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Abstract

Purpose: Trade credit is one of the main sources of funding for global companies. The importance of trade credit can also be seen from the proportion of investment that is financed through it. Despite the potential importance of trade credit, limited attention has been paid to its role and use, especially in developing countries. The main aim of the study was to establish the determinants of trade credit and moderating role of the age of the firms listed in Nairobi securities exchange.

Methodology: The study adopted an explanatory research design which was guided by both the transaction cost and the credit substitution theories. The study was based in firms listed on the Nairobi securities exchange for the period 2012 to 2013 and used document analysis to collect secondary data from the company's annual report. Data were analysed through the use of descriptive statistics and inferential statistics methods.

Results: The study findings indicated that debt levels ($\beta_1 = 0.5422$, $p < 0.05$), liquidity ($\beta_3 = -0.0275$, $p < 0.05$) and inventory ($\beta_4 = -0.0399$, $p < 0.05$) have a significant effect on firm trade credit with an explanatory power of 56% ($R^2 = 0.5695$, $p < 0.05$), while collateral ($\beta_2 = -0.1363$, $p > 0.05$) have an insignificant effect. On the other hand, firm age has a significant moderating effect on the relationship between determinants and trade credit. In particular, firm's age has significant interaction effect on debt level ($\beta_6 = -2.3609$, $p < 0.05$), the interaction effects on liquidity ($\beta_8 = -2.4649$, $p < 0.05$).

Unique Contribution to Theory, Practice and Theory: Firms need to establish a well-defined trade-credit granting criteria to assess the creditworthiness of the buyers to avoid default risk or late payment by buyers. Firms should be cautious while pledging an asset as collateral since the bank has exclusive access to pertinent information. Also, firms should hold liquid assets to meet their financial obligations. There is also a need for firms to transform the raw material supplied into finished goods so that suppliers' advantage in repossessing and selling supplied goods is reduced. The study also contributes to credit substitution theory by indicating the possibility of using internal equity or external debt financing that cannot be undervalued in the market.

Keywords: *Trade credit, debt levels, liquidity, inventory*

1.0 Introduction

Trade credit has been viewed as one of the main sources of funding for companies worldwide in all developing or developed economies (Van Horen, 2007). Trade finance is more advantageous to the buyers because of several reasons; first, suppliers are better placed in evaluating and controlling the credit risk of their buyers, that specialized financial institutions, trade credit may serve as a channel to access capital for firms that are unable to raise it through more traditional channels; second, it allows the suppliers to price discriminate through credit, third, trade credit reduces the cost of the transaction involved in accessing credit from a financial institution and lastly, it provides assurances about the quality of the supplier's products (Vaidya, 2012).

There are variations in trade credit across countries and across time, however, with perfect legal protection of creditors, trade credit loses its edge, because it becomes as difficult to divert cash as to divert inputs (Burkart & Ellingsen, 2004). The importance of trade credit as short-term finance has been documented by several studies (Vaidya, 2011). Recent research has found evidence that trade credit is financing approximately 60 per cent of small businesses in the US (Cunat & Garcia-Appendini, 2012). Evidence from a study done in Italy showed that trade credit finances average 38.1% of the input purchases of non-rationed firms, as opposed to the 37.5% of rationed ones (Fabbri & Menichini, 2010). In all economies, the volume of trade credit is higher than short-term loans received from banks (Blasio, 2005) and it results from payment intervals mutually agreed by non-financial companies, Therefore, firms in countries with efficient legal systems use higher bank credit in comparison to trade-credit indicating that the development of a country's banking system and legal infrastructure predicts the use of trade credit (Yang & Birge, 2013).

In developed market economies, access to a bank loan is positively correlated with familiar determinants of high credit quality (Cook, 1999) and represents more than one half of businesses' short-term liabilities and a third of all firms' total liabilities in most OECD countries (Boissay & Gropp, 2007). Therefore, in almost all industries, the volume of trade credit is higher than short-term loans received from banks (Blasio, 2005). Li, Zhou, Du and Zhao (2018) found that there exist differences between the use of trade credit between developed and developing countries. They indicated that a country's legal system has a larger impact on trade credit for firms with overdraft facilities than for those without overdraft facilities, and the impact of legal systems on trade credit is significant in more developed countries but not in less developed countries.

In the United States, Dary and Haruna (2019) indicated that trade credit accounted for 17.8% of firms' total assets. In the UK, accounts receivable accounted for 28% of total assets while accounts payable constituted 19% of total assets of SMEs (Garcia-Teruel & Martinez-Solano, 2010). In Sub-Saharan Africa, Ghana, Dary (2018) reveals trade credit as the most important external source of financing working capital among firms in the informal sector. In related studies, Abor (2017) found high use of trade credit as informal finance in Ghana among small and medium scale non-traditional exporters while trade credit ranks second to personal finance as source funds for new small and medium enterprises in South Africa (Fatoki & Odeyemi, 2010). Among African agro-food manufacturing firms, Dary and James (2017) found that 19% and 22% of sales and purchases of inputs respectively are on trade credit terms. In Tanzania, 65% of rice trade occurs in trade credit terms (Kihanga et al., 2010). Using survey data from Kenya and Zimbabwe, Fafchamps (2000) found a median share of trade credit in total purchases and sales of 75% and 50% respectively. Finally, Kwenda and Hosten (2014) found

trade-credit payable and trade credit receivable constitute 32% and 29% of firms' total assets respectively. Also, recent empirical evidence does not support the long-held notion that trade credit is a costly form of credit relative to bank credit (Dary, 2017; Ellingsen et al., 2016).

A study in the US revealed that trade credit is a net source of financing for about a third of the firms while for the firms in the retail sector it is over half of the net source of funds (Vaidya, 2012). A survey covering 48 countries by Beck, et al., (2008) showed that on average 19.7% of all investment financed through trade credit, while in Russia 17% of the firms use trade finance with a further 31% of the firms use both bank loans and trade credit suggesting that bank credit and trade credit are used concurrently (Cook, 1999). In the UK and France, trade credit is the second most important source of external finance, preceded only by bank credit and as observed, trade credit represents more than 30% of all external finance (Cunningham, 2004).

In Europe, the number of creditors as a percentage of total assets is between 16 to 24 per cent for these countries (Gama, Mateus & Teixeira, 2010). Italian firms display high levels of trade credit in their balance sheets either as receivables or payables with both representing more than 35 % and 25% of the asset amounts respectively (Blasio, 2005). In Turkey, trade credits constitute a large portion of the corporate sector's external finance (Özlü & Yalçın, 2012). Giannetti (2003) analysed a sample of non-traded smaller European firms in Portugal and found slightly higher ratios of accounts payable to assets, but lower ratios of accounts payable to other short-term debt indicating that trade credit can represent up to three times other types of short-term debt. Russian firms using trade credit are shown to have a higher probability of acquiring bank credit indicating that the use of trade credit is the precursor to obtaining bank credit (Cook, 1999).

In the African region, a study by Fisman (2001) indicated that credit shortage impact on the firm's capabilities and thus trade credit is an important form of financing for businesses in a broad range of industries and economies. Fisman, and Raturi (2004) document that industries with higher dependence on trade credit financing achieve higher rates of growth in countries with weak financial institutions. This advantage is especially important in an environment with weak financial institutions. Biggs et al., (1996) seeks to identify the determinants of access to trade credit using the first survey year (1993) of the Kenyan Regional Development on Enterprise Development (RPED) data using the Probit model, they find that access to trade credit increases with firm age and that it is positively influenced by the owner being of Asian origin.

A Kenyan Regional Development on Enterprise Development survey by Biggs et al., (1994) focused on enterprise finance in Kenya at large confirmed that the use of trade credit increases with firm age. Advance payment by clients, on the other hand, appears to be more frequent among relatively small firms. Asian entrepreneurs appear to use trade credit preferably compared with their African counterparts. The ratios of various forms of trade credit to sales are below 10 per cent, except for trade credit provided, which climbs to 17 per cent at most (for medium-sized firms). A Tobit regression on the proportion of suppliers extending credit shows that African-owned firms obtain trade credit from a smaller proportion of suppliers than do ethnic groups. Another Tobit regression revealed that African-owned firms rely less on trade credit for purchases, while relatively large firms tend to rely more on such credit.

1.1 Statement of the Problem

Trade credit is considered an important source of finance for firms and has been well researched, but the focus has been on financial trade-offs and is a major element of corporate finance (Bougheas, Mateut & Mizen, 2009) such that at the onset, small firms facing financial

constraints due to their newness or opaqueness in their balance sheet use trade credit (Blasio, 2005). Thus, relatively few studies have attempted to ascertain its determinants. Past empirical evidence has indicated that trade credit is prevalent in countries with weaker financial institutions and poorly developed financial markets (Fisman & Raturi, 2004). This forms the external determinants of trade credit which is significant in African firms which are highly rationed out of credit markets, and thus trade credit has become an important source of financing (Dary & Haruna, 2019). Most of the study findings on trade credit have attributed trade credit to heterogeneity in country characteristics (Dary & Haruna, 2019) and markets (Dary, 2017) and methodological weaknesses (Kihanga, Lensink, Lutz, & Hermes, 2010). Second, most studies estimate demand and supply equations for trade credit separately raising concerns of model misspecification and estimation bias (Kihanga et al., 2010).

Despite the potential importance of trade credit, limited attention has been paid to its role and use, especially in developing countries (Gustafson, 2004). The uptake of trade credit seems to weaken the credit channel as firms substitute it for bank credit in instances of monetary tightening regimes (Bougheas et al., 2009). Unfortunately, there is very little systematic evidence about why trade credit is extended or which firms are the largest providers or users of trade credit (Vaidya, 2012). There is a dearth in studies on trade credit in listed firms coupled with few comprehensive empirical tests in Africa and thus the study seeks to estimate the moderating effects of firms' age on determinants of trade credit on the firms listed in the NSE, Kenya.

2.0 Literature Review

Trade credit is one of the oldest forms of corporate financing and it continues to be very important at present (Wei & Zee, 1997). It typically involves three elements: the agreed discount rate, qualification for early payments and maximum payment days (Cunat, 2007) three elements; the agreed discount price, qualification for early payment and maximum payment days, however, depending on the type of credit policy, payments can be made at different times and may occur before delivery, on delivery or after delivery (Bastos & Pindado, 2007).

Trade credit has both financial and transactional components. The financial aspects relate to the source of financing alternative to the bank credit while the transactional components serve to facilitate the exchange of goods, time-invariant aspects of trade credit (Blasio, 2005). Trade credit can also be a convenient cash management tool by matching the timing between the cash inflows and outflows. The growth effects of working capital needs in firms suggests that the use of trade credit is related to a firm's revenues and current assets such as inventories and account receivables, which are themselves related to a firm's field of activity or industry (Alphonse, Ducret & Séverin, 2006). The three important factors driving trade credit: 1) as a way for suppliers with cheaper access to credit to finance buyers; 2) As a means for the buyer to exercise market power and obtain favourable price discrimination, and 3) As a warranty assuring buyers of product quality. Given these three factors, terms may be influenced by the supplier's need to contain financial risks (Klapper et al., 2012).

Trade credit is an arrangement where the suppliers lend to firms under constraints because of the comparative advantage of information access which gives them access to assets during liquidation and is generally associated with the purchase of intermediate goods with empirical evidence showing that the implicit interest rate in a trade credit agreement is generally very high compared to the rates of bank credit (Cunat, 2007). This, therefore, lends the supplier firms an implicit equity stake in the firms in exchange for better access to more credit than would have been not available (Vaidya, 2012) in that suppliers not only sell goods and services

but extend large amounts of credit as well (Burkart & Ellingsen, 2004). In some instances, suppliers may also act as lenders of last resort by insuring against liquidity shocks (Cunat, 2007).

Non-financial firms have a comparative advantage of acting as intermediaries to channel funds short terms to buyer firm information (Yang & Birge, 2013), therefore the importance of trade credit is also seen from the proportion of investment that is financed through it, a fact that is attributable to suppliers who lend more liberally than the banks because it is typically less profitable for an opportunistic borrower to divert inputs than to divert cash (Fisman & Raturi, 2004). However, in the absence of effective legal enforcement, trade credit requires trust and reputation (Fisman & Raturi, 2004).

Trade credit (measured by accounts receivable and accounts payable in the balance sheet of a firm) is an arrangement that allows firms to buy goods or services without making an immediate payment (Delanny & Weill, 2004) and has been conceptualized as trade receivables fewer trade payables (divided by the total assets) (Blasio, 2005). Trade credit does not require immediate payment for product delivery and is an important source of funds for business customers (Alphonse, Ducret & Séverin, 2006). The use of trade credit in the long run an expensive source of credit (Cunningham, 2004) but varies substantially across firms and industries and a substantial body empirical research exists that attempts to explain this variation (Vaidya, 2012). According to Burkart and Ellingsen (2004), trade credit should have shorter maturity than bank credit, in that the trade credit loses its advantages once illiquid input is transformed into liquid output.

Trade credit may also be used as a source of funds if raising capital through other sources is more expensive. Price discrimination being illegal in many countries, firms may choose to discriminate between buyers using trade credit. Some firms may choose to make early payments to take advantage of discounts while others may have an incentive to pay towards the end of the credit period. Suppliers may have some funding advantage over banks in evaluating and controlling credit risk. If suppliers are likely to interact much more closely and more often with buyers compared to banks then this is likely to give them a better idea of the business prospects that the buyer faces. If the good supplied cannot be resold by the buyer then the supplier could hold off the threat of stopping supplies if payments are not made in time (Vaidya, 2012).

Trade credits usually a highly flexible form of credit, which relies mostly on informal mechanisms of enforcement, based on 'reputation' and long-term relationships and often without any written contract. For example, suppliers are often willing to accept late payments without charging interest or to allow customers to take unearned cash discounts, especially when they have a long-standing relationship (Summers & Wilson, 2002; Cannari et al., 2004). Besides being an obvious advantage for the buyer, this flexibility can also benefit the supplier, when he has an interest in relaxing ex post-trade credit terms, for example in order to help customers overcome a temporary financial difficulty, thereby protecting his long-term investment. In this case, suppliers can be seen as liquidity insurance providers (Cuñat, 2002).

When supplier firms deliver goods to their customers, they often do not require to be paid immediately, but instead, they offer credit terms with a delay in the payment. This practice is called trade credit (García-Appendini, 2007). Trade credit transactions normally involve short-term for example thirty to sixty days delayed payment of purchases of intermediate goods or services. By delaying payment, these supplier firms are effectively funding their clients with short-term debt. However, trade credit has three main differences concerning other types of

corporate debt. First, suppliers lend ‘in-kind’; they seldom lend cash. Second, in contrast with bonds or loans, trade credit is frequently not subject to specific, formal contracts between the lender and the borrower. Finally, trade credit is issued by non-financial firms. Trade credit is one of the most important sources of borrowing at an individual firm level. This is true among all types of firms and throughout different economies (Giannetti, 2003).

Suppliers may also have an advantage over banks concerning the repossession and resell of the goods supplied in case of default. Trade credit may arise as a financial response to variable demand. Trade credit can be seen as an outcome of the interaction between the product and financial markets which arises because it provides the seller with an advantage in inventory management. Sellers can reduce their finished goods inventories by offering trade credit. When business conditions are bad (i.e. inventories pile up) firms may choose to postpone payments for raw materials purchased. Trade credit may also enable firms to lower transactions costs (Cunningham, 2004).

Trade credit has been thoroughly researched mainly from the financial substitutes and complements perspective (Bougheas et al., 2009) with numerous theories providing explanations for the provision of credit by suppliers, however, these theories relate to the market structure and/or product characteristics and suggest that certain industries have a greater ability to utilize trade credit more than others (Van Horen, 2005).

2.1 Research Gaps

Since Meltzer (1960) research, a substantial number of studies have investigated the determinants of using trade credit, however, most of these studies have been done in industrialized economies. Only a few researches have specifically been interested in developing countries’ cases (Kwenda, and Holden, 2014; Fatoki, 2012; Yang & Birge, 2013); Fisman, & Raturi, 2004; Isaksson, 2002; Van Horen, N. (2005). It appears that companies operating in countries having underdeveloped and/or inefficient legal and financial system depend relatively more on trade credit (Johnson et al., 2002; Beck et al., 2008; Saito & Bandeira, 2010). Further, previous studies only provided partial results on the effect of collateral, liquidity, debt levels and inventory on trade credit. Most of the studies were also conducted in developed countries which have different financial markets from developing countries such as Kenya.

3.0 Research Methods

The study adopted an explanatory research design since it attempted to clarify why and how a relationship exists between two or more phenomena. Explanatory research design is a useful educational research method, particularly for gathering and analyzing data at a specific point in time to describe the causative relation among existing conditions, identifying standards against which existing conditions can be compared and determine the relationships that exist between specific events (Manion & Cohen, 1994).

The study was conducted in firms listed on the Nairobi securities exchange for the period 2013 to 2014. These companies must have been trading actively and consistently (not suspended) for at least eight (8) years. Firms in the study only 29 included companies in 47 MIMS and 13 AIMS arriving at a total population of 60 companies.

Out of the 60 listed companies, the study chose those industries which are goods oriented as opposed to service-oriented. Firms which are goods oriented tend to have stock of inventory which serves as a definitive factor in determining trade credit. Second, the study chose firms

that had been consistently trading for the study period from 2006. This was meant to eliminate the problem of missing data which would have violated the precision and completeness principle. Third, the study thus utilized data from 41 companies as the other 14 companies had either been recently listed or had inconsistently traded at the NSE and another five (5) were service-oriented firms. The distribution of the companies utilized for the study was as follows: seven (7) agricultural, seven (7) commercial and services; twelve (12) banking and insurance; five (5) construction and allied; two (2) automobile and accessories; three (3) energy & petroleum and five; and (5) manufacturing and allied sector.

4.0 Results

Descriptive Analysis of Sectoral Data

The study captured data from 31 firms and this figure represent 75.70 per cent of the target population. The researcher ignored the ten(10) firms from further analysis due to the incompleteness of the data.

Agricultural sector

The statistics on Table 1 shows that listed firms in the agricultural sector had a mean figure of 0.0811 which denote a surplus of trade receivables over trade payables, while the firms were 67%(0.67) leveraged with moderately low inventory levels (4.49). The firms had approximately six times (5.7685) the ratio of current assets to current liabilities with debt levels of nearly half (0.4984) the value of total assets. This statistic suggests that firms use less trade credit in that there were surpluses of receivable over payables complemented by moderate leveraging, low inventory levels and higher liquidity levels thus the firms had sufficient cash to cover the cost of all its operations.

Table 1 Agricultural Sector

Variable	n	Minimum	Maximum	Mean	Std. Deviation
Debt levels	6	0.1881	1.0000	0.4984	0.3744
Leverage	6	0.2317	1.3697	0.6688	0.4978
Liquidity	6	0.8699	16.8692	5.7685	4.9446
Log Inventory	6	1.5563	5.7894	4.4995	1.4636
Firm's Age	6	20.000	20.000	20.000	0.0000
Trade credit	6	-0.0053	0.3530	0.0811	0.1294

Source (Field Data, 2016)

Automobiles and accessories sector

The figures in Table 2 show that listed firms in the automobiles sector had a mean figure of -0.0761 which denotes a deficit of trade payables over trade receivables, while the firms were 109% (1.09) leveraged, with low inventory levels (5.85). The firms had approximately 1.5784 times the ratio of current assets to current liabilities with debt levels of nearly half (0.4818) the value of total assets. These statistics suggest that the firms use more trade credit than bank credit because of the deficits in receivables over payables, low inventory levels, collateral accompanied by less liquidity.

Table 2 Automobiles and accessories

Variable	n	Minimum	Maximum	Mean	Std. Deviation
Debt levels	3	0.2696	0.6526	0.4818	0.1560
Leverage	3	0.3690	1.8784	1.0871	0.6301
Liquidity	3	0.5933	3.3740	1.5784	1.1206
Log Inventory	3	4.9527	6.4508	5.8518	0.6848
Firm's Age	3	20.000	20.000	20.000	0.0000
Trade credit	3	-0.3461	0.2013	-0.0761	0.2249

Source (Field Data, 2016)

Commercial and service sector

As depicted in Table 3 listed firms in the commercial and services sector had a mean figure of 0.0260 which denote a surplus of trade receivables over trade payables, while the firms were 122%(1.22) leveraged with low inventory levels (4.38). The firms had approximately 1.2423 times the ratio of current assets to current liabilities with debt levels of nearly half (0.4775) the value of total assets. These statistics suggest that the firms use less trade credit than bank credit because there are surpluses of the trade receivables over trade payables, low inventory levels accompanied by high collateral coupled with low liquidity levels.

Table 3 Commercial & Services

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Debt levels	7	0.2659	0.8101	0.4775	0.1674
Leverage	7	0.3622	4.2661	1.2169	1.1079
Liquidity	7	0.4648	2.4602	1.2423	0.8051
Log Inventory	7	2.9752	6.1249	4.3765	1.2554
Firm's Age	7	8.0000	20.000	14.200	5.0199
Trade credit	7	-0.2529	0.2869	0.0260	0.1646

Source (Field Data, 2016)

Construction and allied sector

Study results in Table 4 showed that the listed firms in the construction and allied had a mean figure of 0.0160 which denotes a marginal surplus of trade receivables over trade payables, while the firms were 147% (1.47) leveraged with moderate levels of inventory (5.55). The firms had approximately 1.3327 times the ratio of current assets to current liabilities with debt levels of more than half (0.5507) the value of total assets. These statistics suggest that the firms use less trade credit than bank credit because there is a marginal surplus of the trade receivables over trade payables accompanied by high collateral, high debt levels accompanied by low liquidity levels.

Table 4 Construction & Allied

Variable	n	Minimum	Maximum	Mean	Std. Deviation
Debt levels	5	0.2675	0.7448	0.5507	0.1598
Leverage	5	0.3652	2.9182	1.4728	0.8243
Liquidity	5	0.4692	2.6768	1.3327	0.6640
Log Inventory	5	3.7289	6.6060	5.5484	1.1439
Firm's Age	5	9.000	20.000	17.250	5.5000
Trade credit	5	-0.1026	0.2458	0.0160	0.1233

Source (Field Data, 2016)

Energy and petroleum sector

In Table 5, the statistics show that the listed firms in the energy and petroleum had a mean figure of 0.0520 which denotes a surplus of trade receivables over trade payables, while the firms were 214% (2.14) leveraged with high levels of inventory (6.73). The firms had approximately 1.1464 times the ratio of current assets to current liabilities with debt levels of nearly two thirds (0.6494) the value of total assets. These statistics suggest that firms use less trade credit than bank credit because there are surpluses of the trade receivables over trade payables accompanied by high collateral, high debt levels, high inventory with low liquidity levels.

Table 5: Energy & Petroleum

Variable	Statistic	Minimum	Maximum	Mean	Std. Deviation
Debt levels	4	0.4957	0.7629	0.6494	0.0790
Leverage	4	0.9812	3.2185	2.1446	0.7258
Liquidity	4	0.9346	1.4882	1.1464	0.2203
Log Inventory	4	5.8967	7.1752	6.7278	0.5425
Firm's Age	4	11.0000	22.0000	19.2500	5.0920
Trade credit	4	-0.0304	0.1837	0.0520	0.0802

Source (Field Data, 2016)

Manufacturing and allied sector

In Table 6, the statistics show that the listed firms in the manufacturing and allied had a mean figure of -0.00675 which denote a deficit of trade receivables over trade payables, while the firms were 164% (1.64) leveraged with high inventory levels (6.02). The firms had approximately 2.4986 times the ratio of current assets to current liabilities with debt levels of nearly two thirds (0.4598) the value of total assets. These statistics suggest that the firms use more trade credit than bank credit because there are deficits of trade receivables over trade payables accompanied by high collateral, low debt levels, high inventory levels with high liquidity levels.

Table 6: Manufacturing and Allied

Variable	n	Minimum	Maximum	Mean	Std. Deviation
Debt levels	6	0.1270	0.8684	0.4598	0.2464
Leverage	6	0.1455	6.5962	1.6434	2.1976
Liquidity	6	0.4093	10.0893	2.4986	2.8506
Log Inventory	6	4.5582	6.9869	6.0225	0.8796
Firm's Age	6	20	22.0000	20.6667	0.8945
Trade credit	6	-0.1601	0.0600	-0.0675	0.0675

Source (Field Data, 2016)

All Sectors

In Table 7, findings show that the listed firms in sector sampled had a mean figure of 0.0104 which denote a marginal of trade receivables over trade payables, while the firms were 134%(1.34) leveraged with moderate levels of inventory (5.38). The firms had approximately 2.3962 times the ratio of current assets to current liabilities with debt levels of more than half (0.5125) the value of total assets. These statistics suggest that firms use less trade credit than bank credit because there is a marginal surplus of the trade receivables over trade payables accompanied by collateral, low debt levels with high liquidity levels.

Table 7 All Sectors

Variable	Firms	Minimum	Maximum	Mean	Std. Deviation
Debt levels	31	0.1270	1.0000	0.5125	0.2288
Leverage	31	0.1455	6.5962	1.3418	1.2549
Liquidity	31	0.4093	16.8692	2.3962	3.0310
Inventory	31	1.5563	7.1752	5.3786	1.3569
Firm's Age	31	11.0000	22.0000	20.4839	3.1868
Trade credit	31	-0.3461	0.3530	0.0104	0.1412

Source (Field Data, 2016)

Inferential Statistics

Diagnostic statistics

Diagnostic tests are carried out before any classical linear regression analysis is conducted. These tests include the existence of a linear relationship between parameters, no perfect collinearity, unidimensionality, specification of the relationship between the variables, normally distributed and homoscedastic (Wooldridge, 2009).

Table 8 Shapiro Wilk Normality test

Variable	Observation	W	p-value
Liquidity	62	0.59017	0.0672
Collateral	62	0.76241	0.0974
Debt levels	62	1.00000	0.5838
Inventory	62	0.91951	0.2112
Sector	62	0.98548	0.58259

Source (Field Data, 2016)

Since the p-values for the W-test were greater than 0.05 the assumption that all the variable data in the model were normally distributed was upheld. The W-test is designed to test the distributional differences between cases and controls for categorical variable set, which can be a single or environment pairs. It takes a combined log of odds ratio form, calculated from the contingency table of the variable set. It is therefore inferred that data variables in the study were drawn from a normally distributed population.

Test for Homoscedasticity

The study tested for heteroscedasticity using Breusch-Pagan/Cook-Weisberg test for heteroscedasticity indicated that $\chi^2(1) = 1.38$, $p = 0.2408$, indicating that the assumption of homoscedasticity can be upheld.

Table 9 Heteroscedasticity Test

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity	
Ho: Constant variance	
Variables: fitted values of trade-credit	$\chi^2(1) = 1.38$
Prob > $\chi^2 = 0.2408$	

Source (Field Data, 2016)

Test for multicollinearity

The test for collinearity for the regression residuals in table 10 indicates that all the VIF < 10.00 indicating that multicollinearity wasn't encountered.

Table 10 Collinearity test

Variable	Tolerance	VIF
Liquidity	.597	1.675
Collateral	.391	2.555
Debt levels	.412	2.429
Log inventory	.502	1.990

Source: Field Data (2016)

Correlation Statistics

Table 11 represents Pearson correlation results of the study. Findings revealed that liquidity significantly associated with trade credit ($r = 0.461$, $p < 0.01$) such that when liquidity increased the trade credit also increase. Further, collateral did not correlate ($r = -0.045$, $p > 0.05$) indicating that collateral does not significantly correlate with trade credit. The debt levels significantly correlated with trade credit ($r = 0.167$, $p < 0.05$) indicating that an increase in debt levels will result in a corresponding increase in trade credit. Additionally, inventory relates with trade credit ($r = -0.239$, $p < 0.05$). This implies that liquidity and debt levels are expected to influence trade credit.

Table 11 Correlation Results

	Trade credit	Liquidity	Collateral	Debt levels	Inventory	Log Inventory
Trade credit	1					
Liquidity	.461**	1				
Collateral	-.045	-.259	1			
Debt levels	.167*	.091	.706**	1		
Inventory	-.093	-.246	.497**	.318	1	
Log Inventory	-.239*	-.509**	.308	.143	.613**	1

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

Source (Field Data, 2016)

Regression Analysis

The regression results in Table 12 shows the ANOVA statistic, $F(8, 53) = 2.65$, $p < 0.05$, which indicate that the regression model was statistically significant in explaining for the variances in trade credit. The $R^2 = 0.5695$ indicating that about 57 per cent of trade credit can be explained by the independent variables which comprise of firm effect.

Table 12 Moderating Effect of Firm's Age on Determinants of Trade Credit

Variable	Beta coefficient	Statistics t-statistic	
			p-value
(Constant)	0.2420	-1.54	0.313
Debt levels	0.5422*	3.37	0.040
Collateral	-0.0275	-1.30	0.972
Liquidity	-0.1363*	-3.11	0.012
Inventory	-0.3399*	-2.97	0.036
Age*Debt level	2.3609*	-3.36	0.046
Age*Collateral	-0.4637	1.30	0.831
Age*Liquidity	-2.4649*	4.21	0.020
Age*Inventory	0.2250	1.10	0.386
Other statistics			
F	2.65		
R Square	0.5695		
Adjusted R Square	0.4793		
Sig.	0.0055 ^a		

^aDependent Variable: Trade credit, *significance at 0.05

Source: Research Data (2016)

Firm's trade credit = 0.5422 (debt levels), $p\text{-value} < 0.05$ indicate that the coefficient is significant. This indicates that a positive unit change in the debt levels has a 0.5422-unit change decrease in the use of trade credit. This suggests that a rise in the debt levels will always lead to an increase in the use of trade credit.

Firm's trade credit = -0.1363 (liquidity), $p\text{-value} < 0.05$ indicate that the coefficient is significant. This indicates that a positive unit change in the liquidity levels has a 0.1363-unit

change decrease in the use of trade credit. This suggests that a rise in the liquidity levels will always lead to a reduction in the use of trade credit.

Firm's trade credit = $-0.3399(\text{inventory})$, $p\text{-value} < 0.05$ indicate that the coefficient is significant. This indicates that a positive unit change in the inventory has a 0.3399unit change decrease in the use of trade credit. This suggests that a rise in the inventory levels will always lead to a reduction in the use of trade credit.

Firm's trade credit = $2.3609(\text{age} \times \text{debt levels})$, $p\text{-value} < 0.05$ indicate that the coefficient is significant. This indicates that yearly progressive unit increases in the firm's debt levels have a 2.3609-unit change increase in the use of trade credit. The indications are that progressive use of debt over a certain period by the firms will always lead to more than two-fold increases (2.3609 times) in the use of trade credit.

Firm's trade credit = $-2.4649(\text{age} \times \text{liquidity})$, $p\text{-values} < 0.05$ indicate that the coefficient is significant. This indicates that yearly progressive unit increases in the firm's liquidity levels have a 2.4649-unit change decrease in the use of trade credit. The indications are that progressive use of debt over a certain period by the firms will always lead to more than a two-fold decrease (2.4649 times) in the use of trade credit.

Overall, the firm's trade credit = $0.5422(\text{debt levels}) - 0.1363(\text{liquidity}) - 0.3399(\text{inventory}) + 2.3609(\text{age} \times \text{debt levels}) - 2.4649(\text{age} \times \text{liquidity})$ and the $p\text{-value} < 0.05$ indicate that the coefficients are significant.

As hypothesized in the study, the moderating effects between a firm's age on the firm effects explain about 57% of the variation in the firm's trade credit. Thus, the firm's age has a positive and significant effect in that it enhanced the explanatory power of the firm and industry effects by close to 57% ($R^2 \text{ change} = 0.5693$). This effect is considered significant and could be attributable to the fact that the more established firms tend to be more liquid than the less established firms.

As indicated in Table 12, on the converse the amount of debt level held by the firms ($\beta_1 = 0.5422$, $p < 0.05$), liquidity levels ($\beta_3 = -0.3399$, $p < 0.05$) and inventory levels ($\beta_4 = -0.3399$, $p > 0.05$) are significantly determinants of the use of trade credit.

Hypothesis Testing

Hypothesis one

H_{01} : Debt levels has no significant effect on firm trade credit

The coefficients for debt levels, $\beta_1 = 0.5422$ ($t = 3.37$, $p < 0.05$) indicate that debt level has a significant effect on trade credit. The findings, therefore, reject the null hypothesis that debt levels have no significant effect on firm trade credit. The study concludes that debt levels determine the trade credit of listed firms.

Hypothesis 1 stipulated that debt levels have no significant effect on firm trade credit. Nonetheless, study findings showed that debt levels have a significant effect on firm trade credit. According to Summers and Wilson, (2001), trade credit provides a guarantee of product quality and also builds customer relationship. Thus, a firm's decision to use accounts receivable as collateral can be seen as a means to lower funding costs to offer trade credit at competitive terms. Contrary to the results, Boot and Thakor (2003) suggest that pledging an asset as collateral leads to loss of flexibility, which may represent the other side of its financial advantage. For instance, suppliers benefit when there is interest in relaxing ex-post trade credit terms to help customers overcome temporary financial difficulty, thus protecting the long-term

investment. Moreover, sellers and buyers are prevented from renegotiating their contracts since it is the bank and not the seller that collects the receivables. Consequently, whenever customers fail to pay their debts on time, the reputation of the customer and that of the supplier are damaged. From the foregoing, placing account receivable as collateral can be used to lower the probability of default or low payment among the buyers.

Hypothesis two

H₀₂: Collateral has no significant effect on firm trade credit

The beta coefficient for collateral, $\beta_2 = -0.0275$ ($t = -1.30$, $p > 0.05$) shows that collateral has no significant effect on trade credit. The findings, therefore, fail to reject the null hypothesis that collateral has no significant effect on firm trade credit. The indications are that collateral used by the listed firms does not determine trade credit.

Hypothesis 2 stipulated that collateral has no significant effect on firm trade credit. Nonetheless, study findings showed that collateral has an insignificant effect on firm trade credit. According to Summers and Wilson, (2001), trade credit provides a guarantee of product quality and also builds customer relationship. Thus, a firm's decision to use accounts receivable as collateral can be seen as a means to lower funding costs so as to offer trade credit at competitive terms. Contrary to the results, Boot and Thakor (2003) suggest that pledging an asset as collateral leads to loss of flexibility, which may represent the other side of its financial advantage. Moreover, sellers and buyers are prevented from renegotiating their contracts since it is the bank and not the seller that collects the receivables. Consequently, whenever customers fail to pay their debts on time, the reputation of the customer and that of the supplier are damaged. From the foregoing, placing account receivable as collateral can be used to lower the probability of default or low payment among the buyers.

Hypothesis three

H₀₃: Liquidity has no significant effect on firm trade credit

The beta coefficient for liquidity, $\beta_3 = -0.1363$ ($t = -3.11$, $p < 0.05$) showing that liquidity has a significant effect on trade credit. The findings, therefore, reject the null hypothesis that liquidity has no significant effect on firm trade credit. This indicates that the amount of liquidity as measured by the ratio of current assets to current liabilities held by the firm determines trade credit.

According to hypothesis 3, liquidity has no significant effect on firm trade credit.

However, study results showed that liquidity has a significant effect on the firm's trade credit. For instance, the matching approach is adopted by firms to finance short term needs with short term finance. In this logic, accounts payable should have a positive relationship with the holding of liquid assets. Contrary to the findings, Vaidya (2011) finds that liquid assets have a significant positive influence on both accounts payable and accounts receivable. From the foregoing, it is evident that a fall in liquid assets leads to a rise in accounts payable.

Hypothesis four

H₀₄: Inventory has no significant effect on firm trade credit

The beta coefficient for inventory, $\beta_4 = -0.3399$ ($t = -2.97$, $p < 0.05$) shows that inventory has a significant effect on trade credit. The study findings, therefore reject the null hypothesis that inventory has a significant effect on firm trade credit. The indications are that amount of inventory used by the listed firms determines trade credit.

Hypothesis 4 stated that inventory has no significant effect on firm trade credit. However, study results showed that inventory has a significant effect on firm trade credit. Bougheas *et.al* (2009) relates inventories to both accounts receivable and accounts payable and find a negative relationship between inventories and accounts receivable. Thus, firms use trade credit (allow buyers to delay payment) to increase sales and reduce inventories. According to Cunat (2007), there is a positive and significant relationship between accounts payable of firms and inventories. This is because accounts payable are higher for firms with higher inventories since inventories act as collateral.

Hypothesis five

H_{05i}: Firm age has no significant moderating effect on the relationship between debt levels and firm trade credit.

The coefficients for the moderating effect of age (Age*Debt level) $\beta_5 = 2.3609$ ($t = -3.36$, $p < 0.05$) indicating that the coefficients are significant.

The study finding rejects the null hypothesis that a firm's age has no significant moderating effect on the relationship between debt levels and firm trade credit. Therefore, the moderating effects of age on debt levels explain the variations in trade credit. The study concludes that a firm's age has a significant moderating effect on the relationship between the amount of debt and trade credit.

H_{05ii}: Firm age has no significant moderating effect on the relationship between collateral and firm trade credit.

The coefficients for the moderating effect of age (Age*Collateral) $\beta_5 = -0.4637$ ($t = 1.30$, $p > 0.05$) indicating that the coefficient is not significant.

The study findings, therefore, fail to reject the null hypothesis that a firm's age has no significant moderating effect on the relationship between debt levels and firm trade credit. Therefore, the moderating effects of age on debt levels do not explain the variations in trade credit. The study concludes that a firm's age has no significant moderating effect on the relationship between the amount of debt and trade credit.

H_{05iii}: Firm age has no significant moderating effect on the relationship between liquidity and firm trade credit.

The coefficients for the moderating effect of age (Age*liquidity) $\beta_6 = -2.4649$ ($t = 4.21$, $p < 0.05$) indicating that the coefficient is significant.

The study finding rejects the null hypothesis that a firm's age has no significant moderating effect on the relationship between liquidity and firm trade credit. Therefore, the moderating effects of age on liquidity explains for the variations in trade credit. The study concludes that a firm's age has a significant moderating effect on the relationship between liquidity and trade credit.

H_{05iv}: Firm age has no significant moderating effect on the relationship between inventory and firm trade credit

The coefficients for the moderating effect of age (Age*inventory) $\beta_5 = 0.2250$ ($t = 1.30$, $p > 0.05$) indicating that the coefficient is not significant.

The findings, therefore, fails to reject the null hypothesis that a firm's age has no significant moderating effect on the relationship between inventory and firm trade credit. Therefore, the moderating effects of age on inventory does not explain the variations in trade credit. The study

concludes that a firm's age has no significant moderating effect on the relationship between inventory and trade credit.

The characteristics of the firms such as age and size have been highlighted by past studies as having significant correlations with trade credit. However, the study findings show that a firm's age has a significant moderating effect on the determinants of the trade credit in listed firms. Alphonse *et al.*, (2006) indicated that young firms tend to be less capitalized and more indebted than older compatriots, the firms having similar age characteristics would not display any significant difference in the moderating effects.

Discussion

Firms in agricultural, commercial and services, construction and allied and energy and petroleum have a surplus of trade receivables over trade payables indicating a probability of higher bank credit with less of trade credit. Thus, according to Blasio (2005), there are wide variations across industries in credit terms, but little variation within industries indicating that credit terms are stable over time.

Regarding the inventory level, both manufacturing and allied and energy and petroleum sectors had high levels of inventories with agricultural and commercial sectors having low levels of inventory. This lends credence to the study by Fisman (2001) which suggested that supplier credit was significant in determining capacity utilization in inventory - intensive industries. Looking at the two sectors mentioned; manufacturing and allied and energy and petroleum their nature of the business operations requires inventory for its operations and in such cases, trade credit would significantly aid them in acquiring the necessary inventory. Furthermore, an inventory financing model predicts the use of trade credit in a wide range of firms (Yang & Birge, 2013). Therefore, when firms are facing demand uncertainty, the trade credit enhances supply chain efficiency by serving as a risk-sharing mechanism and in such cases, the supplier balances its impact on operational profit and costs of financial distress.

The firms in the agricultural sector had high liquidity levels with the ratio of 5.77 with manufacturing and allied sector having a ratio of 2.49 however, all other sectors were of ratio 1:1. Findings by Fabbri and Menichini (2010) indicated that firms with a high degree of liquidity or a high collateral value are more likely to take trade credit to exploit the liquidation advantage of the supplier, while evidence adduced by (Boissay & Gropp, 2007) show that trade credit allows credit-constrained firms to cope with liquidity shocks. Since the firms in the agricultural and manufacturing and allied sectors are high liquidity in comparison to their peer sectors, there are high chances that they use trade credit since this form of credit accrues them with advantages of exploiting the supplier. On the converse firms with low liquidity levels would likely have a mix of bank and trade credit.

In general, the debt levels across the sectors was more than half the total assets with firms in the energy and petroleum being highly indebted at nearly two thirds the total assets, while manufacturing and allied having the lowest debt levels. The implications are that all firms in these sectors have pledged their assets against the firm's assets and as informed by Giannetti *et al.*, (2011), these firms would prefer trade-credit firms over bank credit due to three reasons: first, their assets have been used to guarantee debt, therefore they cannot access more bank credit, second, the latitude of exploiting trade credit for longer period of time until they are able to repay large amounts of bank credit and third, trade credit serves as an insurance against survival or liquidity shocks.

Virtually all firms used collateral with different ratios but the average collateral for the firms was 1.34 implying that the total debt to total equity ratio was 4:3, however, certain sectors were highly leveraged and this included the manufacturing and allied and energy and petroleum at 1.6: 1 and 2.05: 1 respectively while construction and allied had 1.50:1. The agricultural sector was least collateral at 0.67:1 with the other sectors having a ratio of approximately 1:1. The indications are that firms which are inventory – based are likely to hold high collateral and thus they are likely to use trade credit more than bank credit thus Bandos & Pindado (2007) assert that the use of collateral depends on the value of a product and as such the more the value and thus the supplier firm may have a cost advantage. Evidence obtained from studies indicates that the more durable the goods, the better collateral it provides and the greater the trade credit being offered.

The results show that liquidity correlates with trade credit signifying that most firms in the country would prefer to hold high liquidity levels in order to protect themselves against shocks that result from economic conditions. This suggests that liquidity determines the use of trade credit among the listed firms in Kenya. Further, trade credit significantly associates with debt levels due to the significant increase in the overall debt held by the firms in the form of trade payables. This result augur with what Alphonse *et al.*, (2006) identified a significant negative relationship between loans and accounts payable, and thus firms that use trade finance would likely increase their overall debt. However, the use of trade credit is related to the firm's growth cycle and as indicated by Klapper *et al.*, (2012) the accounts payable first increase with age and then eventually fall.

Firm's age does have a significant moderating effect on the determinants of the trade credit in listed firms. Although firm's age seems to characterize the financial structure, young firms tend to be less capitalized and more indebted than older compatriots, a fact that is attributed to the use of trade credit (Alphonse *et al.*, 2006). Due to this young firms relying on debt seem to have a higher total asset in comparison. Firm's age seems to characterize firms financial structure such that young firms are less capitalized and more indebted than older compatriots due to the use of trade credit (Alphonse, Ducret & Séverin, 2006).

5.0 Conclusion and Recommendations

Summary of the findings

The study findings show that the use of trade credit is not widespread in all sectors in that there was as twice the number of sectors having a surplus in receivables over payables. This illustrates that the usage is restricted to those sectors which are inventory intensive in that its business model revolves around the usage of inventory while allowing for the use of trade credit. In particular, the two sectors using more trade credit were the automobiles and accessories and manufacturing and allied sectors, a fact that is attributable to the intermediate nature of the inventory thus the usage of trade credit would accrue the firm the benefits from the value addition process.

Agriculturally based firms have high liquidity levels while energy and petroleum firms are highly indebted with manufacturing and allied sector being highly leveraged. It indicates that the different sectors hold different approaches to how they run their operations.

Liquidity, inventory and debt levels were significant determinants of trade credit while collateral was not. The findings could be explained by the fact that more firms use more of bank credit than trade credit and thus the effect of these variables on trade credit would be only significant if all the firms in all sectors held a common view on the issues of trade credit.

Conclusion

Based on the study findings, the study makes the following conclusions;

The provision of trade credit is associated with default risk or late payment hence it impacts negatively on firm profitability. However, discrimination between buyers through trade credit results in a positive relationship between gross profits and accounts receivable. In this logic, granting trade credit heightens a firm's sales and results in higher profitability.

Based on the findings, collateral has no significant effect on trade credit. The firms' decision to post accounts receivable as collateral is an indication of lowered funding costs so as to offer trade credit at competitive terms. However, the collection of accounts receivable is disadvantageous in that the bank has exclusive access to a wide array of exclusive information and in the event, such information is disseminated to third parties it can be harmful to both the borrower and the customer (Ruckes & von Rheinbaben 2004). Thus, pledging an asset as collateral leads to loss of flexibility. However, long term investments for suppliers are protected when there is interest in relaxing ex-post trade credit terms to aid customers to meet their financial obligation.

In the same vein, liquidity had a positive and significant effect on trade credit. Specifically, liquid assets have an impact on trade credit. Because firms finance short term needs with short term finance, there is a positive relationship between accounts payable and holding of liquid assets. However, liquid assets have a negative impact on accounts payable. Thus, a decline in liquid assets is accompanied by a rise in accounts payable. Thus, firms need to ensure there is appropriate liquidity which will lower account payable.

Further, the study indicated that inventory has a significant effect on trade credit. The accounts payable are higher for firms with higher inventories since inventories act as collateral. However, whenever firms use trade credit to increase sales inventories are reduced. This implies that the amount of inventory is not always totally controlled by company management because it is affected by sales, production, and economic conditions.

Recommendations

There is evidence from the study results that debt levels have a positive effect on trade credit. As a result, firms need to establish a well-defined trade-credit granting criteria to assess the creditworthiness of the buyers to avoid default risk or late payment by buyers.

Similarly, liquidity has a positive and significant effect on firm trade credit. Therefore, firms with a high share of short-term assets tend to use more trade credit as a form of short-term financing. There is a need for firms to mitigate the effects of firms' financial constraints through trade credit. Also, firms should hold liquid assets so that they can be able to meet their financial obligations. Moreover, through trade credit, credit-constrained firms can afford to insure their customers, an extension of reciprocity of insurance from their suppliers.

Policy Recommendations

Since collateral has some significant effects on trade credit, regulatory agencies should propose legislation governing trade financing in the industry. This would promote the use of trade financing and thus reduce dependence on bank credit which sometimes require collaterals. However, the recent advances in laws governing credit availability (capping of interest rate) may spur the use of credit within the industry, but also complicate the conduct of the monetary policy which at times result in perverse outcomes.

The sectoral differences in the use of trade credit have a beneficial effect reducing the cost of credit. The firm that tends to substitute bank credit for trade credit is, therefore, reducing the cost of transactions and therefore the policymakers should develop regulations governing the use of trade credit within the different sectors. In doing so, the industry will stand to gain from regulations through the evening out of obstacles governing the use of trade credit.

Age is a significant determinant in the use of trade credit in that well-established firms tend to hold high debt levels and more liquid than relatively younger firms. The use of trade credit then is pegged on the age of the firm signifying that other extraneous variables are influencing the use of trade credit. Thus, any policy framework on trade credit should aid in promoting the use of trade credit among newly established firms

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