HOW RELEVANT IS THE WORKING CAPITAL MANAGEMENT IN EXPLAINING PROFITABILITY IN THE RETAIL SECTOR COMPANIES OF SOUTH AFRICA?

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ABSTRACT

This paper sought to ascertain the impact of the working capital management on firm profitability in the retail sector of the South African economy. The working capital variable was proxied by the Cash Conversion Cycle (CCC) calculated from the components that constitute it. To minimise the possibility of committing errors of misspecification of the econometric model the research included a few other control variables that are known to have effect on firm profitability and these are Financial Debt Ratio (FDR), Sales as well as the Leverage-Factor of the firm. The Analysis was via the use of Panel Data Regression Technique. The research found an expected and significant negative relationship between working capital (CCC) and firm profitability. This means a shorter CCC means higher cash liquidity and hence higher profits. The relationship between firm profitability and Financial Debt Ratio was also negative and statistically significant, meaning that a higher Debt to Assets ratio leads to lower profits. Higher firm sales were found to produce a positive and significant effect on the profits. Lastly the leverage-factor variable showed a positive effect on firm profits but the impact was not statistically significant.

Key words: Working Capital, Cash Conversion Cycle, Firm profitability, Panel Regression.

Introduction

In the present global environment of aggressive competition, almost all business firms have no other viable option but to cut the cost of operations in order to be competitive and be financially healthy. Efficient working capital management is therefore an integral component of the overall corporate strategy to create shareholder's wealth. Most businesses fail especially in the current economic recession mainly as a result of failure to meet their working capital requirements (Deloof, 2003: 574). According to Nazir and Afza (2009:21), working capital management has become one of the most important issues in organisations where many financial managers are struggling to identify basic working capital drivers and appropriate levels of working capital.

Background

The retail business contributes a significant proportion of the annual Gross Domestic Product (GDP) in South Africa and therefore is regarded as an important sector in the economy. The economy of South Africa is made up of Mining, Agriculture, Manufacturing as well as Retail Business among other sectors.

Motivation of the study

Literature on this topic shows that the outcomes of the studies carried out in the area of the relationship between working capital and profitability are conflicting in nature. In fact the

interrelationship between working capital and profitability is still a debatable issue. Although a few studies have been done in South Africa none have been done with a particular focus on the general retail sector on its own. This has motivated this study as the general retail industry is one of the key contributors to the economy which affects the entire population.

Research Purpose

This study seeks to extend findings and explain the relationship between working capital management and profitability for the Johannesburg Stock exchange (JSE) listed companies in the general retail sector.

The Problem Statement

The above literature suggests that the relationship between working capital and profitability remains inconclusive. Furthermore a lot of studies have been carried out in the area of working capital management, few studies have been carried out in the retail sector on its own particularly in South Africa. Variations in working capital performance between companies in various sectors as alluded to by the study done by Sur and Chakraborty (2011:20) points to a significant potential for improvement. The trend in the retail industry of outsourcing has brought with it a number of risks, including potentially longer and more variable lead times, excess safety stocks, higher logistic costs and loss of control. It is therefore imperative that the impact of working capital management must be determined through the analysis of the relationship between working capital components and profitability. Hence the following objectives:

Objectives of the study

1. To study the relationship between working capital (as proxied by cash conversion cycle, CCC) and the profitability for selected JSE listed retail sector companies.
2. To assess what affect the financial debt ratio (FDR) has on firm profitability for selected JSE listed retail sector companies.
3. To determine whether the size of the selected companies measured by sales has any relationship on firm profitability.

Research Hypothesis
1. The research postulates that a shorter cash conversion cycle is associated with higher firm profitability

2. A higher Financial Debt Ratio(FDR) may lead to firm distress and hence the research postulates a negative relationship between FDR and firm profitability

3. In business size is a culmination of years of experience in the business as well as huge capital commitment and as such we expect a positive correlation between size and firm profitability

Literature review.

This chapter explores the subject of Working capital management as previously studied by various scholars. The literature review is broken down into two sections which are the theoretical review and the empirical review.

Theoretical Review

Every organisation whether profit oriented or not, irrespective of size and nature of business requires necessary amount of working capital. (Rahman, Afza, Qayyum and Bodla, 2010:7). According to Mukhopadhyay (2004:54), working capital is the most crucial factor for maintaining liquidity, survival, solvency and profitability of a business. Working capital management is one of the most important areas while making the liquidity and profitability comparisons among firms (Eljelly, 2004:10), involving the decision of the amount and composition of current assets and the financing of these assets. Azam and Haider (2011:481) postulates that maintaining liquidity on daily base operation to make sure its running and meets commitment is a crucial part required in managing working capital. According to Harris (2005:52), working capital management is a simple and straightforward concept of ensuring the ability of the firm to find the differences between the short term assets and short term liabilities. Arshad and Gondal (2013:384), attest that efficient management of working capital is one of the pre-conditions for the success of an enterprise. They further noted that efficient management of working capital means management of various components of working capital in such a way that an adequate amount of working capital is maintained for smooth running of a firm and for fulfilment of twin objectives of profitability.

Considering the importance of working capital management and profitability relationship such as Uyar, (2009:30), Samiloglu and Demirgunes, (2008:48), Vishnani and Shah, (2007:267), Garcia-Teruel and Solano, (2007:170), Lazaradis & Tryfonidis, (2006:30), Padachi, (2006:49), Shin and Soinen, (1998:39), Smith *et tal* (1997:5) among others, Working capital management is an essential component of all business activity, and many companies invest a large proportion of their funds in working capital, in some instances up to 70% in their total investment in assets (Correia, Flynn, Uliana and Wormald, 2007:11).

Efficient management of working capital is thus an important indicator of sound health of an organisation which requires reduction of unnecessary blocking of capital in order to bring down the cost of financing.

Working capital is probably one of the most basic but least studied topics in corporate finance. It should involve the analysis of the investments in operating assets and its corresponding financing. Literature has shown that there is some relevant research on the individual components of working capital like receivables, payables and creditors, but little academic effort has been devoted to develop a comprehensive view.

According to Etiennot, Preve and Sarria Allende (2012:163), working capital should be understood as the long-term capital a firm chooses to apply to the financing of the net operating investment, and therefore as part of the capital structure decision of a firm. They further alluded that to analyse the determinants of working capital patterns, it is important to keep this intuition in mind.

Goel (2011:106) suggest that working capital management is a relevant subject for financial managers who invest a significant amount of time and effort seeking an ideal balance between risk and return, profitability and liquidity, in order to create value for the company.

Early literature on working capital was probably first developed by Sagan(1955:122), who emphasized the need for management of working capital accounts and warned that it could vitally affect the health of the company. Deloof (2003:4) stresses that the way working capital is managed has a significant impact on profitability of firms. The result indicates that there is a certain level of working capital requirement which potentially maximises returns. Nazir and Afza (2009:20) attest that working capital management is a simple and straightforward concept of ensuring the ability of the organisation to fund the difference between the short-term assets and short-term liabilities. Hall (2002:27) argued that a total approach is desired as it can cover all the company's activities relating to vendor, customer and product. In practice working capital management has become one of the most important issues in the organisation where many financial executives are struggling to identify the basic working capital drivers and appropriate level of working capital. Consequently, companies can minimise risk and improve the overall performance by understanding the role and drivers of working capital management.

According to Seeger, Locker and Jergen (2011:87), the operating cycle is composed of the inventory period and the accounts receivable. The inventory period represents the average amount of time the inventory is held before being sold, whereas the receivables period is the average number of days it takes from the sale of the goods until the cash is received from the customer.

The accounts payable period measures the average span between the purchase of raw materials and the cash outflow to the supplier. Seeger *et al* (2011:87) concurs that the difference between the operating cycle and the accounts payables is the cash conversion cycle (CCC). It is therefore the time period it takes on average from the cash outlay by the firm to the suppliers to the cash inflow from the customer which then shows the financing needs of a company regarding the operating needs of a company regarding the operating activities. This is so because part of the inventory and accounts receivable has to be financed by either borrowing money or holding a liquidity reserve (Farris and Hutchison, 2003:84). The amount of this additional financing depends on the length of the cash conversion cycle, that is the longer the CCC is, the higher are the capital requirements and vice versa (Boer (1999:29). This is caused by the fact that the longer a firm has to wait after the cash outflow to the supplier to the cash inflow from the customer, the longer it has to finance the operations through other sources.

As argued by Chittenden and Brag *(*1997:170), while working capital management is of importance to all firm size operating in both developed and developing countries, working capital management is of particular importance to the business firms operating in emerging markets. Firms in emerging markets are mostly small in size with limited access to the long term capital markets. They further argued that successful management of resources will lead to corporate profitability given that management success might be measured by market value.

Abuzayad (2011:156) asserted that since working capital is based described by cash conversion cycle, there is a link between accounting as well as market performance and management of cash conversion cycle. It also is an indication of how long a firm can carry on if it was to stop its operation or it indicates the time gap between purchase of goods and collection of sales. The optimum level of inventories is expected to have a direct effect on profitability since it will release working capital resources which will in turn be invested in the business cycle or will increase inventory levels in order to respond to higher product demand.

In his studies of the relationship between working capital management and profitability of companies listed on the Johannesburg stock exchange, Ngwenya (2012:1204) alluded that CCC is a powerful tool used to assess how well a company is managing its working capital. He further suggested that a company with a lower CCC is more efficient because it turns its working capital over more times a year and thus allows it to generate more sales per money invested. The working capital cycle starts when a company buys inventory on credit from suppliers which then give rise to accounts payable. During the course of business a company may sell its finished goods to customers on credit, which then gives rise to accounts receivable. Therefore the time taken by a company to pay for the inventory purchased is the average payment period. The CCC is then calculated by the number of days accounts receivable plus the number of days inventory minus the number of days accounts payable. It therefore means that a longer CCC indicates more time between outlay of cash and recovery.

The value of CCC can be positive or negative. A positive value indicates the number of days a company must borrow or tie up capital while awaiting payment from customers and a negative value indicates the number of days a company has received cash from sales before it must pay its suppliers, (Uya, 2009:188)

Some authors refers to the CCC as the Cash operating cycle. The operating cycle is composed of the inventory period and the accounts receivable period place (Ross et al., 2008) cited by Seeger et al (2011:87). The inventory period is the average amount of time the inventory is held, whereas the receivables period is the average number of days it takes from the sale of the goods until the cash receipt from the customer. The accounts payable period, in turn, is the average time span between the purchase of the raw materials and the cash outflow to the supplier. The difference between the operating cycle and the accounts payable period is also referred to as the cash cycle. It is the time period it takes on average from the cash outlay by the firm to the suppliers to the cash inflow from the customer. In other words, it shows the financing needs of a company regarding the operating activities, since part of the inventory and accounts receivable have to be financed by either borrowing money or holding a liquidity reserve (Farris and Hutchison, 2003:84). The amount of this additional financing depends on the length of the cash cycle: the longer the cash cycle is, the higher are the capital requirements and vice versa (Boer, 1999) cited by Seeger et al (2011:87). This is due to the

fact that the longer a firm has to wait after the cash outflow to the supplier to the cash inflow from the customer, the longer it has to finance the operations through other sources.

Figure 1 Operating and cash cycle
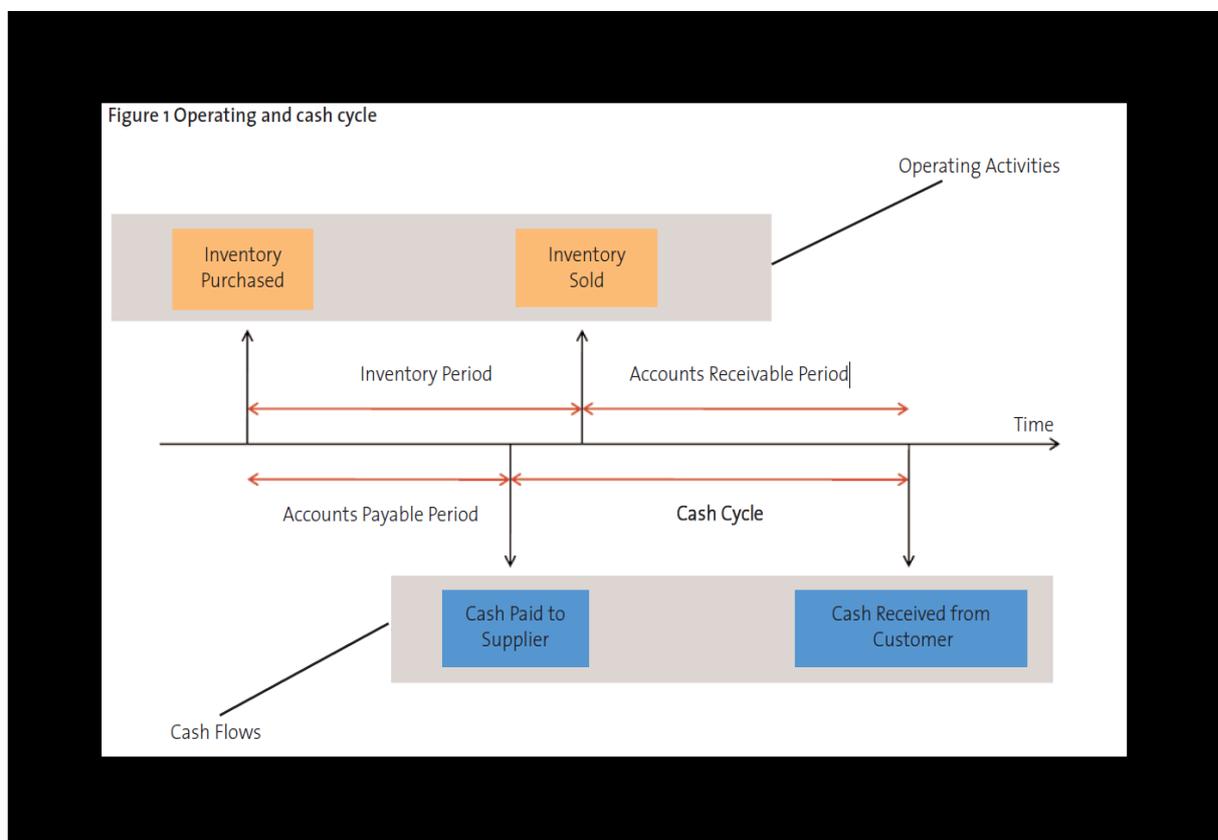
Adapted from Seeger et al (2011:88)

The connection between the operating activities and the financing needs of a company becomes more obvious when considering its impacts on the balance sheet. The length of the operating cycle determines the actual inventory and accounts receivables levels and hence considerably affects the amount of current assets which is held by the company. On the other hand, the length of the accounts payable period has a substantial impact on the level of a

firm's current liabilities, namely the amount of accounts payable. The capital needs, with respect to the operating activities are finally determined by taking the difference between the sum of the accounts receivable and the inventories minus the accounts payable. This difference is called the net working capital and corresponds to a company's short run financing needs (Wagner and Locker, 2008:6).

In order to incorporate the dynamic nature of a firm's business the working capital ratios and the cash cycle are becoming more popular (Losbichler and Rothböck, 2008:60). The Days Working Capital ratio (DWC, also called cash conversion cycle or cash-to-cash cycle) expresses the cash cycle in terms of days, and is calculated based on the lengths of the underlying periods, The days sales outstanding ratio (DSO) converts the receivables period into days (Brealey and Myers, 2005) cited by Seeger et al (2011:88)

$$DSO = \frac{Accounts\ Receivable}{Sales} * 365 = \frac{Accounts\ Receivable}{Average\ Daily\ Sales}$$

The DSO measures how many days it takes on average from the sale of the goods until the customers pay their bills. **A high DSO leads to a longer cash cycle, and hence also to higher working capital levels.** The days inventory outstanding (DIO) denotes the average time span in terms of days for a good to be purchased as raw material, converted into the finished good, and finally sold to the customer. Its implication for Working Capital/cash flows?

$$DIO = \frac{Inventory}{Sales(\boldsymbol{not\ COGS}?)} * 365 = \frac{Inventory}{Average\ Daily\ Sales(\boldsymbol{not\ avrge\ COGS}?)}$$

The sum of the DSO and DIO result in the operating cycle. Therefore, an increase in these ratios leads also to an increase in the cash cycle. The days payable outstanding (DPO) expresses the average number of days a company waits until it pays its suppliers

$$DPO = \frac{Accounts\ Payable}{Sales} * 365 = \frac{Accounts\ Payable}{Average\ Daily\ Sales}$$

Since the cash cycle is the difference between the operating cycle and the payables period, an increase in the DPO results in a shorter cash cycle. Hence, the later the cash outflows to the

suppliers occur, the less capital is needed to finance the operating activities of a company. The Days Working Capital is calculated by putting these ratios together:

DWC = Days Sales Outstanding + Days Inventory Outstanding – Days Payable Outstanding

The cash conversion cycle thus measures the average time span between the cash outflow for the purchase of inventories and the cash inflow from the collection of receivables. The importance of an efficient working capital management is confirmed by several studies (e.g. Jose et al., 1996 or Shin and Soenen, 1998) cited by Seeger et al (2011:88) , which show that a shorter cash cycle leads to higher profitability and rising share prices thus, resulting in an increased enterprise value.

Working capital and corporate performance

The investment in receivable accounts and inventories represents an important proportion of a firm's assets, while trade credit is an important source of funds for most firms. Cuñat (2007:495) reports that trade credit represent about 41% of the total debt and about half the short term debt in UK medium sized firms. There is substantial literature on credit policy and inventory management, but few attempts to integrate both credit policy and inventory management decisions, even though Schiff and Lieber (1974), Sartoris and Hill (1983), and Kim and Chung (1990) cited by Caballero *et al* (2013:16) do show the importance of taking into account the interactions between the various working capital elements (i.e. receivable accounts, inventories and payable accounts). Lewellen, McConnel, and Scott (1980) cited by Caballero *et al* (2013:17) demonstrate that under perfect financial markets, trade credit decisions do not serve to increase firm value. However, capital markets are not perfect and, consequently, several papers demonstrate the influence of trade credit and inventories on firm value (see, for instance, Bao & Bao, 2004:64).

The idea that working capital management affects firm value also seems to enjoy wide acceptance, although the empirical evidence on the valuation effects of investment in working capital is scarce. There are various explanations for the incentives of firms to hold positive working capital. Firstly, a higher investment in extended trade credit and inventories might increase corporate performance for several reasons. According to Blinder and Maccini (1991:298), larger inventories can reduce supply costs and price fluctuations and prevent interruptions in the production process and loss of business due to scarcity of products. They

also allow firms better service for their customers and avoid high production costs arising from high fluctuations in production (Schiff & Lieber, 1974) cited by Caballero *et al* (2013:17). Granting trade credit, on the other hand, might also increase a firm's sales, because it can serve as an effective price cut (Brennan, Maksimovic, & Zechner, 1988:1146) and encourages customers to acquire merchandise at times of low demand (Emery, 1987:220); it strengthens long-term supplier–customer relationships, it allows buyers to verify product and services quality prior to payment. Hence, it reduces the asymmetric information between buyer and seller. Working capital may also act as a stock of precautionary liquidity, providing insurance against future shortfalls in cash (Fazzari & Petersen, 1993:150). Finally, from the point of view of accounts payable, Wilner (2000:164) also demonstrate that a firm may obtain important discounts for early payments when it reduces its supplier financing. However, there are also possible adverse effects of investment in working capital which may lead to a negative impact on firm value at certain working capital levels. Firstly, keeping stock available supposes costs such as warehouse rent, insurance and security expenses, which tend to rise as the level of inventory increases (Kim & Chung, 1990) cited by Caballero *et al* (2013:17). Secondly, since a greater working capital level indicates a need for additional capital, which firms must finance, it involves financing costs and opportunity costs. On the one hand, companies that hold a higher working capital level also face more interest expenses as a result (Kieschnick et al., 2011:5) and, therefore, more credit risk. As working capital increases, it is more likely that firms will experience financial distress and face the threat of bankruptcy. This gives firms with high investment in working capital incentives to reduce working capital levels and minimize the risk of financial distress and costly bankruptcy. On the contrary, keeping high working capital levels means that money is locked up in working capital (Deloof, 2003:36), so large investment in working capital might also hamper the ability of firms to take up other value-enhancing projects. These positive and negative working capital effects indicate that the working capital decisions involve a trade-off. Consequently, we expect firms to have an optimal working capital level that balances these costs and benefits and maximizes their value. Specifically, we expect corporate performance to rise as working capital increases until a certain working capital level is reached. Conversely, we expect that, beyond this optimum, the relation between working capital and performance will become negative (Caballero *et al* (2013:19).

Most empirical studies relating to working capital management (WCM) and profitability support the fact that aggressive working capital policies enhance profitability. Teruel and Solano (2007:45) did a study to identify the effects of WCM on profitability of small and medium sized Spanish firms. The results showed that there was a significant negative relationship between an SME's profitability and number of days accounts receivable and days of inventory.

Studies were also conducted to identify the trends in WCM and its impact on Mauritian small manufacturing firms, Padachi (2006:49) identified that the working capital needs of an organisation change overtime as does its internal cash generating rates. It was then recommended that small firms should ensure a good synchronisation of its assets and liabilities. Another analysis was also done by Kerstien and Rai (2007:15) which tried to examine the marked reaction to positive and negative earnings changes influenced by large unexpected working capital accruals and predicts the circumstances where large working capital accruals lead to varying market expectations of earnings quality. The literature went on to argue that the market is more likely to suspect earnings management and view earnings as being of lower quality when firm's reports small increases in earnings with the help of positive or negative large working capital accruals.

Raheman and Nasr (2007:284) conducted a study to analyse the relationship between WCM and profitability in cases of Pakistani firms and the results shows that there is a strong negative relationship between WCM and profitability of the firms and that managers could create positive value for the shareholders by reducing the cash conversion cycle to a possible minimum level. There was also a significant negative relationship between liquidity and profitability. On the same vein Nazir and Afzar (2009:27) explored the traditional relationship between WCP policies and a firm's profitability. The results showed that managers could create value if they adopt a conservative approach towards working capital investment and working capital financing policies. In the same studies, it was also found that investors give weight to the stocks of those firms that adopt an aggressive approach to managing their short term liabilities.

 While a large number of studies examined factors affecting working capital management, a lesser number directly examined the effect on firm's performance. The empirical question whether a short cash conversion cycle is beneficial for the company profitability has been

questioned in the previous literature. Shin and Soenen (1998:39) argued that organisations can have larger sales with a generous credit policy, which extends the cash cycle. The longer cash conversion cycle may result in higher profitability. However the traditional view of the relationship between the cash conversion cycle and firms' profitability is that, ceteris paribus, a longer cash conversion cycle hurts the profitability of a firm. Lazaridis and Tryfonidis (2006:25) investigated the relationship between corporate profitability and working capital management using listed companies on the Athens stock exchange. They discovered that a statistically significant relationship existed between profitability and the cash conversion cycle. They concluded that businesses can create profits for their companies by their companies by handling correctly the cash conversion cycle and keeping each component of the cash conversion cycle to an optimum level. Deloof (2003:574) also concurred and found that the way working capital is managed has a significant impact on the profitability of businesses. He also suggests that less profitable firms wait longer to pay their bills. This was also further attested by Ghosh and Maji (2004: 364) who made an empirical study on the relationship between utilisation of current assets and operating profitability in the Indian cement and tea industry. The study concluded that the degree of utilisation of current assets was positively associated with the operating profitability of all companies under study. The results of their study indicate that there is a significant positive relationship between the cash conversion cycle and traditional liquidity measures of current and quick ratios. The cash conversion cycle is also positively related to the return on assets and the net profit margin but had no linear relationship with the leverage ratios. Conversely, the current and quick ratios and negative relationship with the debt to equity ratio, and a positive one with the times interest earned ratio.

Weinraub and Visscher (1998:17) discussed the issue of aggressive and conservative working capital management policies by using quarterly data for the period 1984-93 of US firms. Their study considered 10 diverse industry groups to examine the relative relationship between the aggressive /conservative working capital policies. Their study concluded that industries had distinctive and significantly different working capital policies. The study further showed a high and significant negative correlation between industry asset and liability policies and found that when relatively aggressive working capital asset policies are followed, they are balanced by relatively conservative working capital financial policies.

Soenen(1993:55) investigated the relationship between the net trade cycle as a measure of working capital and return on investments in the US firms. The results of the Chi-square test

indicated a negative relationship between the length of the net trade cycle and return on assets. Furthermore, this inverse relationship was found different across industries depending on the type of industry. A significant relationship for about half of the industries studied indicated that results might vary from industry to industry.

Jose *et al* (1996: 29) examined the relationship between aggressive working capital management and profitability of US firms using cash conversion cycle as a measure of working capital management, where a shorter cash conversion cycle represents the aggressiveness of working capital management. The results indicated a significant negative relationship between the cash conversion cycle and profitability, indicating that more aggressive working capital management is associated with higher profitability.

Rehman(2006) investigated the impact of working capital management on the profitability of 94 Pakistani firms listed on Islamabad Stock Exchange(ISE) for the period 1999-2004. He studied the impact of the different variables of working capital management, including average collection, inventory turnover in days, average payment period and cash conversion cycle on the net operating profitability of firms. He concluded that there is a strong negative relationship between working capital ratios mentioned above and profitability of firms.

The relationship of CCC with firm size and profitability for firms listed on the Istanbul Stock Exchange was studied by Uyar(2009:40), using ANOVA and correlation analysis. The results showed retail/wholesale industry has shorter CCC than manufacturing industries. The study also found significant negative correlation between CCC and profitability as well as between CCC and firm size.

Most of the empirical studies support the traditional belief about working capital and profitability that reducing working capital investment would positively affect the profitability of a firm (aggressive policy) by reducing proportion of current assets in total assets. Deloof, (2006:570), analysed a sample of Belgian firms , and Wang(2002:170), analysed a sample of Japanese and Taiwanese firms, emphasized that the way the working capital management is managed has a significant impact on the profitability of firms and increase in profitability by reducing number of days accounts receivable and reducing inventories. Soenen, (1998:42), analysed a sample of US firms also reported similar findings but has used net trading cycle as comprehensive measure of working capital management and found significant negative relationship between net trading cycle and profitability.

YaghoobNejad (2010:130) examined the relationship between working capital management and profitability. For this purpose, selected a sample of 86 active companies on Tehran stock exchange for the period of 2002-2007. This study for analysis the data has used regression and Pearson correlation. The results show that there is a negative relationship between variables of working capital management and profitability. Also, the results indicate that increase in number of days accounts receivable, number of days accounts payable, number of days inventories and cash conversion cycle leads to decrease in profitability of companies. Managers can increase the shareholder's wealth by reducing number of days accounts receivable, number of days accounts payable, number of days inventories and cash conversion cycle.

Raheman *et al*, (2010:151), conducted a study on working capital management and corporate performance of manufacturing firms listed on the Karachi Stock Exchange using panel data.The results show that for overall manufacturing sector, WCM has a significant impact on profitability of the firms and plays a key role in value creation for shareholders as longer CCC and net trade cycle have negative impact on net operating profitability of a firm. Arshad and Gondal, (2013:388) also did a study in Pakistan on the impact of WCM on profitability in the cement industry. The empirical findings of the study indicate that the current ratio and net current ratio on total ratio have significantly positive effects on firm profitability.

Further studies on impact of WCM on firm profitability has also been done in relation to different business cycles. In an empirical study, Einarsson and Marquis, (2001:881) found that the degree to which companies rely on bank financing to cover their working capital requirements in the U.S is countercyclical; it increases as the state of the economy weakens. Furthermore, Braun and Larrain, (2005; 1122) found that high working capital requirements are a key determinant of a business' dependence on external financing. Enquivist *et al*, (2014:38), did a study on the impact of WCM on firm profitability in different business cycles on Finnish firms. Their results also show that that economic conditions exhibit measurable influences on the working capital-profitability relationship. The low economic state was generally found to have negative effects on corporate profitability.

Working capital and profitability in South Africa

Not much study has been done about the relationship between working capital management and profitability in South Africa. However Ngwenya (2012:1204) did a research on the relationship between working capital management and profitability of companies listed on the Johannesburg Stock Exchange. He used data from financial statements of all companies listed on the JSE from 1998 to 2008. Only companies listed for all 10 years were included and all companies in the insurance and banking sector were excluded as they had no bearing on working capital management. The cash conversion cycle and its components were used as the main independent variables and gross profit as the dependent variable.

The results concluded that there is a statistically significant negative relationship between profitability and the cash conversion cycle.

Smith and fletcher (2009:15) did a similar study which however focused on the factors influencing working capital management in South African industrial companies. Building on previous research, Smith and Fletcher used net liquid balance and working capital requirements as proxies for working capital management. These proxies were tested for influence of industry, turnover, debt ratio, cash flow and return on assets on the measures. The results showed no significant industry effect on working capital management. However, when absolute values were used, the study found that turnover displayed the greatest influence on working capital management. More research in South Africa per sector is needed so as to determine how profitability is affected by working capital management hence the focus of this study on the retail sector of companies listed on the Johannesburg Stock Exchange.

Conclusion

The existing body of knowledge on working capital management focuses on traditional, well known working capital measures like the current ratio, the acid test ratio and net working capital in the appraisal of the working capital management of an entity. Although these measures are time- honoured, convenient way of classifying large amounts of data to compare firm's performance, the financial textbooks note their limitations. Whilst their usefulness is entirely dependent on skilful interpretation, traditional ratios are criticised for inconsistence in measurement and presentation of myopic results. The chief censure is that the static nature of traditional ratios makes them unreliable for appropriate estimation of the operating cash flow, which ultimately determines the extent of liquidity of a firm. (Smith and Fletcher, 2009:15)

The literature has also on the on the hand strongly attested that a successful working capital strategy relies on the commitment and awareness of the management and on efficient working capital practices on the operative level. In addition, internal and external collaboration leads to more competitiveness, both for the firm as well as for the whole supply chain. A consistent and on-going monitoring ensures sustainable improvements, and can be supported and enhanced by a benchmarking analysis and the adaption of best practices. It is clear that working capital management is the backbone of any company's operations for both large and small organisations. Further studies are needed to find lines of best fit so as to optimise the sustainability of organisations so as to contribute to overall growth in economies which will eventually lift the standards of living for society.

Research Methodology

The study adapted a case study of JSE listed companies in the general retail industry. The data required for this study will be extracted from the published annual reports of the companies and therefore the nature of the data is secondary. The study will cover a period of 5 years from 2009 to 2013. Firm data from 15 companies in the general retail sector listed on the JSE will be used. The reason for the chosen JSE listed companies is primarily due to the reliability and availability of financial information. Additionally as argued by Lazaridis and Tryfonidis (2006:27), hiding profits in order to avoid corporate tax is a common tactic for non-listed firms in emerging markets which makes them less of a suitable sample for analysis where one can draw inference, based on financial data for working capital practices. The Cash conversion cycle was used as a comprehensive measure of working capital and its three components namely accounts payable, accounts receivable and inventory were the independent variables. The dependent variable to be used to determine the relationship between working capital management and profitability will be the operating profit before tax which is calculated as sales minus cost of goods sold divided by total assets minus financial assets. The reason for subtracting financial assets from total assets is to exclude the participation of any financial activity that might affect overall profitability (Lazaridis & Tryfonidis (2006:28).

Liquidity ratio analysis, mean, variance and standard deviation on profitability and working capital components will be used as data analysis tools. The relationship between working capital management and profitability will be assessed through relevant Statistical Analysis such as Bivariate and Partial Correlation Coefficients as well as Parametric Regression Analysis as opposed to Kernel Regression.

Research Variables and Symbols

S = firm's annual sales used for calculating Gross Operating Profit

COGS = Cost of goods sold for a year

GOP = gross operating profit (used as the dependent variable in measuring profitability

ITO = inventory turnover given in terms of days

ACR = accounts receivable days (explaining the average number of days a firm realises receipts from debtors)

AP = accounts payable in days show, on average, the amount of time in days it would take a firm to pay its creditors)

CCC = cash conversion cycle is a variable that measures how long a firm will be deprived of cash if it increases its investment in resources in order to expand customer sales and it is given by :

(CCC = Inventory Conversion period + Receivables Conversion period **-** Payables Conversion period

$$= \frac{Avg.Inventory}{COGS/365} + \frac{Avg.Accounts\ Receivable}{Sales/365} - \frac{Avg.Accounts\ Payable}{[Inventory\ increase + COGS]/365})$$

CR = Current Ratio $\quad$ (CR $= \frac{Current\ Assets}{Current\ Liabilities}$)

ATR = Acid test ratio $\quad$ (ATR $= \frac{current\ Assets - Inventories}{Current\ Liabilities}$)

GR = Gearing ratio $\quad$ (GR = Debt Equity ratio)

FFAR = Fixed financial assets ratio (FFAR $= \frac{Fixed\ Financial\ Assets}{Total\ Assets}$)

FDR = Financial debt ratio $\quad$ (FDR $= \frac{short-term\ loans + long-term\ loans}{Total\ Assets}$)

CCC: This variable is used as a control variable to ascertain the extent to which profitability can be affected by the period it would take to realise receipts out of investments made in an attempt to increase sales. It is a liquidity risk measure.

FFAR: the variable is used in the regression as financial assets are a reasonable and large part of total assets. It would be good to see how this variable impacts on profitability.

FDR: It is prudent to know how much of the external funding, in relation to total assets, would affect profitability

The dependent variable, **GOP,** is chosen as a regressand since it is the target variable whose factors are those discussed already as control variables.

Variable Transformation

Most variable transformations are monotonic by nature and therefore do not distort the fundamental relationships they have with each other. Most of the control variables in this study will not be transformed as they are within the same scale and this makes it easy to interpret.

Without loss of generality, the sales figures shall be transformed into logs to result in a logarithmic variable. Sales are huge figures such that using them in their raw (original) form results in far-fetched interpretations which might not make much sense as they are not in sync scale-wise with the rest of other variables. The other advantage of using variables in logarithms is that the regression coefficients of log-log models are automatically interpreted as elasticities.

Descriptive Statistics (Theory)

Descriptive statistics shall form part of the data analysis as it is important to do a number of tests on the data the research is going to use. Normally distributed data usually give credible results when analysing it. Non-normal data will give spurious regression results as well as misleading statistics such as means (*averages*) and dispersion measures. To this end normality tests shall be carried out using the Jarque-Bera Normality tests. The Box-Plot

diagrams shall be used to identify the presents of outliers and then 'clean' the data if needs be.

Correlations as predictors of relationships among variables

Correlation coefficients measure the degree to which two variables are linearly related. There are basically two different types of correlations namely Bivariate and Partial correlation. The Bivariate correlation does not give a pure linear relationship between variables as it does not filter out the influence of other variables present.

This paper shall work with Partial Correlation Coefficients as these filter out the influence of other variables in coming up with a pure relationships between two variables. The pure linear relationships together with their probability values shall be shown in a Pearson Partial Correlation Matrix. The correlations will help in deciding the different variables that should go into a model as it may be possible to estimate simultaneous equation model. If some variables are highly correlated then using both of them in a model may cause the problem of multicollinearity (Raheman et al, 2010: 157).

Panel Data Regression Analysis (Theory)

The data this research used is the Panel Data collected from firms in the general retail sector and listed on the Johannesburg Stock Exchange (JSE). Panel data is data that has both Time-series as well as Cross-sectional components. The data is collected from general retail firms over a constant period of five (5) years from 2009 to 2013 in South Africa. This results in a sample that is reasonably large in order to produce statistically significant.

The fact that the research shall be using Panel Data Regression means it will be possible to capture firm-specific characteristics (Fixed-Effects) as well as pure random characteristics (Random-Effects) in the model. Different firms are by their very nature different and any disparities of behaviour are likely to be systematic. To this end, therefore, there is need to subject panel Data to hypothesis testing to ensure we are going to deal with the right model. Tests will be done to make a choice between a Fixed –Effects Model Estimation or a Random-Effects Model Estimation using the Hausman Specification tests and this follows the Yafee (2003) recommendations on the choice of model.

Functional Form of the Model

The empirical framework adopted in this paper was that suggested by Deloof(2003) and subsequently by Padachi (2006) as mentioned in the paper by Raheman et al (2010: 154). The model will take the form that is known as an Unobserved Effects model shown below and is a version of the model used by Tryfonidis (2006) and modified by Raheman et al (2010: 154)

$$GOP_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 FFAR_{it} + \beta_3 lnS_{it} + \beta_4 FDR_{it} + \lambda_i + u_{it}$$

The subscripts show that the variable is taken at time t for an observation i and this is the standard form of writing a panel regression model.

The variables in the model have been defined earlier.

The term λ_i is representing the unobserved firm-specific characteristics and the term u_{it}

stands for the random term.

Statistical software to be used in data Analysis

The software to be used in this research is STATA Version 10. STATA is an appropriate software to use given that it is suitable to analyse cross-sectional data and also to estimate the Panel Data Regression models. Where relevant, E-Views software Version 8 will be used especially to do time trends of variables and plots of one variable against another.

Data Analysis and Interpretations

Partial Correlations between Dependent & Independent   variables

The partial correlations measure the degree of linearity or association between pairs of variables. They are important to gauge the direction of relationship that exists between variables though they do not explain the quantitative impact independent variables have on the dependent.

The *apriori* expectations of the correlations between Operating Profit Margin (OPM) and the Independent variables

Apriori signs:

$$r_{\text{OPM lnsales (ALL others constant)}} > 0$$

$$r_{\text{OPM liverage\_factor (ALL others constant)}} > 0$$

$$r_{\text{OPM FDR (ALL others constant)}} < 0$$

$$r_{\text{OPM CCC (ALL others constant)}} < 0$$

key: where $r_{\text{OPM X (ALL others constant)}}$ means partial correlation between OPM and the independent variable X holding the effect of all the other independent variables constant.

Interpretations of the Partial Correlations between OPM and Independent variables

1. OPM and lnsales:

   There is a positive correlation between log of sales (log of turnover) and Operating Profit Margin[1]. The partial correlation coefficient of 0.4960 means we expect profitability to increase as turnover increases in the long run. The correlation is significant given the probability value of 0.0000 as shown.

2. OPM and Liverage_Factor:

   A negative correlation of -0.0182 that exists between OPM and Leverage-Factor shows that highly leveraged firms experience lower operating profit margins.

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[1] See Appendix 3 for all the correlation coefficients

However, due to high probability value of about 0.8153, the association between these two variables is not significant. One would expect that when the firm is highly leveraged then its operations are more financed by debt there by freeing the cash flows to other operations that would raise profitability.

3. OPM and FDR:

The profit margin shows that it is negatively correlated with the Financial Debt ratio (FDR). A situation where the Debt-Asset ratio is high means the debts a firm holds are more than the assets it has and this erodes both investor and customer confidence and ultimately affects profit negatively. The probability value of 0.000 ($< 5\%$ limit) means the correlation is significant.

4. OPM and CCC (i.e. OPM and Working Capital):

The Cash Conversion Cycle (CCC) is a proxy for working capital. This is inspired by the components that are used to compute CCC and constitute working capital.
The greater the cash conversion cycle is the smaller will be the profit levels posted by the firms. The correlation coefficient between CCC and Profit Margin is negative and this is what is expected. Larger CCC means a firm pays its creditors more quickly than it receives from its debtors and so this affects cash flow situation. The correlation between OPM and CCC is quite significant as shown by a very low probability value of less than 5%.

Overall statement on the Partial Correlations:

All the *apriori* signs of the partial correlations save for that of liverage_factor have been confirmed by the results. Only the correlation between OPM and the liverage-factor was found to have the unexpected sign but at the same time not significant.

One can also verify the correlation results by looking at the scatter plot between the Operating Profit Margin and the Independent variables. An example between OPM and Log of Sales has been shown below.

Graph of OPM versus Log of Sales
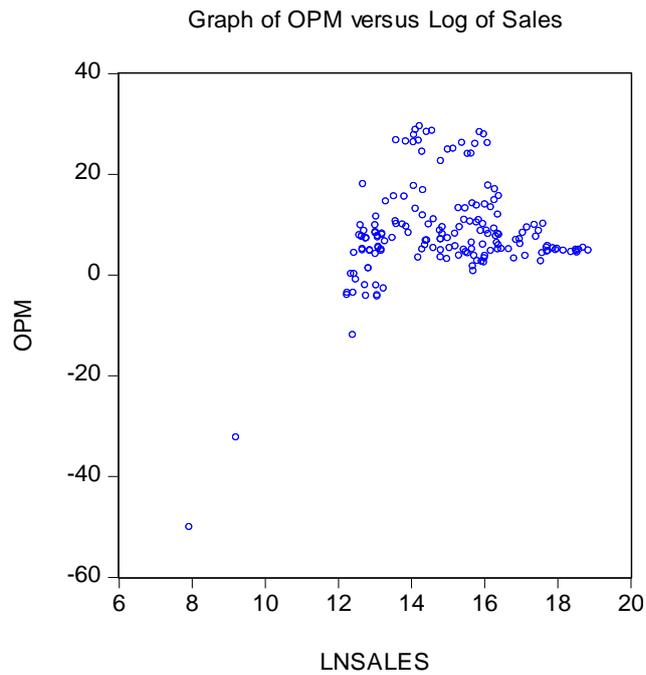
The scatter plot above shows that generally as the sales (hence its logarithm) increases Profit Margins also increase within a firm. This confirms the results of the correlation coefficient between the two variables.

Descriptive Statistics

	CCC	OPM	FDR	LNSALES	TDCFR
Mean	-20.75775	8.379906	0.464702	14.95163	4.953958
Median	0.857264	7.209187	0.441794	15.00168	2.606726
Maximum	104.0801	29.45431	0.907941	18.84859	49.62368
Minimum	-696.1382	-50.08977	0.099827	7.932003	-37.99234
Std. Dev.	124.1876	9.589063	0.204499	1.864674	8.809564
Skewness	-3.793393	-1.148426	0.085577	-0.208463	2.313331
Kurtosis	17.79332	12.04439	2.178841	3.342802	16.28983
Jarque-Bera	1957.846	616.7914	4.983806	2.063662	1402.681
Probability	0.000000	0.000000	0.082752	0.356354	0.000000
Sum	-3528.817	1424.584	78.99940	2541.778	842.1729
Sum Sq. Dev.	2606414.	15539.57	7.067577	587.6143	13115.82
Observations	170	170	170	170	170

Jarque-Bera tests of Normality in variables and implications for regression:

Due to the nature of the data it is not expected that the series would be normally distributed since the data is Panel data coming from various firms. Only FDR and lnSales are the variables that are normally distributed. In this case, therefore the normality assumption may be ignored and the normal regression appropriate for this data proceeds without worrying about spurious regression results.

Granger causality Tests

The Granger causality tests are tests of ascertaining the direction of causality. The tests are essentially done to see if one variable has the power to predict the movement of the other variable in the future. We can find either no causality between variables or we can find unidirectional causality or even bidirectional causality.

Null Hypothesis:	Obs	F-Statistic	Prob.
LNSALES does not Granger Cause OPM	136	4.80547	0.0097
OPM does not Granger Cause LNSALES		13.9107	3.E-06
CCC does not Granger Cause OPM	136	2.28163	0.1062
OPM does not Granger Cause CCC		1.49612	0.2278
FDR does not Granger Cause OPM	136	14.3121	2.E-06
OPM does not Granger Cause FDR		3.61245	0.0297
CCC does not Granger Cause LNSALES	136	0.65126	0.5231
LNSALES does not Granger Cause CCC		0.87629	0.4188
FDR does not Granger Cause LNSALES	136	16.0832	6.E-07
LNSALES does not Granger Cause FDR		0.20389	0.8158
FDR does not Granger Cause CCC	136	1.75924	0.1762
CCC does not Granger Cause FDR		1.36698	0.2585

Interpretations of the Granger Causality Tests

From the Granger Causality results we can reject the null hypothesis that log of sales do not affect OPM. The reverse causality can be rejected as well given the probability values of less than 5%. We therefore conclude that there is bidirectional causality between lnsales and OPM.

The results also show that there is not enough evidence of the relationship between CCC and OPM. In other words cash conversion cycle cannot predict future values of the profit margins.

There is bidirectional causality between Financial Debt Ratio and OPM as given by the probability values of less than 5% in both cases. By way of conclusion one can say that we can use Log of sales and Financial Debt Ratio to predict behaviour of OPM (Profitability). CCC can be used as a predictor of OPM but with a 'pinch of salt'. This means that CCC may not resoundingly be argued as a good predictor of future movement in OPM.

Panel Unit Root Tests

The unit root tests are necessary to ensure we are dealing with stationary series. Non-stationarity may result in spurious regression results. Since we have time series taken on a cross section of firms in a particular industry we have a panel unit root tests. One such test is shown below on the OPM series.

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-Sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-11.8029	0.0000	17	136
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.03763	0.0208	17	136

ADF - Fisher Chi-square	52.3452	0.0230	17	136
PP - Fisher Chi-square	38.2478	0.2826	17	153

** Probabilities for Fisher tests are computed using an asymptotic Chi

-square distribution. All other tests assume asymptotic normality.

Interpretation of the Panel Unit Root Tests

All the unit root test statistics show that as a panel we have stationarity in the OPM variable in its level. This is important for regression purposes. When stationarity is achieved in a variable it means the regression results can be relied upon and the chances of spurious regression results are minimised.

Similar tests were carried on the other variables namely the Log of Sales, FDR, Liverage_Factor and Cash Conversion Cycle (CCC). They were all found to be stationary in their levels.[2]

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[2] See the Appendices Section for Stationarity results

Fixed Effects Regression Results
(Note that the fixed effects regression has been chosen after the Hauman Specification test)

```
. xtreg opm  ccc fdr lnsales leverage_factor, fe

Fixed-effects (within) regression            Number of obs      =        170
Group variable: firm_id                      Number of groups   =         17

R-sq:  within  = 0.4488                       Obs per group: min =         10
       between = 0.0832                                      avg =       10.0
       overall = 0.1199                                      max =         10

                                              F(4,149)           =      30.34
corr(u_i, Xb)  = -0.7364                      Prob > F           =     0.0000
```

opm	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
ccc	-.0160767	.0078418	-2.05	0.042	-.0315722	-.0005812
fdr	-13.63939	5.524729	-2.47	0.015	-24.55633	-2.722455
lnsales	6.920217	.6693615	10.34	0.000	5.59755	8.242884
leverage_factor	.0226581	.0368556	0.61	0.540	-.050169	.0954853
_cons	-89.12395	10.48759	-8.50	0.000	-109.8476	-68.40034
sigma_u	12.076146					
sigma_e	4.4842952					
rho	.87881984	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(16, 149) =    19.41          Prob > F = 0.0000

. estimates store fixed
```

The choice between estimating a Fixed Effects or Random Effects[3] model was decided through model choice Testing using the Hausman Specification Test Shown below.

---

[3] The Random Effects Regression results are shown in the Appendices Section.

Hausman Specification Test

```
. hausman fixed ., sigmamore
```

| | —— Coefficients —— | | | |
	(b) fixed	(B) .	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
ccc	-.0160767	-.0230613	.0069846	.0039875
fdr	-13.63939	-23.58156	9.942171	3.096999
lnsales	6.920217	4.936587	1.98363	.441715
leverage_f~r	.0226581	.0118836	.0107745	.0043317

```
                    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

            chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                    =       24.65
          Prob>chi2 =      0.0001
```

The Hausman Specification test shows that there is a significant difference in the coefficients of the Fixed Effects model and the Random Effects model. We reject the Null Hypothesis that the differences in the coefficients are not systematic and therefore the model to be estimated is the Fixed Effects Model that captures firm specific effects on profitability.

Interpretation of the Fixed Effects Model

The Hausman specification test favoured the estimation of the Fixed Effects model ahead of the Random Effects model. This means that there are significant differences in the structure of the firms even though they are in the same industry. Besides the commonly identified factors of profitability such as FDR, Sales and CCC, there are other factors that are specific to the firms in the industry which affect profitability. These factors are not of random nature across the industry.

Of importance to the estimated model is not really the quantitative impact of the exogenous variables but its directional impact to the dependent variable which is the operating profit margin (OPM).

Discussion of Results and Policy Implication

The fact that the Hausman specification test returns a verdict in favour of the Fixed Effects model means that the profitability of firms are affected by specific factors unique to each firm despite being in the same industry. The industry is largely retail by nature but they deal in differentiated products and so are not homogenous. Non-homogeneity of products means firms have some power over the prices they charge and therefore different profit levels across the firms in the industry. One would have been inclined to suggest that a Random effects model would fit the data better but then reality on the ground is that being in the same industry does not mean facing the same cost and market factors exactly.

The discussion shall be centred on the Panel Regression Results between the Operating Profit Margin (OPM) and its independent variables which are Log of Sales, Financial Debt Ratio (FDR), Cash Conversion Cycle (CCC) and the Liverage_Factor.

OPM and logSales:

The Fixed Effects results show a positive relationship between the two variables. This means that increasing sales would result in increasing profitability (OPM). The impact that sales has on profitability is significant as shown by both large value of the t-statistic(in absolute terms) and a very low probability value.

Implication for Policy at a firm level:

The firm should strive to maximise its sales through a number of strategies. The strategies may include widening the market through vigorous marketing drive, being innovative with regards to improving product quality among other strategies.

OPM and Cash Conversion Cycle (CCC):

As was expected there is a negative relationship between OPM and CCC. A shorter CCC means the firm takes longer period to pay its creditors than it takes to collect from its debtors. This scenario allows the firm to mobilise and increase its cash flows needed to make it stay afloat. The impact that the CCC has on profitability is *just* significant at the 5% level of significance but not at the 1% level of significance. A firm that is liquid is likely to post more profits than the one whose cash is locked up in illiquid assets.

Implication for Policy at Firm level:

The firm is encouraged to devise methods to expedite collection of outstanding payments due to it and at the same time negotiate for favourable terms of payment with its suppliers. From the results, however, the CCC does not seem to be that strongly significant in explaining profitability judging from the results of the Panel Least Squares results[4]. The results of the Granger Causality Tests also corroborate the weak relationship that exists between CCC and profitability.

OPM and FDR:

The sign of the coefficient of the FDR in the Fixed Effects results show the expected sign. It was expected that as the ratio between Firm Debt and Its Assets widen then this results in more interest rate payments which reduces cash flows and hence profitability of the firm. This would be the case especially if most of the debt is short-term rather than long-term. The level of impact that FDR has on profitability is quite significant as shown by the large t-statistic coupled with a very low probability value. The relationship remains steadfast whether the regression was Fixed Effects type or simple Panel Least Squares regression. The Granger Causality tests also show a strong bidirectional causality between the variables.

Implication for Policy at Firm level:

Long-term debt should be preferred as this is usually associated with favourable terms of payment that do not put the firm's cash position under stress.

Panel Regression Results versus the Research Hypotheses

The results of the Panel Regression Estimation confirm the Hypotheses made earlier in Chapter 1. The only slight point of departure is on the significance of the Cash Conversion Cycle in determining Operating Profit margins. The Hypothesis was that the Cash Conversion Cycle would be negatively related to profitability and is a significant factor. The direction of relationship has been confirmed by the regression results save for the significance relationship.

The correlation results also confirm the hypotheses suggested earlier in the research paper.

Working Capital and Profitability relationship

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[4] See the Panel Least Squares Results in the Appendices

Sales and liverage_factor are indirect components of working capital. Increasing sales, which means increasing working capital, results in increasing profitability according to the regression results. An increase in liverage_factor helps to free more cash flows which in turn increases working capital and ultimately improves on profitability. The cash conversion cycle (CCC) is a direct component of working capital and the smaller it is the better is the working capital position. The regression results show that a fall in the CCC , which imply a rise in the working capital, positively affects profitability. Generally, then, an increase in working capital positively and significantly increase firm profitability.

Delimitations of the study

The study concentrated on one type of industry using 17 firms for a period of ten years from 2004 to 2013. There were twenty nine (29) firms in total in the industry but only seventeen (17) firms had complete observations while the rest had too many missing observations. This means data from eleven (11) firms could not be used in the analysis. Having more firms increases variability and hence sharpens the regression results and other data analysis. The study could have been more interesting if different types of industries were studied as well. Due to time and data availability constraints the researcher decided to use firms in a specific industry.

Suggestions for further studies

Given time and other resources the study of this nature can be repeated using firms in different industries to ascertain the nature of profitability and the Cash conversion Cycle as well as the relationship between profitability and other factors. Again a much longer period must be considered if data is available in order to increase the degrees of freedom which in turn improve data analysis.

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