

Influence of Debtors Payment Period and Inventory Conversion Period on Liquidity Risk of Manufacturing Firms Listed at Nairobi Securities Exchange, Kenya

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Abstract:

Manufacturing firms listed at Nairobi Securities Exchange have an obligation just like other firms to generate income that is adequate to cover their operational costs, inherent risks and enhance their institutional capital. Working capital involves management of current assets and current liabilities with an aim of ensuring the firm is able to meet its obligations as and when they arise even as they aim at making profits. Given the current ever dynamic business environment, Manufacturing firms listed at Nairobi Securities Exchange are exposed to liquidity risk that is brought about by various factors such as the nature of the customer base, prevailing economic environment among others. The study sought to determine the effect of debtor's payment period and inventory conversion period on liquidity risk and determine the effect of cash conversion cycle on liquidity risk. The study was guided by the anticipated income theory, liquidity theory and Cash Conversion Cycle. The sample size will be the 8 listed manufacturing firms listed at the NSE. The study employed a descriptive cross-sectional design because it permitted the researcher to break down associations among a substantial number of factors in a study. Secondary data was collected for duration of 5 years (January 2016 to December 2020) annually. In data analysis, both descriptive and inferential statistics were conducted. Descriptive statistics involved determining the mean, the standard deviation, skewness and kurtosis of each variable under study while inferential statistics involved both the correlation and regression analysis. A trend analysis for 5 years helped the researcher in investing whether the selected independent variables have a significant influence on liquidity risk of companies quoted at the NSE. STATA 15 was employed for the data analysis purposes. The results indicated that debtor payment period and inventory conversion period has positive effect on liquidity risk. This implied that increase in debtor payment and inventory conversion periods will result to increase in liquidity risk while increase in credit payment period and cash conversion cycle will reduce liquidity risk. The study therefore recommended that that the management to elongate the credit payment period by good name created with suppliers and suppliers so as not to interrupt supplies to the firm which in turn leads to smooth operation during the year and ends up with better liquidity. Further, manufacturing firms should increase their inventory conversion period so as to release reduce liquidity risks associated with their inventory.

Key Word: Inventory Conversion Period, Debtors Payment Period, Liquidity Risks, Listed Manufacturing Firms, Nairobi Securities Exchange.

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I. Introduction

Liquidity risk is the potential of financial loss that arises from the inability either to meet obligations or to fund increases in assets as they fall due without incurring unacceptable costs or losses (Ajanthan, 2013). The risk emanates from maturity mismatches where liabilities have a shorter tenure than assets. According to Puneet and Parmil (2012), liquidity concerns in the financial sector have been a source of worry to the management of firms. The inability of a financial entity to meet its financial obligation is a premise on which a crisis may result. An unexpected rise in the borrowers' demands above the expected level can lead to shortages of cash or liquid marketable assets (Asongu, 2013). In manufacturing firms, liquidity crisis could lead to insolvency and unanticipated runs. Consequently, minimizing liquidity risk is one of the most important aspects in working capital management. In essence, the objective of working capital management is to mitigate the impact of the maturity mismatch on the firm's statement of financial position. This requires the understanding of how cash flows are moving within an organization, identifying the presence and location of cash flow strains by measuring emerging liquidity pressures and taking corrective action to prevent these pressures from growing (Krippner, 2011).

Managing liquidity risk is one of the top priorities of a financial institution's working capital management. In the context of Manufacturing firms listed at Nairobi Securities Exchange' liquidity, the ability to fund increases in assets and meet obligations as they come due, is critical to the ongoing viability of the Manufacturing firms listed at Nairobi Securities Exchange. Since there is a close association between liquidity and solvency, sound liquidity management reduces the probability of Manufacturing firms listed at Nairobi Securities Exchange becoming insolvent, thus reducing the possibility of bankruptcy and disruptive runs. Ultimately, prudent liquidity management as part of the overall risk management ensures a healthy and stable manufacturing sector (Brigham & Ehrhardt, 2012). In addition, Omimo (2014) emphasize the significance of manufacturing firms liquidity management in achieving both short and long term objectives of the financial entity. Ideally, it is imperative that Manufacturing firms listed at Nairobi Securities Exchange retain sound ability to sustainable liquidity controls to provide basis for insulating them against uncertainties and market dynamics while maximizing their owners' worth (Wanyama, 2012).

Since independence, Kenya has experienced numerous cases of liquidity risk of quoted firms. This is evidenced by some companies facing financial restructuring and others being placed under receivership and subsequently delisted (Ong'era, Muturi, Oluoch & Karanja 2017). According to Gibendi (2015) firms that have gone under include Mumias sugar company, Webuye Paper Mills, Muhoroni Sugar Company, Uchumi Supermarket and Kenya Meat Commission. Eighteen listed companies have issued profit warnings, an indication of tough economic times (Mwiti, 2016). In 2014, eleven listed companies issued profit warnings up from eight in 2013 an indication of tough economic times (Mwiti, 2016). According to Kipruto (2013) failure of high profile public and private companies in the past include; Uchumi supermarkets (2006), Discount Securities (2008), Invesco insurance (2008), Standard Assurance (2009), Ngenye Kariuki Stock brokers (2010) and Hutchings Biemer (2010). Moreover, more than 56% of the companies quoted on NSE had a downward trend on their market capitalization for the years 2011, 2012, 2013, 2014 and 2015 (CMA, 2016). Companies listed at NSE have showed poor performance. For example, Kenya Airways reported a loss of Ksh 25.7 billion because of operational inefficiencies (Okoth, 2015), Mumias sugar company reported a loss of Ksh 3.4 billion (Gibendi, 2015), Uchumi supermarket creditors have sued for unpaid billions (Michira, 2016), Eveready East Africa Limited is exiting the Kenyan markets having lost Ksh 248 million (Aderibigbe, 2015).

Nairobi Securities Exchange – formerly the Nairobi Stock Exchange (July 2011) is the only firm mandated to list companies in Kenya. The NSE was established in 1954 and currently is the leading securities exchange in East and Central Africa. The products traded at the NSE are shares (equity) and bonds (debt/leverage instruments) which are financial instruments that are jointly referred to as securities. NSE facilitates investments and savings by bringing together borrowers and lenders. Currently a total of sixty-five firms are listed at the NSE spanning eleven market sectors: agricultural, commercial and services, telecommunication and technology, automobiles and accessories, banking, insurance, investment, manufacturing and allied, construction and allied, energy and petroleum, and growth enterprise market segment (NSE, 2019). The listing requirements for firms at the NSE provide for among others, adoption of a stable dividend policy and total indebtedness not exceeding four hundred per centum of the net company worth, a gearing ratio of 4:1 (NSE manual, 2013). Listing requirements at the exchange are reinforced by Gazettement of Legal Notice No. 60 (2002) which provides that firms wishing to be listed must have a clear future dividend policy. In Kenya most of the quoted companies pay dividend semi-annually. No legal requirements recommend firms to employ a particular divided payment schedule. Nevertheless, dividend distribution is monitored through some legal restrictions for instance the dividend should not be paid out of capital unless during liquidation.

Statement of the Problem

Illiquidity is one of the main reasons for liquidation of firms. Managing a firm's liquidity is therefore important and necessary for all businesses. When a company does not identify areas that affect liquidity and manage it well, it can fall into cash shortages and as a result become unable to settle its obligations when they fall due. Because of these reasons firms have come up with strategies to improve their liquidity position (Deloof, 2003). According to Lamberg & Valmig (2009), levels of liquidity should not fall below the minimum required as it will lead to liquidity risk. Manufacturing companies are key pillars of the distribution of resources hence liquidity risk is a strategic aspect of the financial performance (Attari, 2012). Manufacturing company's liquidity need to be managed properly in order for them to maintain a competitive edge and remain sustainable. Liquidity risk of the manufacturing companies listed in the NSE is based on the company's cash flow statements and the budgets. According to Muriithi (2016), companies affected by the liquidity, delay payments of current liabilities like the supplier's debts which affect the company's credit terms.

Kenya's publicly listed manufacturing entities are gradually facing imminent demise because of illiquidity problems. Many of these listed manufacturing firms are increasingly petitioning the exchequer for bailout, citing their strategic national importance. Kenya has experienced a fair share of listed manufacturing companies facing liquidity problems notable examples are Eveready Company, East Africa Packaging, Sameer

Africa, Mumias sugar, Athi River Mining, East Africa Portland Cement, and the East Africa Cables. Several firms in Kenya have been delisted from NSE due to liquidity and financial health. The delisted firms include Mumias Sugar Company, Kenya Airways, East Africa Packaging and Uchumi Supermarket (Kakah, 2015; Mbaru, 2014). Mugenyah (2015) evaluated the determinants of liquidity risk on commercial banks in Kenya and arrived at the conclusion that capital adequacy had a positive effect on liquidity risk, while size, liquid asset ratio and leverage had negative effect on liquidity risk. Mwangi (2014) seek to find out relationship between liquidity risk management and performance of commercials banks and found out a negative relationship between the two variables. A study conducted by Maaka (2013) indicated that liquidity risk had significant negative effect on the profitability of the banks in Kenya. Kamau & Njeru (2013), liquidity Risk had a negative effect on profitability of insurance companies in Kenya. Njuguna (2015) was on the effect of liquidity management on profitability of cement manufacturing firms.

Most studies have looked at liquidity and liquidity risk as the independent variable. Local studies on determinants of liquidity risk have been on commercial banks. The study aimed to make a contribution on liquidity in the manufacturing sector in Kenya by identifying factors that would make companies face liquidity risk. This study therefore, the study seeks to assess the effect of working capital component on liquidity risk of manufacturing firms listed at Nairobi Securities Exchange.

Objectives of the Study

- i) To determine the effect of debtors payment period on liquidity risk of manufacturing firms listed at Nairobi Securities Exchange, Kenya
- ii) To establish effect of inventory conversion period on liquidity risk of manufacturing firms listed at Nairobi Securities Exchange, Kenya

Hypotheses of the Study

- i. H₀₁: There is no significant effect of debtors payment period on liquidity risk of manufacturing firms listed at Nairobi Securities Exchange, Kenya
- ii. H₀₂: There is no significant effect of inventory conversion period on liquidity risk of manufacturing firms listed at Nairobi Securities Exchange, Kenya

II. Literature Review

Theoretical Framework

Anticipated Income Theory

The anticipated income theory which is one of the liquidity management theories was developed by H.V. Prochanow in 1944 on the basis of the practice of extending term loans by the US commercial banks (Kiambati & Mutunga, 2018). The theory posits that maintaining cash and near cash assets even though increases liquidity, but it forgoes income opportunity. Therefore, financial institutions should go for term loan of different dimension where from principal and interest can be received on installment basis. Prochnow considered the following factors in his theory: firstly, maintaining liquidity in the form of cash is not important as installment of term loan is enough to fulfill liquidity requirement. Secondly, bond and securities can be used as collateral to give term loan thus a financial = can collect fund in times of emergencies by selling them in the secondary market or by keeping it as collateral. Thirdly, banks must given such long term loan from which the fund be recollected on due time. The theory thus provides a broader spectrum of firm's financial structure compared to other theories of liquidity (Onchwari, 2018).

According to this theory, regardless of the nature and character of a borrower's business, the bank plans the liquidation of the term-loan from the anticipated income of the borrower. A term-loan is for a period exceeding one year and extending to less than five years. It is granted against the hypothecation of machinery, stock and even immovable property. Financial institutions put restrictions on the financial activities of the borrower while granting this loan. At the time of granting a loan, the bank takes into consideration not only the security but the anticipated earnings of the borrower. Thus a loan by the bank gets repaid out of the future income of the borrower in installments, instead of in a lump sum at the maturity of the loan According to this theory, manufacturing firms listed at Nairobi Securities Exchange hold the view that liquidity can be estimated and met if scheduled payments are based on the income of the debtors.).

Liquidity Theory

According to Mun and Jang (2015), liquidity theory as a function of current assets and current liabilities is an important factor in determining working capital and indicates firm's capability of generating cash in case of need. Current ratio, acid-test and cash ratios as traditional measures of liquidity are incompetent because these balance sheet based measures cannot provide detailed and accurate information about effectiveness of working capital management. Formulas used for calculating these ratios consider both liquid

and operating assets in common. Besides, mentioned traditional ratios are also not meaningful in terms of cash flows (Wanyoike, 2015). Another variation of the liquidity theory is that companies with negative cash flow or fallen sales are most likely to request for trade credit (Kestens et al., 2012). Following the aforementioned argument therefore, in times of restricted monetary policy, trade credit make amends for the decline in credit from financial institutions. Due to the negative correlation between financial institution lending and trade credit, an excellent affiliation with banks curbs the exploitation of trade credit (Makori, 2017).

The liquidity theory explains the relationship between credit payment period and liquidity risk. This is because a company with liquidity problems may delay payment to suppliers in order to use that money to settle other expenses as and when they fall due, which may improve profitability (Davis & Franks, 2014). Thus, trade credit is a substitute for institutional financing. Given that, financially unrestrained firms are less likely to require trade credit and more likely to advance it, and therefore, a negative relationship between access of a purchaser to other sources of funding and trade credit utilization is projected (Casey & O'Toole, 2014). Makori (2017) points out that a company ought to select to borrow by means of accounts payables on condition that it is the inexpensive basis of financing. The liquidity theory suggests a positive relationship between inventory conversion period and financial performance.

Conceptual Review

This is a diagram showing the linear relationships between independent factors (Debtors payment period and inventory conversion period) and the dependent variable (Liquidity Risk) as illustrated in figure 1.

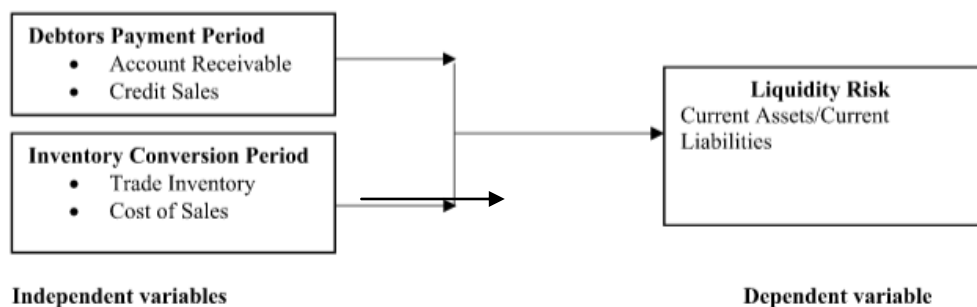


Figure 1.0: Conceptual Framework

Efficient debtors payment period management augmented by a shortened creditors collection period, low levels of bad debts and a sound cash conversion cycle often improves the firm's ability to attract new customers and accordingly improve its financial performance (Wanyoike, 2015). Management of accounts receivable is a practical issue and businesses can find their cash flow under considerable strain if the levels of accounts receivable are not well managed. Without efficient management of accounts receivable, Bhatia and Srivastava (2016) state that receivables build up to excessive levels resulting into bad debts which lowers the firm's financial performance. Uremandu et al (2012) state that investment in accounts receivable take a big amount of a firm's assets which are highly vulnerable to bad debts and losses if not efficiently managed. This may in the long run lead to liquidity challenges or insolvency. Debtor payment period was calculated as $365 \times [\text{Account receivable}/\text{Credit Sales}]$. This variable represents the average number of days that the firm takes to collect payments from its debtors. The higher the value, the higher its investment in debtors. The variable was used as an independent variable by other authors such as Muturi et al. (2016), Nwude and Agbo (2018), Kimani et al. (2014) as well as Jindal and Jain (2017).

The inventory conversion period is the length of time needed by the firm in order to acquire and sell inventory. It is calculated by dividing inventory by sales and multiplying the result by 360. The average number of day's inventories represents the period that inventories are held by the companies before they are sold. In order to help shorten the cash conversion cycle, a lower number of days are better. The average amount of inventory is received by taking the sum of the beginning and ending balance of inventory for a year, and divide with two, to get the average. The average amount of inventory is then divided with the cost of goods sold to see how big part of cost goods sold that comes from the inventory.

Liquidity risk is an essential component of the overall risk management framework of the manufacturing industry. The liquidity of an asset means how quickly the assets can be transformed into cash. In corporate context, liquidity means ability of a company to meet its obligations when they fall due (Puneet & Parmil, 2012). Farhi and Tirole (2012) distinguish two types of liquidity risk: asset side of balance sheet and liability side of balance sheet liquidity risk. Liability side liquidity risk arises when financial institutions liability holders claim cash in their financial claims immediately. Liquidity risk was determined using the ratio of current asset to current liabilities as recommended by Basel III (Barus, 2017; Maniagi, 2018). Kim (2015) also used

liquid asset and total assets to measure liquidity in investigating relationship between liquidity risk and performance. Arif and Anees (2012) undertook a research on liquidity risk and its effects on banks profitability in Pakistan also used liquid asset and total asset as a measure of liquidity risk. Other studies were Liu (2011), Norazwa, Mohamad, and Hawati (2015) in their research on liquidity risk and performance.

Empirical Review

Niranjan et al. (2010) attempted to provide an insight into the conceptual side of working capital and to assess the impact of working capital management on liquidity, profitability and non-insurable risk of ONGC, a leading public sector enterprise in India over a 9 year period (i.e. from 1998-99 to 2006-07). The study concluded that debt payment period is very much useful to ensure better productive capacity, good profitability and sound liquidity of an enterprise. A study by Oladipupo and Ibadin (2013) in Nigeria examined the relationship between working capital management practice and liquidity risk of manufacturing companies quoted in Nigeria Stock Exchange. The results of the study revealed that liquidity risk was influenced positively by profitability and net trade cycle was negatively by growth rate in earnings. Corporate profitability, working management, and growth in earnings had statistical insignificant effects on the liquidity risk at 5% confidence level.

Bushuru et al. (2015) examined the impact of working capital management on liquidity risk in Kenya using data from listed firms on the Nairobi securities exchange for the period 2006-2013. The results from the multiple regression analysis established that working capital management (in terms of cash conversion cycle and accounts payable period) have a significant positive relationship with liquidity risk. On the other hand, working capital management (in terms of accounts receivable collection period and inventory collection period) related negatively to liquidity risk though statistically significant. In Kenya also, Olang and Grace (2017) found that working capital management (measured by cash management, inventory management, and accounts receivables) have a positive and significant impact on firms' dividend payout policy.

Nyarangi (2016) investigated the effects of working capital management decisions on the profitability of manufacturing and allied firms listed at the NSE. Using Pearson's Bivariate Correlation, multiple regression and ANOVA analysis, the study finds a significant impact of WCM on the financial performance of the firms under study. ACP and CCC had a negative significant relationship with the financial performance represented by ROA. However, the relationships of ICP and APP with ROA were statistically insignificant with ICP having a negative relationship with ROA and APP having a positive relationship with ROA. The current study was different from this study in that it will focus on firm efficiency and it will also be conducted in a different context (commercial and service firms).

Mohamed (2016) sought to investigate how WCM decisions affect the financial operations of smallholder tea companies in Kenya. From the findings, there is a positive correlation between the actual ROA of the smallholder tea firms over the period of the study, and the return predicted by the regression model, considering that the coefficient of multiple correlation. The regression model explains approximately 23.5% of the variation in the smallholder tea firms' return on assets over the period covered by the study.. Awunya (2017) examined how working capital management affects financial performance of firms listed at the Nairobi Securities Exchange both commercial and service. The findings of the study indicated that both conservative investment policy and aggressive financing policy had an insignificant positive effect on profitability while leverage had a negative and significant effect on profitability. In addition, firm size and profitability had an insignificant positive relationship.

Katiwa (2012) studied the relationship between working capital management and the profitability of small and medium enterprises in Nakuru municipality. The results of the analysis indicated that there is a negative relationship between cash conversion cycle and profitability. A positive relationship between current ratio and profitability was also noted as well as that of debt ratio and profitability. For the sales growth, evidence is positively related to profitability. Kweri (2012) conducted a study on the relationship between working capital management and profitability of manufacturing firms listed in Nairobi Securities Exchange. The results indicated that the model examined in this study was significant with an adjusted R² of 56.4% and also that all the independent variables had a significant relationship individually with the net operating profit.

Mitau (2013) studied working capital management and its effect on firm's profitability in Kenya a survey of non-financial institutions listed on the Nairobi Securities Exchange. The result of study indicated that there exist a negative relationship between accounts receivables period and firm's profitability among nonfinancial institutions listed in the NSE and a negative relationship between inventory turnover period and firm's profitability among the same institutions. Wamugo, Kosimbei and Muathe (2014) examined the effects of WCM on profitability of Non-Financial Companies. A census of 42 nonfinancial companies listed in the Nairobi Securities Exchange, Kenya was taken. Feasible Generalized Least Square (FGLS) regression showed that there was a positive significant relationship between return on assets and return on equity resulting from an aggressive financing policy. Olang and Akenga (2017) sought to determine the effect of working capital on dividend

payout of a firm. he study revealed that cash management, inventory management and account receivables has a positive effect on dividend payout decisions

Research Gaps

Further, few studies have investigated the effect of working capital components on liquidity risk in financial sector and specifically in manufacturing listed firms in Kenya. Kimani (2012) focused on 9 listed commercial banks in NSE while Sayeda (2011) focused on cement industry in Dhaka Stock Exchange and Yakubu et al. (2017) on non-financial firms in Ghana, Ganesan (2007) on telecommunication equipment industry and Onyeji (2013) banking industry in Nigeria. From survey of relevant literature it was found that there are no studies specific to Kenya in regard to the assessment of working capital components on the liquidity risk of Manufacturing firms listed at Nairobi Securities Exchange in Nairobi County in Kenya. This study was therefore conducted in order to fill the contextual gaps in literature by studying the effect of working capital components on liquidity risk of Manufacturing firms listed at Nairobi Securities Exchange in Nairobi County, Kenya. Conceptually, various studies have used debtor average payment period and creditor average payment period as well as cash conversion cycle as components of working capital components. Some authors have failed to differentiate between payment periods and cash conversion cycle as cash conversion cycle comprise of inventory, debtors and creditors management. Some studies have used liquidity as mediating variable on the relationship between working capital components and profitability. However, this current study used debtors' payment period, creditor payment period and cash conversion cycle regulation as working capital components and liquidity risk was determine using liquid asset to total assets.

III. Material And Methods

This study used a descriptive research design. Akonga (2014) defined descriptive research as one which involves collecting data so as a researcher can be able to study a given research topic. It helped in understanding the characteristics of a given group and assisted in good planning of various aspects. This study's population comprised of the 8 listed manufacturing companies listed at the NSE as at 31st December 2020. The sample frame for this study was all the 8 listed manufacturing firms at the NSE. Secondary data was used while conducting this research, by collecting information from the published financial statements of the 8 listed manufacturing firms in the NSE. The secondary data collected was based on a five year period between January to December of the year 2016 to 2020. Secondary panel data which is multi-dimensional and a combination of time series and cross sectional data were used.

Cross-sectional data is a type of data collected by observing many subjects at the one point or period of time. The study used Im, Pesaran and Shin (IPS) to test for the presence of unit roots in panels that combine data from the dimension of the time series with that of the cross-section dimension, so that fewer time observations are required for power to be available for the test. The study determined whether to run a fixed effects model or a random effects model when conducting panel data analysis. Hausman's 1978 specification test was used to determine whether the effect was fixed or random (Guggenberger, 2010). If the null hypothesis of $E(\mu_i/x_i) = 0$ is not rejected, then the random effect is an efficient estimator; otherwise, if the null hypothesis is rejected, the estimation of the fixed effect gives a better or more efficient beta estimate. The research utilized quantitative data analysis techniques. The gathered data was processed, cleaned, coded and calculated using STATA 15. A descriptive statistical analysis described data in understandable form, using maximum, minimum, means and standard deviations; whereas inferential statistics, correlation, linear and multiple regression analyzes are calculated for variable relations

IV. Result and Discussion

Descriptive Analysis

In order to describe the features and characteristics of the data set, the study computed descriptive statistics. It provided a summary of the data and measures used in the study. Some of the descriptive statistics that were used were measure of spread as well measure of central tendency. In this study, measure of spread used included minimum, vales, variance, standard deviation and maximum values. The measures of central tendency in this data set include mean. The study calculated standard deviation, mean, maximum and minimum value for all the variables bot dependent variables (Liquidity Risk) and the independent variables (debtors payment period and inventory conversion period). The descriptive statistics for the variable are presented in Table 1.

Table 1: Descriptive Statistics

Stats	Debtors payment period	Inventory conversion period	Liquidity Risk
Mean	131.2924	111.3723	2.357797
Median	110.7864	102.7679	1.677098
Maximum	438.4032	265.1773	9.428015

Influence of Debtors Payment Period and Inventory Conversion Period on Liquidity ..

Minimum	27.6806	12.88136	0.453799
Standard Deviation	96.60887	50.66182	1.943931
Skewness	0.706025	0.31286	0.450171
Kurtosis	2.799237	1.516267	1.892521
Jarque Bera	.8476	1.08	.8488
Probability	.6546	.5826	.6542
Sum	5251.696	4454.891	94.31187
Sum of Square of Dev.	9333.274	2566.62	3.778866

DPP=Debtors payment period, **CPP**=Creditor payment period, **CCC**=Cash conversion cycle, **ICP**=Inventory conversion period, **LR**=Liquidity risk

From Table 1, debtors’ payment period was calculated as $365 \times [\text{Account receivable}/\text{Credit Sales}]$. From 2016 to 2020, debtor payment period ranged from 28 days to 438 days with a mean of 131 days and standard deviation of 97 days. Inventory conversion period was calculated this as $365 \times [\text{inventory}/\text{cost of sales}]$. Inventory conversion period ranged from 13 days to 265 days with a mean of 111 days and standard deviation of 51 days. Liquidity risk which is the dependent variable was determined using current asset to current liabilities. From Table 1, observing overall statistics as obtained from panel data, between 2016 and 2020, liquidity risk ranged from 0.454 to 9.43 with a mean of 2.38. There was high variability in the liquidity risk as indicated in Figure 2.0.

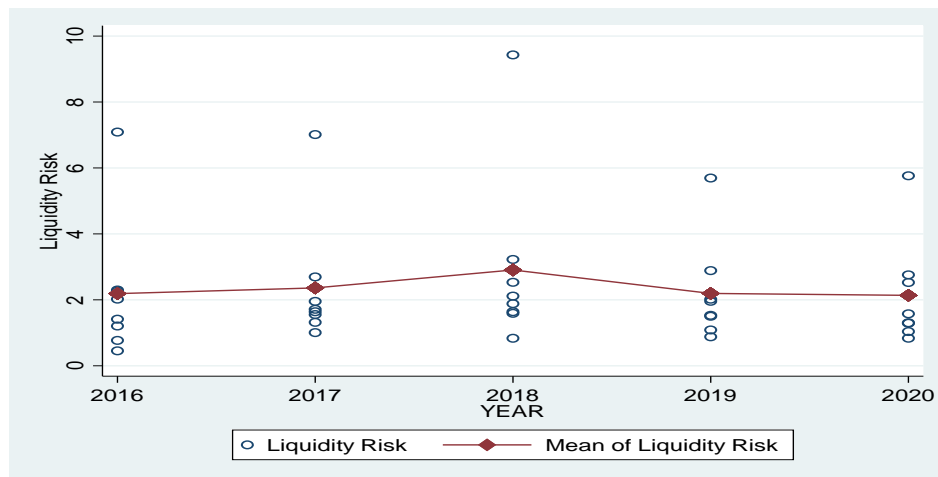


Figure 2.0: Scatter Plot for Profitability

Inferential Analysis

Unit Root Test

The study carried out a unit root test to ensure that there was no presence of unit roots (the panel data are stationary). Unit root test were conducted to ensure that the series were stationary and check the problem of having a spurious regression. A variable can only be said to be stationary when it has no unit root. The study used Im, Pesaran and Shin (IPS) which is based on propositions

Ho: All panels contain unit roots

Ha: At least one panel is stationary

The results are as shown in Table 4.6.

Table 2: Unit Root Tests without Difference (Augmented Dickey-Fuller (ADF))

	Statistics	P-Value	Significant
Debtors payment period	64.311	0.0159	*
Inventory conversion period	19.453	0.000	**
Liquidity Risk	22.459	0.0011	**

* sig at 5% level, ** sig at 1% level

Table 2 shows the summary results for Stationarity test. A p-value of more than 0.05 indicates the presence of unit roots (H0) while a p-value of less than 0.05 was an indication that there was no presence of unit roots for Im, Pesaran and Shin (IPS). The results indicated that there was absence of unit root for all the study variables.

Hausman Test (Choice of Model)

A Hausman test was carried out to determine whether to use the fixed effect or random effect model to address objectives of this study. The appropriate approach of choosing between fixed and random effect model is running a Hausman specification test to determine the more efficient model (Borenstein, Hedges, Higgins, & Rothstein, 2010). Under the test, the null hypothesis is that there is no significant correlation between the individual effects and the independent variables. A rejection of the null hypothesis confirms the argument in favor of the fixed effect against the random effect model. The results are as shown in Table 3.

Table 3: Hausman Test

Coefficients ----	(b) Fixed	(B) Random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
Debtors payment period	0.219229	0.005198	0.214031	0.063183
Inventory conversion period	0.578961	0.412568	0.166393	0.125583

b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg
 Test: Ho: difference in coefficients not systematic
 $\chi^2(2) = (b-B)'[(V_b-V_B)^{-1}](b-B)$
 = 13.83
 Prob>chi2 = 0.0010

Results in the table 3 indicated a prob>chi2 value of 0.0010 which is less than critical P value at 0.05 level of significance which implies that the null hypothesis that a random effect model is the best was rejected. The study hence used a fixed effect regression model.

Correlation Analysis

Correlation analysis was employed in assessing the linearity association among the variables. So as to deduce the nature of statistical relationship between each pair of variables, the study conducted correlation analysis. To this end, Pearson correlation was performed for the relationship between the study variables. The correlation matrix of all the variables under study, are shown in Table 4.0 below.

Table 4. 0: Correlation Matrix Results

		Liquidity risk	Debtors payment period
Debtors Payment Period	Pearson Correlation	0.2942*	1
	Sig. (2-tailed)	0.0354	
	N	40	40
	Pearson Correlation	0.3507*	0.3053
	Sig. (2-tailed)	0.0265	0.0554
Inventory Conversion Period	N	40	40

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

The results indicated that the debtors payment period has a significant positive weak effect on the liquidity risk of listed manufacturing firms at NSE($r = 0.2942, P=0.0354$). The findings are in agreement with Bushuru et al. (2015) examined the impact of working capital management on liquidity risk in Kenya using data from listed firms on the Nairobi securities exchange for the period 2006-2013. Working capital management (in terms of accounts receivable collection period) related positively to liquidity risk though statistically significant. Mohamed (2016) sought to investigate how WCM decisions affect the financial operations of smallholder tea companies in Kenya. Awunya (2017) examined how working capital management affects financial performance of firms listed at the Nairobi Securities Exchange both commercial and service. Wasiuzzaman (2015) provide that the effectiveness of management of accounts receivable have a significant impact on a firm's exposure to liquidity risk. According to Panigrahi (2013), an increase in the level of accounts receivables in a firm increases both the net working capital and the cost of holding and managing accounts receivable and both lead to a decrease in the value of the firm

Inventory conversion period has a positive moderate and significant effect on the liquidity risk of listed manufacturing firms at NSE($r =0.3507, P=0.0265$). This implied that the working capital components used in this study were all having a significant effect on the liquidity risk of listed manufacturing firms at NSE. Katiwa (2012) studied the relationship between working capital management and the profitability of small and medium enterprises in Nakuru municipality. The results of the analysis indicated that there is a negative relationship between inventory conversion cycle and profitability.

Panel Model Multiple Linear Regression

Regression analysis was used to check for the hypothesis concerning the connection of independent variables with dependent variables. The main aim of regression analysis is to show how and extent of which each variable separately influences the dependent variables. Regression analysis is used in estimating the weight of the influences of the independent variables in the dependent variable.

Model summary is used to show the percentage of dependent variable that can be explained by changes in the independent variables. The model summary was used to show the amount of changes in liquidity risk that can attributes to changes in Debtors payment period and Inventory conversion period. In this regression, the four independent variables were entered as a block. Table 5.0 below shows the model summary of the adopted fixed effect model.

Table 5: Model Summary Fixed Effect of Working Capital Components on Liquidity Risk

Fixed-effects (within) regression	Number of obs =	40
Group variable: FIRMID	Number of groups =	8
R-sq:	Obs per group:	
within = 0.3604	min =	5
between = 0.3493	avg =	5
overall = 0.2434	max =	5
corr(u_i, Xb) = 0.5277 (assumed)	F(2,30)=	7.06
	Prob > F=	0.0031

The analysis shows that the panels were strongly balanced for this multivariate analysis as shown by the number of observations per group. There were a total of 40 observations used in this analysis considering 8 groups of entities implying strongly balance panels. The minimum, maximum and average numbers of observations per groups were all equal to 5. The result obtained from fixed effect model indicated that the model accounted for 36.04% (Overall R square=0.3604) of the variation in liquidity risk of manufacturing firms listed at Nairobi Securities Exchange, Kenya. The F-statistic to the model shows is 7.06 which is greater than 0 implying that the estimated parameters in the model are at least not equal to zero. This implies that four working capital components have an influence on liquidity risk of manufacturing firms listed at Nairobi Securities Exchange, Kenya. This influence is significant (P=0.0031).

Regression coefficients are estimates of the unknown population parameters and describe the relationship between a predictor variable and the response. In linear regression, coefficients are the values that multiply the predictor values. P-values and coefficients in regression analysis work together to tell which relationships in the model are statistically significant and the nature of those relationships. The coefficients describe the mathematical relationship between each independent variable (working capital management components) and the dependent variable (Liquidity risk). The p-values for the coefficients indicate whether these relationships are statistically significant. The results are presented in Table 4.14.

Table 4. 2: Regression Coefficient

LQ. Risk	Coef.	Std. Err.	T	P>t	[95% Conf. Interval]	
Debtors Payment Period	0.219229	0.103004	2.13	0.005	-0.03198	0.470437
Inventory Conversion Period	0.578961	0.160168	3.61	0.001	0.251854	0.906068
_cons	-3.07581	1.029576	-2.99	0.006	-5.17848	-0.97314
sigma_u	0.729746					
sigma_e	0.26987					
Rho	0.879692	(fraction of variance due to u_i)				

F test that all u_i=0: F(7, 28) = 18.08 Prob > F = 0.0000

The study regression model as obtained from table above is as shown below.

Liquidity Risk = -3.07581 + 0.219229DPP + 0.578961ICP

From the findings, debtors payment period had a regression co-efficient (β_1) of 0.219229, p=0.005 implying that when inventory conversion period are controlled, a unit increase in debtors payment period across time and among listed financial firms at NSE would result in a significant increase of 0.219229 units in liquidity risk. Since the t value is greater than 1.96 and P value is greater than 0, the first null hypothesis was rejected as debtors payment period does significantly influence liquidity risk of manufacturing firms listed at Nairobi Securities Exchange, Kenya. The results confirms with Dekesi and Ozogbuda (2019) who found out that

average collection period of Oil Service companies has a positive significant relationship with their current ratios as a measure of liquidity. The results suggest that managers can increase liquidity by reducing the number of days of accounts receivable. This is also confirmed by Abuzayed (2012) who find that Belgian firms with a shortage of cash reduce investment in accounts receivable. Gill et al (2010) found a significant negative relation between an SME's profitability and the number of days of accounts receivable.

Lastly, the results revealed that inventory conversion period had a regression co-efficient (β_2) of 0.578961, $p=0.001$ implying that when debtors payment period is controlled, a unit increase in inventory conversion period across time and among listed manufacturing firms at NSE in Kenya would result in significant increase of 0.578961 units in liquidity risk. The t value is less than 1.96 and P value is greater than 0, therefore the second null hypothesis was rejected as inventory conversion period does not significantly influence liquidity risk of manufacturing firms listed at Nairobi Securities Exchange, Kenya. The findings are in agreement with Kweri (2012) conducted a study on the relationship between working capital management and profitability of manufacturing firms listed in Nairobi Securities Exchange. Olang and Akenga (2017) revealed that inventory management has a positive effect on dividend payout decisions.

V. Conclusion and Recommendation

Based on the empirical evidence, a number of logical conclusions can be made as follows and presented in terms of study objectives: In line with the first objective, influence of debtor's payment period on liquidity risk of manufacturing firms listed at Nairobi Securities Exchange, Kenya the study concluded that debtor's payment period has significant positive effect on liquidity risk. An increase in debtor's payment period would results to significant increase in liquidity risk. Therefore, the study concluded that listed manufacturing firms are able to increase their liquidity when they shorten their debtors' repayment period. The second objective of the study was to establish the influence of inventory conversion period on liquidity risk of manufacturing firms listed at Nairobi Securities Exchange, Kenya. The study concluded that inventory conversion period has significant positive effect on liquidity risk as indicated by multiple linear regressions. An increase in inventory conversion period would results to insignificant decrease in liquidity risk. Hence, inventory conversion period has significant predictor of liquidity risk of manufacturing firms listed at Nairobi Securities Exchange, Kenya.

The study recommended that listed manufacturing firms should keep the debtor payment period at minimum in order to enhance their liquidity position. To achieve this, firms need effective credit management strategies, proper undertaking of credit analysis on the prospective buyers, and making efforts to ensure that funds are not tied up in receivables for longer periods. However, despite all these techniques, the firm has to adopt lenient mode of approaching customers for receivable collection. This is because a more stringent approach would scare away customers. Further, management of manufacturing firms should ensure that stock levels stocks are sufficient to meet customer demands at all times. At the same time, the firms should avoid holding onto dead stock as it ties up finances hence negatively impacting on the firm's liquidity. This would be through crafting firm level policy framework that can enhance sales.

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