, net income to total assets ratio and base lending rate. Future studies should be conducted on the prediction of financial distress companies in other individual sectors in Malaysia. In addition, cash-flow-based ratios should be considered as the independent variables in predicting financial distress companies in Malaysia (Onyiri, 2014) found that Altman's z-score model and the sustainable growth rate can be used together in the prediction of corporate financial distress. This will help firms develop better strategic financial plans contribute to a general understanding of how sustainable growth rate can better be. (Gunathilaka, 2014) collected a sample of 82 firms listed on Colombo Stock Exchange across different sectors, over a period of five years from 2008 to 2012. It analyzes company financials using independent sample t-tests and multivariate discriminant analysis. He found that the solvency test does not discriminate solvent and insolvent firms meaningfully. The Altman's Z-score models yield similar predictive power. In particular, Altman's Z-model shows a higher degree of discriminant power in identifying financially distressed firms, at least one year prior to the distress. The market value and book value contribute similarly between Z-models. This indicates the level of care required in solvency test-based decision making, he also compared between solvency test and Altman Z-score he found that Altman's Z-score models show a higher degree of accuracy in predicting the financial distress. In particular, it has the potential of minimizing the error of classifying a firm as safe when the firm is not safe.

(Sulub, 2014), investigated the predictive power of applying Altman's Z' model to the multinational companies, and taken a sample of 10 companies selected randomly and distributed equally to two groups failed and non-failed companies. Edward Altman's Z' model for financial distress prediction was found to be an accurate for the failed multinational companies at a predictive power of 70%, and for the non-failed at a predictive power of 55%. (Khaliq et

al., 2014) The unhealthy financial state can be a massive and can cause long term distress which can result to restrictions of investments activities, capital flows and performance of firms. Thus, it is vital for organizations to identify the reasoning that may lead to a corporate failure and take measures accordingly to refrain from such condition. Thus, addressing the financial distress measurement among 30 GLC's listed companies in Bursa Malaysia over the period of five years (2008 until 2012). Assessing the financial distress determinant measured by Z- score statistics model. Further on, determinant such as current ratio and debt ratio were identified. Results show that there is significant relationship between both variables and Z – Scores that determine financial distressed of the GLC. Results indicate that there is existence of significant relationship between both variables and Z – Scores that determine financial distressed of the GLC. Few GLCs do signpost their position falls under financially distress cluster. (Almamy et al., 2015) the extension of the Z-score model in predicting the health of UK companies using discriminant analysis, and performance ratios to test which ratios are statistically better in predicting the health of UK companies from 2000 to 2013. He contributed towards Altman's original Z score model by adding a new variable. He found that, cash flow when combined with the original Z-score variable is highly significant in predicting the health of UK companies. A J-UK model was developed to test the health of UK companies. Finally, he compared to the Z - score model, the predictive power of the model was 82.9%, which is consistent with (R. J. Taffler, 1982) UK model. Moreover, to test the predictive power of the model before, during and after the financial crisis period; results show that J-UK model had higher accuracy to predict the health of UK companies than the Z-score UK model. So, the extension of Altman Z score model leads to better results and assist users such as researchers, managers, regulators, and other practitioners to manage their risk profile more effectively. (Shahwan, 2015), This paper aims to empirically examine the quality of corporate governance (CG) practices in Egyptian-listed companies and their impact on firm performance and financial distress in the context of an emerging market such as that of Egypt. Based on a sample of 86 non-financial firms listed on the Egyptian Exchange 2010, the effects of CG on performance and financial distress are assessed. Tobin's Q is used to assess corporate performance. At the same time, the Altman Z-score is used as a financial distress indicator, as it measures financial distress inversely. The bigger the Z-score, the smaller the risk of financial distress. There is an insignificant negative relationship between CG practices and the likelihood of financial distress. The current study also provides evidence that firm-specific characteristics could be useful as a

first-pass screen in determining firm performance and the likelihood of financial distress examine the relationship between CG practices and a firm's financial distress. Company with a Z-score over 2.67 is considered to be healthy, whereas a Z-score below 1.81 implies a predicted bankruptcy. Z-scores between 1.81 and 2.67 indicate potential bankruptcy or a gray area. The firm financial distress status was regressed on the CGI and eight control variables. There are three points to notice. First, regarding the CG practices as measured by the CGI, we find insignificant negative association between CG practices and the probability of financial distress. Such a result might be expected due to the low quality of the CG practices within our sample. Thus, there is a need for Egyptian corporations to raise the level of their CG practices. (Zhang et al., 2014) investigate determinants of financial distress in large financial institutions based on the Distance-to-Default and Z-Scores measures. Using data of U.S. bank holding companies (BHCs), we find that the housing price index is a consistently significant factor across all BHCs and the non-performing loan ratio is the most powerful indicator for financial distress. Short-term wholesale funding is also a reliable default risk indicator. We additionally find that all the three regulatory capital requirements are very important for controlling default risk, particularly in the post-crisis period. (JEL C53, G14, G21, G28), we use a sample of 629 BHCs in the United States to probe the impact of various factors on the financial distress of BHCs, before, during, and after the recent financial crisis. Our main findings are: First, the HPI is consistently significant and is positively associated with the DD and the Z-Score measures. Second, the NPLR is the most powerful indicator predicting financial distress, and STWF can also be considered a reliable default risk indicator. Third, although existing studies have shown that the two alternative measures of BHC activity diversification are very important factors affecting default risk, in this study no conclusive findings have been reached regarding their role as determinants of default risk. Fourth, all three measures of regulatory capital requirements have a directly positive impact on both DD and Z-Score from 2010Q1 to 2013Q4, showing their importance in the post-crisis period. (Kihooto et al., 2016) assessing the financial distress amongst commercial and services companies listed at the Nairobi Securities Exchange, Kenya with an objective of determining whether the companies in this sector were prone to bankruptcy. Utilized secondary data collected from the Nairobi Securities Exchange over a five-year period (year 2009 to year 2013). Using Altman's Z score model, indicating that the companies' Z scores (on average) lay between -1.88 to 3.5. This is an indication that the companies are relatively not in danger of bankruptcy. The Z score for Express Kenya limited was below

1.81 which may be treated like a company in financial distress for all the years investigated. The Kenya Airways had a relatively strong Z score which reduces as time goes by. This is correct finding because the company has been making substantial losses in recent years and facing financial difficulties up to the extent of experiencing government intervention. Longhorn Kenya limited is having a high Z score on average thus interpreted not to be in financial distress. Nation Media Group, Scangroup Limited and TPS East Africa Serena and Uchumi have shown a relatively high Z score on average thus not considered to be on verge of financial distress. However, interpretation of the ratios is not to be taken on the face value only. Uchumi limited has been experiencing financial difficulties and have been engaged in creative accounting where they dispose off their assets for cash which is in turn used to settle short term obligations. May be that is the reason their Z score is relatively safe and does not raise any queries. (Vosoughi et al., 2016) investigating the relationship between financial distress and investment efficiency of companies listed in the Tehran Stock Exchange. To calculate investment efficiency, the Richardson's model 2006 (Richardson, 2006). The aim of the present study is applied, and its method is correlational- ex post facto. Using the exclusion sampling method and by applying the conditions of selecting the sample, 94 companies were selected from 2008 to 2013. To test the research hypotheses, multiple regression was used. Findings of the research indicate that there was a correlation between financial distress and investment efficiency in companies listed in the Tehran Stock Exchange, and institutional ownership had positive effects on the relationship between financial distress and investment efficiency of companies listed in the Tehran Stock Exchange. That the company which faces with financial distress, avoids doing investment in projects with positive NPV. The results indicate that from among control variables entered the model, leverage has a negative correlation with investment efficiency. It means that companies with a lot of debts avoid investment in projects with positive NPV. (Liao & Mehdian, 2016), Comparing between two approaches to indicate which is more accurate in predicting financial distress and they are aggregate bankruptcy index (ABI) and Z-score, the study found out that (ABI) is more accurate in predicting insolvency than Z-score. Also (ABI) is more powerful when you apply it with other parametric and non-parametric models to predict financial distress in corporations. Edward I. (Altman et al., 2017) Assessing the classification performance of the Z-Score model in predicting bankruptcy and other types of firm distress, with the goal of examining the model's usefulness for all parties, We analyze the performance of the Z-Score model for firms from 31 European and three non-European countries using different modifications

of the original model. We use the original Z00-Score model developed by Altman, Corporate Financial Distress: A Complete Guide to Predicting, Avoiding, and Dealing with Bankruptcy (1983) for private and public manufacturing and non-manufacturing firms. While there is some evidence that Z-Score models of bankruptcy prediction have been outperformed by competing market-based or hazard models, in other studies, Z-Score models perform very well. Without a comprehensive international comparison, however, the results of competing models are difficult to generalize. This study offers evidence that the general Z-Score model works reasonably well for most countries and classification accuracy can be improved by using country-specific estimation that incorporates additional variables. The purpose of this study was to assess the classification performance of the Z"-Score model originally introduced by (R. Taffler, 1983) using a very large international dataset. The analyses for all data show that the original Z"-Score model performs very satisfactorily in an international context.

(Ul Hassan et al., 2017) found out that the logit regression model (LRM) is much more accurate than multivariate discriminant analysis (MDA) for better prediction of financial bankruptcy. However, accurate prediction of bankruptcy is beneficial to improve the regulation of companies, to form policies for companies and to take any precautionary measures if any crisis is about to come in future. (Imelda & Alodia, 2017) The Multiple Discriminant Analysis is derived from the Altman Model While the Logit Analysis is derived from the Ohlson Model, at the end they found that the O-Score is much more accurate than the Z-Score in finding the financial distress. The examination Population is all organizations that are recorded on the Indonesian Stock Exchange. The example of the exploration is 40 assembling organizations recorded on the Indonesian Stock Exchange in the time of 2010-2014 that are partitioned into Companies with budgetary pain and those without money related trouble. (Restianti & Agustina, 2018) analyzing the influence of financial ratios proxied by the current ratio, the retained earnings to total assets, earnings before interest and tax to total assets, return on equity, debt to assets ratio, and total assets turnover against Financial distress. The population is a sub company of various industry listed in Indonesia Stock Exchange (IDX) in the period from 2013 to 2015 with the number of 40 companies. The sampling technique used purposive sampling technique and acquired 35 companies with 105 units of analysis. Data were analyzed with descriptive statistics and logistic regression. These results indicate that earnings before interest tax to total assets and return on equity have an impact on financial distress. While the current ratio, the retained earnings to total assets, debt to assets ratio, and total assets turnover

has no influence on the financial company's distress. The conclusion is that the company's financial distress condition can be avoided by reducing the financing coming from debt. In addition, increasing sales and maximizing the use of assets and equities that companies have can also reduce and avoid the company from financial distress. Descriptive analysis is used to provide an overview or description of a data. Descriptive statistical analysis is used to explain the frequency and percentage of companies which are experiencing financial distress and non-financial distress. The results of descriptive statistical analysis describe the minimum, maximum, average, and standard deviation values of independent variables and dependent variable. (Manaseer & Al-Oshaibat, 2018) examining the validity of Altman Z-score model used to predict financial distress in insurance companies in Jordan listed on Amman stock exchange (ASE) from 2011 to 2016. And the study outcome found that Z-score model have high predictive power, as well as ability to maintain and monitor firms' risk, and it also showed how Z-score model can be a valuable instrumental indicator for a lot of users of financial statement. But Z-score model is not the only measurement used to predict firm financial distress as the research advices use of other measurements in predicting financial distress in firms. (Mohd Ali & Mohd Nasir, 2018) comparing the relationship of between corporate governance mechanisms and financially distressed companies in Malaysia. They collected data from 2010 till 2016 they thing that the board activity has a significant relationship with financially distressed companies. They aim to improve corporate governance mechanisms among financially distressed companies and improve shareholders value. As far as the connection between leading body of chief's credits and monetarily troubled organizations, the outcomes from the double calculated relapse examination show that there is a critical positive connection between board movement and monetarily upset organizations. The outcomes give proof that more top managerial staff gatherings are held when the organizations are monetarily upset. Notwithstanding, board size, board freedom, and CEO duality have no critical relationship with monetarily troubled organizations. It is recommended that more continuous load up movement during money related pain can be a decent procedure for those chiefs with restricted communication time to sit together and examine the best techniques to end the organization's monetary trouble. This likewise gives proof that board movement will in general be more responsive as opposed to proactive. (Waqas & Md-Rus, 2018) comparing between the most admired financial distress prediction O-score, logit model and multiple discriminant Analysis model (MDA), and the result of this study is that the use of logit model is more accurate in predicting financial distress than

(MDA) and O-score, Because prediction model provided more precise results with overall accuracy of 91.7 and 93.3 percent for the estimation sample while they found that the percentage of accuracy of O-score model is 61%. (MDA) proved its insufficiency in predicting financial distress in many studies in developed countries. This study was held in Pakistan with a sample of 290 firms divided into 45 distressed and 245 healthy firms for the period 2006-2016 and covered all sectors of Pakistan Stock Exchange. (Altameemi, 2021) investigating the effect of some of the firm level variables on the relation between financial distress and capital structure decisions The manufacturing firms listed in Turkish market between 2007 and 2017 are analyzed. Fixed effect panel regressions are used in the analyses. Financial distress level increases as leverage and short-term debt maturity usage increase. Firm size, return on equity, asset tangibility variables are reported as effective on the association between leverage and financial distress. Return on equity and asset tangibility have impacts on the relation between financial distress and debt maturity. The findings show that increased debt level results in higher level of financial distress which is in line with Trade-Off Theory. As the debt level of more profitable firms increases, the financial distress level of those firms increases. Moreover, increasing debt among large firms causes higher level of financial distress. Asset tangibility is also effective in reducing negative impact of debt on financial success. Increasing long term debt among firms with higher ROE, results in increased financial distress levels. Finally, increasing long-term debt ratio among firms with higher tangibility causes higher financial distress level. Altman Z Score and Springate S-Score are used to measure financial distress and negative relation is found between financial distress variables and capital structure variables. (Assagaf et al., 2019) overcoming weaknesses of using the logistic model used in previous studies to measure financial distress by using marginal approach because it provided evidence by mathematics and accounting calculations, And by using marginal approach this can also have a huge impact in evaluating the financial condition of SOEs, the study also showed the factors that have huge effect on financial distress, and this factors will help assist in developing strategies and management policies to raise marginal level scores. (Kashyap & Bansal, 2019) in India they started to predict the companies that may get bankrupt or “Financial Distress” so they started to collect some data from some of the companies and put them in a modeling and see if they will fall in a financial distress in the future or not and at the end they predicted 95% of the cases accurately prior to distress. The exploration was done to develop a factual model utilizing bookkeeping proportions to conjecture monetary misery among Indian listed organizations

enlisted under new indebtedness and insolvency code. The model was created utilizing distinctive money related proportions for both monetarily trouble just as sound organizations. Numerous discriminant investigations were utilized to segregate the organizations with between monetarily troubles from solid ones. As indicated by results, monetary proportions are very powerful for separating between conceivably trouble and non-trouble firms. The outcome found that money related proportions can exactly anticipate the trouble among Indian firms both two years just as three years ahead of time adequately. So, the proposed models can be utilized to discover the recorded organizations in India which can confront trouble in future well ahead of time. (Indriyanti, 2019) comparing the financial distress of technology companies, they got the data of world's 25 biggest tech companies from 2015-2016 and compared them, the total was 30 companies in the comparison and they started calculating. In this examination, each organization will be seen by their last exchange. Last exchanging demonstrates that the organization is as yet dynamic and not delisted on the stock trade. Furthermore, the organization will likewise be seen following a time of forecast whether the organization has consolidated or gained with another organization or not. It means to investigate and look at the prescient consequences of every expectation model with the current genuine state of the organization. The hour of perception of the organization's keeps going exchanging is done on August 5, 2018 on each stock trade which is where the organization is posting. The stock trades incorporate Nasdaq, New York Stock Exchange, Korea Stock Exchange, London Stock Exchange, India Stock Exchange, and National Stock Exchange of India. Likewise, to seeing the truth of the organization's condition, ICR was likewise determined for Robustness check investigation. In this investigation, each organization will be seen by their last exchange. Last exchanging demonstrates the assurance of the exactness of the expectation model in this investigation depends on the high-rate level of every forecast model. The level of results is acquired from the correlation of the consequences of the expectations of each model contrasted with the truth of the organization after the year anticipates. The model with a rate level drawing closer 100% is the most precise model in foreseeing the monetary trouble of an organization that can possibly bankrupt later on. The outcome shows that the expectation models which are the most exact to anticipate truth of the organization is Grover models. Grover models can anticipate with exact until 96,6%, and it is near 100%. After Grover model, Altman model can foresee with exact until 86,6%, and afterward Taffler model 85%, Zmijewski model 85%, Springate model 70%, Ohlson model 46,6%, and the last Fulmer model 40%. Table 2 show the consequence of Robustness

Check which depend on looks at count models with interest inclusion proportion. Furthermore, the outcomes demonstrate that the Grover model which is the most noteworthy precision model is right and still exact. In spite of the fact that the rate diminished from 96.6% to 95%, the Grover model remains the forecast model of monetary misery with the most elevated exactness contrasted with the Altman, Zmijewski, and Taffler models with an exactness pace of 83.3%, the Springate model with 71,6% precision rate, Ohlson's model with a 46.6% precision rate, just as the forecast model with the least exactness rate is the Fulmer model with a precision pace of 45%. (Elviani et al., 2020) determined the most accurate model among (Elviani et al., 2020) with binary logistic regression as analysis technique. A sample of 53 trade sector companies in Indonesia. it proved that the most appropriate and accurate model in predicting bankruptcy of trade sector companies in Indonesia is the Springate model and the Altman model. (Tanjung, 2020), Comparing between Altman Z-Score, Springate, Zmijewski and Ohlson models to determine which is the most accurate in predicting financial distress it's shown that The Altman model is the most accurate prediction model in predicting financial distress. And there is a huge difference between them. The sampling method used purposive sampling with 45 data from 9 pharmaceutical companies listed in IDX. This paper is conducted to examine the prediction model of financial distress, few researches were done in different industries and different time periods to unfold the puzzled phenomena and they used different variables to predict the financial distress so the effect of firm performance is still ambiguous. The paper has shown the prediction models of financial distress during the period 2011 to 2020. Through this study we predicted the financial distress by applying Z-score model on firms that have had financial problems and those that didn't face problems. However, most of the studies in developed countries have highlighted some models in predicting the financial distress, although all these models have the same ability to predict the probability of the firm facing financial distress. We found a high predictive power for Z-score model and that revealed that Z-score model could be valuable, but the problem still which model is the best to best predict financial distress. All the authors found positive relation between Z-score and financial distress so we will examine if there is a negative relation between Z-score and financial distress and the new measurement used to predict financial distress. Z-score model was developed in 1968 and it was the most appropriate for public firms (Altman, 1968). Edward Altman was considered to be the first one to start working on a model to assess a predictor of financial distress for companies. Altman was New York University Finance Professor; he developed the model widely

known as Z-score through using a statistical tool named as "Multiple Discriminant Analysis" (Calandro, 2007). Multiple discriminant analysis or MDA identifies well the distressed firms from the non-distressed ones through the ratios of Z-score. Z-score is based on five financial ratios; these ratios were chosen after analyzing various financial ratios (Calandro, 2007) , (Khurshid, 2013) and (Sandin & Porporato, 2007) The five ratio classifications included are: Liquidity, Profitability, Leverage, Solvency, and Activity ratios (Altman, 1968) and (Sandin & Porporato, 2007) Certain weights are given to each ratio (al Zaabi, 2011). This model has high predictive power ability 2 years before financial distress (Altman, 1968). This model has 2 modifications which are Z' and Z" models which will be discussed later in this section. Z-score is calculated as follows:

$$Z = 1.2 X1 + 1.4 X2 + 3.3 X3 + 0.6 X4 + 1.0 X5$$

X1: Working Capital/Total Assets

X2: Retained Earnings/ Total Assets

X3: Earnings before interest and taxes/Total Assets

X4: Market Value Equity/Book Value of Total Liabilities

X5: Sales/Total Assets

If Z is greater than 2.99, then the firm is not having any financial distress risk or it is financially solid. If Z is lower than 1.81, then the firm is identified as financially distressed. If Z is between 1.81 and 2.99, then the firm is falling in the grey zone (Altman, 1968). X1 shows the working capital which is the difference between firm's current assets and its current liabilities (Khurshid, 2013). This ratio tests the net liquid assets of a company with respect to total assets. Also, it measures the firm's ability in controlling its liquidity or the net liquidity of its assets (Al Zaabi, 2011). Thus, a financially distressed firm experiences deterioration in working capital or if the firm is having continuous operating losses, the current assets will decrease compared to total assets. Liquidity and size attributes are clearly considered. This ratio is the most relevant ratio (Altman, 1968). Also, (Khurshid, 2013) agreed that working capital is the blood of any company since it meets the daily business obligations. Also, he claimed that this ratio has been used frequently in common finance. It reflects how much part of assets is allocated for meeting business needs. So, (Al Zaabi, 2011) concluded that a financially distressed firm suffers from low working capital. X2 analyzes the retained earnings compared to total assets as it shows to what extent retained earnings are expressed by total assets needed (Al Zaabi, 2011). It measures the cumulative profitability of the firm (Altman, 1968). Correspondingly, (Khurshid, 2013) agreed that it is one of the most critical ratios in standard finance. Since the

firm's age is very crucial, therefore, a new firm has a relatively low retained earnings ratio and an old firm has a relatively high retained earnings ratio. Firms employ their high retained earnings as a source of capital financing thus using debt as a source of financing declines, so if the firm is having low retained earnings it will be highly leveraged. X3 is calculated by dividing earnings before interest and taxes (EBIT) by total assets (Al Zaabi, 2011). It is used to calculate return on total assets for examining the company's ability to earn profits from its assets. This ratio is used in evaluating the firm's going concern and measuring the firm's profitability since the firm's success or bankruptcy depends on its earning capability (Altman, 1968) and (Khurshid, 2013). This ratio measures the firm's productivity without considering leverage indicators, and taxes. Since the main reason for existence of any firm is based on its assets earnings, then this ratio is the most appealing one for measuring corporate failure (Altman, 1968). This ratio indicates to what extent EBIT is reflected by total assets or how much of total assets are being a part of EBIT (Khurshid, 2013). Also, it highlights the company's productivity resulting from its borrowed funds (Al Zaabi, 2011). X4 examines the shareholders' equity relative to total liabilities. Equity is assessed by the market value of all types of stocks. This ratio indicates how much the assets can decrease in value before liabilities get higher than assets and the firm becomes distressed (Altman, 1968). The higher this ratio, the lower the possibility that the company will be distressed (Al Zaabi, 2011). Accordingly, it reflects the firm's value over its total duties. This ratio is sometimes calculated by dividing net worth by total liabilities. Net worth is the amount by which assets exceed liabilities. So, the ratio evaluates the net worth of the company at the market as was mentioned by (Calandro, 2007) and (Khurshid, 2013). This ratio measures financial stability on the long-run. The increased gearing resulting from equity trading leads to insolvency and distress (Al Zaabi, 2011). X5 indicates how much the company is growing. Firms have to exploit their assets in an efficient way to achieve sales growth. Firms that are well-performing have high sales to total assets ratio (Khurshid, 2013). This ratio is known as capital-turnover ratio, it reflects the capability of assets in generating sales. Moreover, it shows how managers are effective in market competitions (Altman, 1968). This ratio shows the management ability to deal with competitive conditions. Also, it ranks second in terms of the model's ability to identify financial distress (Altman, 2000). However, Altman modified his original Z-score into two new models known as Z'-score model and Z''-score model.

Data Analyzed



Figure 1: Juhayna Z-SCORE

Validity of Altman Z-Score Model to Predict Financial Distress Page 7 of Number Pages 55

Juhayana z-score fluctuates through the years but most of the time it's in grey zone, in 2016 the company z-score was decreasing that it went from grey zone to becoming financial distressed and the big reason for this is decreasing in the value of X4 (Market Value Equity/Book Value of Total Liabilities) because it measures the financial stability of the company on the long-run but starting from 2017 Juhayna started improving till it came out of the financial distress and back to the grey zone and that due to the increase in the value of X4 (Market Value Equity/Book Value of Total Liabilities), furthermore the company entered the safe zone in end of 2018 but again in 2019 it went to the grey zone and small fluctuation over the year but in 2020 second quarter decreased because of the pandemic, but then the company began to progress again.



Figure 2: Edita Food Industries Z-SCORE
 Validity of Altman Z-Score Model to Predict Financial Distress Page 7 of Number Pages 55

The company past 5 years was in (Safe Zone) where the Z score was higher than 1.81 even higher than 2.99 so this means that the company is in the safe zone.

The company working capital has been decreasing the past years but this is a good indicator that the company is not keeping a working capital and its investing all its money but the last two years 2019-2020 they started increasing the working capital, They kept dealing with the total asset and year by year it has been increasing gently and this is a sign that the company is growing, the Retained earnings kept its growth and this is one of the major signs that company is staying consistently profitable From 2016 till 2020 the Z-Score decreased from 9.14 to 3.11 the big reason that the company decreased its total Z score is the EBIT. The company faces unstable amount of Increasing EBIT it may be due to marketing campaigns or taxes the total amount of EBIT/Market value Decreased in 2020 and this caused that the Z-score decrease to 3.1 and also the Market value compared with the other years, in 2020 it decreased, in the past 5 years the book value of this company has been increasing hugely this mean that the company stock price has increased too and it's a good indicator for the purchasing or investing in this company.



Figure 3: Telecom Egypt Z-SCORE
 Validity of Altman Z-Score Model to Predict Financial Distress Page 7 of Number Pages 55

Telecom Egypt Company was in the distressed zone in the past 5 years (2016-2017-2018-2019-2020) as the z score in the 4 quarters of the 4 year was less

than 1.81 except quarter 2 in 2016 the company was in the grey zone which means that the company is headed for bankruptcy as the X1 (working capital/Total Assets) increased in Q2 2016 and began to increase negatively from Q3 2016 to Q4 2020 which indicates that the company current liabilities exceeded its current assets. And the liabilities that need to be paid within one year exceed the current assets over the same period.

Also, there is a moderate fluctuation in all the other variables as they gradually increased where X2 (Retained Earnings/ Total Assets) went from 0.18 to 0.26, X3 (Earnings before interest and taxes/Total Assets) from 0.01 to 0.02, X4 (Market Value Equity/Book Value of Total Liabilities) from 1.53 to 0.45, X5 (Sales/Total Assets) from 0.09 to 0.11 despite this increasing all of the variables still below 1.81 which indicates that the company still in the distressed zone.



Figure 4: Lecico Egypt Z-SCORE

Validity of Altman Z-Score Model to Predict Financial Distress Page 7 of Number Pages 55

Lecico suffered from financial distress from the start of 2016 to the end of 2020 as it's z-score in the past 5 years never were higher than 1.81 as shown the highest z-score Lecico had in 2018 fourth quarter was 1.32 and that was due to the increase in the value of X5 (Sales/Total Assets) or in other words increase capital-turnover ratio which shows the increase in the capability of assets in generating sales. Moreover, it shows improve in the management ability to deal with competitive conditions.

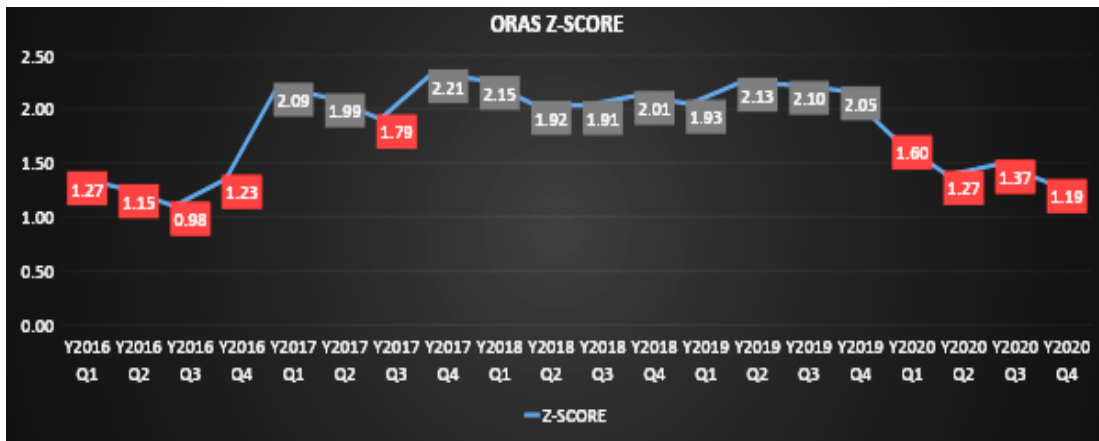


Figure 5: Orascom Construction Z-SCORE

Validity of Altman Z-Score Model to Predict Financial Distress Page 7 of Number Pages 55

ORASCOM company in 2016 faced financial distress because appreciation of US dollar relative to Egyptian pound and the inflection in Egypt so all construction sector in Egypt face problem, the company have problem in Asset turnover, Average collection period and stock of company fall in stock market. But in 2017 to 2019 the company moved from distress zone to grey zone, so the ORASCOM company didn't face any distress due to the company decrease in the expenses and collect Account receivable faster to convert Account receivable into cash, turnover asset in sales faster and the company become more efficient in shareholder return so the EPS increase. But in 2020 all construction sector in world faced problem because COVID-19.



Figure 6: Ezz Steel Z-SCORE

Validity of Altman Z-Score Model to Predict Financial Distress Page 7 of Number Pages

In 2016 and 2017 years Ezz steel company was in safe zone as their scores were above 3 which indicates that the company will not declare bankruptcy, as the company has good efficient retained earnings compared to their total assets for buying more income producing assets, higher future profitability. In those years in the last quarters the company was just facing a problem for weak sales and possibly excess inventory (overstocking). But it seems that they have improved those problems as in 2018, we can see that the company is not facing any distress due to their improvement with a z score 2.3 and above 3 indicating grey and safe zones. In 2019 and 2020 the company has fallen to the distress zone with a very low z score as the longer the company take to pay their creditors and bad inventory management and for the COVID-19 world pandemic.

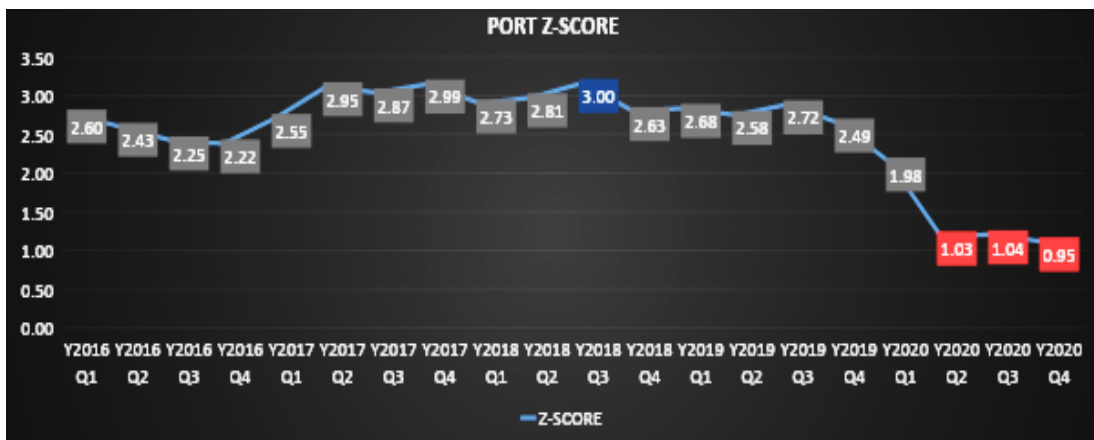


Figure 7: Porto Group Z-SCORE

Validity of Altman Z-Score Model to Predict Financial Distress Page 7 of Number Pages 55

Porto Group Company in 2016, 2017, 2018 and 2019 years are in grey zone as their z score is above 1.81 and below 2.99 which suggests there is a moderate chance of the company going bankrupt within the next two years of operations which indicates that the business was not bad, both in terms of sales performance and inventory management. While in 2020 as its shown the company has fallen to the distress zone with a z score below 1.81 which is leading to facing a problem of a difficulty in paying its bills and it meets difficulty in converting its inventories to sales and a bad average collection period, in addition to the COVID-19 world pandemic.

Result

After testing our hypothesis, we reached out that z-score is a good indicator to measure financial distress of a firm working in the Egyptian stock market, in a sample of 7 companies in the Egyptian stock market we calculated the z-score and we found out companies that have financial distress and in the danger zone and others that don't have financial distress and in the safe zone and we also found out the cause of the problems that are putting the companies in the danger zone. The Z-score model is a very practical tool that can be used to predict the insolvency of companies in Egypt. This tool also could be used by investors to decide if they would invest in any of those companies showing the company's financial position. The study showed that z-score is valid model in measuring financial distress as it differentiated distressed firms from safe and grey ones in the used sample. Also, in this study we used Altman Z score model as a tool on a sample of 7 companies in Egyptian stock market over the period 2016 – 2020 for predicting failure of companies and measuring the related risk of bankruptcy and we found out that financially distressed firm experiences deterioration in working capital, low **EBIT** (earnings before interest and taxes). Decreasing in sales which makes these companies fall in the distressed zone and also, we found out non distressed companies these experience effective noticeable increasing in all of the 5 variables which made them in the safe zone away from being financially distressed. And after analyzing the sample we found out that in the second quarter in 2020 all of the seven companies suffer from the pandemic and that cause decrease in the Z-score although the effect differs from one company to another obviously. The purpose of this study was to investigate the accuracy of Altman Z-score model in predicting corporate financial distress in Egypt. The Z score Altman's model may not be the only model to measure the financially distressed firms but Z-score is a valid model to determine the financial distressed firms. We recommend that further researches are conducted including companies in other sectors, increase the sample size and increase the number of years used in the sample. Also using other models to predict financial distress and compare it with z-score would be effective for future research. The study only relayed on financial data to predict financial distress, while there are other measures which can be used for financial distress detection Such as corporate governance, investment efficiency, equity return, cash flow. Capital structure, prevailing economic as well as political conditions. If such information is incorporated in financial distress prediction models, then the study can be conclusive. This study could have been conclusive if done for the whole population of the firms listed at the

Egyptian stock market. However due to inadequate data only 7 companies were analyzed. Critical sectors like insurance and banking were totally left out in the analysis due to disclosure requirements which minimize availability of data. The study covered only five years. This is due to time limitation and as such results may be different if the time frame covered was expanded.

References

- Al Zaabi, O. (2011). Potential for the Application of Emerging Market Z-Score in UAE Islamic Banks. *International Journal of Islamic and Middle Eastern Finance and Management*, 4(2), 158–173.
- Alifiah, M. N. (2014). Prediction of Financial Distress Companies in the Trading and Services Sector in Malaysia using Macroeconomic Variables. *Procedia-Social and Behavioral Sciences*, 129, 90–98.
- Almamy, J., Aston, J., & Ngwa, L. N. (2015). An Evaluation of Altman's Z-Score using Cash Flow Ratio to Predict Corporate Failure Amid the Recent Financial Crisis: Evidence from the UK. *Journal of Corporate Finance*, 36, 278–285.
- Altameemi, A. F. (2021). The Relationship Between Financial Flexibility and Market Value Added: The Mediation Effect Role of the Corporate Size (A Practical Study on a Sample of Jordanian Industry Sector Firms). *International Journal of Economics and Finance*, 13(1), 1–52. <https://ideas.repec.org/a/ibn/ijefaa/v13y2021i1p52.html>
- Altman, E. I. (1968). Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy. *Journal of Finance*, 23(4), 589–609.
- Altman, E. I. (2000). Predicting Financial Distress of Companies: Revisiting the Z-score and ZETA Models. In *Handbook of Research Methods and Applications in Empirical Finance*.
- Altman, E. I., Iwanicz-Drozdowska, M., Laitinen, E. K., & Suvas, A. (2017). Financial Distress Prediction in an International Context: A Review and Empirical Analysis of Altman's Z-Score Model. *Journal of International Financial Management & Accounting*, 28(2), 131–171. <https://doi.org/10.1111/JIFM.12053>
- Assagaf, A., Murwaningsari, E., Gunawan, J., & Mayangsari, S. (2019). Estimates Model of Factors Affecting Financial Distress: Evidence from Indonesian State-owned Enterprises. *Asian Journal of Economics, Business and Accounting*, 1–19.
- Calandro, J. (2007). Considering the Utility of Altman's Z-score as a Strategic Assessment and Performance Management Tool. *Strategy and Leadership*, 35(5), 37–43.
- Edward Altman. (2012). Enhancements to Assess Credit Risk in Global Environment--. Experience Stern. <https://www.stern.nyu.edu/experience-stern/faculty-research/altman-launches-zscore-plus>
- Elviani, S., Simbolon, R., Riana, Z., Khairani, F., Dewi, S. P., & Fauzi, F. (2020). The Accuracy of the Altman, Ohlson, Springate and Zmijewski Models in Bankruptcy Predicting Trade Sector Companies in Indonesia. In *Budapest*

- International Research and Critics Institute (BIRCI-Journal) (Vol. 3, pp. 334–347).
- Gunathilaka, C. (2014). Financial Distress Prediction: A Comparative Study of Solvency Test and Z-score Models with Reference to Sri Lanka. *The IUP Journal of Financial Risk Management*, 11(3), 39–51.
- Habib, A., Bhuiyan, B. U., & Islam, A. (2013). Financial Distress, Earnings Management and Market Pricing of Accruals during the Global Financial Crisis. *Managerial Finance*.
- Hua, Z., Wang, Y., Xu, X., Zhang, B., & Liang, L. (2011). Predicting Corporate Financial Distress Based on Integration of Support Vector Machine and Logistic Regression. *Expert Systems with Applications*, 33(2), 434–440.
- Imelda, E., & Alodia, I. (2017). The Analysis of Altman Model and Ohlson Model in Predicting Financial Distress of Manufacturing Companies in the Indonesia Stock Exchange. *Indian-Pacific Journal of Accounting and Finance*, 1(1), 51–63.
- Indriyanti, M. (2019). The Accuracy of Financial Distress Prediction Models: Empirical Study on the World's 25 Biggest Tech Companies in 2015–2016 Forbes's Version. *KnE Social Sciences*, 442–450.
- Kashyap, S., & Bansal, R. (2019). Modeling Financial Distress Prediction of Indian Companies. In *International Journal of Recent Technology and Engineering (IJRTE)* (Vol. 8, Issue 1C2).
- Khaliq, A., Altarturi, B. H. M., Thaker, H. M. T., Harun, M. Y., & Nahar, N. (2014). Identifying Financial Distress Firms: a Case Study of Malaysia's Government Linked Companies (GLC). *International Journal of Economics, Finance and Management*, 3(3).
- Khurshid, M. R. (2013). Determinants of Financial Distress Evidence from KSE 100 index. *Business Review*, 8(1), 7–19.
- Kihooto, E., Omagwa, J., Wachira, M., & Emojong, R. (2016). Financial Distress in Commercial and Services Companies listed at Nairobi Securities Exchange, Kenya. *European Journal of Business and Management*, 8(27), 86–89.
- Kordestani, G., Bakhtiari, M., & Biglari, V. (2011). Ability of Combinations of Cash Flow Components to Predict Financial Distress. *Business: Theory and Practice*, 12(3), 277–285.
- Liao, Q., & Mehdian, S. (2016). Measuring Financial Distress and Predicting Corporate Bankruptcy: An index approach. *Review of Economic and Business Studies*, 9(1), 33–51.
- Manaseer, S., & Al-Oshaibat, S. D. (2018). Validity of Altman Z-score Model to Predict Financial Failure: Evidence from Jordan. *International Journal of Economics and Finance*, 10(8).

- Mohd Ali, M., & Mohd Nasir, N. (2018). Corporate Governance and Financial Distress: Malaysian Perspective. *Asian Journal of Accounting Perspectives*, 11(1), 108–128. <https://doi.org/10.22452/AJAP.VOL11NO1.5>
- Mu-Yen Chen. (2014). A High-Order Fuzzy Time Series Forecasting Model for Internet Stock Trading. North-Holland, 37, 461–467.
- Onyiri, S. (2014). Predicting Financial Distress using Altman's Z-score and the Sustainable Growth Rate. In Northcentral University. ProQuest Dissertations Publishing.
- Restianti, T., & Agustina, L. (2018). The Effect of Financial Ratios on Financial Distress Conditions in Sub Industrial Sector Company. *Accounting Analysis Journal*, 7(1), 25–33. <https://doi.org/10.15294/AAJ.V7I1.18996>
- Richardson, S. (2006). Over-Investment of Free Cash Flow. *Review of Accounting Studies*, 11(2–3), 159–189. <https://doi.org/10.1007/S11142-006-9012-1>
- Sandin, A. R., & Porporato, M. (2007). Corporate Bankruptcy Prediction Models Applied to Emerging Economies Evidence from Argentina in the years 1991-1998. *International Journal of Commerce and Management*, 17(4), 295–311.
- Shahwan, T. M. (2015). The Effects of Corporate Governance on Financial Performance and Financial Distress: Evidence from Egypt. *Corporate Governance*, 15(5), 641–662. <https://doi.org/10.1108/CG-11-2014-0140>
- Sulub, S. A. (2014). Testing the Predictive Power of Altman's revised Z' model: The Case of 10 multinational companies. *Research Journal of Finance and Accounting*, 5(21), 174–184.
- Taffler, R. (1983). The Assessment of Company Solvency and Performance using a Statistical Model. *Accounting and Business Research*, 52. [https://www.research.manchester.ac.uk/portal/en/publications/the-assessment-of-company-solvency-and-performance-using-a-statistical-model\(734e4dee-5f31-4f80-85df-7e8eaa64389c\)/export.html](https://www.research.manchester.ac.uk/portal/en/publications/the-assessment-of-company-solvency-and-performance-using-a-statistical-model(734e4dee-5f31-4f80-85df-7e8eaa64389c)/export.html)
- Taffler, R. J. (1982). Forecasting Company Failure in the UK Using Discriminant Analysis and Financial Ratio Data. *Journal of the Royal Statistical Society. Series A (General)*, 145(3), 342. <https://doi.org/10.2307/2981867>
- Tanjung, P. R. S. (2020). Comparative Analysis Of Altman Z-Score, Springate, Zmijewski And Ohlson Models In Predicting Financial Distress. *EPR International Journal of Multidisciplinary Research (IJMR)*, 126.
- Ul Hassan, E., Zainuddin, Z., & Nordin, S. (2017). A Review of Financial Distress Prediction Models: Logistic Regression and Multivariate Discriminant Analysis. *Indian-Pacific Journal of Accounting and Finance*, 1(3), 13–23.
- Vosoughi, M., Derakhshan, H., & Alipour, M. (2016). Investigating the Relationship Between Financial Distress and Investment Efficiency of Companies listed on the Tehran Stock Exchange. *Accounting*, 2(4), 167–176.

- Waqas, H., & Md-Rus, R. (2018). Predicting financial distress: Applicability of O-score and logit model for Pakistani firms. *Business and Economic Horizons* (BEH, 14(1232-2019-760), 389-401.
- Zhang, Z., Xie, L., Lu, X., & Zhang, Z. (2014). Determinants of Financial Distress in U.S. Large Bank Holding Companies. *SSRN Electronic Journal*.
<https://doi.org/10.2139/SSRN.2392892>