

**MANAGEMENT OF WORKING CAPITAL BY LISTED
SOUTH AFRICAN RETAIL COMPANIES**

BY

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- My family and friends for their prayers and support.

I dedicate this study to the light of my life, Katryn.

DECLARATION

I hereby declare that this thesis is wholly my own work and has not been submitted at any other University or College for degree purposes.

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Date

ABSTRACT

The working capital management of a firm has a strong influence on the firm's profitability and liquidity. The retail industry is vital to the South African economy; hence, if poor working capital management influences a firm's profitability negatively, it will have a negative impact on the economy. Overinvestment in current assets affects profitability adversely, due to costs such as storage and inventory insurance costs. It is therefore important to find a balance between profitability and liquidity. The purpose of this study is to investigate the effect of working capital management on the profitability of a firm.

This study investigated the operations of South African retail firms listed on the Johannesburg Securities Exchange (JSE) over a period of nine years (2004–2012). The sample consisted of 18 retail firms listed on the JSE during that time. The sample was divided into sub-sectors, namely clothing (four firms), food (three firms), furniture (one firm) and other retailing firms (nine firms). The working capital management of the firms was measured by means of calculating the cash conversion cycle (CCC), which measured the time that the firm's cash was tied up in its operations. Profitability was measured using four variables: return on equity (ROE), return on assets (ROA), gross profit margin (GPM) and economic value added (EVA).

The results of this study indicated that South African retail firms reduce their CCC by reducing their selling prices and/or cost prices, causing profitability to increase. The reduction in the CCC can be accomplished by reducing average age of inventory (AAI) and average age of receivables (AAR), and increasing average age of payables (AAP). A reduction of AAI seems to have the most statistically significant impact on a firm's profitability, and appears to be a useful strategy, given the importance of inventory management to a retail firm. By contrast, a reduction in AAR does not have as high an impact on profitability. If the AAP increases, only the GPM increases, none of the other profitability measures do. It can therefore be concluded that South African retail firms should manage their CCC by focusing on inventory

management and by reducing the AAI to a minimum. Decreasing their AAI will improve their profitability.

A limitation of the study was that only 18 South African retail firms were listed on the JSE during the period under review, resulting in a small data sample. The data samples for three out of the five sub-sectors were very small (food, furniture and clothing) and statistically significant results could not be obtained; therefore only the results of the total sample and for other retailing firms were included in the results. The study covered a period of nine years, but if the period had been extended, the sample of 18 firms would not have been reduced, due to some firms not being listed on the JSE for the entire period (2004–2012).

Searches of prior studies on Google Scholar and the University of Pretoria Library's database indicated that there have been few prior studies on working capital management in a South African context, and none that focus specifically on the retail industry. The study aimed at providing insight into the management of working capital in the retail sector by measuring the effect of strategies used on profitability, identifying areas that could be improved as well as apparently successful management techniques.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

The optimal level of current assets and current liabilities a firm should have is unresolved in financial literature (Gitman, Smith, Hall, Lowies, Marx, Strydom and Van der Merwe 2010). An optimal level of net working capital has not been established because different industries have different characteristics, the nature of operations being different and responses to the economic environment being different (Chiou, Cheng and Wu 2006). However, within the same industry ratios can be compared to industry averages. By doing this the possible reasons why the ratio deviates can be investigated, should it be found that a ratio deviates significantly from the industry average.

The current assets of a firm normally consist of cash, trade receivables, short-term investments and inventory. Current liabilities consist of trade and other payables, accruals and short-term borrowings. Current assets minus current liabilities are the net current assets (also referred to as net working capital).

1.2 BACKGROUND

The working capital management of a firm has a major influence on the firm's profitability and liquidity. Managing working capital, according to Deloof (2003:585), has a significant impact on the profitability of firms. Various studies have been performed to research the effect of changes in working capital on the profitability and liquidity of a firm (Dash & Hanuman, 2009; Erasmus, 2010; Smith & Fletcher, 2009) and to investigate the importance of working capital management (Erasmus, 2010; Kargar & Blumenthal, 1994). If a firm over-invests in current assets, it may be losing the opportunity to earn interest, since the excess cash could have been invested in interest-bearing assets. However, if a firm has liquidity problems, there is a risk of it not being able to settle short-term liabilities. It is therefore important that a firm should have the optimal level of current assets and current liabilities at all times. In the event of a recession the firm will more than likely not survive financially if the

optimal level of working capital is not maintained. It can therefore be concluded that, if working capital is not managed carefully, firms can experience significant liquidity problems, and can become technically insolvent.

Figure 1 shows the correlation between the opening of new shopping centres in South Africa and the GDP growth rate from 1994 – 2009. The research performed by the Gauteng Provincial Government indicated the following: During 2006 when the GDP growth was 5.6% (the highest of the century), the additional shopping centres increased by its largest area at 750 000m². However, during the economic crisis in 2008/2009, the retail industry was also affected, as seen from the decrease in additional shopping centre space from 690 000m² to 330 000m² in 2008.

Figure 1
New Shopping Centre Space & GDP Growth Rate, 1994 – 2009.



Source: Gauteng Province Quarterly Bulletin (2012:14)

According to the Gauteng Province Quarterly Bulletin, retail trade sales increased from R389.8bn to R504bn from 2004 to 2008. The growth rate was at its highest in 2006 at 11.9% and at its lowest during 2009 at 3.7%. This was due to a rise in interest rates in 2006, which reached its peak at 15% in 2008. The implementation of the National Credit Act, No 34 of 2005 (NCA) in 2007 had a further negative effect on

consumer spending. Together with the global economic crises in 2009 an overall decrease of total retail sales was experienced. From 2009 to 2010 total retail sales increased by 5.1% and by 6.1% from 2010 to 2011. Figure 2 is an illustration of the relationship between total retail sales and the economic climate.

Figure 2
Retail trade sales, 2004-2011



Source: Gauteng Province Quarterly Bulletin (2012:20)

Smith and Fletcher (2009) researched the factors influencing working capital management in South Africa. In their study all industrial companies listed on the JSE during the years 1998 – 2007 were included. The largest sector was the retail sector, since 16 of the 103 companies (15.5% of the total) included in this study were operating within the retail sector.

The retail industry plays a vital role in the South African economy and excellence in this industry will benefit the retailers, consumers and the economy in general (Gauteng Province Quarterly Bulletin, 2012).

The Quarterly Bulletin issued by the Gauteng Province (2012) indicated that the market share of the retail industry grew from an estimated 10.8% to 13.8% from 2003 to 2011. After the Finance and business, Community, Social and personal services and Manufacturing sectors it is the fourth largest sector within the South African economy. Of the total Mass Grocery Retail sector in Africa, Pick n Pay and Shoprite Holdings are the largest with each having a market share of 30%, followed by the Spar Group with approximately 26% and Woolworths Holdings with 11%.

Due to the importance of the retail industry in the South African economy and for the general public, if such firms should become technically insolvent it will have a negative impact on the South African economy. An over-investment in current assets will adversely affect profitability, due to the costs required, such as storage and insurance costs of inventory held. It is therefore important to have a balance between profitability and liquidity (Dash & Hanuman 2009).

1.3 PROBLEM STATEMENT

The aim of any firm is to be profitable, which will create shareholders' wealth. With an industry such as the retail industry, where the management of net working capital is part of the daily operations, any effect on profitability should be considered. If the management of working capital has an effect on profitability it should be managed in such a way that profitability is maximised. This study will be aimed at investigating the effect of working capital management on the profitability of retail firms. It will also determine the effect on profitability based on the financing approach used to finance working capital.

1.4 AIM OF THE STUDY

This study was aimed at investigating the working capital management of retail firms in South Africa, and to equip management to manage the levels of working capital in order to increase profitability. This was performed by specifically investigating the effect of working capital management on profitability ratios such as return on assets, return on equity, gross profit margin and economic value added of firms within the retail industry.

1.5 IMPORTANCE OF THE STUDY

There have been few prior studies on working capital management in a South African context, and none that focus specifically on the retail industry. The aim of this study was therefore to provide some insight into the management of working capital implemented in this sector, and the effect of the strategies used on profitability. This included investigating which areas require improvement and which management techniques seem to be effective.

1.6 METHODOLOGY

The aim of the study was to investigate working capital management of South African retail firms. Due to the availability and reliability of data, retail companies listed on the JSE was used. On the date of this study there were 20 retail firms listed on the JSE, of which 18 had been listed for nine or more consecutive years. The period of analysis will be nine years, hence data of 18 firms will be analysed over the period 2004 – 2012.

Table 1 consists of a description of each of the retail firms included in this study.

Table 1
Description of South African retail firms included in the study

Firm	Brief description of services
Rex Trueform Clothing Company	Retailer of fine quality men's and women's clothing and related accessories.
Mr Price Group	Retailer through corporate-owned and franchised stores in Africa, focusing on clothing, footwear, sportswear, sporting goods, accessories and homewares.
The Foschini Group	Retailer of ladieswear, footwear, accessories, fine jewellery, cosmetics and fragrances, as well as kidswear.
Truworths International	Retailers of clothing, jewellery, accessories, sporting and outdoor apparel and equipment, cellular goods and services and homeware.
Pick n Pay Stores	Retailer of food, clothing, general merchandise, pharmaceuticals and liquor.
Shoprite Holdings	Retailer of food, clothing, general merchandise, pharmaceuticals, liquor and homeware.
The Spar Group	Wholesaler and distributor of goods (food) and services to independent retailers who trade under the SPAR brand.
JD Group	Retailer of household furniture and electrical appliances.
Lewis Group	Retailer of household furniture and electrical appliances.
Alert Steel Holdings	Retailer of steel and steel-related products and services to the construction, manufacturing and building industries.
Clicks Group	Retailer of health and beauty merchandise.
Verimark Holdings	Retailer of unique superior quality products in the housewares, exercise and fitness, health, DIY, automotive, educational toys and personal comfort categories.
Combined Motor Holdings	Retailer of motor vehicles, car hire, marine and leisure.
Taste Holdings	Provider of specialist restaurant and retail brands such as Scooters Pizza, Maxi's, St Elmo's, The Fish and Chip Co. and NWJ (Natal Wholesale Jewellers).
Cashbuild	Retailer of quality building materials, including cement, and associated products.
Italtile	Supplier of ceramic tiles and related products through its destination one-stop branded outlets, Italtile and CTM.

Massmart Holdings	Wholesaler and retailer of mainly branded consumer goods.
Woolworths Holdings	Retailer of fashion, food, beauty and homeware.

Data will be obtained from the InetBFA database. This database consists of standardised financial data for all companies listed on the JSE.

1.7 SCOPE OF THE STUDY

As mentioned above this study will focus on South African retail firms.

1.8 STRUCTURE OF THE DISSERTATION

Firstly, a literature review will be conducted in Chapter 2 on previous studies performed on the topic of working capital management. Secondly, Chapter 3 will discuss the research design and methodology followed in the present study. Thirdly, Chapter 4 will present and include a discussion of the results found on the hypothesis testing. Lastly, Chapter 5 will draw conclusions on the study performed and its impact on future research.

1.9 CONCLUSION

The study will investigate the effect of working capital management on the profitability of South African retail firms. Eight hypotheses will be tested against the data available over a period of nine years for 18 retail firms listed on the JSE.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The literature review consists of two parts. First, a theoretical review of working capital management as discussed in various publications will be conducted, and this will be followed, as a second point, by an analysis of studies performed on various aspects of working capital management. Different techniques of managing working capital implemented by management will have different financial effects on the entity. The overall aspects of working capital management will be discussed in detail throughout the literature review.

Net current assets are defined as current assets minus current liabilities. It is also referred to as net working capital. Current assets are 'working capital' and when current liabilities are deducted from current assets, it is referred to as 'net working capital'. Current assets are short term in nature, and will be turned into cash within the coming 12 months. This study will focus on the management of two types of current assets, namely inventories and trade receivables. Other current assets such as short-term investments, cash and cash equivalents, short-term loans and current tax assets are included in 'current assets', however these items will not be investigated individually in this study. The same applies for current liabilities other than trade payables, such as accruals, short-term borrowings, provisions, bank overdrafts and current tax liabilities, which will not be investigated individually.

2.2 WORKING CAPITAL MANAGEMENT

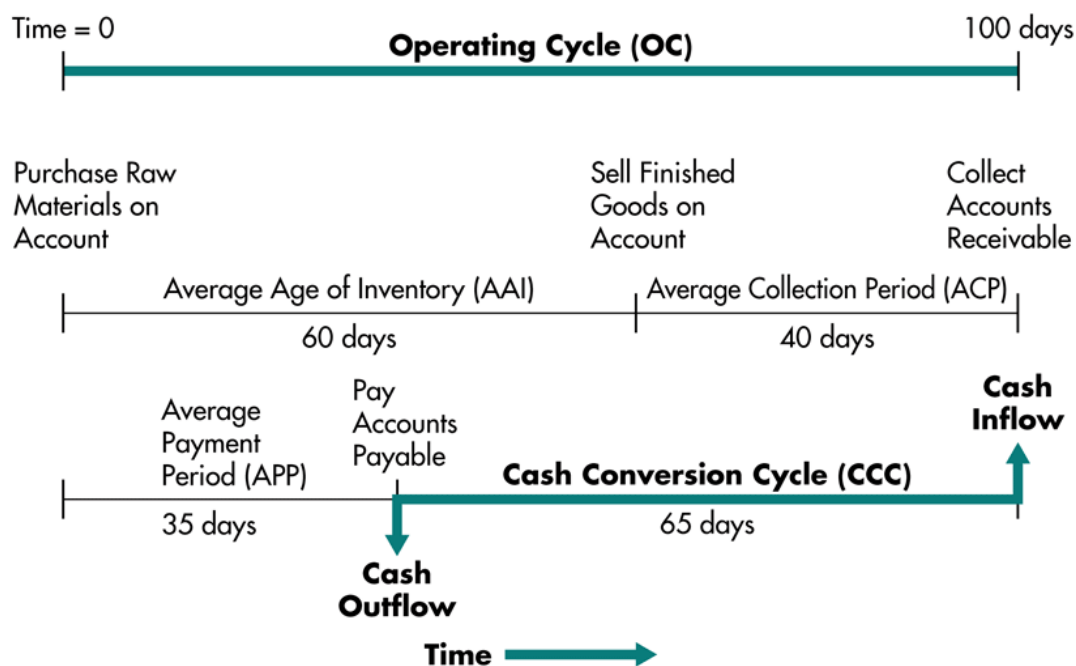
2.2.1 Introduction

The management of working capital is one of the most important functions in any organisation. Palmer (2011:40) found that 80% of companies identified the improvement of working capital as one of their top priorities. The reason for this is that the optimal level of working capital is a key performance indicator of a company.

It can also be an indicator of how well customers are being served and whether the company's product is meeting customer's needs.

One measure to evaluate the management of working capital is to determine the liquidity level. Over the years measures such as the current ratio (current assets ÷ current liabilities) and the quick ratio ((current assets – inventory) ÷ current liabilities) was used to determine a firm's liquidity. As a general rule, a current ratio of 2:1 indicates a sound liquidity position. Studies over the years suggested that there were better measures to assess the working capital and liquidity of a firm (Eljelly, 2004:48, Erasmus, 2010:3 and Smith & Fletcher, 2009:15). Measures such as the cash conversion cycle (CCC) measure the time that working capital is tied up in a firm's operations. The CCC includes the major components of the net working capital cycle namely: trade receivables, inventories and trade payables. When the CCC is determined, the operating cycle (OC) is calculated. The first component of the OC refers to the time from when inventory is purchased (as finished goods by a retailer or as raw materials by a manufacturer), until it is sold, also referred to as the inventory turnover time. The second component is the time from when goods are sold on credit until that outstanding credit is recovered from the debtor, referred to as the trade receivables turnover time. The CCC incorporates the time it takes from buying inventory from the supplier until the supplier is paid, also referred to as the trade payables turnover time. For each of these components the time it takes to be converted into cash can be calculated. Below is a graphical illustration of the CCC.

Figure 3
Cash Conversion Cycle



Source: Gitman (2010:571)

As explained by Brigham and Houston (2009:495) the average age of inventory is the average time required to convert raw materials into finished stock and to sell it. The average collection period is the average time it takes from selling the finished goods to a customer until a customer pays for that purchase. And lastly, the average payment period is the average time it takes, from buying required materials from a supplier, until that supplier is paid for the goods purchased. The CCC is calculated as follows: average age of inventory + average collection period – average payment period. The average ages of the different components are expressed in terms of the number of days in the year and are normally calculated as follows:

Average collection period: $365 \times (\text{Accounts receivables} \div \text{sales})$

Average age of inventory: $365 \times (\text{Inventories} \div \text{purchases})$

Average payment period: $365 \times (\text{Accounts payable} \div \text{purchases})$

The longer the cycle, the longer cash resources are tied up in a firm's OC and cannot be used elsewhere. Hence, the current asset balance might appear strong

due to large balances, but it still needs to be converted into cash. An increase in the age of inventory and receivables and a decrease in the age of payables will make the cycle longer, where a decrease in the age of inventory and receivables and an increase in the age of trade payables will shorten the cycle. With a short CCC management can invest excess short-term capital in interest-earning investments or productive assets, which will have a positive effect on profitability. By investigating this cycle a firm can establish the reasons for the duration of the CCC and form strategies on how to improve the cycle time. Some firms may even have a negative CCC. This will be the result of a very low age of inventory and receivables and a longer time of paying trade payables. This is expected for a retailer of low cost items who mainly has cash sales. The age of trade receivables will be insignificant due to sales being mostly on a cash basis, and due to the nature of the inventory the turnaround will be very fast, resulting in the age of inventory being low. By making use of the maximum payment terms the age of payables can be extended, and with all this taken into account the CCC may end up being negative. This results in the age of payables being longer than the OC, implying that the OC is financed by the supplier. If this is still within agreed credit terms the firm will not incur any interest or penalties and is therefore free financing, which will have a positive effect on profitability.

The management of working capital will include the management of inventory, trade receivables and trade payables.

2.2.2 Inventory Management

Inventory management includes processes to minimise costs such as storage, insurance and transport by maintaining only the necessary level of inventory. However, inventory levels must be kept at a sufficient level to reduce the risk of stock outs and lost sales (Deloof, 2003:573). The required levels of inventory will differ between industries and companies, and should be individually determined by the management of a particular firm. From a retail industry perspective inventory management is very important, due to the positive correlation between inventory and profitability. Retailers tend to have higher inventory levels, as most customers prefer to be provided with all their needs under one roof, which will decrease the

customer's' time and further costs to search for the required products (Choudhary and Tripathi, 2012:46). This implies that a store with a greater variety and availability of products will attract more customers, resulting in a higher inventory turnover, which is better for the retailer. Choudhary and Tripathi (2012:60) note that this can be established by implementing concepts such as quick response, efficient customer response, resource planning and just-in-time (JIT) processes. These techniques will result in better forecasting of inventory levels, which will keep inventory costs to a minimum. Supply chain management as part of inventory management is also encouraged by Brigham and Houston (2009:505).

Within large corporations there are various processes and suppliers involved from the ordering phase, through manufacturing processes up to when the final item is ready for sale. The suppliers of a firm have their own suppliers and so forth, and all of these suppliers will form part of the supply chain. When planning and forecasting strategies are exchanged between the different members of the supply chain, processes can be implemented to benefit all the parties involved. Such benefits will include a firm having more control over inventory levels and the pricing and availability of its inventory items.

2.2.3 Trade Receivables Management

Trade receivables should be managed in such a way that outstanding debt is recovered as soon as possible. This can be accomplished by enforcing stricter collection processes and following up on outstanding debt more regularly. Factors such as the type of industry the company is trading in, its size and its customer base will influence the credit terms enforced by a firm. To encourage supply chain management the credit terms should be set to benefit both the supplier and the customer. A relaxed credit policy will stimulate sales by attracting more customers. Management of sales and collections should establish the credit terms, based on the effect it will have on sales and on the collections.

As noted by Deloof (2003:574), relaxing the credit terms will have a positive effect on sales; however, it will take longer to collect trade receivables. Other factors such as discounts, credit standards and the collection policy should also be considered. This

is done because credit policies have an effect on sales, bad debts and the amount tied up in trade receivables (Brigham & Houston, 2009:507). The motivation for implementing discounts on early settlement by debtors can be two-fold. Firstly, it boosts sales when customers can get the required product at a lower price. Secondly, customers will settle their accounts earlier to make use of this discount, which will result in a reduction of the investment in trade receivables. Management should determine the costs associated with lowering the selling price and the increase in sales due to this reduction, in order to decide whether it should be implemented or not.

Setting of credit standards is the process of determining whether a proposed customer is in an acceptable financial position to receive credit. This is determined by assessing the customer's current debt- and interest obligations and credit history. When these standards are set too high it may result in lost sales and a reduction in profitability, whereas too low standards may result in bad debts when goods are sold to customers who may not be creditworthy. The policies on methods of collection should also be set judiciously due to the effects it can have, because if collection policies are too harsh and extreme, customers may take their business elsewhere. However, if policies are not set, or not firm enough, bad debts and write-offs may increase significantly.

2.2.4 Trade Payables Management

Trade payables result from credit purchases, which are recorded as trade receivables by the seller and trade payables by the purchaser. It can be further defined as spontaneous debt, because it arises spontaneously from the normal business activities of the firm (Brigham & Houston, 2009:509). Trade credit is often referred to as "free" credit, because if payments are made within the agreed time frame no interest is charged. However, it can be costly when discounts are available and payments are made earlier to make use of these discounts, which will result in an increase of the cash conversion cycle due to the shortening time of trade payables. Management should therefore calculate the cost of giving up the credit if it is offered, and decide whether to use it or not, based on the calculated cost.

Trade payables management often includes processes to delay payments as much as possible in order to establish a better cash position, which will have a positive effect on the firm's CCC. Such processes may however damage the relationship between the supplier and the customer. If delays exceed the agreed credit terms, suppliers may levy penalties and fines.

2.2.5 Summary

Palmer (2011:40) reported different ways of accessing working capital in a time where credit is limited due to the current economic climate. Working capital can be unlocked internally by using the company's own funds for short-term financing needs. This will ensure that a firm is not dependent on uncertain credit markets. Cash within the working capital cycle is known as one of the cheaper sources of finance (Palmer 2011:40). To have more cash available, the levels of inventory and accounts receivables should be managed carefully.

The riskier option of managing working capital is to limit levels of inventory by discontinuing slow-moving product lines. Too low levels of inventory can lead to stock outs and in the end can also have a negative effect on a firm's liquidity and profitability. The level of trade receivables can be reduced by further reducing credit limits granted to customers. This is not a sustainable model of managing working capital because it can damage customer relations, and possible future growth, once the economy has improved.

Palmer (2011:40) further suggested ways in which accounts receivables can be managed more effectively, such as ensuring that accounts receivables are shown correctly in the respective age categories. This will enable firms to have a better idea of the age of debt outstanding and can help management to recover the accounts receivables outstanding more effectively. Palmer (2011:41) concluded that firms should improve the average collection period by implementing processes such as: Contacting clients before payment is due, identifying payment behaviour associated with deteriorating client conditions and performing analytical procedures to investigate the firm's ability to convert receivables into cash. Reducing the collection period of receivables will ultimately improve the working capital position of a firm by

shortening the CCC. As mentioned earlier, a shorter CCC will have a positive effect on a firm's profitability.

Every firm should determine its optimal level of working capital and how it is compiled in order to reach the desired level of liquidity and profitability. McCosker (2000:58) did an analysis of three different industries (retail, tourism and leisure). This study suggested that the type of industry would have a major impact on the composition of working capital accounts. The retail firm used for his analysis was the largest supermarket chain in the United Kingdom, selected based on its pre-tax profits. Its current ratio was less than 1:1 which would, by only using the current ratio as measure (the norm of this ratio being 2:1), indicate major liquidity problems. The composition of working capital of a retailer should however be considered before concluding that the firm has liquidity problems. The inventory levels of a supermarket retailer with 600 stores, such as the retailer included in this study, will be very high. Inventory will be purchased mainly on credit, resulting in an increase of trade payables, but is often sold to consumers even before it is paid for. Therefore even though the current liabilities exceed the current assets, it does not necessarily indicate liquidity problems. One should consider the type of industry and the nature of cash and credit transactions before taking any actions to implement a working capital policy.

2.3 MANAGEMENT POLICIES AND FINANCING TECHNIQUES OF WORKING CAPITAL

2.3.1 Introduction

Brigham and Houston (2009:492) explain the three different financing policies that can be implemented by management. When a firm is matching its assets with its liabilities it is known as the "maturity" approach, also referred to as the "self-liquidating" approach. For example, the inventory balance which is expected to sell within 30 days is covered with a 30 day current liability and a vehicle which is expected to be used for four years, by a four year long term loan. The difficulty with this matching principle is determining the life of the various assets, which can be uncertain. The example above regarding the inventory, which is expected to sell

within 30 days, implies that, if sales are lower than expected, the settlement of the corresponding current liability will be a problem and the firm may experience cash flow problems.

When non-current assets are financed predominantly by short-term debt, it is known as an aggressive financing policy. The percentage of non-current assets financed with short-term debt will depend on the level of aggressiveness of the approach. Short-term debt is the cheaper source of financing and therefore management sometimes prefers short-term- over long-term debt, which results in the level of current liabilities being high in relation to total liabilities. The problem arises when it becomes necessary to extend the loan; it might not be allowed by the credit provider, and if allowed it will be at a cost. The policy further entails processes to keep the investment in current assets to a minimum by investing more in non-current assets. The level of investment in current assets such as inventory, trade receivables and cash resources is very low. Hence by implementing this policy liquidity problems may occur. However, by investing excess funds in higher earning long-term investments a firm's profitability is likely to improve.

When total liabilities are predominantly made up of non-current liabilities it is known as conservative financing, which is financially a very safe financing approach. This policy also entails a large portion of investment in current assets and lower levels of non-current assets. With this policy management tends to overinvest in working capital components, limiting funds available for more profitable investments. When excessive funds are invested in working capital it is in a sense locked up in the working capital cycle. Unsold inventory and outstanding account receivables are not earning any profits for the firm, and on the contrary it has a negative impact on profitability due to costs such as storage of inventory and opportunity costs.

The question arises: which approach is the best and should be implemented by management, financing its assets with short-term or with long-term debt? Brigham and Houston (2009:494) explain that short-term debt is the cheaper source of financing, and the negotiating phase is much faster than that for long-term loans. It can however change from being the cheaper source of financing to becoming quite expensive when a temporary recession forces the company to extend their current

debt or acquire additional debt, at a higher cost. On the other hand, the interest costs of long-term debt will be relatively stable over the period of the loan, but may be higher than for short-term debt. The negotiating process will also be longer than for short-term financing, due to the much longer time period covered and the need for more detailed documentation. These long-term agreements are also known to include various provisions and covenants to protect the lender, more so than in a short-term loan agreement. It can therefore be concluded that both the short- and long-term financing approaches have their advantages and drawbacks. The approach to be followed should be decided individually for each firm based on their perception of risk and the preferences of management (Brigham and Houston 2009:494). The different financing approaches will have different effects on profitability, and should be considered by management.

2.3.2 The Conservative and Aggressive Working Capital Management Policies

Russell and Izzo (2009:98) focused his study on the effects that different working capital policies, aggressive versus conservative, have on the cash flow of a firm. A more aggressive financing policy will result in more cash being available to management and will create shareholders' wealth.

The study performed by Russell and Izzo (2009:101) included 48 of the 2005 Fortune top 500 firms in the USA, covering a period of 15 years (1990 – 2004). The assumption was that firms were implementing a more aggressive approach than in previous years, and as a consequence a significant improvement in accounts receivable was expected, measured by the accounts receivable turnover ratio. This was confirmed in the empirical results. Firms offering cash discounts for early settlement were more vigorous in their collecting policies.

With a more aggressive financing policy inventory levels will be managed more effectively. Therefore an improvement in inventory management was expected in the 15-year period, and was confirmed. This was measured by the inventory turnover ratio. It appeared that storage costs and obsolescence were minimised by applying the JIT concept. Furthermore, design improvements to reduce the number of parts of products and improve manufacturing aspects were implemented.

Another expectation of the study was that accounts payable management would improve to such an extent that a decrease in accounts payable would occur in the 15-year period. However, results indicated that accounts payable increased slightly over the period under review. The average payment period of creditors increased which will result in an improvement of the CCC. An improvement in working capital management was expected and was measured by the working capital per share ratio. An improvement from 1990 to 2004 was confirmed. Another expectation of the study was that the improvement in working capital management would be accompanied by an improvement in the cash flow per share ratio. Over the 15-year period improvement in both the working capital management and cash flow per share were noted, and therefore the hypothesis was confirmed.

In addition to the hypotheses above, an improvement in capital expenditure was expected, which would be indicated by a reduction in the investment ratio. This was confirmed and could also be due to an increase in information technology, which should decrease lead times and manufacturing costs. The study did not consider industry differences and the influences of a specific industry on the working capital management. Overall it can be concluded that, over a 15-year period, working capital management did improve, as did the cash flow.

Nazir and Afza (2009:19) built on the study of Russell and Izzo (2009) by researching the impact of aggressive working capital management on the profitability of Pakistani firms. The sample for this study consisted of 204 non-financial firms listed on the Karachi Stock Exchange from 1998 – 2005. Nazir and Afza (2009:20) emphasized that the optimal level of working capital would be reached when there is a balance between risk and return. Generally, an aggressive financing policy results in high risk and high returns, whereas a conservative financing policy will result in the opposite. Both risk and return have an effect on shareholders' value, hence the policy adapted by a firm must have a balance between risk and return.

Nazir and Afza (2009:27) found a negative correlation between the profitability of firms and the degree of aggressiveness of the financing policy, hence companies following an aggressive financing policy showed lower profitability. Market

profitability indicators also showed a negative correlation to profitability, however investors preferred firms with a more aggressive approach in managing their current liabilities. The results are in contradiction to earlier studies, that an aggressive approach would result in higher returns. The author mentions that this could be due to the current volatile economic conditions in Pakistan.

The results found by Nazir and Afza (2009:26) do appear to be inconsistent with the results expected when implementing an aggressive policy. A firm following an aggressive approach in managing its working capital will keep the levels of working capital to a minimum. Excess cash will be invested in more profitable investments and productive assets. Such investments should result in higher returns earned by the firm and should therefore increase profitability.

Losbichler and Mahmoodi (2012) analysed the results of International Business Machines Corporation (IBM) with specific reference to its CCC in 2010. Trade receivables amounted to \$ 10,834 million and the age of receivables was 41 days, inventories amounted to \$ 2,450 million and the age of inventories was 17 days. Trade payables amounted to \$ 7,804 million and the age of trade payables was 54 days. This resulted in the CCC being four days and, in monetary terms, \$ 1,578 million cash flow per day. This implies that if IBM managed to decrease their cash conversion cycle with one day, it would have improved the company's cash flow with \$ 1,578 million. This reduction would also enhance profitability, especially when inventory costs such as storage, taxes, insurance and obsolescence are reduced, which could be accomplished if supply chain processes are implemented successfully. Some processes may improve profitability but may increase the investment in working capital and *vice versa*. For example, the investment in working capital can be reduced by implementing JIT processes, but this may result in a decrease in profitability due to higher transport costs. The opposite may be true when there is a switch from local to overseas suppliers. A reduction in costs would cause the profitability to increase; it could however result in an increased investment in working capital due to longer lead times (Losbichler and Mahmoodi 2012:28). The use of overseas suppliers could however reduce profitability due to the increase in exchange rate risk, which is ignored by Losbichler and Mahmoodi.

2.3.3 Effect of Financing Techniques on Working Capital Management

The influence of operational and financing factors on working capital management was investigated by Hill, Kelly and Highfield (2010:784) in a sample of firms from the United States (US), comprising of 3 343 companies over a ten-year period (1996 - 2006). The study integrated the components of working capital to assess the effect of operational factors on the net working capital.

The hypotheses for this study were developed based on different operating conditions such as sales growth, contribution margin and sales volatility. Other issues the study focused on was the ability of financing working capital with operating cash flow, the cost of external financing, capital market access, competitive advantage and financial distress. Below is a discussion of the various hypotheses and the corresponding results on each one.

The first hypothesis was based on the assumption that sales growth has an effect on working capital levels. Sales growth can be accomplished by a relaxation of credit and/or inventory standards; hence as an independent variable it can be a problem due to possible endogeneity problems. This is mitigated by lagging the sales growth, which is defined as the lagged percentage change in sales over time. The effect of sales growth on inventory has not been investigated in detail before. The expectation of this study was that sales growth would show an inverse relationship with the working capital requirement (WCR). WCR is defined as the sum of inventories and trade receivables minus trade payables. Results showed an inverse relation between the WCR and lagged sales growth. The results also indicate that sales growth provides net financing, because creditors are willing to provide better credit terms for high-growth firms to improve and build relationships. High growth firms have no need to relax credit terms; therefore credit terms are negatively correlated to WCR. Based on this it can be concluded that sales growth contributes in providing financing to a firm's net working capital needs.

The contribution margin per unit is calculated by subtracting variable costs from the sales price of a unit. By selling more units, the firm will have more funds contributing

to the fixed costs of a firm. Furthermore, by selling more items, more funds will be available internally to provide financing; resulting in every item sold contributing to the financing of the firm's working capital. Based on this the second hypothesis was formulated; that there was the expectation that the WCR and the contribution margin would be related. However, results indicated that no significant relationship between WCR and the contribution margin exists.

Sales volatility has a negative effect on inventory as it makes it difficult to determine the required level of inventory. This can be compensated for by providing better credit terms, which will compensate for the effect of a decrease in demand. Firms subject to sales volatility have a difficult task in determining day-to-day liquidity needs. These firms tend to rely on trade payables to maintain the desired liquidity position. The sales volatility is determined by calculating the sales variability over a period. Hill's third hypothesis implies that sales volatility has a negative correlation to WCR and was confirmed. This indicates that management tends to manage working capital more aggressively when sales are volatile, by decreasing investment in net working capital.

The fourth hypothesis states that firms with greater operating cash flows will manage their net working capital more conservatively. A conservative net working capital strategy can be easily maintained by having a positive operating cash flow and by planning future sales growth. However, firms with a negative operating cash flow will need to identify other sources of financing for its working capital requirements. Findings by Hill *et al.* (2010:796) suggested a positive correlation between WCR and operating cash flow.

As noted above, a positive working capital must be financed, which is often done externally, hence the cost of external financing must be considered. However, Hill *et al.* does not consider that a firm will attempt to use some of its long-term funds before obtaining funds externally. Hill's fifth hypothesis was that firms with a high cost of external financing would reduce its investment in net working capital, to avoid these costs. The market to book value will be used to determine the method of financing and is defined as the sum of market value of equity and total liabilities

minus payables scaled by net assets. An inverse relationship was expected and confirmed with the results.

Creditworthy firms with access to the capital market will be able to finance their working capital gap externally. Larger firms will find it much easier than smaller firms to obtain external credit. Based on this, the sixth hypothesis was formulated; that a direct relationship is expected between the net investment in operating capital, and firm size. The results supported this hypothesis. Small firms tend to have less access to capital markets than larger firms. Hence small firms are expected to manage and monitor their investment in net working capital closely, due to fewer alternatives of financing being available.

A firm with competitive advantage will be in the position to negotiate more favourable credit terms with both suppliers and customers. Firms with a competitive advantage are expected to have less inventory and receivables but more payables, hence a reduced WCR. The expectation was therefore that there would be a negative correlation between having competitive advantage and net working capital, and was included as the seventh hypothesis. The results did not support this hypothesis, as no such correlation was found.

Firms in financial distress are also expected to have less investment in cash and in receivables if credit terms are tightened. Again, a negative relation between WCR and a financial distressed firm was expected. A firm can be identified as in financial distress if it is not able to cover interest payments comfortably, and if it is overleveraged. Results indicated that WCR was negatively correlated with firms in financial distress, confirming the final hypothesis that firms in financial distress would be forced to have an aggressive net working capital strategy, due to their lack of additional resources. Hill *et al.* (2010:790) investigated the relationship of WCR with specific industry factors. This could be used as a parameter to determine the optimal level of net working capital.

Hill *et al.* (2010:796-797) concluded that factors such as financial distress and sales volatility are risk factors which should be considered when determining the optimal level of net working capital. The optimal level of net working capital will result in the firm reaching their target liquidity and profitability goals.

2.3.4 Working Capital Financing and Profitability

Baños-Caballero, García-Teruel, and Martínez-Solano (2012) performed a study to investigate the influence of financing of working capital on a firm's profitability on a sample of non-financial Spanish SME's (Small and medium enterprises). The reason for their sample selection is twofold: Firstly the fact that efficient working capital management has become increasingly important for small and medium-sized firms due to their difficulty in obtaining long term funding from banks and other financial institutions. Secondly, the capital markets in Spain are less developed and have a banking-orientated financial system. The sample included small and medium Spanish firms over a ten-year period (1997 – 2007). The criteria of an SME set by the European Commission were used to make the selection of SME's and included criteria such as fewer than 250 employees being employed, a turnover of less than 50 million euros per year and total assets of less than 43 million euros. Based on these criteria, and eliminating firms with missing data, a panel of 1,062 firms was included in the sample. Baños *et al.* (2012) measured the WCR financing (WCF) by using the following formula:

$$WCF = \frac{\text{Short - term bank debt}}{\text{Current assets - Accounts payable}}$$

The greater this ratio, the greater the risk would be, since working capital is financed through short-term bank debt. Additional variables such as firm size, sales growth, leverage and return on assets were included to investigate the relation between WCR financing and a firm's performance.

The aim of the study performed by Baños *et al.* (2012:2) was to investigate the relationship between working capital financing and a firm's performance, hence the study focused on firms having a positive net working capital that will require financing. As mentioned earlier, financing over the short term is riskier than long term financing. As Baños *et al.* (2012:2) explains, refinancing and interest is a higher risk when using short-term financing, however there are advantages using short-term

debt. The nominal rate of short-term debt is often lower than the rate for long term debt due to inflation premiums which often increase as the time of maturity of debt increases. Another advantage of short-term debt is that it mitigates the possible agency effect between shareholders and debt holders.

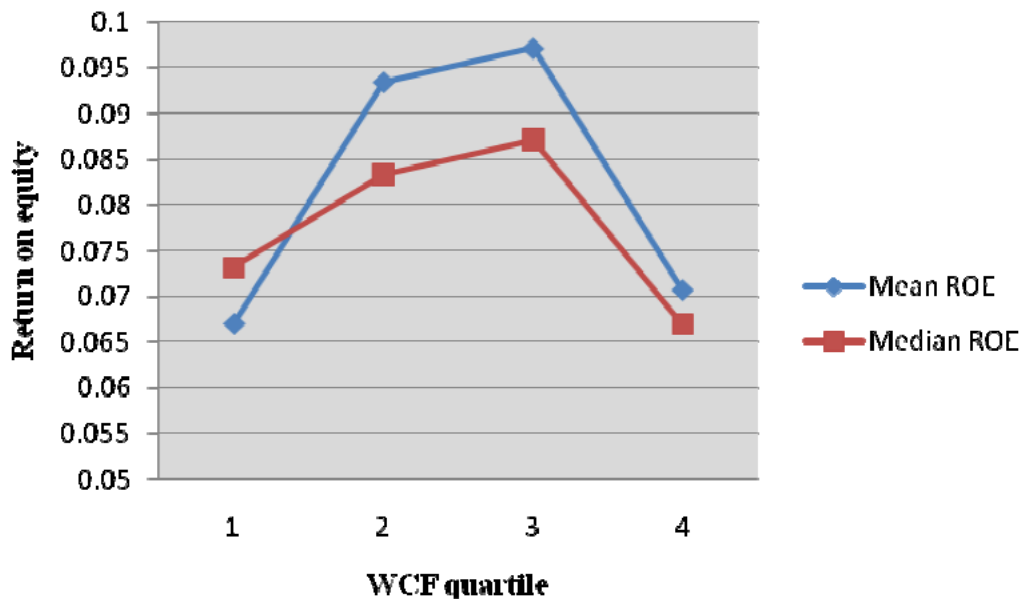
Based on the advantages and disadvantages of short-term debt the following interaction between working capital financing and firms' performance was anticipated: when a low percentage of working capital is financed through short-term financing there will be a positive effect on the firms' performance, as the advantages of short-term financing is expected to out-weigh the disadvantages of short-term financing. However, due to the refinancing and higher interest rate risks of short-term financing, when a high percentage of working capital is financed through short-term financing, it will negatively affect the firms' performance.

Baños *et al.* (2012:11) grouped the results into annual quartiles based on the WCR financing as WCF1 to WCF4; WCF1 including firms with the lowest WCF ratio and WCF4 firms with the highest WCF ratio. The results showed a non-monotonic relationship between working capital financing and ROE. It appears that a firm's WCR positively affects its performance, however when high percentages of WCR is financed through short-term debt this riskier WCR now negatively effects the firms' performance.

Figure 4 presents a graphic representation of the relationship between the WCR financing, which is measured by $\text{short-term debt} \div \text{net working capital}$, and the return on equity.

Figure 4

Working capital requirement financing and Return on Equity



Source: Baños *et al.* (2012:23)

Baños *et al.* (2012:12) conducted an alternative research design, which was based on spline regression to ensure the results were correct and found to be consistent. Due to the possibility of WCR financing policies being different across industries the quadratic model was adapted to include sub-samples by industry, and to determine whether there is still a concave relationship between working capital financing and a firm's performance. The sectors reviewed were agriculture and mining, manufacturing, construction, wholesale and retail trade and service and transport. Again the concave relationship was confirmed, except for the agriculture and mining sectors showing insignificant coefficients, which may be due to the smaller number of firms included in these sectors.

From the results of their study Baños *et al.* (2012:16) concluded that, from a certain point (breaking point), the financing of working capital by means of short-term financing has a negative effect on a firm's profitability. This is the basis for the following research question asked by Baños *et al.* (2012:14): To what extent does the firm's ability to generate internal funds influence the breaking point? The firms were classified on the basis of ability to generate internal funds by using the cash

flow variable ((net profit + depreciation) ÷ total assets) with a higher ratio indicating a better ability to generate internal funds. Secondly the firms were classified according to their market value (annual sales ÷ total annual sales in relevant industry), with the assumption that firms with market power and having a high demand will be able to generate sufficient cash flow. The initial equation was modified by including a dummy variable that distinguishes between firms with the ability to generate internal funds and those that do not.

The hypothesis that the breaking point is dependent on the firm's ability to generate internal funds was confirmed. Firms that finance a greater percentage of their working capital with short-term financing will be exposed to a greater interest- and refinancing risk. However, it was also found that the performance of these firms with a greater ability to generate internal funds would be affected more negatively when short-term financing is used beyond the breaking point.

Baños *et al.* (2012:16) concluded that working capital decisions should not only be focused on the amounts invested in it, but also on the financing requirements with regards to working capital. The working capital financing strategy has an impact on the firm's performance and should therefore be analysed carefully. For policies where a low percentage of short-term financing is used the benefits of short-term financing will enhance a firm's performance. However, a higher percentage of short-term financing will have a negative influence on a firm's performance and is dependent on a firm's ability to generate internal funds. The study focused on SME's in a Spanish context; future research can therefore be done for larger firms and in different geographical areas.

Ding, Guariglia and Knight (2011:1) carried out a study to investigate the relationship between working capital management investment and financial constraints. This study was carried out over a seven-year period (2000 – 2007) on 116,724 Chinese firms by means of investigating the sensitivity of investment in working capital to cash flow (WKS), and to the sensitivity of investment in fixed capital to cash flow (FKS). Firms with annual sales of \$ 650 000 and more and operating within the manufacturing and mining sectors were included. Firms with missing data and with negative observations such as negative sales or assets were excluded from the

study. For the period under review (2000 – 2007) the ratio of investment in working capital to the investment in fixed capital was very high (66.6%), this ratio emphasizes the importance of effective working capital management. The study aimed to investigate the ability of a firm to adjust their working capital to compensate for cash flow. Ding *et al.* (2011:3) found that no such study has yet been performed for a developing country. The 116,724 firms were grouped into state-owned, foreign, private and collective enterprises.

The cash flow effect on working and investment capital was calculated by including components such as time, business cycle effects and possible industry effects together with the cash flow, working capital and fixed capital investment of the firms. The extent of adjusting the working capital due to fluctuations in cash flows would depend on the level of working capital employed and available, the same applies for the level of investment in fixed capital. Due to potentially different effects on cash flow fluctuations this was also built into an equation.

Foreign, private and collective enterprises showed a high sensitivity of fixed investment and working capital investment to cash flow, which indicates that, in a situation of fluctuation in cash flows, firms tend to reduce both their fixed and working capital investment. It was also noted that firms with a relatively high ratio of working capital to fixed investment would be able to adjust their working capital when cash flow fluctuations occur.

Ding *et al.* (2011:23) extended their study by investigating firm-level sensitivities of investment in fixed capital to cash flow (FKS) and the investment in working capital to cash flow (WKS). Findings suggested that younger, smaller and fast growing firms are able to decrease the investment in working capital when cash flow fluctuations arise, in contrast to older, larger and slow-growing firms that will decrease their investment in fixed capital. It was also noted that firms with lower cash resources were adjusting both their working and fixed capital investment, while firms with higher cash resources were actively adjusting their working capital investment. Ding *et al.* (2011:23) combined these findings and noted that firms with high WKS and low FKS (the smaller, younger and fast growing firms) tended to be financially constrained, have high investment opportunities and high working capital. When

cash flow shocks should occur, these firms would be able to maintain their high levels of investment in fixed capital by reducing the investment in working capital.

2.3.5 Economic Value Added and Working Capital Management Strategies

Bolek, Kacprzyk and Wolski (2012:1) performed a study investigating the correlation between economic value added (EVA) of a firm and its CCC. As noted earlier, the CCC is a measurement of a firm's investment in working capital. A short CCC indicates that funds are converted to cash faster making cash available for other cycles within the firms operations. EVA is also a measure of profitability but it indicates the value generated by the firm which is now available for its shareholders. It can be defined as the remainder of operating profit after subtracting the cost of capital. The EVA is therefore dependent on the level of operating profit, where a high operating profit will result in a higher EVA. The EVA is further dependent on the size of capital invested, where the larger the capital invested, the higher the EVA, given that the return on investment is higher than the cost of capital (Bolek *et al.* 2012:7).

When a firm is following a conservative approach in financing working capital, long term debt is predominantly used for financing. And as mentioned above, the larger long term debt is, the higher EVA will be if the return on investment is higher than the cost of capital. A strong relationship can therefore be expected between the CCC and EVA when the conservative approach is followed. Bolek *et al.*(2012:7) hypothesized that the shorter the CCC is, the higher the EVA will be. Bolek *et al.* (2012) based this on the relationship of the CCC with the net operating profit; where if the net operating profit increases, the CCC will decrease.

The study performed by Bolek *et al.* (2012) included companies listed on the Warsaw Stock Exchange in Poland and despite low parameters of the model presented in the study, the relationship was confirmed. Bolek *et al.* (2012:9) concluded that the CCC, as the liquidity indicator, and the EVA as a market assessor of business profitability, used together could be a very efficient indicator of company performance.

2.4 THE IMPACT OF WORKING CAPITAL MANAGEMENT ON PROFITABILITY AND LIQUIDITY

2.4.1 Introduction

Working capital management has an effect on both the profitability and liquidity of a firm. Brigham and Houston (2009:491) explain that there are three major policies regarding current asset holding, which will have a direct effect on profitability. Firstly a 'relaxed' current asset investment policy allows large amounts of current assets to be carried and is mainly due to a liberal credit policy implemented by the firm. Secondly a 'restricted' current asset investment policy allows minimum amounts of current assets to be held. Lastly the policy between these two extremes is the 'moderate' current asset investment policy. Due to the effect the composition of current assets can have on profitability, the effect of asset should be established before a policy is implemented. The effect on profitability can be explained by means of the effect on a key performance measure, namely return on equity (ROE).

In the presence of a restricted policy the low level of assets will result in a high total asset turnover ($\text{Total asset turnover} = \text{Sales} \div \text{Assets}$), which will result in a high ROE ratio. Due to the restriction of assets this policy may result in problems such as inventory shortages and unsatisfied customers. A relaxed policy will not have these problems but it will have a negative effect on profitability as noted from the decrease of the ROE.

Working capital must be managed so as to ensure that a firms' risk and return is kept at the required level. Higher returns can be earned when funds are invested in interest bearing investments and in productive assets. The corresponding risk occurs when working capital is kept at very low levels and a firm is not able to settle its current liabilities when they fall due, and is known as the liquidity risk. Therefore, current assets must be sufficient to cover a firm's current liabilities as they fall due. For this reason the restricted current asset investment policy with low levels of net current assets is risky, because if short-term funds are needed urgently it might not be readily available. And even though this policy is likely to increase profitability,

liquidity can be compromised when funds are not available to meet short-term requirements, thus increasing the overall risk.

When a firm has low levels of net current assets, operations cannot be properly supported and low returns will result. At the optimum level of net current assets the firm will expect to be profitable. Being over liquid (too high net current assets) will result in idle assets, thus decreasing profitability. Too low levels of net current assets can result in insolvency problems, because when the firm is not in a position to pay its short-term debt it can even result in bankruptcy. When a firm has very high levels of net current assets it may imply that investment opportunities are not used, resulting in opportunity costs, which has a negative effect on profitability. Hence, one would expect that profitability and liquidity will be negatively correlated.

The composition of net current assets will differ between firms; hence a target ratio will only be similar if companies being compared are similar. Within a similar industry there will be corresponding characteristics, and an optimal level may be established for a group of firms within a similar industry. The impact of net current assets on liquidity and profitability is not new to the financial literature. As part of the literature review of this study recent studies investigating this aspect will be discussed below.

Traditionally, the main objective of management is to maximise profitability, which is evaluated by measures such as operating profits and earnings per share. Each major department within a firm, such as sales, logistics and manufacturing, is supplied with its own set profit targets (Losbichler and Mahmoodi 2012:30). From a sales manager's perspective sales will be maximised in order to reach these targets by selling goods to customers as fast as possible. This may result in sales made to clients without performing sufficient credit checks, and obtaining desired products at higher costs to ensure there is no waiting time for the customer. Sales managers would want a wide variety of products available at all times for this purpose, which will result in high inventory levels. In this example processes will be implemented to maximise profitability at the expense of working capital. Companies should implement processes in all of the departments to maximise not only profitability but also cash flow, which has a direct effect on working capital (Losbichler and Mahmoodi 2012:30).

2.4.2 Profitability and Liquidity

Eljelly (2004) examined the relation between liquidity and profitability and the effect thereof on shareholders' value. A sample of 29 Saudi Arabian companies were selected from three different sectors, namely agriculture, industrial and services. The sample was restricted by various companies not disclosing key figures that were required for this study. For example, most cement companies did not disclose their sales revenue. Companies from the banking and electricity sectors were excluded, resulting in a 50% sample of public trading companies in Saudi Arabia. A number of hypotheses were formed and tested.

The first hypothesis formulated by Eljelly (2004:51) was that there is a negative correlation between liquidity and profitability. Hypothesis two is that profitability may be a function of firm size. This is due to large companies being able to buy inventory in bulk, and receive discounts for such purchases. In order to qualify for some discounts, smaller companies tend to pay creditors within discount periods, which negatively effects profitability. The third and final hypothesis is that the working capital needs and liquidity is influenced by the specific industry. Required working capital was lower for capital intensive- than for labour-intensive industries, hence liquidity requirements will have no significant negative impact on the profitability of capital intensive firms.

This first hypothesis was confirmed, as results indicated that liquidity and profitability were indeed negatively correlated. Hypothesis two and three were also confirmed as it was found that company size and industry did have an effect on profitability, with the exception of the service sector, where the focus is on the efficiency of asset use and not the size of assets. The Eljelly (2004:58) study found that firms holding excess inventory incurred unnecessary costs resulting in a decrease in profitability.

Erasmus (2010:2) tested the correlation between profitability and working capital management of South African firms in the industrial sector. Firstly, the relationship between profitability and net working capital management was investigated. The return on assets (ROA) was used as indicator of profitability and the net trade cycle as quantifier of net current asset management. The second part was the comparison

of results between listed and delisted firms. This was to evaluate possible effect of survivorship bias, and determine if similar observations apply to both listed and delisted firms.

ROA was used as the dependant variable to measure profitability. This is normally calculated by dividing net profit by total assets. To ensure that the profitability of the actual operational side of the firm is measured, net profit was replaced with profits from operations. The net trade cycle (NTC) was used as the independent variable, measuring the net working capital of a firm.

Working capital can also be measured by the CCC but Erasmus (2010:3) found the following problems when calculating the CCC. In terms of the International Financial Reporting Standards (IFRS), firms are not required to disclose cost of sales in the financial statements. In order to calculate the average age of inventory the cost of sales for the year is required. However, as some firms do not disclose it, an accurate age of inventory could not be determined by Erasmus. Furthermore, in order to calculate the average age of payables, purchases are needed, which also does not need to be disclosed in terms of IFRS.

Due to the above mentioned problems in calculating the CCC, the NTC was used as alternative measure.

$$\text{NTC} = \frac{\text{Trade receivables} + \text{Inventory} + \text{Trade payables}}{\text{Revenue}} \times 365$$

The study covered a period of 19 years (1989 to 2007), and included only industrial firms listed on the JSE. The optimal level of net current assets will differ between sectors, hence the study focused on one sector. To reduce survivorship bias, Erasmus (2010:4) excluded firms that delisted during this period from the sample.

Combined results of listed and delisted firms indicated a strong negative correlation between profitability and liquidity. The results showed a strong negative relationship between the NTC and the firm's profitability. The question arises: could the decrease in the NTC be due to an increase in profitability, or *vice versa*? The firms were

ranked according to their levels of profitability, and the median NTC values were calculated.

However, the negative relationship between the NTC of a firm and its profitability identified shows that, with low levels of net current assets, a firm will be more profitable. Management should consider the correlation between profitability and liquidity and maintain the optimal level of net current assets.

2.4.3 Working Capital Management and Profitability

Deloof (2003:576) studied 1009 Belgian firms over the period 1992-1996 to analyse whether working capital management has an effect on profitability. Unlike the study performed by Erasmus (2010:3) where NTC was used to measure working capital, the CCC was used in his study. Profitability was measured by the gross operating income $((\text{Sales} - \text{cash costs of goods sold}) \div (\text{Total assets} - \text{financial assets}))$. Deloof used gross operating income as the variable to measure profitability, because it gave a better indication of a firm's profitability than other variables. According to Deloof (2003:576), ROA measures the effect the firm's assets have on profitability. However, for firms with mostly financial assets, this will not be the best indicator, because operating activities will not contribute significantly to return on assets. Earnings per share can also not be used as measure, as a number of firms included in the sample were not listed on the Belgium stock exchange.

Results showed a negative correlation between the number of day's accounts receivable, inventories, accounts payable and the gross operating income. The question is again: does profitability affect working capital management, or *vice versa*? Most of the firms included in the sample had large amounts of cash invested in working capital, and Deloof (2003:585) therefore concluded that the way in which working capital is managed has an effect on the profitability. It was further concluded that shareholders' value could be created if managers reduce the value of accounts receivable and inventories to a reasonable minimum.

Lazaridis and Tryfonidis (2006:27) built on the study by Deloof (2003:573) and investigated the relationship between working capital management and corporate

profitability of listed companies on the Athens Stock Exchange. The study was performed over a four-year period (2001 – 2004) and included 131 listed companies. The original sample was 300 firms and sectors such as electricity & water, banking & financial institutions, insurance, rental & other services firms were excluded due to the type of activity of these companies. The independent variable used to measure the working capital management was the CCC. Firm size was calculated as the natural logarithm of sales and lastly the financial debt ratio was used to indicate the relationship between the firm's assets and its external financing. The dependent variable was the gross profit margin, calculated by subtracting cost of goods sold from sales, divided by total assets minus financial assets.

The first finding in the study carried out by Lazaridis and Tryfonidis (2006:28) is that gross profit is positively correlated to financial debt. This may be due the fact that companies that are more profitable and have more cash in hand can negotiate and obtain better credit facilities. Lazaridis and Tryfonidis (2006:28) further suggested that companies listed on the Athens Stock exchange use financial debt to finance their working capital needs and increase their profitability in the process. The next finding of their study was that accounts payable and gross profit were negatively correlated, as was found by Deloof (2003:585), implying that less profitable firms takes longer to pay their suppliers. The study also found a highly significant negative correlation between profitability and the CCC. Results further indicated with a high significance that larger firms (based on firm size calculated as the natural logarithm of sales) would have even larger gross profit.

Accounts receivables and gross profit also indicated a negative relationship and were highly significant. This shows that reducing the time of accounts receivables by collecting outstanding debt faster will have a positive effect on a company's profitability. A negative relationship was also noted between inventory turnover and gross profit, but the result was not statistically significant. It does however indicate that the higher the value of inventory and therefore increasing the level of working capital, the more negatively profitability will be affected.

Based on the results noted above, Lazaridis and Tryfonidis (2006:34) concluded that working capital is negatively correlated with profitability. This also suggests that

management can improve profitability by keeping each of the working capital components at their optimal level.

Dash and Hanuman (2009:1) developed a goal programming model, building on the model by Agarwal (1988:155-161). Agarwal linked the net working capital management primarily to liquidity. Dash made modifications to this model, to give equal importance to profitability. This model calculates the opportunity loss a company has due to excess liquidity. It also determines the sensitivity of the results to changes in net current asset items. The model proposes the combination of working capital in order to reach the optimal level of profitability and liquidity. The study was performed on a single company in the food-processing sector, over a period of five years. The problem with this model is that it compares actual results with target results. Target results are set for the current ratio, working capital turnover ratio, fixed asset turnover ratio and the net profit ratio. The model calculates the value of the opportunity loss due to excess liquidity held. The model proposes the amount of excess working capital that can be transferred to fixed assets earning higher returns, by still maintaining a safe liquidity position. The results further indicated that the model is highly sensitive for changes mostly in trade receivables, followed by changes in inventory, current liabilities, marketable securities, fixed assets and last of all with changes in cash.

Pimplapure and Kulkarni (2011:53) performed tests on an Indian firm, Bherat Petroleum Corporation Ltd., to investigate the trade-off between profitability and liquidity over a five-year period (2005-2009). The first objective formulated was to establish the relationship between working capital management and profitability, and more specifically the effect of the different components in working capital on profitability. The second objective was to examine the changes in return on investment (ROI) as the level of working capital changes.

Ratios used to determine the efficiency of working capital included the current ratio (CR), quick ratio (QR), current assets to total asset ratio (CATAR), current assets to sales ratio (CASR), working capital turnover ratio (WCTR), inventory turnover ratio (ITR), debtors turnover ratio (DTR) and creditors turnover ratio (CTR), and to determine the profitability the Return on Investment (ROI).

Findings reported by Pimplapure and Kulkarni (2011:59) imply that the ROI and CATAR are negatively correlated, therefore the greater the CATAR, the lower profitability will be. The relationship between ROI and CASR were also found to be statistically significant, but indicated a lower degree of negative correlation. It implies that the lower the CASR of a firm, the greater the efficiency of working capital and higher profitability, and *vice versa*. A positive correlation between WCT and ROI were found, meaning that the faster turnover of working capital is, the higher profitability will be.

With respect to the results of specific components of working capital the inventory turnover ratio is positively correlated to ROI. For an effective inventory turnover ratio the effect on profitability will be positive. Similar results were detected for receivables, indicating that a lower investment in receivables will increase profitability. The correlation between ROI and CTR were found to be negatively correlated, but statistically insignificant.

Pimplapure and Kulkarni (2011:58) also performed tests to assess the impact of working capital leverage (WCL) on the profitability. WCL is calculated as follows: $\text{Current assets (CA)} \div \text{Total assets (TA)} + \text{Change in current assets (DCA)}$.

The WLC measures the sensitivity of ROI to changes in current assets, with a higher WCL implying higher risk, and *vice versa*. Together with an increase in risk it also increases the possibility of higher profitability. Results over the five-year period showed fluctuating trends, however for all of the five years the WCL was less than one. This formula assumes that the change in current assets from the prior year will be maintained during the current year. From these results the conclusion was made that the increase in profitability is less than the proportion of the decrease in working capital over the period.

Mansoori and Muhammad (2012:475) investigated the effect of working capital management on the profitability of 92 firms in Singapore over an eight-year period (2004 - 2011). Firms in sectors such as banking & finance, insurance, mutual funds and business services were excluded from the study due to the specific nature of

such firms. Also, sectors with less than ten firms were excluded to enable the study to investigate industry effects. Of the 92 firms 25 represented the electronic sector. The second largest sector represented was the construction & material sector with 19 firms. The other firms were made up as follows: 17 in the technology hardware-, 16 Industrial engineering- and 15 in the food producers industry. The independent variable used was the CCC to measure the investment in working capital. In order to measure the effect of working capital management on profitability the return on assets (ROA) was used as the dependent variable. Further to the components to working capital (days of receivable, days inventory and days payables outstanding) the firm size, debt ratio and gross domestic product were calculated for the firms under review. The ROA yielded the following results for the various sectors: The construction and material sector had the highest ROA at 8.58%, followed by the Food producers- with 6.39%. The third highest ROA was noted for the industrial engineering sector at 4.43%. The second lowest ROA was -0.52% for the electronics sector and lastly the lowest ROA was noted for the technology hardware industry at -2.46%. When the CCC in days was compared with the ROA, it was noted that the industry with the highest ROA (construction and material) also had the highest CCC of 182 days.

In order to investigate the relationship between working capital management and profitability the regression based framework Pooled Ordinary Least Squares model (OLS) was used. Results indicated a highly negative correlation between working capital management and profitability, and that if the CCC can be reduced by one day, the increase in profitability will be between 0.01% - 0.02%. It also indicated a negative relationship between days trade receivables and the CCC, and that if days of receivables should be increased by one day, the ROA will decrease with between 0.01% and 0.02%. The age of trade payables were also negatively correlated with profitability, implying that less profitable firms take longer to pay their suppliers. Results further indicated that ROA increases as firm size and growth does; the debt ratio is however negatively correlated with a firm's profitability.

Mansoori and Muhammad (2012:478) concluded that profitability could be improved if the components of working capital are managed effectively. The highly negative correlation between the days of accounts receivable and inventories indicates that if

the firm manages to reduce these days, profitability will improve. The negative correlation with days in accounts payable suggests that delaying payments to suppliers may damage the firm's reputation, which will result in a decrease of profitability.

2.5 WORKING CAPITAL MANAGEMENT IN DIFFERENT INDUSTRIES

2.5.1 Introduction

The management of working capital will differ across industries. This is due to a difference in inventory needs, customer base and the type of goods and/or services offered. For example, a firm in the retail industry will have a faster turnover of inventory than a manufacturing firm. A retailer purchases finished goods from its suppliers and sells it directly to the public with little or no alterations, and the product line is mostly made up of low cost or necessary household items. Manufacturers produce their own products from various raw materials, resulting in a longer process than that of a normal retailer. Therefore the investment in inventory in the manufacturing sector will be very different from that in the retail sector, and will also differ from other industries. A manufacturing firm will have significant levels of work in process in their inventory, where a retailer's inventory will mainly consist of finished goods, and firms within the service industry will have no inventories.

2.5.2 Industry Impact on Working Capital Management

Cross sectional influences of the industrial industry on working capital of South African industrial firms were tested by Smith and Fletcher (2009:15). The study was performed on 103 companies listed on the JSE, after excluding companies with missing data. Of the 103 companies the highest number of participants was in the retail industry.

Thirteen working capital measures were identified, namely: current ratio, quick ratio, inventory turnover, accounts receivable turnover, accounts payable turnover, sales divided by net working capital, long-term loan capital divided by net working capital, accounts receivable divided by accounts payable, total current liabilities divided by

gross funds flow, cash conversion cycle, net trade cycle, comprehensive liquidity index and net liquid balance divided by total assets. Of these 13 working capital measures, only long-term loan capital divided by net working capital, turnover divided by net working capital and the comprehensive liquidity index did not have any significant industry effect, when using an overall significance level of 5%. The conclusion can be made that there is a significant sector effect in the working capital measures of listed South African industrial firms.

Smith and Fletcher (2009:19) performed a further study to test the specific influence of factors such as industry, turnover, debt ratio, cash flow and return on assets on working capital management. No significant industry effects on working capital management such as turnover, debt ratio, cash flow and return on assets were identified. The two measures used as proxies for working capital was the net liquid balance (NLB) and WCR. The NLB can be defined as the difference between working capital and working capital requirements. It measures the true liquid balance of financial assets by splitting the operational assets from the liquid assets. WCR are those assets specifically utilised in the operating and production cycle, procurement and sales. It is the difference between operational current assets (accounts receivable, inventories and prepaid expenses) and operational current liabilities (accounts payable and accruals). A positive NLB reflects the true liquid surplus of a firm, where a negative NLB reflects the need for short-term external funding. The results from this study indicated that the influence of industry factors such as turnover, debt ratio, cash flow and return on assets on the NLB and WCR was insignificant. It was however noted that turnover had a major influence on working capital management. This implies that management should consider working capital requirements when planning future turnover targets.

2.5.3 Working Capital Management in the Manufacturing Industry

Raheman, Qayyum and Afza (2011:285) performed a study on 204 manufacturing and trading firms grouped into 24 sectors listed on the Karachi Stock Exchange (Pakistan) over a period of ten years (1998 - 2007). The measures used to evaluate working capital management include the CCC and the NTC, and the ROA to evaluate the firm's performance. The CCC was negative for the oil and gas

exploration and the refinery sector. Together with the cement and oil and gas marketing sectors, they had the lowest days in the CCC. The NTC showed similar results, placing these three sectors on top for their working capital management policies. The negative CCC for the oil and gas exploration and refinery sector is properly due to it being a non-manufacturing sector, where a shorter OC is expected.

The sectors that did not perform that well in the working capital management category was cable and electric goods, engineering, and the leather and tanneries sector. The results from the CCC can be investigated in more detail by looking at the specific elements which would influence the CCC to change, being the inventory days, receivable days and payables days. The unfavourable CCC in the three sectors mentioned above was due to a high number of inventory days.

An analysis between the working capital management performance and the sector's profitability showed the following results: The food & personal care product-, tobacco - and fertilizer sectors are among the highest performance in terms of profitability and working capital, indicating a definitive correlation between working capital management and profitability. Below is a summary of the best performing sectors in terms of working capital and profitability as tested by Raheman *et al.* (2011).

Table 2

Working capital management performance and the sector's profitability

Sector	Working capital (CCC)	Profitability (ROA)
Fertilizer	16 days	24%
Tobacco	44 days	28%
Chemical	59 days	14%
Automobile assembly	62 days	18%
Food and personal care product	69 days	32%

These sectors managed to have a consistent CCC over the ten years, or even improved it over the period. As concluded by Raheman *et al.* (2011:296) managers can create shareholders' value by optimizing the cash conversion- and net trade cycle, by implementing policies for the specific components (inventories, receivables

and payables). These policies may be similar for firms within the same sector but the size and type of firm may also have an influence. The Raheman study does not focus on the correlation between the working capital and profitability trends over the ten-year period, but focuses more on the overall performance of the sectors. Further analysis can be performed to investigate the trends in working capital management over the period and the corresponding effect it has on profitability.

The current study will focus on the effect of working capital management policies over the period and how changes made will affect the profitability of the firm. These effects will be determined for the different types of retail firms within the retail industry.

2.5.4 Working Capital Management in the Retail Industry

Gosman and Kelly (2003:25) analysed the working capital management processes in the retail industry specifically, focusing on the inventory management and payment policies. Some companies shifted their inventory risk to their suppliers by implementing the JIT delivery systems. The investment in inventory was further reduced by implementing consignment procedures. When inventory is purchased as consignment stock the inventory can be on the shelves of the retailer before it has been paid for. Hence the risk of holding the title of the inventory will lie with the supplier, and only once sold the purchase of the item and corresponding trade payable will be accounted for. According to Gosman and Kelly (2003:27) many large retailers such as Wal-Mart has been implementing consignment procedures, with a significant increase from the 1990's. Further to this firms often arrange shipment of goods directly from the supplier to the customer, thus decreasing inventory costs even more.

Regarding the payment policies of large retailers Gosman and Kelly (2003:27) note that, irrespective of the payment terms they are able to negotiate with their suppliers, they can pay outstanding accounts on whichever date they prefer as suppliers do not want to lose their business and will therefore not implement harsh collection techniques. The study further suggests that retailers with an increased power over their suppliers have managed to improve their sales growth without additional

investment in their working capital. This, however, empowers only the retailer at the expense of the supplier. Working capital should be managed so as to benefit all the parties involved. This is known as working capital management from a supply chain perspective. Working capital should also be managed in such a way that profitability and liquidity goals formulated by management are adhered to. The level of different components in the investment in net working capital will be dependent on the liquidity and profitability goals set by management.

Choudhary and Tripathi (2012:44) performed their study of Indian retail firms, investigating the impact inventory management has on the profitability of a firm, for a ten-year period (2000 – 2010). The reason for investigating the retail industry in particular was due to the key importance it played in the emerging economy in India. The retail industry was dominated by three major retailers, Pantaloons Retail (India) Limited (Pantaloons), Trent Limited (Trent) and Shoppers Stop Limited (Shoppers), who between them accounted for 75% of the sector. Due to missing data over the period and these companies being representative of the entire sector, only these three were included in the study. The study was aimed at investigating inventory management in particular. For these companies the impact of inventory days on key financial indicators, such as return on assets, return on capital employed and the value addition margin, were investigated.

ROA is an indicator of the firm's profitability, and return on capital employed (ROCE) measures the efficiency of the firm to generate revenues with capital employed. The final measure calculated as a performance measure is the value added as percentage of sales (VAM). These indicators are calculated as follows:

$ROA = \text{Operating profit} \div \text{Total assets}$

$ROCE = \text{Operating profit} \div \text{Average capital employed}$

$VAM = \text{Value addition} \div \text{Sales}$

Where,

Capital employed = Tangible net worth and long term borrowings, and

Value addition = Profit after tax + Employee compensation + Interest paid + Depreciation.

The hypothesis formulated for this study was that inventory days influence ROA, ROCE and VAM negatively.

Of the three companies included in this study Shopper's Stop Ltd had the lowest inventory days (42.22 days), but the effect on the financial performance is in contrast with the hypothesis formulated. Pantaloons Retail managed to obtain the highest ROA and ROCE despite having the lowest number of inventory days (98.84 days). Trent Limited, with a ROA of 70.41 days had the highest VAM. To explain the above results Choudhary and Tripathi (2012:55) investigated the inventory management processes followed by these different companies. Shopper's Stop Ltd is a fashion retailer and performs merchandise planning semi-annually. The inventory levels are maintained, based on the forecast sales, and not on actual sales, which can result in excess inventory. Normally with a fashion retailer a sale is held at the end of each season in order to get rid of old stock. However, the revenue received for these sales may even be less than the original cost price, which will have a negative effect on profitability. Pantaloons is a multi-retailer of various products such as apparel and groceries. The management of Pantaloons is concerned with inventory optimization and having a positive effect on their working capital. Pantaloons has a strong supplier network, which is evident in the high inventory turnover. There are various distribution centres which are equipped to hold excess inventory. This is often needed, because Pantaloons strives to ensure product availability to its customers and is seen as a "one-stop shop", therefore products must be available. The major difference between Shopper's Stop and Pantaloons inventory management is the treatment of merchandise defined as concessionaires. Pantaloons purchases such items which are recorded in the accounting records, where, in the case of Shopper's Stop, the supplier owns the inventory until it is sold. In both cases the supplier takes back the unsold goods, only Pantaloons earns a commission for this arrangement.

Trent Limited is a retailer of fashion and lifestyle goods, including some private labels. Management identified the busy season as being from October to January and ensures that, especially during these times, no stock out occurs, which is evident from the high inventory levels during these months. The downside to this is that, if all the inventory is not sold, it will result in items being sold for less during a sale. Choudhary and Tripathi (2012:56) further notes that all of these retailers make use of programs such as SAP advanced planning tool to help in the automation of

retail inventory, and build on relationship with suppliers to enhance the inventory cycle.

The study showed that even in a single sector, in this case the retail industry, management of working capital components will differ. Choudhary and Tripathi (2012:61) focused on inventory management within the retail industry, and results not only proved that differences exist, but also that these different techniques used by the companies will have different effects on financial indicators. Therefore the relationship between inventory turnover and financial performance tested in this study was inconclusive. The study concludes by emphasizing the need for proper planning in forecasting sales in order to mitigate risks such as excess inventory and stock outs. Especially in the retail industry, where inventory is often made up of fashion and perishable goods, the write offs can be very high if planning is not done properly. The limitation for this study was that the period tested (2000 – 2010) was in the midst of the latest economic recession, which does have an effect on sales and inventory levels. The Choudhary and Tripathi (2012:54) study also found that working capital management would be different for firms even within the same industry. Not only are differences expected between firms within a specific industry, but also between firms that are different in size.

2.6 WORKING CAPITAL MANAGEMENT AND ITS RELATION TO THE SIZE OF A FIRM

Working capital management processes are not only dependent on the type of industry a firm is operating in, but also to the size of the firm. A large firm will have more resources available to implement proper working capital management procedures and the manpower to manage it accordingly. In smaller firms the owner of the firm may be performing the financial and managerial functions. In larger firms the management of the different components of net working capital will be amongst knowledgeable people within the particular field, all working towards the same goal set by management. In smaller firms the management of net working capital may be performed by the owners, whom might not be an expert in this particular field.

2.6.1 The Effect of Working Capital Management on Large Retail Firms' Profitability

Lifland (2010:37) studied larger firms from the United States of America (USA) to investigate the working capital management practises of these firms and the effect thereof. The 1000 largest firms listed on the USA stock exchange were selected for this study, Lifland does however not define the selection criteria in order to be classified as a "large" firm. The data was obtained from the CFO magazine's annual working capital management survey for 2010, which included 1000 large public firms in the USA, and represents 58 industries. In this study 118 firms representing five industries (chemicals, durables, food, health and oil-gas) were analysed over a six-year period (2004-2009).

Lifland (2010:38) used the CCC as measurement of working capital efficiency, however the calculation of components was different as calculated in other studies (Garcia and Martinez 2007:168). In the Lifland (2010:38) study the days will be expressed as a percentage of sales indicating the days' sales needed to finance the working capital needs. The reason for this is to have a more meaningful comparison between industries. The calculation of the CCC in this study can be expressed as days in the working capital cycle (DWCC) = days accounts receivable (DAR) + days of inventory (DINV) – days payables (DAP).

The Lifland study builds on the study performed by Garcia and Martinez (2007:172) who divided the firms into four quartiles based on the results on profitability in order to analyse the effect of working capital management on the firm's profitability over the period 1996 – 2002. Lifland (2010:37) uses a more recent sample (2004 - 2009) to investigate the trends of working capital management. Overall, all industries showed significant changes in their working capital cycles. The chemical, food and health sectors showed decreases in the time that cash was needed to support working capital where the durables and oil-gas industries had the opposite results, namely an increase in time that cash is needed to support working capital accounts. The food and oil-gas industry had the lowest cash conversion cycle (18 days) and the health industry the highest at 103 days.

Results within the specific industries were analysed to get a better understanding of the changes of the time invested in working capital accounts and are presented in the table 3.

Table 3

Changes in working capital accounts within specific industries

Industry	DAR	DINV	DPAY	DWCC	Change from 2004 to 2009
Chemical	62	45	31	76	DWCC decreased by 3.61%, mainly due to the 8.85% increase in DPAY.
Durables	49	57	30	76	DWCC increased slightly by 1.03%, mainly due to an increase in DINV of 2.29%.
Food	7	29	18	18	DWCC decreased by 5.02%.
Health	74	47	18	103	DWCC decreased by 0.41%.
Oil-gas	37	13	32	18	DWCC increased by 2.9%, resulting from significant changes of all of the components.

Lifland (2010:43) extended his study by evaluating the financing needs resulting from the working capital requirements. To determine the financing need to maintain the working capital cycle, components were incorporated into the study, such as the firm's annual sales, projected sales growth and the ratio of days in working capital to the days in the operating cycle. This calculation was performed for every firm in each sector. For example, the financing need to maintain the working capital cycle for the firm Consolidated Energy Inc. was as follows: The sales growth between 2008 and 2009 was 0.364% and the total sales in 2009 \$4 537.734 billion. The DWCC was 29.8 days and the potential external financing (PEF) need to support the current working capital requirements \$ 1.352 million. The PEF to support the working capital requirements is calculated as: $\text{Sales in 2009} \times \text{sales growth} \times \text{DWCC}/365$, and for Consolidated Energy Inc. it amounted to \$ 1.352 million.

The results of their study indicated an overall positive relationship between DWCC and PEF, meaning that as the DWCC decreases the need for external financing also

decreases. During the period under review (2006 - 2009) the durables-, food- and oil-gas sectors had significant positive increases in their financing needs, meaning that the need for external financing increased over time together with the increase in number of days' working capital. The other two sectors, chemicals and health, reported the opposite. For these sectors the days in working capital cycle decreased over the period resulting in the need for external financing to decrease as well. This may be due to a number of reasons such as extending credit terms, improved credit ratings from suppliers and reducing the need for short-term borrowings.

Lifland (2010:45) concludes that firms should be more committed to managing their working capital accounts to enhance the cash position, and not only focus on the bottom line, again confirming that there should be a trade-off between the desirable liquidity and profitability.

2.6.2 The Effect of Large Retail Firms' Working Capital Policies on the Market

According to Gosman and Kelly (2003:25) large retailers have a certain power to dominate the market due to their market share and size. Firms were classified as "large" based on their total revenue. The study was carried out to measure the extent by which large retailers were using this power to achieve working capital efficiencies. This was measured by using an excess-days calculation which examined the inventory days reduced and the increase in day's purchases by large retailers. The excess days were analysed for various leading department stores, discount department stores and category specialists. This data can be used by lenders to give them insight into a specific retailer's operations and how they are using suppliers in order to improve their own working capital.

The "excess days" metric was designed by Gosman and Kelly (2003:25) to simultaneously examine both inventory and payables management to determine the efficiencies obtained in working capital by utilising the power large retailers have. Inventory and payables management both have an effect on working capital and it is therefore important to evaluate both at the same time. The results showed excess days of these retailers ranging between -1 and 73 in 2001. The lower the amount of days the more effective is the working capital management. The retailer Best Buy

had -1 excess days, indicating that their inventories are sold to customers before it was paid for. Of the 20 retailers included in the study the excess days could be calculated for 19 of the retailers. Fourteen retailers showed an improvement in the excess days from 1995 to 2001 and a number of firms outperformed their sectors. However, there were a number of firms that underperformed within their sectors.

As noted earlier, the excess days is a combination of days in inventory and payables, however it is necessary to look at the components individually in order to assess the reason for the achieved excess days. Of the 14 firms that managed to improve their excess days, six showed a decrease in the average age of inventory and an increase in average age of payables. The remaining eight firms improved in one area but deteriorated in the other area. In five instances payables were improved which resulted in lower excess days and in the other three instances inventory days were reduced.

Further to the results above the following trends and relationships were noted: 14 firms managed to reduce their excess days between 2% and 103% with an average of 41%, between 1995 and 2001. It was noted that many successful retailers held two months' worth of inventory during 2001. As a result of making use of consignment inventory over the 1995 - 2001 period, such retailers showed a significant decline in their days accounts payables which is due to purchases only being recorded once the inventory held as consignment is sold to the customer. Vast differences were identified between different sectors, and even within a sector variability was noted. The study did however show again that an increase in sales will require an increase in working capital, and large retailers make use of their suppliers to fund this needed increase in working capital investment.

As mentioned before, the working capital management policies will differ between larger and smaller firms. Within small firms, where there are limited staff members, the accounting- and managerial functions are not always separated. Also, the management of the different components to net working capital may be performed by one individual. Smaller firms will not have the same resources available as larger firms, which limit the implementation of certain net working capital policies.

2.6.3 The Effect of Working Capital Management on Small Retail Firms' Profitability

Garcia and Martinez (2007:164) studied the effect of working management policies on profitability in Spanish SME's, including 8 872 SME's over a seven-year period (1996 – 2002). The importance of working capital is clear, the current assets of firms included in this study was 69% of total assets and current liabilities represented more than 52% of total liabilities.

ROA was used as the dependent variable and was calculated as the ratio of earnings before interest and tax to total assets. The working capital management as independent variable consisted of days accounts receivable, days of inventory and days accounts payable. From these three variables the CCC was calculated for each of the observations. Other control variables were included such as firm size, sales growth and leverage. The results were presented for the different sectors (agriculture, mining, manufacturing, construction, retail trade, wholesale trade, transport and public services and services) because net working capital has certain distinct characteristics within the sector in which it operates.

The highest ROA was noted for the mining industry and service sector with a value of 10%, and the lowest ROA of 7% was present for agriculture, trade (wholesale and retail), transport & public services. The lowest figure for days of trade receivables was noted for the retail industry (38 days). This was expected, for retail industries are prone to have predominantly cash sales. The highest number of days of trade payables was found in the construction sector where customers take more than 145 days to pay outstanding amounts due. The retail industry paid their suppliers the fastest (56 days) and the mining & construction sectors paid their suppliers only after 140 days. For inventory, the agriculture sector had the longest number of days (106 days) with transport & public services having the lowest days at 15 days. The effect of the low number of inventory days for the transport & public service sector was that it resulted in a negative CCC. The longest CCC was noted for the agriculture (95 days) and manufacturing firms (96 days).

The study further showed a negative correlation between the ROA and days inventory, days of accounts receivable and days accounts payable, indicating an overall negative correlation between the ROA and the cash conversion cycle. This implied again that storing inventory for the shortest possible time, collecting receivables more timeously and paying suppliers faster will have a positive effect on a firm's profitability. Based on the results presented by Garcia and Martinez (2007:175) the best way to improve profitability is to lower the days in inventory and accounts receivable, due to the high negative correlation identified with the ROA.

An optimal CCC is achieved by keeping it as short as possible, which may include processes to keep the turnover time of trade payables as long as possible. However, the results presented by Garcia and Martinez (2007:175) indicates that the days in accounts payable is negatively correlated to the ROA, implying that if payments are delayed to suppliers it will have a negative effect on profitability. Delaying payments to creditors will have a positive effect on the firm's cash flow, however it may affect profitability adversely. The study concludes that the number of days in inventory and accounts receivable does have an effect on the profitability of SME's, however the effect of days in accounts payables loses statistical significance when the study controls for possible endogeneity problems.

Hofmann and Kotzab (2010:312) identified areas of concern from the empirical results in his study. Firstly, when investigating the collection period of debtors, a deficiency in the order-to-cash cycle was identified. The delay in receipts of debtors outstanding could be caused by a delay in invoice reconciliation, which would have a negative effect on the days of sales outstanding. Management of firms needed to consider the cost and benefits of implementing more effective debtors' management processes. Secondly, the deficiency in the forecast-to-fulfil cycle should be considered. Holding excess amounts of inventory would result in an increase of costs and may also lead to tax disadvantages. However, it would ensure that the firm are less likely to have stock outs and would increase its ability to deliver, but would not add to shareholders' wealth. It was therefore important to have the correct trade-off between costs of holding the stock, and the costs of stock outs.

The third and final area identified by Hofmann and Kotzab (2010:312) was the deficiency in the purchase-to-pay cycle when dealing with suppliers and deciding on the payment approach followed by the firm. Suppliers were often seen as a form of cheap financing and this was then often misused. In the long term this may result in strained supplier relationship and an increase in prices of goods and/or services. Hofmann and Kotzab (2010:313) believed that these deficiencies in the working capital management of single companies could be addressed by investigating the working capital management of supply chain orientated companies and applying certain approaches from a supply chain perspective which would improve the working capital of a firm.

2.6.4 The Effect of Working Capital Management on Profitability and Liquidity of Smaller Firms

Bellouma (2011:71) aimed his study on the emerging market of Tunisian companies, as previous studies tended to focus on large corporations in the US and Europe. As noted in the previous section, SME's are more reliant on internal financing to finance working capital needs. Bellouma (2011:75) performed this study on 386 export SME's for which data was obtained from the Tunisian Export Promotion Center (CEPEX). Of the 386 companies included in this study 136 were in the food industry, 96 in the product construction materials industry, 104 in the textile business and 22 in the service industry.

The first hypothesis formulated for this study was that more profitable Tunisian export SME's tended to maintain lower levels of inventory. This was based on the theory that inventory levels should be kept at the minimum level to reduce unnecessary costs. The inventory days was used to determine the inventory management and was calculated as follows: $(\text{Inventories} \times 365) / \text{Cost of sales}$. The dependant variable was corporate profitability, which was measured by the gross profit margin. The following formula as used by Deloof (2003:576) was used by Bellouma (2011:75) to calculate the gross profit margin: $(\text{Total sales} - \text{cost of sales}) \div (\text{Total assets} - \text{financial assets})$.

The second hypothesis of Bellouma (2011:73) stated that less profitable firms will take longer to pay their suppliers, as was found in the study of Belgium firms by Deloof (2003:585). Due to the damage late payments can do to a company's reputation payments would be made in good time if the company was in the position to do so. However, companies that were less profitable would have to wait longer to pay their suppliers. The days of trade payables was calculated as $(\text{accounts payable} \times 365) \div \text{purchases}$. Bellouma (2011:73) formulated another hypothesis stating that less profitable Tunisian export SME's spent more time in receiving payment from customers. Results were similar to those of Deloof (2003:585) that there is a significant negative correlation between gross operating income and the period that a company takes to collect outstanding debt.

The fourth hypothesis stated that the amount of liquidity generated by Tunisian export SME's would negatively influence their profitability. The liquidity of a firm was measured here by the CCC, with a longer cash conversion cycle indicating higher levels of liquidity. Previous studies (Deloof, 2003:585; Eljelly, 2004:59; and Erasmus, 2010:9) found a negative correlation between profitability and liquidity, indicating that higher levels in liquidity would have a negative effect on a firm's profitability.

Results indicated that all the companies had a positive gross profit margin, with the CCC being negative for some, and positive for others. The average collection time was 100 days, the average payment time 98 days and the average days in inventory 79 days. All the working capital components were found to be negatively correlated to the gross profit margin, confirming the fourth hypothesis. These results suggested that companies should reduce their days of receivables and inventories in order to improve profitability.

In terms of financing, Bellouma (2011:80) investigated the effect of the debt ratio on the profitability of a company, and found a positive correlation. This finding suggested that outside funding would be more beneficial and that leveraged companies will have higher profits. Companies should therefore consider obtaining external funding before lengthening the cash conversion cycle by investing into trade receivables and inventories.

The study managed to prove that the management of working capital will have an effect on a company's profitability, and that management should manage the different components in order to have a positive effect on profitability.

The following table was constructed by Bellouma (2011:74), summarising the findings of similar studies performed to determine the effect of working capital management on the liquidity and profitability of a firm.

Table 4
Summary of main studies on working capital management

Authors and date	Sample	Period	Results
Shin and Soenen (1998)	58,985 American listed firms	1975 – 1994	Negative relationship between profitability and net trading cycle, average collection period, inventory turnover and average payment period.
Deloof (2003)	1009 non-financial firms	1992 – 1996	Negative relationship between profitability and net trading cycle, average collection period, inventory turnover and average payment period.
Eljelly (2004)	29 Saudi listed companies	1996 – 2000	Negative relationship between profitability and liquidity
Gaur and Kesavan (2006)	353 US listed retailers	1985 – 2003	Negative relationship between inventory turnover and gross margins
Lazardis and Tryfonidis (2004)	131 listed Athens companies	2001-2004	Negative relationship between profitability and inventory, receivable, cash conversion cycle and payable
Ganesan (2007)	349 American telecommunication equipment companies	2001 - 2007	Negative relationship between profitability and inventory and days of working capital.

Source: Bellouma (2011:74)

Based on the summary above it can be concluded that profitability and liquidity are negatively correlated for SME's as well as for larger companies. Liquidity will be the result of how the components of working capital is structured and managed by each company, and will be different for all. However, for companies in similar sectors there should be similarities in the management of net working capital.

Howorth and Westhead (2003:95) carried out a study to investigate the working capital management practises of small companies in the United Kingdom (UK). One

of the motivations of this study was the importance of working capital in any company and the perception that small companies often don't see the need to implement working capital processes. However, working capital management could improve profitability and reduce the risk of business closure. Management and ownership was often not separated and the need for formal management accounting processes was often overlooked. A qualitative approach was adopted for this study by sending out questionnaires to small companies in the UK. Small companies are defined by the UK Companies Act as companies with reported sales revenue of less than £ 2.8 million and with less than 50 employees. Out of the 1928 small companies in the UK in 1996 when the questionnaires were sent out, 343 responses were obtained.

Eighteen hypotheses (H) were formulated for this study and will be discussed briefly. H1 and H2 was that larger and older firms were associated with implementing working capital routines, because in larger firms control systems are more sophisticated, and more resources are available for an investment in working capital. Older firms would have larger human resources, where in smaller firms as noted earlier the financial management functions might be the responsibility of the principal owner. H3 states that firms with low levels of financial skills will not invest in working capital routines, due to the lack of expertise and resources available. H4, H5 (a) and H5 (b) noted that firms with high returns on total assets and firms that reported high cash sales were negatively associated with implementing working capital routines. H6 stated that companies that reported high cash sales were negatively associated with cash flow and debtor management routines. H6 and H7 stated that firms providing seasonal products or services and firms desiring a growth in their business size were positively associated with implementing working capital routines. H8 (a) and (b) indicated that firms reporting frequent use of external financing were positively associated with implementing working capital management and cash management routines. H9 (a) and (b) was that firms reporting high credit purchases were positively associated with implementing working capital, credit and stock management routines. H10 (a) and (b) stated that firms with longer production cycles were positively associated with working capital and stock management routines. H11 (a) and (b) stated that firms that reported that a small proportion of customers pay on time were positively associated with implementing working capital and credit

management routines. H12 (a) and (b) stated that firms reporting that they pay suppliers late were positively associated with the implementation of working capital and cash management routines.

The questionnaire sent to respondents included 11 working capital routines (i.e. stock turnover, stock levels, stock reorder levels, customer credit periods, customer discount policy, bad debts, doubtful debts, customer credit risk, payment period to creditors, finance of working capital and use of cash budgeting). The respondents were required to indicate how often they reviewed the 11 routines, bearing in mind that the questionnaire was completed by the managing director, principal or founder of the company. The options as to how often they review these routines were: never, sometimes, quite often, often or very often. 75% of the respondents indicated that they do review payment periods to creditors, 71% customer credit risk, 70% cash budgeting, 70% customer credit periods, 68% doubtful debts, 68% finance of working capital, 64% stock levels, 61% bad debts, 60% stock reorder levels, 59% stock turnover and 30% review the customer discount policy. From the feedback of the respondents it appeared that inventory and debtor's management processes were not implemented properly. Firms tended to focus on different components in the working capital cycle (debtors, inventory or creditors management).

The study was extended by grouping the 283 companies into four categories to get a better understanding of the working capital management techniques and to test the hypotheses formulated. The categories were: companies focusing on cash management routines (61 companies) referred to as "CASH" type, companies focusing on stock management routines (67 companies) referred to as "STOCK" type, companies focusing on debtor management routines (49 companies) referred to as "CREDIT" type, and lastly companies that do not focus on any working capital routines in particular (106 companies) referred to as "LOW" type.

Of the eighteen hypotheses set by Howorth and Westhead (2003), twelve were confirmed to be true and can be summarised as follows: CASH type companies were larger firms that have fewer cash sales. They were associated with seasonal sales, dependant on external financing and possibly had more cash problems than other types of companies. STOCK type companies tended to be smaller and younger

companies, were less dependent on external financing and had longer production cycles. CREDIT type companies had lower profitability, were noted to be more likely to be interested in future growth, and had more purchases on credit but less customers paying on time. LOW type companies with the least working capital techniques implemented were noted to have the least sophisticated financial skills; they have higher profitability but were less focused on growth in the future. They were less dependent on external financing, had fewer purchases on credit, shorter production cycles, more of their customers were paying on time and they had less cash flow problems.

From the results above Howorth and Westhead (2003:107) found that small companies were not all managing working capital similarly and focused on different areas in the working capital cycle. This indicates that resources available were limited and firms were not in a position to concentrate on all the aspects. This is not necessarily the main reason why management is not focused on all the working capital components but it could definitely be a reason. Further studies should be considered to investigate the relationship between working capital management and financial managerial skills in more detail (Howorth and Westhead 2003:109).

2.7 SUPPLY CHAIN MANAGEMENT AND WORKING CAPITAL MANAGEMENT

2.7.1 Introduction

During 2009 the world economy found itself in a recession period. The availability and costs of inputs such as raw materials were unpredictable, and had a direct effect on working capital management (Bittner, Porda & Serda 2012:53). Bittner further noted that risk identification and measures had to be sufficient to ensure that the management of net working capital was safeguarded against unforeseen changes in the economy and marketplace. By managing working capital effectively a company could improve operating margins and maximise its liquidity position. Operating risks, the cost of borrowing and inefficiencies could therefore be minimised.

Net working capital is made up of various components, however, according to Bittner *et al.* (2012:53), a company will focus attention of the area identified according to its

business structure and type of industry in which it operates. Bittner believes that net working capital management should start in the office of the CEO (chief executive officer). He further stresses that effective working capital should start with proper cash forecasting.

Bittner *et al.* (2012:55) concluded that firms with a more holistic approach will have better management over working capital. This can be accomplished by having an open relationship with suppliers and customers, and finding opportunities to decrease the levels of inventory, which will have a direct effect on carrying costs and obsolete stock. Also, an enterprise-wide approach for the managing of working capital will be more effective and will create business opportunities.

2.7.2 The Role of the Supply Chain on Working Capital Management

Supply chain management has become increasingly important over the years due to the global recession, intense competition between firms and the increased demand to improve shareholders' value. Supply chains are being analysed to understand the relationships between the members of the supply chain, in order to determine ways in which different companies within a supply chain can work together to improve overall financial performance and ultimately shareholder wealth. The world economy is just recovering from a global recession where companies tended to negotiate better prices with suppliers, and paid them later in order to improve their working capital cycle, which was often at the expense of other members of the supply chain (Losbichler and Mahmoodi, 2012:32).

Supply chain processes include open discussions with the suppliers and consumers to share planning and forecasting strategies. This would enable suppliers to plan according to the customers' needs by sharing planning and forecasting strategies with their suppliers. All of the members of the supply chain would then have better control over their inventory levels and could reduce unnecessary costs in holding excess inventory. Therefore the benefits of supply chain processes include the possible reduction in operating and logistical costs, and if implemented properly by management it could be done to benefit the overall working capital, not only for the company but also for supply chain members. Companies that recognise this and

realise that it will have a positive effect on their profitability would strive to minimise operating costs and implement initiatives that will not only benefit themselves but also their supply chain members (Losbichler and Mahmoodi 2012:33).

According to Losbichler and Rothboeck (2006:282) companies that announced that there were problem areas in their supply chain processes experienced significant losses in their share value. Due to the interactive influences of suppliers and buyers of goods and/or services in a working capital cycle, effective supply chain processes can have a significant impact on the working capital management. This could be accomplished if the buyers and suppliers involved implemented strategies which would at the end not only benefit themselves, but also other parties in the relevant supply chain.

Working capital management often entails processes to maximise the age of payables to such an extent that the suppliers are impacted negatively. From a supply chain perspective the goal is still to optimize working capital by reducing the time that cash is tied up in operations to a minimum, however this is done in a way that benefits all parties involved within the supply chain.

2.7.3 Supply Chain Approach to Working Capital Management

Filbeck and Krueger (2005:11) studied the results of working capital management across industries. The study was based on the CFO magazine's annual survey of working capital management of the top 1000 firms in the United States of America. These 1000 firms were firms across all industries, and in his study Filbeck wanted to investigate the effects of working capital management on firms in different industries.

As noted by Filbeck and Krueger (2005:11) many firms introduced the Six Sigma methodology to improve their working capital management. This methodology implied that all sectors in a firm should be managed in such a way that the overall working capital of a firm improves. This supply chain methodology would improve customer satisfaction and reduce the investment in working capital. It was however still important to identify the optimal level for a specific firm, which would differ between industries.

The CFO magazine carried out this annual study on the top 1000 firms of 26 industries, with participation of at least eight firms per industry. This study incorporated the data from 1996 to 2000. For each firm the cash conversion efficiency (CCE) was calculated, which measured the firm's ability to convert revenues into cash flows. The days of working capital (DWC) which measures the time from when inventory was purchased until when the cash was collected from the creditor was also calculated. Other meaningful ratios were the days outstanding of receivables, inventory turnover and the days outstanding of payables. The 1000 firms were then also ranked according to overall working capital management, which was calculated as follows:

$$\text{Overall ranking} = (\text{Highest overall CCE} - \text{company CCE}) \div (\text{Highest overall CCE} - \text{Lowest overall CCE}) \times (\text{Lowest overall DWC} - \text{Company DWC}) \div (\text{Lowest overall DWC} - \text{Highest overall DWC})$$

Filbeck and Krueger (2005:13) formed two research questions in this study. The first was whether firms within the same industry would have consistent working capital measures, and the second whether working capital performance for firms within the same industry changes from year to year. Industry specific findings suggested that the petroleum industry had the best overall working capital rankings, followed by the electric and gas utility. The two worst performing industries with regards to overall working capital was the textiles and apparel industries. The telecommunications industry showed the greatest variation on overall working capital performance. The furniture industry was one with the biggest extremes, due to at least one of the companies in this industry having opposite results from the rest of the firms. In other industries however, it was found that firms within a given industry had very similar working capital management styles. Findings also suggested that the management style of working capital did not change significantly over time.

The food industry, a typical industry in the retail sector, was expected to have a low number of days in overall working capital. This was due to inventory being sold fast, which would result in creditors being paid fast. The findings showed low number of days in working capital, as a result of the quick inventory turnover and short period of

days of payables. The food industry did however show poor cash flow based on the cash conversion efficiency which suggests that receivables were not collected as quick as the creditors were being paid. The food sector found itself together with the food and drug stores, forest products, petroleum, pharmaceuticals and publishing, in the lowest and highest three levels of the different working capital measures.

Filbeck and Krueger (2005:17) listed the shortcomings of his study as the time period being very short. But probably the most significant shortcoming was the fact that only the top firms of every industry formed part of this study.

Grant Thornton (2010:1) together with World Trade magazine conducted a series of three surveys to investigate supply chain solutions. Management of US companies were asked to complete a survey in the World Trade magazine, and during the period 3 – 18 Feb 2010, 316 responded. Of the respondents 90% indicated that they did take some action in 2010 to reduce their investment in working capital, which is significantly higher than the reported 78% in 2009. It was however noted that the processes involved in reducing the investment in working capital was mainly price negotiations with suppliers and not improvement of infrastructure such as warehousing and transportation processes (Grant Thornton, 2010:2). To negotiate price concessions is not necessarily a bad thing, but more aggressive approaches such as improving infrastructure will reduce overall costs of a company and will be more effective over the long term. As explained by advisory services partner Lyman (Grant Thornton, 2010:2), as part of price concession discussions the supply chain partners should share forecasting and planning schedules which would cut the costs of the supplier and benefit the consumer. Only 33% of the respondents indicated that they shared forecasts and planning schedules with their supply chain partners and 33% established supply chain-wide inventory management strategies. Other findings in this survey are documented below.

Of the 316 respondents in this study the following types of actions were reported to be implemented by the different companies, in order to optimize the working capital invested within its supply chain: 55% of the respondents noted that they received concessions from suppliers, 43% extended payment terms with their suppliers, 43% indicated that they provided pricing concessions to customers and 29% extended

payment terms for their customers. 36% of the respondents implemented information technology improvements and 34% implemented inventory infrastructure improvements.

Further to the above processes respondents were asked to indicate which processes they implemented during 2010, and they were also asked to indicate their planned action for the 2011 to optimize the working capital invested within their supply chain. 44% of respondents were planning to receive pricing concessions from suppliers, 33% were planning to extend payment terms with suppliers, 31% were planning to provide pricing concessions to customers and 20% to extend payment terms for customers. 39% of respondents were planning to share forecasts and planning schedules with supply chain partners (6% more than in 2010) and 36% were planning to establish supply chain-wide inventory management strategies.

Another study emphasizing a supply chain-orientated approach to the working capital management was the study by Hofmann and Kotzab (2010:305). To test the effect of supply chain management Hofmann and Kotzab (2010:306) investigated the differences between the cash cycle of firms applying the supply chain approach, and those firms that don't.

2.7.4 Effective Supply Chain Approaches

Approaches that are commonly used by firms to enhance working capital management is to delay payments to suppliers, implement stricter collection techniques of receivables and keeping inventory levels at a minimum. According to Hofmann and Kotzab (2010:305) these are insufficient techniques. Delaying payments to suppliers may have a short-term benefit on the working capital balance of a firm. However, the profitability of the supplier will be affected negatively and the risk exposure will be high for that supplier. Therefore, delaying payments to creditors could result in a high risk supplier base. Hofmann and Kotzab (2010:306) aimed his study at investigating the effect of collaborative approaches on the working capital of a firm.

The data used in this study was the largest 300 US and European companies in 2005, as investigated by Reason (2005:1) in the annual CFO's working capital survey. The data was obtained by REL consultancy group, which is based in New York. The overall results of the study by Reason (2005:3) showed an improvement in payables, but fewer companies were able to improve receivables and inventory from 2004 to 2005. Even though the companies were delaying payments to creditors in order to improve overall working capital, the delay in payment may result in the supplier raising prices in the future to cover the finance cost due to these late payments. An increase in days payables outstanding can indicate one of two things. Firstly, a company can delay payments to suppliers purely to improve their working capital position. As mentioned by Reason (2005:3) this should be done with caution for it may damage the supplier-customer relationship and result in higher future prices of products and services. A second reason why payments to suppliers are delayed is if a company does not have sufficient cash resources to make the necessary payments. It is therefore important to investigate the underlying reason for the increase in days payables outstanding. From a supply chain perspective, improving the overall working capital position must be set as an overall goal which will result in all departments of a firm benefiting from the management of the working capital.

Hofmann and Kotzab (2010:306) distinguished between two different types of companies. The first was single companies not applying a supply chain approach and the second inter-organizational companies applying the supply chain approach. In his study he explored the differences between these two types by analysing the role of payment terms for working capital improvements. The data of the largest 300 US and European companies in 2005 were used and divided into single- and supply chain oriented companies. The cash-to-cash cycle (also known as the cash conversion cycle) was used to assess the working capital management of a firm. In support of comparability between firms and the availability of information, when calculating days inventory held and days payables outstanding, net sales are used and not costs of goods sold.

This time-based working capital measure (cash-to-cash cycle) is important from an accounting and operational perspective. From an accounting perspective it is a

measure of liquidity, to assess whether a firm can cover its short-term obligations with the cash flow available. The different components of the cash-to-cash cycle can also be analysed to enable management to monitor and control these components. Due to the interaction of various elements the cash-to-cash cycle is a very useful tool from an operational perspective. As noted by Hofmann and Kotzab (2010:322) a major shortcoming of using the cash-to-cash cycle as a single time-based assessment is that it does not consider the added value of inventory from the raw material stage until it is ready for sale.

A shorter cash-to-cash cycle is preferred as the firm has access to its own capital on a more regular basis, which will enhance profitability and ultimately increase shareholders' value. This cycle can be shortened mainly in three ways: Firstly by reducing the production cycle, which will result in the days of inventory held being lower. Secondly the days sales outstanding can be reduced and thirdly, the payments outstanding can be increased. Companies can manage their working capital in such a way that the cash-to-cash cycle is negative, hence the outstanding amounts is collected from debtors before the suppliers are paid and the company is in fact financing its operations interest free. Of the top 20 companies in the study performed by Hofmann and Kotzab (2010:310), 15 of the 20 companies had a negative cash-to-cash cycle. However, from an industry perspective, none of the top 20 industries had a negative cash-to-cash cycle. Based on these results Hofmann and Kotzab (2010:310) investigated whether there was an improvement over a period and what drove the industry averages, by analysing supply chain relationships. Results indicated that companies tended to operate from a single perspective, not considering effects on customers and suppliers.

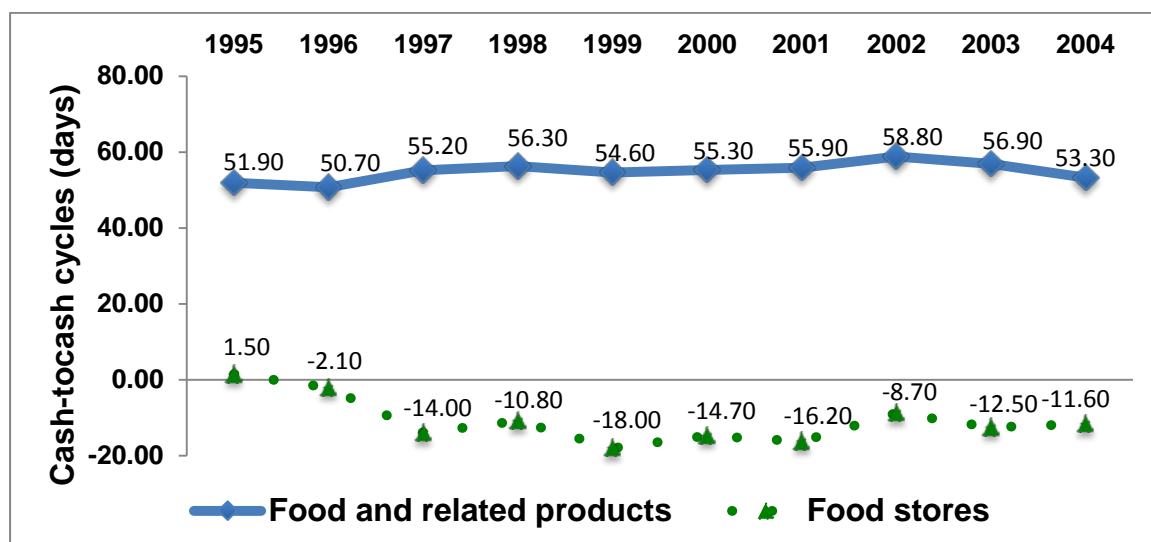
Losbichler and Rothboeck (2006:281) performed a study of the cash-to-cash cycle of 6 925 European companies over a period from 1995 to 2004. The data was obtained from Amadeus' Top 250 000, which covers companies operating in Europe. The cash-to-cash cycle formula was used to determine the number of days for each company included in the study.

Results indicated an improvement from 1995 to 2004 in the total cash-to-cash cycle of the 6 925 European companies. The cash-to-cash cycle was 56 days in 1995 and

in 2006 only 53.9 days. A more detailed inspection of the changes in the different components of this cycle explains the decrease. From 1995 to 2004 the average days sales outstanding decreased from 52.3 days to 52.1 days, average days payables outstanding decreased from 52.9 to 51.2 days and the average days in inventory decreased from 56.6 days to 53 days. The most significant change is the reduction in inventory days by 3.6 days.

From these results Losbichler and Rothboeck (2006:291) identified the question whether companies were improving their cash-to-cash cycle at the expense of other companies or industries? To test the possibility of this, two industries with a supply relationship between the two were investigated further. The industries used for this study were the food stores industry and the food- and related products industry with which it was in an exclusive relationship. The cash-to-cash cycle for the food stores industry decreased significantly from 1.5 days in 1995 to -11.5 days in 2004, whereas for the food- and related products manufacturing industry it increased from 51.9 days in 1995 to 53.3 days in 2004. This implies that the companies did improve their cash-to-cash cycle at the expense of other companies or industries. The relationship of the cash-to-cash cycle between the two industries is illustrated in figure 5.

Figure 5
COMPARISON BETWEEN FOOD STORES AND FOOD- & RELATED PRODUCTS



Source: Adapted from Losbichler and Rothboeck (2006:293)

The study concluded that even though some companies managed to improve their cash-to-cash cycle, and benefited from supply chain approaches, the overall performance of the European companies did not result in a significant improvement. It is therefore important to have a collaborative attitude to supply chain approaches in order for cross-company improvement.

2.7.5 Supply Chain Practices to Improve Working Capital Management

It is important that the necessary financial skills are available when implementing supply chain processes, and that supply chain managers have an understanding of working capital and the measurement thereof through the cash conversion cycle. Losbichler and Mahmoodi (2012:31) illustrate the importance with the following example: when input costs in the manufacturing department are increased the cost of sales and the unit costs will increase, resulting in higher cost of sales and inventories. When calculating the cash conversion cycle the days of inventory will not be affected that significantly, for in the formula ($\text{inventory} \div \text{cost of sales} \times 365$) the effect is included in the numerator and the denominator. This however is not true when calculating the days of payables outstanding ($\text{accounts payable} \div \text{cost of sales} \times 365$), where the increase in cost of sales will result in a lower days of payables outstanding. When calculating the cash conversion cycle ($\text{days of receivables} + \text{days inventories} - \text{days of payables}$), the cash conversion cycle will now be longer due to the decrease in days of payables. If a supply chain manager has no or little financial skills, the decrease in the cash conversion cycle will be interpreted as a result of payments made to creditors in too short a period, while the actual reason lies within the increased input costs of inventory.

Camerinelli (2007:46) investigated supply chain practices that can reduce working capital. He emphasized the importance of working capital as a goal since it creates profitable growth, something that mere costs reductions do not achieve. By looking at the three components of working capital strategies can be implemented to maximise each and have a positive effect on overall net working capital.

Camerinelli (2007:46) starts off by discussing key factors resulting in a decrease in days of receivables outstanding – which will result in a higher investment in working capital. He states that the most common problem is due to problems in delivery, the process taking too long or not working at all. A delay in the delivery time will not only harm the reputation of the firm, it also results in a delay of receiving payment from that customer. From a supply chain perspective a firm can determine the profitability of a delivery by using time value of money techniques. Additional infrastructure and/or resources can be implemented to improve delivery and retain the profitable customers. Planning to better assess the demand will also improve lead times which, together with optimal delivery time, will have a positive effect on receivable outstanding days.

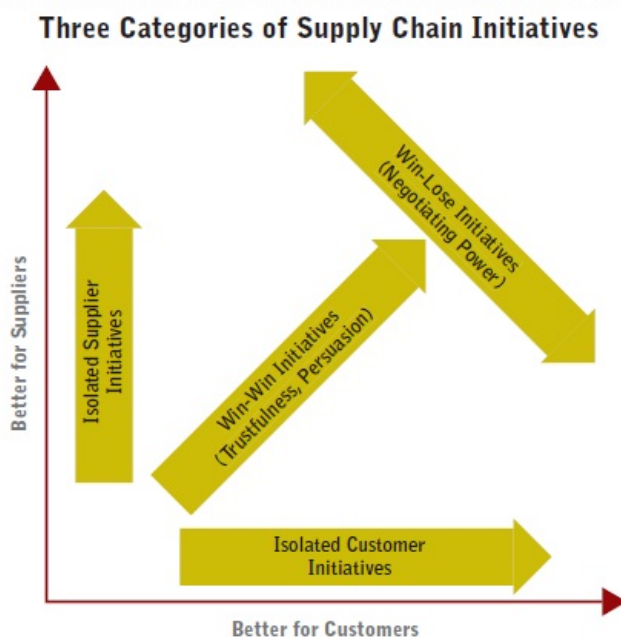
The second area where a company can implement supply chain processes is to shorten the inventory days. Camerinelli (2007:46) noted several problem areas in the inventory supply chain processes where an increase in inventory levels can occur: Excess time spent to receive and process raw materials received and to move these materials into the factory, excess time in managing purchases, sales orders and preparing the merchandise and improper planning and demand forecasts and errors when determining stock levels. Also, purchases were often done based on price volumes instead of on quantity really needed.

Another problem in inventory management was that component-, in-process- and finished goods were created too early in the supply chain process. The supply chain manager should closely monitor the completion of products, to ensure the total inventory in the pipeline is reduced. Some firms believe that the closer a product is to completion, the closer it is to the consumer buying the product. This is however just the case if these products are visible to consumers in store. If the work in process inventories are in the factory this is not true, because as long as there are sufficient goods in store, the quantities in the factory will not necessarily have an effect on the consumers decision making. It is therefore important to minimize volumes of goods not available for sale, and those which are ready for sale must be shipped to stores as soon as possible. The final area that can be improved is the day's purchases in accounts payable. To delay payments by negotiating extended payment terms with suppliers is however not a long term solution. This can only be done successfully if

there is a counterparty offer to the supplier such as offering the supplier visibility or better planning and scheduling. By implementing these supply chain approaches, the days of purchases in accounts payable can be extended and managed better which will have a positive effect on the firms' working capital and profitability.

Losbichler and Mahmoodi (2012:27) investigated the effects and benefits of working capital initiatives on the members of a supply chain. The different initiatives were categorised in different categories namely: isolated supplier or customer initiatives, win-lose initiatives and win-win initiatives. Isolated supplier or customer initiatives were initiatives such as JIT inventory holding and other optimized inventory systems, which are all initiatives benefitting only the supplier or customer. Win-lose initiatives were those where companies reduce their investment in working capital at the expense of other members in the supply chain, mainly by means of delaying credit payments to suppliers. Win-win initiatives occur when there is cooperation and sharing of information between the members of the supply chain, which will benefit all of the members within the supply chain. Losbichler and Mahmoodi (2012:32) illustrated these different initiatives as follows.

Figure 6
Three categories of supply chain initiatives



Source: Losbichler and Mahmoodi (2012:32)

Camereinelli (2007:47) concludes that approaches of reducing the investment in working capital by implementing supply chain approaches will only be successful if the supply chain managers work closely with financial managers. By implementing proper planning and processes the investment in working capital can be reduced and profitability improved.

Within a South African context no studies have yet been performed to analyse the effect of large retailers' power on their working capital investment and the effect on supply chain economics. There are significantly less large retailers in South Africa than in the USA, but it is definitely an area where further research can be done, to determine the effect that large South African retailers have on the supply chain economics. It will also be interesting to assess the number of these large retailers that integrate their financing decisions with supply chain management.

It is clear from previous studies that working capital does have an effect on a firm's profitability. The investment in working capital will determine the financing needed to support the working capital requirements of a firm. Financing decisions are based on the cost and risk imposed by the different components of financing.

2.7.6 Collaborative Cash-to-cash Cycle from a Supply Chain Company Perspective

Under the supply chain-orientated perspective, when the cash-to-cash cycle of one company improves, it will not be at the expense of another company. The approach focuses on the interactions between different parties in the supply chain, which will benefit all the parties at the end.

Hofmann and Kotzab (2010:313) describes the supply-chain-wide approach as the sum of all the participants' cash-to-cash cycle times and identifies two ways of reducing the cash-to-cash cycle time. The first approach would be to optimize the payment periods, reducing the time of days sales outstanding and increasing the time of days payables outstanding as suggested by the traditional approach of reducing the time of working capital. The problem with this technique, from a

collaborative approach, is that companies within the specific supply chain will not all benefit from longer payment time to suppliers, or shorter time to collect receivables. Only companies linked directly to each other will benefit while the rest will be influenced negatively.

The cash-to-cash cycle from the supply chain perspective is similar to the single company with the three main components of days sales outstanding, days inventory held and days purchases outstanding. As noted above the optimisation of the days sales outstanding and days purchases outstanding will not benefit all parties within the supply chain. The best way to manage the working capital from a supply chain perspective will therefore be to manage the days inventory held. The reduction of time that inventory is held will have a positive effect on the cash-to-cash cycle from an individual as well as a collaborative perspective.

In his study Hofmann and Kotzab (2010:322) discusses a good example of the supply approach implemented by the well-known consumer-products company, Unilever. Unilever had a cost of capital of 5% and, with its financial service providers, they offer financing for their suppliers in countries such as Kenya, Indonesia and Sri Lanka for whom the cost of capital in their own countries amounted to 11% or more. These suppliers could now use the financial strength of Unilever and the guarantee of payment which would result in an overall effective supply chain. As noted by Reason (2005:4) the head of global sales and operations of Unilever, Martin Jarvis, announced that, according to Unilever's calculations, net working capital fell with 40% from 2001 to 2004, a decrease of \$ 2 billion in monetary terms.

To enhance supply chain approaches and improve shareholder's value for all parties, proper planning, steering and flow of financial resources on an inter-organizational level is important. This will often be implemented and steered by a market leading company such as Unilever, to work closely with supply chain partners and to improve overall working capital.

2.7.7 Large Retail Firms Working Capital Management and the Supply Chain

Gosman and Kohlbeck (2005:9) studied 37 large retailers in the United States of America over a nine year period (1995 to 2003) to analyse the changes in excess days over the period and investigate the reasons for these changes. The 37 retailers, representing 11 retail sectors, were selected from Stores magazine's listing of the top 100 USA retailers in 2003. Of these 100 retailers, thirty-one firms had to be excluded due to lack of data availability over the period and 11 firms were excluded due to the lack of a peer retailer within the sample. Furthermore 19 supermarkets and two home shopping companies were excluded because the excess days had less meaning due to the nature of their business.

The study performed by Gosman and Kelly (2003:29) showed significant decreases in excess days of large retailers, which was due to a decrease in inventory days and/or days in payables. In this study, Gosman and Kohlbeck (2005:9) wanted to establish the reasons for decreases, as well as the effect on other parties within the supply chain. The sales growth was investigated to determine the changes from 1995 to 2005, which showed an enormous increase. For the large discounters and category specialists (31 firms) sales revenue grew by 154%. For the department stores (6 firms) it grew by 42%, and by 47% for the general merchandise, apparel, furniture and other miscellaneous sales (GAFO) firms, of which only six firms showed an increase of sales revenue of less than 47%. From these results it is clear that sales grew significantly over the years and it therefore shows that there was an increase in retailers' power over suppliers.

For each of the 37 firms included in the study the excess days were calculated. Of the 37 firms 20 managed to lower their excess days by 20 % or more. This decrease was gradually improved by most of the firms, but some did manage to decrease these days significantly in a two year period. The excess days were further investigated by splitting it between the inventory days and days purchases in accounts payables, to get a better understanding of the changes in total excess days. Ten of the 37 firms in the sample managed to lower their excess days by improving inventory days and days purchases in accounts payable. Twelve firms only managed to improve inventory and not days purchases, but the improvement

was great enough to compensate for the weaker days in purchases and these firms still had a lowered excess days as a result. The opposite was true for six firms, which improved days purchases to such an extent that it still resulted in an improved excess days even though days in inventory increased. Of the 17 firms that did not manage to lower their excess days over this period some still did manage to improve the days in inventory or days purchases in accounts payable. The overall decrease in excess days accomplished by the firms was mainly due to the stretching of days purchases in accounts payables.

To evaluate the effect of lowering excess days on working capital, one can compare the working capital investment in 1995 with the investment made in 2003. The firms included in the Gosman and Kohlbeck (2005:14) study managed to decrease their investment in working capital with over \$28 million from 1995 to 2003. Of these firms, nine managed to reduce their investment by \$750 million or more. Firms with very low excess days showed a massive saving in investment in working capital. For example, the firm Best Buy with an excess days of one in 2003, showed a decrease in investment in working capital of 58%. And a firm with a high number of excess days at 87 days in 2003, Borders, only managed to decrease their investment in working capital by 3%. But overall, the retail firms in this sample managed to improve their excess days and investment in working capital and it shows that firms have used their power to transfer the risks of holding inventory to its suppliers and to negotiate better credit terms. The decrease in working capital should result in an improvement of profitability and credit quality.

2.8 CONCLUSION

The management of net working capital is important in any organisation and has an impact on profitability and the liquidity of a firm (Deloof 2003:585). The net working capital components (inventory, trade receivables and trade payables) must be managed in such a way that the optimal level of net working capital assets is maintained to reach profitability and liquidity goals set by management.

Management can decide to follow the aggressive or conservative approach in financing net working capital, which will have different effects on the firms' liquidity

and profitability. Baños *et al.* (2012:17) found that financing working capital with short term financing (aggressive approach) will negatively affect profitability. Hill *et al.* (2010:798) had similar findings, suggesting firms in financial distress and applying an aggressive approach will have a decrease in their profitability.

The composition of the components of net working capital will have an effect on the profitability of a firm. Extending the average payment terms to suppliers may shorten the cash conversion cycle, but some studies found that the average payment terms are negatively correlated with profitability (Lazaris and Tryfonidis, 2006:34). Also, the average age of trade payables were investigated from a supply chain perspective in various international studies (Hofmann & Kotzab, 2010:322; Losbichler & Mahmoodi, 2012:32; and Losbichler & Rothbeeck, 2006:281) and it was found that firms tend to increase the average payment terms at the expense of other firms and industries.

Previous studies focused on the working capital management of different sizes of firms (Garcia & Martinez, 2007:164 and Lifland 2010:37) and some studies on firms within a specific geographical area (Deloof, 2003:575, Lazaridis & Tryfonidis, 2006:27 and Pimplapure & Kulkarni, 2011:54). The composition of net working capital assets and the effect on profitability and liquidity will be different amongst different industries. To the best knowledge of the researcher little research has yet been performed on the retail industry specifically and none in a South African context. Therefore the current study will focus on the retail industry and its subsectors within South Africa.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

This chapter will address the research design and methodology used in this study. This will be performed by detailing the justification for the methodology, research procedures, ethical considerations and any limitations encountered regarding the research design of this study.

3.2 RESEARCH METHODOLOGY

3.2.1 Description of Research Strategy and Design

In this study secondary data was used to test the hypotheses. The aim of this study was to analyse the relationship between working capital management of a firm and its profitability.

The data used in this study was obtained from the InetBFA and this data is available to the public. Data was not created for this study and is therefore known as secondary data.

With experimental research the independent variable is manipulated by the researcher in order to establish the effect it will have on the dependent variable. In financial science it is generally not possible to manipulate or change the data, hence in this study the relationship between the dependent and independent variable will be tested without manipulating the data. This is also known as non-experimental research.

The aim of this study was further to get better insight into the relationship between the management of working capital of a retail firm and the effect it will have on its profitability. Quantitative data was analysed to investigate this relationship.

3.2.2 Data Sample

South African studies investigating working capital management are limited. This study was aimed at investigating the working capital management processes in a South African context. As demonstrated in the literature study working capital management is very important within the retail industry, especially with regards to inventory management. Therefore, this study focused on South African firms within the retail industry.

This study was performed over a nine year period (2004 – 2012), on a sample that consists of 18 retail firms that have been listed on the JSE for this time and can be divided into sub-sectors, namely clothing (4 firms), food (3 firms), furniture (1 firm) and general retailers (9 firms).

The data of 18 firms were included in the data sample, however when the data sample was entered into SPSS statistics data editor (SPSS), five patterns of missing data were identified. There are different ways to deal with missing data, in this study the estimation of patterns of missing data was used. For each pattern of missing data identified, SPSS creates an additional dataset which will include the original dataset values with estimated values included in the missing pattern identified. This is then repeated for each pattern of missing values identified, in this study it was repeated for the five patterns identified. The final data sample will therefore consist of the original data sample plus the newly created data samples with the estimated values for each pattern of missing values. The original sample of 18 was therefore increased to 108 (18 firms x 6 data samples).

The sub-sectors with the various firms are presented in Table 5.

Table 5

Firms per sub-sector

Industry sub-sector	Firm name
Clothing	Rex Trueform Clothing Company Limited Mr Price Group Limited The Foschini Group Limited Truworths International Limited
Food	Pick n Pay Stores Limited Shoprite Holdings Limited The Spar Group Limited
Furniture	JD Group Limited Lewis Group Limited
General retailers	Alert Steel Holdings Limited Clicks Group Limited Verimark Holdings Limited Combined Motor Holdings Limited Taste Holdings Limited Cashbuild Limited Italtile Limited Massmart Holdings Limited Woolworths Holdings Limited

3.2.3 Method of Data Collection

The financial data required to undertake this research was obtained from the InetBFA database. This database offers standardised financial data of firms listed on the JSE, as all the financial data of the firms in this study is in compliance with IFRS.

3.3 HYPOTHESES

As mentioned in the problem statement, the study was undertaken with the aim to determine the effect on profitability based on the management of working capital of a retail firm. This will include tests to determine the composition of different working capital components and their effect on profitability. The components of working capital management investigated were inventory management, receivables management and payables management. From the literature review the following hypotheses were formulated, which was tested in this study.

3.3.1 Hypothesis 1

When amounts are invested in current assets, the investment is effectively tied up in working capital, and it cannot be used for other investment opportunities, which results in opportunity costs. If firms can manage to reduce their investment in working capital, their profitability will increase.

H1: The lower a firm's investment in working capital, the higher its profitability will be.

3.3.2 Hypotheses 2 and 3

Among others, inventory management is one of the important aspects in the retail industry. Due to the size and business types of retail companies the investment in inventory can be very high. Costs of holding relative large amounts of inventory will escalate as volumes of inventory holding increase. Therefore it can be concluded that, by lowering inventory levels, profitability will increase.

H2: The lower a firm's investment in inventory, the higher its profitability will be.

From the hypothesis formulated above one cannot conclude that for a firm to be profitable, no inventory should be kept. The next hypothesis will therefore be aimed to establish the optimal level of inventory to be kept by a retail firm.

H3: A decrease in the profitability of the firm will be due to an increase in inventory.

3.3.3 Hypotheses 4 and 5

Trade receivables are defined as short-term, interest free credit extended to customers buying goods on credit. Trade receivables and the management thereof will differ amongst firms and will be dependent on factors such as credit terms provided, the customer base and the ratio of credit and cash sales. Credit are extended to customers to increase sales volumes, however, while these accounts are outstanding the firm extending the credit cannot utilise that cash. Trade receivables must therefore be collected in the shortest amount of time possible so that the cash can be used to increase profits.

H4: The lower a firm's investment in trade receivables, the higher its profitability will be.

As with inventory, trade receivables cannot be lowered to zero in order to improve profitability, since when a firm extends credit it will result in trade receivables. The question is: to what level can the trade receivables be lowered before profitability is affected negatively?

H5: A decrease in the profitability of the firm will be due to an increase in trade receivables.

3.3.4 Hypotheses 6 and 7

Management of trade payables often include processes to maximise the age of trade payables, which will have a positive effect on the firm's working capital level. Processes such as delaying payments even beyond credit terms can be enforced, which will have a positive effect on the working capital balance but the suppliers will be effected negatively. Such delays can result in penalties and interest charges, damage the supplier/customer relationship and have a negative effect on the supply chain it operates in. However, when payments are extended as far as possible within the agreed credit terms, the firm will have access to cash resources, and the profitability of the firm will increase.

H6: The higher a firm's investment in trade payables, the higher its profitability will be.

Again, it cannot be concluded that when no trade payables are held a firm will be profitable. There is however a level where a change in the trade payables will no longer have a positive changing effect on profitability.

H7: A decrease in the profitability of the firm will be due to a decrease in trade payables.

3.3.5 Hypothesis 8

Working capital can be managed from either a conservative or an aggressive financing approach. Under a conservative approach the total liabilities of a firm mainly consists of current liabilities, and total assets mainly of current assets. In the contrary case when an aggressive financing approach is followed total liabilities will mostly consist of non-current liabilities and total assets of non-current assets. Companies using an aggressive financing approach can use excess cash to invest in more profitable or productive assets.

H8: Companies following an aggressive approach in managing working capital will be more profitable than companies following a conservative approach.

From these hypotheses a number of variables were identified that will be included in this study and are discussed below.

3.4 DEPENDENT AND INDEPENDENT VARIABLES

The dependent and independent variables used for this study were determined by the hypotheses formulated and those identified in previous studies as covered in the literature review. For hypotheses 1, 2, 4 and 6 working capital will be measured with CCC, AAI, AAR and AAP respectively, which will be the independent variables. Profitability will be measured with ROA, ROE, GPM and EVA, which will be the dependent variables. In hypotheses 3, 5 and 7 the dependent and independent

variables will be turned around, therefore working capital will now be the dependent variable and profitability the independent variable. For hypothesis 8 short-term financing will be the independent variable and profitability the dependent variable.

3.4.1 Working Capital

Working capital management will be measured by the CCC for each firm. The CCC measures the time that working capital is tied up in a firm's operations, as it incorporates the inventory turnover time, average collection period and the average payment period, and it is expressed in days. For each of these components (inventory, trade receivables and trade payables) the time it takes to be converted into cash will be calculated. As long as cash is tied up in these operations it cannot be used to invest in profitable investments or productive assets. Therefore the CCC days should be kept to a minimum without compromising operations. The CCC can be compared amongst firms within the same industry to evaluate the management of these components and to identify potential problem areas within working capital management practises of a firm. The different components of CCC namely AAI, AAR and AAP will also be used as dependent variables for the relevant hypothesis testing.

3.4.2 Short-Term Financing

Short-term financing (STF) was used as the dependent variable in hypothesis 8 in order to determine the approach management follows to finance its working capital (conservative versus aggressive) and to investigate the effect it has on a firm's profitability.

Short-term financing was measured as follows:

Short-term financing = Current liabilities ÷ Total liabilities

3.4.3 Profitability

For the purpose of this study the profitability of the firm was measured by various profitability ratios. Firstly, the ROA was determined, which measures the operating profit (EBIT) generated by the firm expressed as a percentage of total assets

employed. Secondly, the ROE will be calculated, measuring the return available to ordinary shareholders. The third ratio is the operating profit margin, which is the operating profit before interest and taxes as a percentage of sales. Fourthly, the net profit margin was calculated, measuring the net profit available to ordinary shareholders as a percentage of sales. Lastly, the EVA was calculated. The EVA is an indicator of the economic value created by the firm after meeting operational needs and capital requirements.

The calculations for the various independent variables are as follows:

- *Return on average assets*

The ROA can be calculated as follows:

ROA = Profit available to ordinary shareholders ÷ total assets

- *Return on equity*

The ROE can be calculated as follows:

ROE = Profit available to ordinary shareholders ÷ ordinary equity

- *Gross profit margin*

Gross profit margin = Sales – Cost of sales ÷ sales

- *Economic value added (EVA)*

EVA = Net operating profit after tax - (Capital invested x weighted average cost of capital)

3.5 RESEARCH PROCEDURES

In this section the method of analyses and statistical techniques employed will be discussed.

3.5.1 Method of Analysis

Panel data was used in this study. The observations of each firm was analysed over the study period (2004 – 2012) for each year, and was analysed in terms of time (the years of the study) as well as cross sectional (sub-sectors within the retail industry).

We estimate the following empirical modules:

- Hypothesis 1:

$$\text{Profitability variable}^* = \beta_0 + \beta_1 \text{CCC} + \varepsilon$$

- Hypothesis 2:

$$\text{Profitability variable}^* = \beta_0 + \beta_1 \text{AAI} + \varepsilon$$

- Hypothesis 3:

$$\text{AAI} = \beta_0 + \beta_1 \text{ROA} + \beta_2 \text{ROE} + \beta_3 \text{GPM} + \beta_4 \text{EVA} + \varepsilon$$

- Hypothesis 4:

$$\text{Profitability variable}^* = \beta_0 + \beta_1 \text{AAR} + \varepsilon$$

- Hypothesis 5:

$$\text{AAR} = \beta_0 + \beta_1 \text{ROA} + \beta_2 \text{ROE} + \beta_3 \text{GPM} + \beta_4 \text{EVA} + \varepsilon$$

- Hypothesis 6:

$$\text{Profitability variable}^* = \beta_0 + \beta_1 \text{AAP} + \varepsilon$$

- Hypothesis 7:

$$\text{AAP} = \beta_0 + \beta_1 \text{ROA} + \beta_2 \text{ROE} + \beta_3 \text{GPM} + \beta_4 \text{EVA} + \varepsilon$$

- Hypothesis 8

$$\text{STF}^{**} = \beta_0 + \beta_1 \text{ROA} + \beta_2 \text{ROE} + \beta_3 \text{GPM} + \beta_4 \text{EVA} + \varepsilon$$

Where ROA is a measure of the return on assets, ROE is a measure of the return on equity, GPM is a measure of gross profit margin and EVA is a measure of

economic value added. CCC is the measure for the cash conversion cycle, AAI for the average age of inventory, AAR for the average age of receivables and AAP the average age of payables, and ε represents an error term.

*Profitability variable** represents ROA, ROE, GPM or EVA, therefore the empirical module will be repeated for each *profitability variable*.

*STF*** represents the different approaches to working capital financing being aggressive, conservative and neutral. The empirical module will be repeated for each financing approach.

3.5.2 Statistical Techniques Employed

The descriptive statistics was performed on both the dependent and independent variables, this was done to obtain the mean value and test the normality of the data.

A Pearson correlation calculation was then performed to establish whether the variables are correlated with each other, and to determine the direction of correlation.

Due to the data set being based on firm-specific observations over time (2004 – 2012) and more than one explanatory variable included in the study, multiple linear regression analysis was performed. According to Pallant (2013:148) multiple regression is based on correlation but allows a more sophisticated exploration of the interrelationship if more than one independent variable are used. When the best indicator of an outcome wants to be identified in a set of variables, multiple regression analysis can be used (Pallant 2013:149).

Standard multiple regression was performed in this study. The independent variables are entered simultaneously into the equation and each is then evaluated in terms of its predictive power in predicting the dependent variable.

The analysis of variance table (ANOVA) was used to determine the variance between the different independent variables. The f test was calculated to establish

the variance between the variables and is interpreted by using the p -value. A significance level of 0.01 was used to compare the p -value of the f test.

With a dataset of one dependent variable and a number of independent variables, a multiple regression is a very good method (Tabachnick and Fidell, 2013:117). There are however some assumptions required by this method. The key assumptions listed by Tabachnick and Fidell (2013:123-128) were dealt with as follows in this study:

- *Ratio of cases to independent variables*

A dataset must consist of enough data points to have meaningful results. The required dataset will be dependent on a number of factors such as desired power, alpha level, number of predictors, and expected effect sizes. The rule of thumb is that $N \geq 50 + 8(m)$ where m is the number of independent variables in the study. In this study there are four independent variables resulting in a required sample size of 82 ($50 + 8(4)$) when the rule of thumb is used. The sample size for this study is $n=108$, therefore the ratio of cases to the independent variables appears to be sufficient.

- *Absence of outliers among the independent variables and on the dependent variable*

Outliers have a large impact on the regression solution and should therefore be deleted or the variable should be transformed. The data points of this study were expected to be widely distributed. For example, the CCC for a food retailer who sells its goods on a cash basis will have a short or even negative CCC. However, a retailer selling higher priced items for cash or on credit such as a clothing store will have a much longer CCC. Food retailer Pick n Pay had a CCC of -17 days while clothing retailer Foshini's had a CCC of 243 days in 2012. Depending on the sector in which the two retailers operate and the composition of cash to credit sales this is a normal occurrence. SPSS however classify these data points as outliers where they are actually perfectly normal under the circumstances mentioned above.

It was therefore decided to scrutinise the dataset manually to identify possible outliers. It was noted that the data of company Nictus Limited for the total period (2004 – 2012) was a major outlier. Upon further investigation it was noted that Nictus Limited is in fact a holding company of not only furniture retailers but also companies offering insurance, which is not included in the scope of our study. It was therefore decided to exclude Nictus Limited from the data sample.

- *Absence of multicollinearity and singularity*

Multicollinearity exists when two or more independent variables are highly correlated. If the IV score is ≥ 9 multicollinearity exists. Between independent variables ROA, ROE, GPM and EVA no collinearity existed.

Singularity exists when variables are redundant and measures the same element which is not the case with the included variables. It can therefore be concluded that there is an absence of multicollinearity and singularity.

- *Normality, linearity and homoscedasticity of residuals*

The two components of normality are skewness and kurtosis. Skewness relates to the symmetry of the distribution and kurtosis to the peakedness of the distribution. For a normal distribution the skewness and kurtosis value will be zero. None of the variables in this data sample have a zero value. The Shapiro - Wilk test was used to assess whether the data sample is distributed normally; a significance level greater than 0.05 indicates normality (Pallant 2013:66). All of the variables in this study have a value below 0.05, therefore it can be concluded that the data sample is not normally distributed. Due to the assumptions for normality not being met, the data will also not meet the criteria of linearity and homoscedasticity. According to Pallant (2013:165) this is quite common for larger samples and according to Tabachnick and Fidell (2013:127) failure of normality, linearity and homoscedasticity does weaken the analysis but does not invalidate it.

- *Independence of errors*

The errors of prediction in cases should be independent from one another. To ensure that variables are independent from each other the histogram, where the residual value (ZRESID) was plotted against the predictable value (ZPRED) for each of the hypotheses, was analysed. The values are evenly and randomly dispersed and are therefore independent from each other.

- *Absence of outliers in the solution*

Outliers in the solution are evident from cases with large residuals; with a large sample it is likely that there will be outliers present. When $n \leq 1000$ the p value should be 0.001. For all the hypotheses the solution will be investigated to identify outliers in Chapter 4.

The coefficient of determination (adjusted R^2) was used to establish the combined explanatory power of the independent variables on the dependent variable. Due to multiple variables being included in this study the adjusted R^2 will be used for the interpretation of the results.

3.6 ETHICAL CONSIDERATIONS

Ethical clearance for this study was obtained from the research ethical committee of the Faculty of Economic Management and Sciences. There were no ethical implications in obtaining and using the data of this study.

3.7 LIMITATIONS

Only retail firms that are listed on the JSE were included in this study. Data of firms that are not listed on the JSE is not freely available to the public. Secondly, the InetBFA database where the data will be obtained from, offers standardised data which results in data being comparable between the various firms. Due to only 20

retail firms being listed on the JSE on the date of the study, the sample was relatively small.

The sample is reduced even further when considering the time period the research will cover. The longer the time of observation, the better and more accurate results will be. However, of the 20 firms listed not all have been listed for more than eight consecutive years. For this reason, only 18 firms could be included in the study.

3.8 CONCLUSION

The statistical procedures discussed above will be used to test the formulated hypotheses on the data sample. The results from the statistical procedures performed on the data sample will be discussed in Chapter 4.

CHAPTER 4

RESEARCH RESULTS

4.1 INTRODUCTION

The aim of this chapter is to analyse the results obtained from the statistical tests performed on the data sample as well as a discussion thereof.

4.2 DATA ANALYSIS

The hypothesis testing was performed for five samples. Firstly, the total sample was subjected to the hypothesis testing. Thereafter the hypothesis testing was repeated for the sub-sectors of the retail industry namely; general-, clothing-, food- and furniture retailers.

4.2.1 Descriptive Statistics

The descriptive statistics was applied to the total data sample and in table 6 is a summary of the variables with its minimum, maximum, median and mean values as well as the standard deviation of each.

Table 6
Total sample: Descriptive statistics

	N	Min	Max	Median	Mean	Standard deviation
CCC days	108	-21	271	26	58	78
AAI days	108	11	205	69	69	31
AAR days	108	7	309	302	75	77
AAP days	108	48	136	83	85	23
ROA %	108	1	38	17	19	7
ROE %	108	5	60	31	31	14
GPM %	108	8	55	26	30	13
EVA R	108	-50 235	974 978	243 027	371 418	320 396

The wide range of the CCC (-21 days to 271 days) was expected for the data sample. As mentioned in Chapter 3, the CCC of a food retailer selling goods predominantly on a cash basis will have a very short CCC or even a negative CCC, where a retailer of luxury items will have a longer CCC. The aim of this study was to investigate the influence of CCC on the profitability of a firm, and from the descriptive statistics it is clear that the CCC varies significantly over the sample. The CCC is influenced by the three components used to calculate it namely the AAI, AAR and AAP and will be discussed below.

The range of the AAI (11 days to 205 days) is also large and contributes to the large range of the CCC noted above. The AAI will depend on the type of retailer, for example a low cost household items retailer versus a retailer of luxury items. The median (69 days) and mean (69 days) of AAI is very close to each other indicating a more symmetrical distribution than for CCC.

The range of AAR (7 days to 309 days) is very large as was the case with AAI. The median value (302 days) indicates that half of the sample values are between 302 days and the sample maximum of 309 days. The mean, (75 days) which is significantly lower than the median value, confirms the negatively skewed distribution. It should be considered that a number of the firms included in the sample sell goods predominantly on a cash basis, which will result in a high AAR due to trade receivables being very small in relation to total revenue. The assumption of this study is that firms that do sell goods on credit will try to minimize the AAR which will result in a shorter CCC.

The range of AAP (48 days to 136 days) is smaller than that of the CCC, AAI and AAR. The median (83 days) and mean values (85 days) are fairly close to each other, indicating an almost symmetrical distribution of the data sample.

The ROA ranges between 1% and 38% with its median (17%) and mean (19%) values relatively close to each other. One of the reasons for the large range in ROA is due to the asset composition and profit being different between firms.

The ROE ranges between 5% and 60%. It is distributed symmetrically, as the median value (31%) is equal to the mean value (31%). The ROE depends on the equity of a firm as well as the profit, which will vary from firm to firm, therefore resulting in a large range identified in this dataset.

The range of the GPM is between 8% and 55%. The median value is 26% and the mean value 30%. The GPM will depend on the mark-up a firm has on its products and will be different between firms in different sub-sectors. Firms selling low cost items in the food sector will have a lower mark-up than firms selling higher value items, such as furniture retailers.

The range of the EVA is between minus R 50 235 and R 974 978. The median value is R 243 027 and the mean value R 371 418. The value of the EVA will depend on the capital invested by the firm, the return on invested capital and the cost of the capital. The composition of the firm's capital structure will differ based on the type of sector. Like the other profitability measures, the EVA is expected to vary significantly between different types of firms.

From the descriptive statistics above it is noted that the range of variables in the data sample is quite large, for both the profitability measures as well as for the working capital measures. This was expected due to the different types of retail firms included in this study. To determine the relationship between these measurements and whether it can add to the prediction of profitability, the empirical results should be analysed.

4.2.2 Empirical Results – Total Sample

The hypothesis testing for the total sample is presented below.

Hypothesis 1:

The first hypothesis aims to determine whether a reduction in the investment in net working capital will result in profitability increasing. The investment in net working capital was measured by the CCC, and profitability by ROA, ROE, GPM and EVA.

In table 7 a summary is given with regards to the Spearman correlation testing.

Table 7

Total sample: Correlation between CCC and profitability measures

	CCC	ROA	ROE	GPM	EVA
CCC	1.000				
ROA	0.161	1.000			
ROE	-0.492**	0.256**	1.000		
GPM	0.436**	0.387**	-0.325**	1.000	
EVA	-0.212*	0.258**	0.663**	0.003	1.000

*Significant at the 5% level

**Significant at the 1% level

According to Cohen (1988:115) the correlations can be classified as small correlation (values 0.10 – 0.29), medium correlation (0.30 – 0.49) and large correlation (0.50 – 1.00). With regards to the CCC, there is a medium correlation between ROE and GPM and a small correlation between CCC and EVA. There are some significant correlations between the profitability measures themselves, but hypothesis 1 aimed at investigating the relationship between CCC and profitability. The two medium correlations (ROE and GPM with CCC) indicate opposite relationships; CCC and ROE is negatively correlated and CCC and GPM positively. From the correlation coefficients in Table 6, a conclusion can be drawn that a decrease in CCC will result in a predictable decrease in GPM due to the positive correlation between GPM and

CCC. However, a decrease in CCC will result in a predictable increase in both ROE and EVA, due to the negative correlation between ROE and EVA with CCC.

Despite the fact that ROE and GPM are both profitability measures, one is influenced by the equity of a firm (ROE) and the other by cost of sales (GPM), which may be the reason why one is negatively and the other one is positively correlated with CCC. GPM is an indicator of the percentage of revenue that is left after cost of sales has been accounted for. If management reduces the mark-up for which they sell their inventory, the profit will reduce. This may result in the firm selling more goods more frequently which will lower the CCC, and GPM may decrease due to the reduced mark-up. However, if sales increase it can result in ROE and EVA increasing.

From the literature review and the hypothesis it is clear that if management can reduce its CCC, its profitability will increase, and *vice versa*. This was confirmed by the negative correlation between CCC and ROE, and CCC and EVA. This correlation confirms that if a firm can reduce its investment in working capital it will have excess funds to invest in more profitable and value-creating investments. In addition to the results, ROE and EVA are both value creation indicators, and these two variables are positively correlated with each other. This positive relationship indicates that if ROE should increase, so would EVA, and *vice versa*.

Spearman correlation coefficients do not indicate whether there is a causal relationship between two variables but whether one variable can predict the other. In order to establish causality between variables, multiple regression analyses were performed between the dependent variable (CCC) and independent variables (ROA, ROE, GPM and EVA). The results from the multiple regression analyses are presented in Table 8.

Table 8

Total sample: Multiple regression analyses between CCC and profitability

	ROA		ROE		GPM		EVA	
	Estimate	t-value	Estimate	t-value	Estimate	t-value	Estimate	t-value
Intercept	17.922	20.25	35.914	23.761	25.614	18.861	421943	11.171
CCC	0.161	1.675	-0.492**	-5.82	0.436**	4.987	-0.212*	-2.236
R ²	0.026		0.242		0.190		0.045	
Adjusted R ²	0.017		0.235		0.182		0.036	
Fisher F test	2.806		33.870		24.871		5.001	

*Significant at the 5% level

**Significant at the 1% level

Regression models:

$$\text{ROE} = 35.914 - 0.492(\text{CCC}) + \varepsilon$$

$$\text{GPM} = 25.614 + 0.436(\text{CCC}) + \varepsilon$$

$$\text{EVA} = 421\,943 - 0.212(\text{CCC}) + \varepsilon$$

Out of the four profitability predictors, three are statistically significant: ROE ($p < .01$), GPM ($p < .01$) and EVA ($p < .05$). The adjusted R² is the strongest for ROE at 23.5%, 18.2% for GPM and the weakest for EVA at 3.6%.

The model suggests that an increase in CCC will result in a statistically significant decrease in ROE ($\beta = -0.492$; $p < .01$) and in EVA ($\beta = -0.212$; $p < .05$). Hypothesis 1 suggests that an increase in CCC will result in a decrease in profitability, which is true as proved by the decline in ROE and EVA. An increase in CCC will however result in an increase of GPM. This suggests that if firms manage to decrease CCC, GPM will also decrease but ROE and EVA will increase.

A reason for the different directions of correlation between profitability predictors may be that retail firms manage their CCC by decreasing their selling prices to increase sales, which will result in GPM decreasing. The increase in sales could then result in an increase of other profitability measures (ROE and EVA).

In his study Barine (2012:233) found that a decrease in CCC would not have a positive effect on the profitability of Nigerian firms. His results further suggested that

an improvement of net working capital did not result in higher levels of returns to shareholders. The study performed by Barine (2012:230) was only done on one year's financial results, and included all types of industries. The present study is over a period of nine years and only focuses on the retail industry.

Lazaridis and Tryfonidis (2006:26) investigated the relationship between working capital and profitability for firms listed on the Athens stock exchange. Results indicated a negative correlation with working capital (CCC) and profitability (GPM) where in the present study the relationship between CCC and GPM was positively correlated.

The results from the present study indicate that a decrease in AAI, AAR or increase in AAP, or a combination of all three will result in CCC decreasing. The positive correlation between CCC and GPM suggests that management is reducing CCC but an increase in GPM is not achieved. The reason may be that the goods are sold for reduced selling prices, resulting in more items being sold as confirmed by the negative relationship between CCC and ROE.

Therefore, if CCC should decrease, so would GPM, but ROE will increase. The value of the firm, as measured by EVA, will increase, as the relationship between CCC and EVA is negative. Similar results were found by Bolek *et al.* (2012:1) who tested the effect of a reduction of CCC on the EVA of Polish firms. In this study a negative correlation was identified. This indicates that, if a firm can reduce its CCC, profitability as measured with EVA will increase.

It can therefore be concluded that a reduction in CCC has a positive effect on profitability (ROE) and on firm's value (EVA). Hypothesis 1 is therefore confirmed: a decrease in CCC will result in profitability increasing.

Hypothesis 2

The second hypothesis addresses the relationship between AAI and profitability. A negative correlation was expected, because if a firm manages to reduce its inventory levels, the investment in working capital will decrease and this will result in an increase of profitability. A summary of the correlation coefficients is presented in table 9.

Table 9

Total sample: Correlation between AAI and profitability measures

	AAI	ROA	ROE	GPM	EVA
AAI	1.000				
ROA	-0.065	1.000			
ROE	-0.645**	0.256**	1.000		
GPM	0.568**	0.387**	-0.325**	1.000	
EVA	-0.507**	0.258**	0.663**	0.003	1.000

*Significant at the 5% level

**Significant at the 1% level

From the Spearman correlation coefficients above it is noted that AAI is positively correlated with only GPM, the rest of the predictors are negatively correlated with AAI as anticipated in the hypothesis. A reason why AAI and GPM are positively correlated may be that, if a firm tries to reduce its inventory levels, it might sell its inventory at reduced selling prices. The gross profit will decrease as the costs remain unchanged but the selling prices are reduced. This will result in a decrease of GPM, a result which is supported by the positive correlation between AAI and GPM.

If a firm reduces AAI by reducing selling prices, it can result in an increase of sales. An increase in sales could result in ROE and EVA increasing, confirming the negative correlation between AAI with ROE and EVA as noted in table 8.

Multiple regression analyses were performed between the dependent variable (AAI) and independent variables (ROA, ROE, GPM and EVA). The results are presented in table 10.

Table 10

Total sample: Multiple regression analyses between AAI and profitability

	ROA		ROE		GPM		EVA	
	Estimate	t-value	Estimate	t-value	Estimate	t-value	Estimate	t-value
Intercept	19.882	11.299	51.372	19.699	13.828	5.661	733685.8	11.198
AAI	-0.065	-0.668	-0.645**	-8.7	0.568**	7.099	-0.507	-6.055
R ²	0.004		0.417		0.322		0.257	
Adjusted R ²	-0.005		0.411		0.316		0.250	
Fisher F test	0.446		75.696		50.396		36.661	

*Significant at the 5% level

**Significant at the 1% level

Regression models:

$$\text{ROE} = 51.372 - 0.645(\text{AAI}) + \varepsilon$$

$$\text{GPM} = 13.828 + 0.568(\text{AAI}) + \varepsilon$$

The only significant correlations between AAI and profitability are ROE ($p < .01$) and GPM ($p < .01$). The adjusted R² is 41.1% for ROE and 31.6% for GPM, both being relatively strong predictors of AAI.

The results indicate that, if AAI should decrease, so would GPM ($\beta = 0.568$; $p < .01$). A firm can for example sell goods at reduced selling prices to decrease the investment in inventory, but the gross profit will also decrease as a result of the reduced selling prices. Another possible reason may be that a firm sells better quality products at higher cost prices, but does not increase the sales prices to the same extent. This will result in inventory decreasing due to items being sold faster, but the gross profit will also decrease as a result of reduced selling prices or higher cost of sales.

The relationship between AAI and ROE indicates that for every one unit reduction in AAI, ROE will increase by 0.645 units ($\beta = -0.645$; $p < .01$). This confirms that when firms reduce their inventory levels by adjusting the gross profit margin, they will sell more items and profitability, as measured with ROE, will increase.

Based on the results above it can be concluded that retail firms manage their investment in inventory by lowering the gross profit margin which could result in ROE increasing. Hypothesis 2 is therefore true, namely that a reduction in the investment in inventory will improve a firm's profitability (ROE).

Bellouma (2011:71) investigated the relationship between working capital and profitability for Tunisian firms. To measure profitability, Bellouma (2011:75) used GPM and found a negative relationship between the investment in inventory and GPM, the opposite to what was found in the present study. The reason for this may be that the Tunisian firms included in his study were classified as small and medium-sized companies within the Tunisian export industry. However, in the present study, firms in the retail industry were investigated and can be classified as large firms, as they are listed on the JSE. Bellouma (2011:87) concluded that a reduction in inventory will increase profitability based on the relationship found between inventory levels and GPM. In this study, even though AAI and GPM are positively correlated, the correlation between AAI and ROE is negative and as noted earlier the conclusion is similar to Bellouma (2011:87) that a decrease in the investment in inventory will improve a firm's profitability (ROE).

Choudhary and Tripathi (2012:43) performed an analysis to investigate the effect of inventory turnover on the financial performance of a firm of three Indian retail firms. The results found were different for each of the three firms operating within different sectors of the retail industry. Choudhary and Tripathi (2012:60) concluded that the problem in inventory management is the incorrect forecasting of sales of retail firms. The results from the present study do not indicate a problem in forecasting sales, as the firms were profitable even when inventory levels were lowered.

Hypothesis 3

In the previous hypothesis (2) the relationship between AAI (independent variable) and profitability (dependent variable) were tested. Hypothesis 1 states that a decrease in CCC will result in an increase in profitability, and an increase in CCC in a decrease in profitability. Therefore, if a firm can decrease its AAI, it will result in an increase in profitability, which was confirmed in hypothesis 2. However, this increase cannot be made indefinitely as any firm needs a certain level of inventory to trade. Therefore hypothesis 3 was formulated where AAI is now the dependent variable and profitability the independent variable. This was done to determine the effect on the average age of inventory if profitability should change. If profitability decreases, a reason could be that inventory was decreased excessively. A positive relationship was therefore expected.

A correlation analysis was performed in the previous hypothesis (2) with regards to AAI and the profitability variables and this was summarised in table 8. Due to the same variables being used in hypothesis 2 and 3, the correlations as identified in table 8 will apply. From the correlation testing it was noted that AAI was negatively correlated with ROE and EVA, but positively correlated with GPM. In table 11 are the results of the multiple regression analysis performed.

Table 11

Total sample: Multiple regression analysis between profitability and AAI

	All firms	
	Estimate	t-value
Intercept	64.638	8.194
ROA	-0.140	-1.932
ROE	-0.207*	-2.174
GPM	0.555**	7.182
EVA	-0.335**	-3.962
R ²	0.628	
Adjusted R ²	0.613	
Fisher F test	43.447	

*Significant at the 5% level

**Significant at the 1% level

Regression model:

$$AAI = 64.638 - 0.207(ROE) + 0.555(GPM) - 0.335(EVA) + \epsilon$$

The adjusted R^2 is relatively high at 61.3%. Only ROA is not a significant predictor of AAI. The positive relationship between AAI and GPM confirms that if a firm reduces its selling prices, it will result in a decrease of inventory levels and therefore AAI ($\beta = 0.555$; $p < .01$). The beta value of 0.555 indicates that a one unit increase in GPM will result in a 0.555 increase in AAI. Therefore, a decrease in GPM will result in inventory levels decreasing. This confirms the findings in Hypothesis 2 that, if firms decrease their GPM by reducing selling prices, inventory will sell faster and will have a positive effect on the AAI.

The negative correlation between AAI and ROE ($\beta = -0.207$; $p < .05$) and EVA ($\beta = -0.335$; $p < .01$) indicates that if the ROE and EVA of a firm decreases, the AAI will increase. These results are different from the stated hypothesis that if profitability decreases so would AAI, therefore hypothesis 3 is found not to be true.

Based on the results found in hypotheses 2 and 3 the following conclusions can be made: Firms reduce their inventory levels by decreasing the gross profit made on their products. This can be accomplished by selling goods at reduced prices or improving the quality of products sold but not increasing selling price to the same extent as the increase in costs. These changes could result in an increase in sales and an increase in ROE.

Based on the results above it could not be proven that if the reduction in inventory levels is extreme then profitability will decrease, and therefore hypothesis 3 was rejected. Even though an optimal level of inventory will differ between every firm and could not be established in this study, it can be concluded that South African retail firms are managing their inventory levels to improve their profitability.

The conclusion that, if a firm can reduce its inventory levels by selling stock faster, profitability will increase, is confirmed by the results of other researchers (Deloof, 2003:585; Garcia and Martinez, 2007:175; and Bellouma, 2011:87).

Hypothesis 4

The fourth hypothesis investigates the relationship between debtors, as represented by the AAR, and profitability. A negative correlation is expected, because if a firm manages to reduce its AAR, CCC will decrease and this will result in an increase of profitability.

Table 12

Total sample: Correlation between AAR and profitability

	AAR	ROA	ROE	GPM	EVA
AAR	1.000				
ROA	0.233*	1.000			
ROE	-0.318**	0.256**	1.000		
GPM	0.373**	0.387**	-0.325**	1.000	
EVA	-0.057	0.258**	0.663**	0.003	1.000

*Significant at the 5% level

**Significant at the 1% level

The Spearman correlation coefficients indicate that a negative correlation between AAR and ROE was confirmed. However, both ROA and GPM are positively correlated with AAR, contrary to the stated hypothesis. Hence, if AAR should decrease, so would ROA and GPM.

If a firm reduces its trade receivables by implementing stricter credit standards, sales may be reduced and this may result in a decrease in profitability. Such a reduction may also result in total assets decreasing due to the reduction of trade receivables, but if profit reduces more than total assets, ROA will decrease. A decrease in sales demand may force a firm to sell goods at reduced selling prices, which will cause GPM to decrease together with the decrease in trade receivables.

Multiple regression analyses were performed between the dependent variable (AAR) and independent profitability variables (ROA, ROE, GPM and EVA). The results are presented in table 13.

Table 13

Total sample: Multiple regression analyses between AAR and profitability

	ROA		ROE		GPM		EVA	
	Estimate	t-value	Estimate	t-value	Estimate	t-value	Estimate	t-value
Intercept	29.288	1.482	126.825	7.614	25.130	16.036	389028.4	9.005
AAR	0.233*	2.470	-0.318**	3.453	0.373**	4.145	-0.057	-0.584
R ²	0.054		0.101		0.139		0.003	
Adjusted R ²	0.045		0.093		0.131		-0.006	
Fisher F test	6.100		11.927		17.177		0.341	

*Significant at the 5% level

**Significant at the 1% level

Regression models:

$$\text{ROA} = 29.288 + 0.233 \text{ AAR} + \varepsilon$$

$$\text{ROE} = 126.825 - 0.318 \text{ AAR} + \varepsilon$$

$$\text{GPM} = 25.130 + 0.373 \text{ AAR} + \varepsilon$$

From the regression analyses it was noted that ROA ($p < .05$), ROE ($p < .01$) and GPM ($p < .01$) are statistically significant to changes in AAR. The adjusted R² is 5.4% for ROA, 9.3% for ROE and 13.1% for GPM, all three indicating a weak statistical power in predicting AAR, with GPM being the best predictor of AAR due to the adjusted R² being the highest. Both ROA ($\beta = 0.233$) and GPM ($\beta = 0.373$) indicate that if trade receivables should decrease, so would ROA and GPM. However, a decrease in trade receivables will result in an increase of ROE ($\beta = -0.318$; $p < .01$).

In testing hypothesis 2 a positive relationship was found between inventory levels and gross profit. In testing hypothesis 4 a positive relationship was also found between trade receivables and gross profit. For every one unit decrease in AAI, GPM will decrease by 0.373 units ($\beta = 0.373$; $p < .01$). One method of reducing trade receivables may be to increase cash sales by offering a cash discount. Products will be sold at a lower selling price but trade receivables will decrease due to less items being sold on credit. This reduction in selling prices will result in a decrease of gross profit, therefore trade receivables and gross profit will be positively correlated. This

may then result in sales increasing and an improvement of profitability (as measured with ROE).

The direction of the relationship (positive or negative) between AAR and the profitability predictors is different for ROA and ROE. If the return of a firm should increase by means of the net profit available to ordinary shareholders, this return will have the same effect on both ROA and ROE. Therefore, the reason for ROA being positively- and ROE being negatively correlated to AAR could be due to a change in total assets. From the discussion above it follows that if AAR decreases, it is expected that profit will increase. An increase in profitability will then result in ROA and ROE increasing. However, as per the regression analysis, if AAR decreases, so would ROA. A possible reason for this may be as follows: If a cash discount is granted, even though trade receivables will decrease, cash levels will increase due to the increase in cash sales. The increase in cash sales will result in an increase in cash balances, therefore increasing total assets, which could result in ROA decreasing ($\beta = 0.233$; $p < .01$). The increase in profit could however result in an increase in ROE ($\beta = -0.318$; $p < .01$).

The following conclusions can be drawn from the results above: Retail firms included in this study manage trade receivables by reducing the gross profit margin. The reduction of GPM will result in a decrease of ROA due to the increase in total assets being more than the increase in profit. The increase in profit results in an increase of ROE. Therefore hypothesis 4, namely that a reduction in AAR will result in an increase in profitability, is true with regards to ROE, but not with regards to the other profitability measures (GPM and ROA).

Hypothesis 5

In hypothesis 4 the relationship between trade receivables and profitability were investigated, and it was confirmed that if trade receivables should decrease, profitability (ROE) would increase. Therefore, if trade receivables are kept at a minimum level, ROE will improve. However, trade receivables cannot be reduced to zero and a firm should maintain a minimum level of trade receivables, otherwise profitability will be influenced negatively. Hypothesis 5 will measure the effect on

trade receivables if profitability decreases. For this hypothesis AAR will be the independent variable and the profitability measures the dependent variable. If profitability decreases, a reason could be that the trade receivables reduced excessively. A positive relationship is therefore expected between profitability and AAR.

A correlation analysis was performed in the previous hypothesis (4) with regards to AAR and the profitability variables and was summarised in table 11. Due to the same variables being used in hypothesis 4 and 5, the correlations as identified in table 11 will apply. From the correlation testing it was noted that AAR was positively correlated with ROA and GPM, but negatively correlated with ROE.

The results from the multiple regression analysis are presented in table 14.

Table 14

Total sample: Multiple regression analysis between profitability and AAR

	All firms	
	Estimate	t-value
Intercept	62.570	2.229
ROA	0.258*	2.498
ROE	-0.470**	-3.453
GPM	0.121	1.096
EVA	0.188	1.561
R ²	0.244	
Adjusted R ²	0.215	
Fisher F test	8.311	

*Significant at the 5% level

**Significant at the 1% level

Regression model:

$$\text{AAR} = 62.57 + 0.258\text{ROA} - 0.47 \text{ROE} + \varepsilon$$

The only statistical significant relationships were between AAR and ROA ($p < .05$), and AAR and ROE ($p < .01$). The adjusted R² of 21.5% indicates that only 21.5% of

the variance in AAR can be explained by the profitability predictors. Therefore the explanatory power of the variables are not very strong and, even though ROE is statistically significant at the 1% and 5% level, the weak adjusted R^2 indicates that the results should be analysed with caution.

The positive relationship between AAR and ROA indicates that if the ROA should decrease by one unit, AAR will decrease by 0.258 units ($\beta = 0.258$; $p < .05$). This coincides with the hypothesis formulated that, if profitability decreases, so would trade receivables. However, ROE being the stronger predictor indicates that a one unit decrease in ROE will result in a 0.470 unit increase of AAR ($\beta = 0.470$; $p < .01$).

Based on the results above, Hypothesis 5 is found not to be true, namely that beyond a certain maximum investment in trade receivables, profitability and the investment in trade receivables will be correlated positively.

The reason for this may be as follows: As confirmed in hypothesis 4, a significant part of sales will comprise of cash sales. Retailers such as Pick n Pay Limited, Spar Limited and Checkers Limited will only have cash sales, therefore the management of trade receivables will not have a significant impact on profitability.

Hypothesis 6

The sixth hypothesis measures the relationship between trade payables and profitability. When calculating the CCC of a firm, an increase in AAP will result in a decrease of CCC ($CCC = AAI + AAR - AAP$), and according to hypothesis 1 will result in an increase in profitability. Therefore an increase in trade payables could result in an increase in profitability.

Table 15

Total sample: Correlation between AAP and profitability

	AAP	ROA	ROE	GPM	EVA
AAP	1.000				
ROA	0.256**	1.000			
ROE	0.387**	-0.325**	1.000		
GPM	0.258**	0.663**	0.003	1.000	
EVA	0.143	-0.232*	0.545**	-0.129	1.000

*Significant at the 5% level

**Significant at the 1% level

From the Spearman correlation coefficients it is noted that AAP has a significant positive correlation with all of the profitability variables, also with EVA, although it is not statistically significant. This confirms the hypothesis that trade payables and profitability are positively correlated. If management purchases higher amounts of inventory at reduced prices from creditors, it will increase GPM by reducing costs. By buying more goods on credit, trade payables will increase. A reduction in the cost of goods could result in firms reducing their selling prices, which will result in sales increasing and so also the firm's profit. This increase in return will cause both the ROA and ROE to increase due to the increase in trade payables, supporting the hypothesis that trade payables and profitability will be positively correlated. To test the causality between the variables, multiple regression analyses was performed as summarised in table 16.

Table 16

Total sample: Multiple regression analyses between AAP and profitability

	ROA		ROE		GPM		EVA	
	Estimate	t-value	Estimate	t-value	Estimate	t-value	Estimate	t-value
Intercept	76.933	12.804	96.623	18.927	4.408	1.127	524342.527	4.425
AAP	0.143	1.486	-0.232	-2.461	0.545**	6.684	-0.129	-1.336
R ²	0.020		0.054		0.296		0.017	
Adjusted R ²	0.011		0.045		0.290		0.007	
Fisher F test	2.208		6.055		44.673		1.786	

*Significant at the 5% level

**Significant at the 1% level

Regression model:

$$\text{GPM} = 4.408 + 0.545 \text{ AAP} + \varepsilon$$

The only significant profitability measure to AAP is GPM, with an adjusted R^2 of 29% indicating that only 29% of the variance in GPM is explained by AAP. The model suggests that for every one unit increase of AAP GPM will increase by 0.545 units ($\beta = 0.545$; $p < .01$). The average age of payables can be increased if better terms are negotiated with suppliers. The retail firms included in this study are large firms and, as found by Gosman and Kelly (2003:27), large firms can even increase the average age of payables without negotiating better terms, as suppliers cannot afford to lose their business, but this will have a negative impact on the supply chain.

From the results above it appears that retail firms negotiate terms which may include reduced purchase prices, as the increase in trade payables will result in an increase of GPM. The effect on other profitability measures could however not be relied on as they were determined to be statistically insignificant.

Goods purchased from a supplier will have a direct effect on the cost of sales of a firm and therefore on the gross profit of a firm. Therefore it was expected that a change in the investment in trade payables would have an effect on the GPM of a firm. The reason why a change in trade payables does not have a significant effect on the other profitability measures may be that the retailing firms in this study does not extend payments to creditors to such an extent that profitability is improved, and that all parties within the supply chain benefit from the payment terms.

Results from studies performed by Losbichler and Rothbeck (2006:293) and Losbichler and Mahmoodi (2012:33) suggested that if CCC is reduced by extending the payment time to creditors by paying them later than specified in agreed credit terms, the supply chain will be affected negatively and the delay in payments to creditors will not have a positive effect on a firm's profitability. In the present study the effect of increasing the investment in trade payables on profitability, as measured with GPM, was positive. This positive relationship may indicate that retail firms included in this study do not exceed credit terms, which would have had a negative effect on the supply chain. It is possible that better prices and credit terms were

negotiated, but it did not have a negative effect on profitability as found in the previous studies as listed above.

Both Deloof (2003:585) and Lazaridis and Tryfonidis (2006:34) found a negative correlation between the investment in trade payables and gross profit and concluded that less profitable firms take longer to pay their suppliers. In the present study, a positive correlation was found between trade payables and profitability (GPM) indicating that profitable firms may make use of terms provided by suppliers and negotiate prices and credit terms to benefit both the retailer and the supplier. Therefore, hypothesis 6 was found to be true.

Hypothesis 7

As confirmed in hypothesis 6, if firms can increase the payment time to creditors it will result in an increase of profitability. Payments to suppliers can however only be extended to a certain level without damaging the firm's credit rating and incurring interest on late payments. Therefore, the payment time to creditors can be increased to a certain level before profitability will decrease. Hence, if profitability decreases a reason may be that the delay in payments to creditors was too extreme. In hypothesis 7, AAP will be classified as the independent variable and profitability as the dependent variable. This hypothesis states that if profitability decreases it may be due to a disproportionate increase in trade payables and therefore a negative correlation was expected between profitability and AAP.

A correlation analysis was performed in the previous hypothesis (6) with regards to AAP and the profitability variables and was summarised in table 14. Due to the same variables being used in hypothesis 6 and 7, the correlations as identified in table 14 will apply. From the correlation testing it was noted that AAP was positively correlated with ROA, ROE and GPM.

Table 17 summarises the results from the multiple regression analysis.

Table 17

Total sample: Multiple regression analysis between profitability and AAP

	All firms	
	Estimate	t-value
Intercept	56.222	7.063
ROA	-0.071	-0.719
ROE	0.100	0.778
GPM	0.605**	5.781
EVA	-0.179	-1.563
R ²	0.319	
Adjusted R ²	0.292	
Fisher F test	12.057	

*Significant at the 5% level

**Significant at the 1% level

Regression model:

$$AAI = 64.638 - 0.207ROE + 0.555GPM - 0.335EVA + \varepsilon$$

The adjusted R² at 29.2% is not very strong, and implies that the profitability predictors can only explain 29.2% of the variance in AAP. However, even with a relatively low adjusted R², GPM is statistically significant, and is positively correlated with AAP ($\beta = 0.605$; $p < .01$). The relationship between trade payables and the other variables are not statistically significant. Even though a positive correlation between AAP and profitability variables ROA, ROE and GPM was identified in the correlation coefficients presented in table 14, it cannot be concluded that a decrease in AAP will cause the ROA and ROE to change, as the correlations are not statistically significant.

The positive relationship between trade payables and gross profit was anticipated and can be explained as follows: The price at which a firm purchases its inventory will affect cost of sales and evidently also the GPM. If a firm can negotiate terms with its suppliers to obtain goods at a lower price and it does not reduce its selling prices to the same extent, the GPM will increase. By negotiating credit terms and extending payment to suppliers, the AAP will increase resulting in a positive correlation between AAP and GPM. Also, if more goods are purchased on credit, trade payables

will increase and, due to it being free credit, costs will decrease. If sold at higher prices, the GPM will increase together with the increase in trade payables.

The results above do not prove that a minimum balance of trade payables should be kept, as profitability could be compromised, but it does prove that the managing of trade payables by retail firms has a positive effect on profitability. Therefore hypothesis 7 was found not to be true, but a better understanding was obtained of retailers' management style regarding the payment of their suppliers.

Hypothesis 8

In this hypothesis, the relationship between short-term financing and profitability was investigated. The 18 firms were categorised as aggressive, conservative or neutral based on their usage of short-term financing as a percentage of total external financing. The total short-term financing (current liabilities) as a percentage of total financing (total liabilities) was calculated for all of the firms included in the sample. The average ratio was calculated over the nine year period (2004 – 2012) covered in this study and the 18 firms were classified as follows: The four firms with the lowest ratio (59% - 67%) of short-term financing as a percentage of total financing, were classified as conservative in financing and the four firms with the highest ratio (90% - 97%) as aggressive in financing. The other ten firms were classified as neutral with short-term financing as a percentage of total financing between 68% and 89%.

In table 18 is the classification of each firm included in the data sample.

Table 18

Financing approach followed by firms

TYPE OF FINANCING APPROACH		
Aggressive	Conservative	Neutral
Firms:	Firms:	Firms:
Taste Holdings Limited	Alert Steel Holdings Limited	Cashbuild Limited
Woolworths Holdings Limited	Combined Motor Holdings Limited	Massmart Holdings Limited
The Foshini Group Limited	Verimark Holdings Limited	Shoprite Holdings Limited
JD Group Limited	Italtile Limited	The Spar Group Limited
	Clicks Group Limited	
	Nictus Limited	
	Mr Price Group Limited	
	Rex Trueform Clothing Limited	
	Truworths International Limited	
	Lewis Group Limited	
	Pick n Pay Stores Limited	

For each category multiple regression analysis was performed, with short-term financing as the dependent variable and profitability as the independent variable.

Hypothesis 8 states that firms having an aggressive financing approach (having high levels of short-term financing in relation to total financing) will be more profitable than firms following a conservative financing approach (having lower levels of short-term financing to relation to total financing). The summarised results are shown in table 19.

Table 19

Multiple regression analyses between the short term financing and profitability

	Aggressive High levels of short-term debt		Conservative Low levels of short-term debt		Neutral	
	Estimate	t-value	Estimate	t-value	Estimate	t-value
Intercept	0.819	612.812	0.814	1.268	0.978	45.035
ROA	0.803**	60.465	-2.662*	-2.146	-0.681**	-5.862
ROE	-0.202**	-15.388	4.110	1.188	-0.869**	-5.409
GPM	-	-	0.294	0.237	-0.600**	-5.314
EVA	-0.679**	-191.951	-4.973	-1.720	1.936**	9.833
R ²	1.000		0.554		0.741	
Adjusted R ²	1.000		0.460		0.722	
Fisher F test	35089.49		5.900		39.259	

*Significant at the 5% level

**Significant at the 1% level

Regression models:

Aggressive financing approach = $0.819 + 0.803ROA - 0.202ROE - 0.679EVA + \varepsilon$

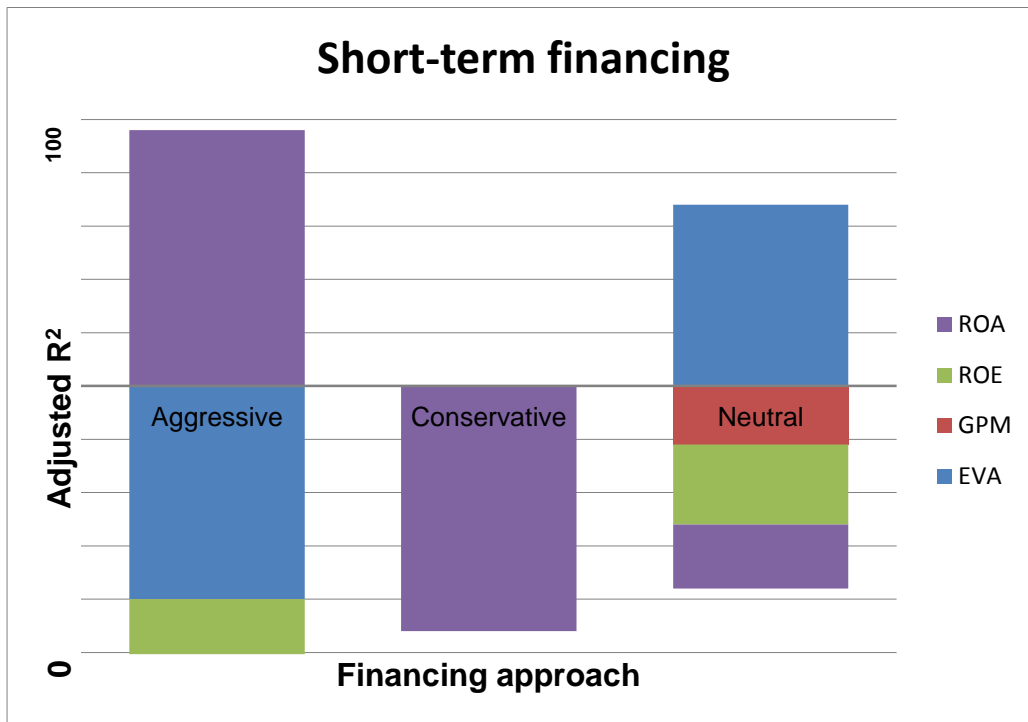
Conservative financing approach = $0.814 - 2.662ROA$

Neutral financing approach = $0.978 - 0.681ROA - 0.869ROE - 0.6GPM + 1.936EVA + \varepsilon$

The R² is relatively high for all three categories. From the summary above it is clear that, if firms have high levels of short-term financing as a percentage to total financing, their profitability (ROA) will increase ($\beta = 0.803$; $p < .01$). However, ROA will decrease for firms that have lower levels of short-term financing as a percentage of total financing ($\beta = -2.662$; $p < .05$). For the firms having neither high nor low levels of short-term financing as a percentage of total financing ROA ($\beta = -0.681$; $p < .01$), ROE ($\beta = -0.869$; $p < .01$) and GPM ($\beta = -0.600$; $p < .01$) profitability measures will decrease as a result of this neutral approach followed.

Figure 7 is a graphical illustration of the results from table 19.

Figure 7
Comparison of short-term financing methods



ROA is the only profitability measure that is statistically significant for all three categories. With regards to ROA, hypothesis 8 is true, namely that those firms having a higher percentage of short-term financing with regards to total liabilities will be more profitable than other firms.

With regards to the results of firms following the aggressive approach, even though following this approach will result in an increase in ROA, the ROE and EVA will decrease.

Retailers within the same sector often make use of the same or similar suppliers and due to the large size of these retailers they may be in a position to negotiate better credit terms. In his study, Hill *et al.* (2010:797) concluded that firms within a concentrated industry have a better ability to negotiate better credit terms. The four firms in this study, classified as using an 'aggressive' financing approach, are large retailers and are in a position to negotiate favourable credit terms. Due to the ROA showing an increase when an aggressive financing approach is followed, it may be that these firms decrease their investment in assets by shortening the CCC and

increasing their return, which was confirmed in hypothesis 1. However, according to the results presented above, by following the aggressive approach ROE and EVA will decrease. This implies that, if a firm should have high levels of short-term financing as a percentage of total liabilities, it will be able to improve ROA; however value creation as measured by ROE and EVA, will be negatively affected. The reason may be that by keeping assets at too low levels, profitability will decrease as proved in hypothesis 3 and 5.

The effect on ROE and EVA for firms following the conservative financing approach cannot be determined as the effect is not statistically significant. Firms following a neutral approach (not having high nor low levels of short-term financing as a percentage of total financing) indicated statistically significant results with all four profitability variables. Following the neutral approach will have a positive effect on EVA but a negative effect on ROA, ROE and GPM.

The only statistical significant relationship between firms following a conservative approach and profitability is a negative relationship between short-term financing and ROA. This indicates that when a firm follows the conservative approach, short-term liabilities are kept at a minimum, therefore the investment in trade payables will decrease. As confirmed in hypothesis 6, if trade payables decrease ROA will increase, confirming the results of hypothesis 8. On the other hand, if firms follow the neutral approach it will have a negative effect on ROA, ROE and GPM but the EVA will increase.

Based on the results presented in table 18 and the effect that a firm's financing approach has on its ROA, having high levels of short-term financing as a percentage of total liabilities, the best approach to follow will be an aggressive approach.

The results of the present study are consistent with Russell and Izzo (2009:107) who found that USA firms following an aggressive approach will improve their profitability. However, Nazir and Afza (2009:27) who did a similar test on Pakistani firms found that implementing an aggressive financing approach will result in profitability decreasing. Both of these studies did not focus on only one industry, whereas the present study only included firms from the retail industry.

4.2.3 Empirical Results – Sub-Sectors

As mentioned earlier, the total sample was divided into sub-sectors namely: food, furniture, clothing and general. The hypothesis testing was performed for each of these sectors. The samples for the food, furniture and clothing sectors were very small and even though statistical procedures were performed, due to the small sizes of these samples, the results were not statistically significant. The size of the category general retailing firms (nine firms) was however sufficient to perform testing. Presented below are the results from the multiple regression analyses on general retailing firms.

Hypothesis 1

Hypothesis 1 states that if CCC should decrease, then profitability should increase. Represented in table 20 is a summary of the regression analyses.

Table 20

General retailing firms: Multiple regression analyses between CCC and profitability

	ROA		ROE		GPM		EVA	
	Estimate	t-value	Estimate	t-value	Estimate	t-value	Estimate	t-value
Intercept	16.033	16.495	33.140	32.491	24.237	16.514	336853	7.523
CCC	0.286*	2.155	-0.823**	-10.462	0.380**	2.961	-0.390**	-3.052
R ²	0.082		0.678		0.144		0.152	
Adjusted R ²	0.064		0.672		0.128		0.136	
Fisher F test	4.642		109.454		8.768		9.318	

*Significant at the 5% level

**Significant at the 1% level

Regression models:

$$\text{ROA} = 16.033 + 0.286\text{CCC} + \varepsilon$$

$$\text{ROE} = 33.14 - 0.823\text{CCC} + \varepsilon$$

$$\text{GPM} = 24.237 + 0.380\text{CCC} + \varepsilon$$

$$\text{EVA} = 336\,853 - 0.390\text{CCC} + \varepsilon$$

All four of the profitability predictors are statistically significant. The adjusted R^2 is relatively strong for ROE at 67.2%, indicating that 67.2% of the variance in ROE can be explained by CCC. The adjusted R^2 is however relatively weak for ROA (6.4%), GPM (12.8%) and EVA (13.6%). The models suggest that a decrease in CCC will result in an increase of ROE ($\beta = -0.823$; $p < .01$) and EVA ($\beta = -0.390$; $p < .01$). The opposite is true for ROA ($\beta = 0.286$; $p < .05$) and GPM ($\beta = 0.380$; $p < .01$) which will increase if CCC increases. Results from the total sample showed the same results with regards to the effect a change in CCC will have on the ROA, ROE and GPM of a firm. The only difference is that for general retailing firms the effect on EVA was statistically significant where for the total sample it was not.

The findings confirm that retail firms lower their selling prices in order to decrease CCC which results in an increase of profitability (ROE and EVA). This confirms Hypothesis 1.

Hypothesis 2

Hypothesis 2 investigates the relationship between AAI and profitability; a negative relationship is expected, implying that if a firm can manage to reduce their inventory levels their profitability will increase. The results from the multiple regression analyses are presented in table 21.

Table 21

General retailing firms: Multiple regression analyses between AAI and profitability

	ROA		ROE		GPM		EVA	
	Estimate	t-value	Estimate	t-value	Estimate	t-value	Estimate	t-value
Intercept	11.673	5.565	38.912	10.870	12.227	4.389	691992.0	7.989
AAI	0.072*	2.854	-0.154**	-3.579	0.188**	5.601	-0.598**	-5.385
R^2	0.135		0.198		0.376		0.358	
Adjusted R^2	0.119		0.182		0.364		0.346	
Fisher F test	8.143		12.808		31.369		29.002	

*Significant at the 5% level

**Significant at the 1% level

Regression models:

$$\text{ROA} = 11.673 + 0.072\text{AAI} + \varepsilon$$

$$\text{ROE} = 38.912 - 0.145\text{AAI} + \varepsilon$$

$$\text{GPM} = 12.227 + 0.188\text{AAI} + \varepsilon$$

$$\text{EVA} = 691\,992 - 0.598\text{AAI} + \varepsilon$$

The effect on profitability, if AAI should change, is statistically significant for all four of the profitability measures. ROA and GPM are positively correlated with AAI, and ROE and EVA are negatively correlated with AAI. Therefore, a decrease in inventory levels will result in a decrease of both ROA and GPM but ROE and EVA will increase. For the total sample the results were the same with regards to GPM and ROE, however the effect on ROA and EVA were not statistically significant.

The adjusted R^2 are relatively weak for ROA ($R^2 = 11.9\%$) and ROE ($R^2 = 18.2\%$) but relatively stronger for GPM ($R^2 = 36.4\%$) and EVA ($R^2 = 34.6\%$). Based on the results the following was determined: The average age of inventory could be decreased by reducing the inventory balance or selling inventory faster or a combination of both. According to the results above, for every one unit decrease in AAI, ROA will decrease by 0.072 units ($\beta = 0.072$; $p < .05$) and ROE will increase by 0.145 units ($\beta = -0.145$; $p < .01$).

A decrease in ROA will be due to a decrease in return or a decrease in total assets, or a combination of both. However, from the results above it was noted that a decrease in inventory levels will result in an increase of ROE, which will be due to an increase in return. Therefore, a decrease in ROA might be a result of an increase of total assets. If a firm reduces the investment in inventory by reducing selling prices it could result in an increase in demand and would require a higher inventory balance. An increase in inventory will result in total assets increasing, which will give rise to a higher ROA.

The effect of the above on firm value is positive: every one unit decrease in AAI will result in a 0.589 increase in EVA ($\beta = -0.589$; $p < .01$). Hypothesis 2 is therefore confirmed.

Hypothesis 3

In hypothesis 3, the effect of keeping minimum levels of inventory will be tested on profitability. The expectation is that, if the inventory levels are too low, profitability will be compromised; therefore a possible reason for a decrease in profitability will be that to an excessive decrease in the inventory levels. A positive relationship is expected; if profitability decreases so would the inventory levels.

The results from the multiple regression analysis are presented in table 22.

Table 22

General retailing firms: Multiple regression analysis between profitability and AAI

	Other retailing firms	
	Estimate	t-value
Intercept	34.456	2.734
ROA	0.049	0.466
ROE	0.108	0.881
GPM	0.539**	5.211
EVA	-0.620**	-5.126
R ²	0.672	
Adjusted R ²	0.645	
Fisher F test	25.077	

*Significant at the 5% level

**Significant at the 1% level

Regression model:

$$AAI = 34.456 + 0.539GPM - 0.62EVA + \epsilon$$

The adjusted R² of 64.5% is strong, however only GPM and EVA are statistically significant in predicting AAI. The positive relationship between GPM and AAI indicates that a reduction in GPM will cause AAI to decrease ($\beta = 0.539$; $p < .01$) and implies that firms will sell inventory faster if they reduce GPM. For every one unit decrease in EVA, AAI will increase by 0.620 units ($\beta = -0.62$; $p < .01$). Hence, it cannot be concluded that a reduction in profitability (EVA) will be a result of inventory

levels being too low. This suggests that retail firms classified as general retailing firms are managing their inventory well and keeping it at the required balance to improve profitability. Hypothesis 3 is therefore confirmed by the results above.

Hypothesis 4

In hypothesis 4 the effect of a change in the investment in trade receivables on profitability was analysed.

The multiple regression analyses performed on trade receivables and the profitability measures are presented in table 23.

Table 23

General retailing firms: Multiple regression analyses between AAR and profitability

	ROA		ROE		GPM		EVA	
	Estimate	t-value	Estimate	t-value	Estimate	t-value	Estimate	t-value
Intercept	15.076	12.048	36.841	24.424	23.140	11.900	330859	5.387
AAR	0.296*	2.233	-0.201	-8.432	0.074*	2.391	-0.207	-1.529
R ²	0.087		0.578		0.099		0.043	
Adjusted R ²	0.070		0.569		0.082		0.025	
Fisher F test	4.986		71.092		5.715		2.337	

*Significant at the 5% level

**Significant at the 1% level

Regression models:

$$\text{ROA} = 15.076 + 0.296\text{AAR} + \varepsilon$$

$$\text{GPM} = 23.14 + 0.074\text{AAR} + \varepsilon$$

The adjusted R² for ROA and AAR is 7% and for GPM 10%, which are both very low. According to the results summarised in table 22, if management reduces AAR by one unit then ROA will reduce by 0.296 units ($\beta = 0.296$; $p < .05$) but it must be considered that only 7% of this variance is explained as the adjusted R². If management reduces AAR by one unit then GPM will reduce by 0.074 units ($\beta = 0.074$; $p < .05$).

Hypothesis 4 is therefore not true: A reduction in trade receivables will not result in an increase of profitability. It must however be considered that the statistical strength of the model is very low.

Hypothesis 5

As mentioned in hypothesis 4, not all retail firms will have a significant amount of trade receivables, due to sales being mostly on a cash basis. However, most retailers will have some trade receivables and if this is reduced disproportionately, for example implementing too strict credit terms, profitability will be compromised. It is therefore expected that, if the decrease in trade receivables is too extreme, profitability will decrease. The results from the multiple regression analysis are presented in table 24.

Table 24

General retailing firms: Multiple regression analysis between profitability and AAR

	Other retailing firms	
	Estimate	t-value
Intercept	134.627	12.270
ROA	-0.056	-0.797
ROE	-1.262**	-15.484
GPM	0.203*	2.967
EVA	0.726**	9.051
R ²	0.856	
Adjusted R ²	0.844	
Fisher F test	72.677	

*Significant at the 5% level

**Significant at the 1% level

Regression model:

$$\text{AAR} = 134.627 - 1.262\text{ROE} + 0.203\text{GPM} + 0.726\text{EVA} + \varepsilon$$

The adjusted R^2 (84.4%) is relatively strong and indicates that the profitability predictors can predict 84.4% of the variance in AAR. The statistically significant predictors are ROE ($p < .01$), GPM ($p < .01$) and EVA ($p < .01$). As per the above results, if a firm decreases its GPM its AAR will decrease ($\beta = 0.203$; $p < .01$) and a decrease in EVA will also result in AAR to decrease ($\beta = 0.726$; $p < .01$). However, a decrease in ROE will result in AAR to increase ($\beta = -1.262$; $p < .01$). The hypothesis is found to be true with regards to ROE, indicating that if ROE decreases so would the investment in trade receivables.

Hypothesis 6

If a firm can increase its investment in trade payables, the CCC will decrease. Hypothesis 1 states that if CCC decreases profitability will increase, therefore if trade payables increase, profitability will increase. Hypothesis 6 will test the relationship between trade payables management and profitability, and a positive correlation is expected. The results from the multiple regression analyses performed on the investment in trade payables and the profitability measures are presented in table 25.

Table 25

General retailing firms: Multiple regression analyses between AAP and profitability

	ROA		ROE		GPM		EVA	
	Estimate	t-value	Estimate	t-value	Estimate	t-value	Estimate	t-value
Intercept	6.843	12.804	21.133	18.927	1.417	0.280	606137.8	3.296
AAP	0.371	1.486	0.118	-2.461	0.578**	5.107	-0.259	-1.935
R^2	0.138		0.014		0.334		0.067	
Adjusted R^2	0.121		-0.005		0.321		0.049	
Fisher F test	8.302		0.736		26.077		3.743	

*Significant at the 5% level

**Significant at the 1% level

Regression model:

$$\text{GPM} = 1.417 + 0.578\text{AAP} + \varepsilon$$

The only statistical significant relationship between AAP and profitability is with GPM ($p < .01$). For every one unit increase in AAP, GPM will increase by 0.578 units ($\beta = 0.578$; $p < .01$). This confirms the results found in hypothesis 6 that, if a firm can negotiate better prices and credit terms, it can increase its GPM. The effect on firm value can however not be determined as the relationship between trade payables and EVA is not statistically significant. Hypothesis 6 is therefore confirmed.

Hypothesis 7

As seen in hypothesis 6, it appears that an increase in AAP will result in an increase of GPM. If the increase in trade payables is too extreme, then interest and penalties can occur and profitability will decrease. Therefore, trade payables should be managed by increasing it but only up to a certain extent. To test this, hypothesis 7 was formulated, expecting that, if profitability decreases, the investment in trade payables will increase. Table 26 summarises the results from the multiple regression analysis.

Table 26

General retailing firms: Multiple regression analysis between profitability and AAP

	Other retailing firms	
	Estimate	t-value
Intercept	23.012	3.030
ROA	0.200	1.919
ROE	0.828**	6.813
GPM	0.519**	5.076
EVA	-0.801**	-6.697
R ²	0.679	
Adjusted R ²	0.653	
Fisher F test	25.963	

*Significant at the 5% level

**Significant at the 1% level

Regression model:

$$AAR = 23.012 + 0.828ROE + 0.519GPM - 0.801EVA + \varepsilon$$

The adjusted R^2 of 65.3% is relatively strong and all the profitability variables but ROA are statistically significant. ROE and GPM has a positive relationship with AAP, therefore if ROE ($\beta = 0.828$; $p < .01$) and GPM ($\beta = 0.519$; $p < .01$) should increase, so would AAP. This is in line with the hypothesis that, if management extends its credit payments to a maximum and increases AAP, its profitability will increase.

If management can negotiate better credit terms and prices with its suppliers, the cost of goods sold could decrease, but with the sales price remaining stable, GPM will increase. This will result in an increase of sales to the increase ROE. The negative correlation between EVA and AAP does however imply that, if AAP increases, firm value will decrease ($\beta = -0.801$; $p < .01$). The reason for this may be that the increase in the time period to pay creditors was too extreme, which will have a negative effect on the supply chain. This can then result in a decrease of firm value.

Losbichler and Rothboeck (2006:281) studied European firms to investigate whether firms improve their working capital by delaying payments to suppliers and thus damaging the supplier's cash flow, and found it to be true. In his study Hofmann and Kotzab (2010:322) notes that increasing AAP is a short-term solution to improve working capital and might result in a high-risk supplier base. His sample consisted of European and USA companies and he found that companies managing their working capital from a supply chain management approach will be more profitable over the long term. Hofmann and Kotzab (2010:324) concluded that, if firms use a supply chain approach and do not reduce AAP at the expense of suppliers, cost of capital can be reduced which would increase firm value.

From the results in table 25 it is noted that every one unit decrease in EVA will result in a 0.801 increase of AAP ($\beta = -0.801$; $p < .01$), confirming Hypothesis 7 that a decrease in profitability (EVA) will be as a result of extreme extension of the payment time to creditors.

4.2.4 Comparison of Empirical Results

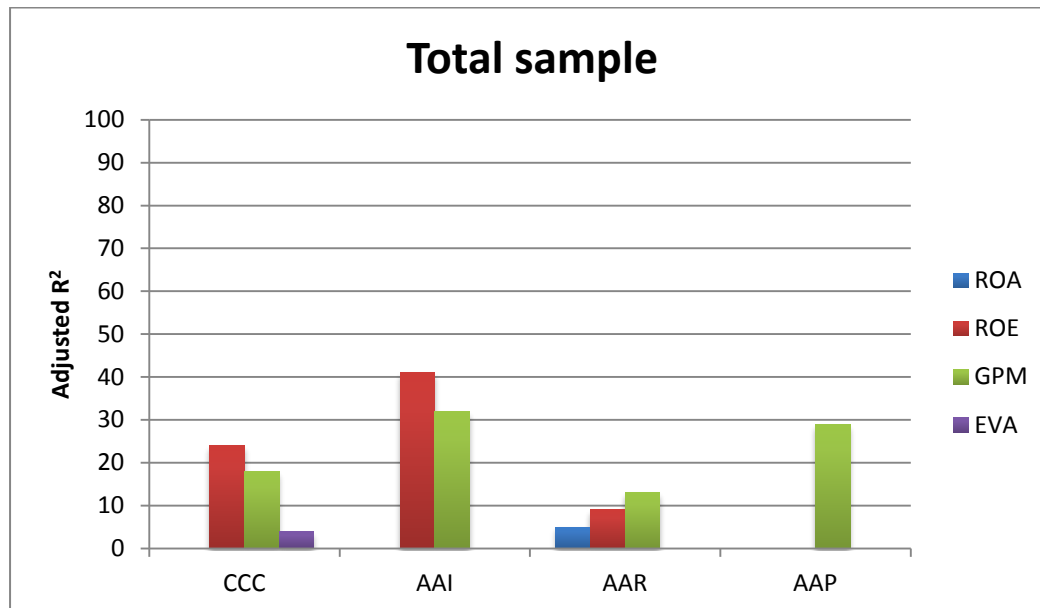
The retail sector was divided into sub-sectors with the aim of getting an in depth understanding how different types of retail firms manage their working capital. However, some of the sub-sectors (food, furniture and clothing) were too small to obtain statistically significant results and could not be used as a comparison. The results obtained from the total sample and general retailers were statistically significant and will be compared to each other.

In hypothesis 1 the relationship between CCC and profitability was investigated. The relationship between the different components of CCC and profitability was tested in hypothesis 2 (AAI), hypothesis 4 (AAR) and hypothesis 6 (AAP). This was done for the total sample and for general retailing firms. The adjusted R^2 that was used as the coefficient of determination varied between the hypotheses; some models were statistically stronger than others. Also, of the four profitability predictors, not all were always statistically significant.

The strength of the different models (measured with the adjusted R^2) and the strength of the profitability predictors (measured by the beta value) are represented in Figures 8 and 9.

Figure 8

Effect of working capital on profitability – Total Sample



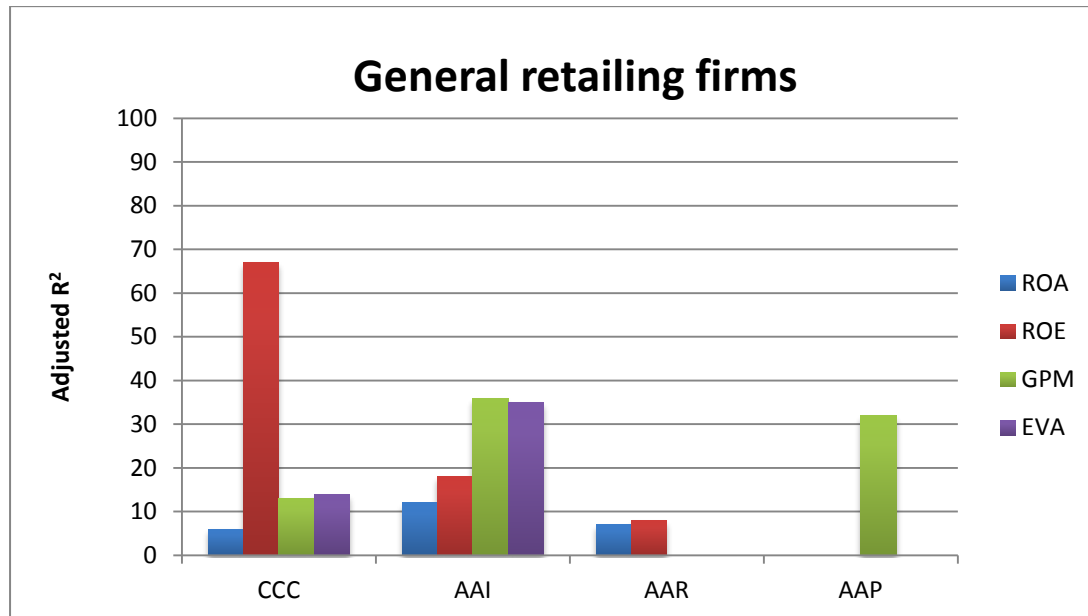
For the total sample, GPM was the best profitability predictor as it is statistically significant in predicting CCC, AAI, AAR and AAP. ROE was statistically significant in predicting CCC, AAI and AAR and having the highest adjusted R^2 in predicting CCC and AAI. EVA and ROA were the weakest predictors as each of these predictors were only statistically significant to one of the working capital components.

The main operating activity of a retail firm is to resell inventory items. Therefore, inventory management is very important to any retail firm and will have an effect on the working capital of a firm. When inventory is sold, sales and cost of sales will be affected, as would GPM. This explains why the relationship between all four working capital measures is statistically significant with GPM.

The management of net working capital refers to the management of current assets and current liabilities; therefore the management thereof might not have a significant effect on total assets. This was confirmed by the relationship between working capital not being statistically significant with ROA. The relationship between working capital and ROE is however statistically significant, indicating that the management of working capital will have a statistically significant effect on ROE. The positive

relationship between working capital and ROE confirms that if management can reduce CCC then its return will increase, which will result in ROE increasing.

Figure 9
Effect of working capital on profitability – General Retailing Firms



Overall, the adjusted R^2 is much higher for the general retailing firms than the total sample. The reason being that the sample of the other retailing firms (9 firms) is smaller than the total sample (18 firms). As with the total sample, ROE has the highest adjusted R^2 in predicting CCC and AAR. ROE and GPM is, for the general retailing firms also, the best statistical significant profitability predictors.

The results for hypothesis 1 (stating that a decrease in CCC will result in profitability increasing) were similar for the total sample and for other retailing firms. For both samples ROE was the strongest profitability predictor, indicating a negative relationship between CCC and profitability and therefore confirming hypothesis 1, stating that a decrease in CCC will result in profitability increasing.

For hypothesis 2 (stating that a decrease in inventory levels will result in profitability increasing) only two of the profitability predictors (ROE and GPM) had statistical power in predicting inventory levels for the total sample. All four of the profitability predictors (ROA, ROE, GPM and EVA) were however statistically significant in

predicting inventory levels for general retailing firms. For the total sample, ROE had the highest adjusted R^2 , and for the general retailing firms, GPM was the strongest predictor. For both of the samples there were no differences in the relationship (whether positive or negative) between the working capital components and profitability, a result similar to that of hypothesis 1.

For both the total sample and general retailing firms, the prediction of profitability by trade receivables was the weakest for all of the working capital components, as it had the lowest adjusted R^2 values (Hypothesis 4). For the total sample all but EVA was statistically significant to the investment in trade receivables but with very low adjusted R^2 values, the highest being 13% for GPM. The highest adjusted R^2 for the other retailing firms was ROE at 8%. It can therefore be concluded that the variance in profitability cannot be explained significantly by trade receivables. As mentioned earlier, many retailers included in this study have more cash than credit sales, therefore even though the reduction of trade receivables will have a positive effect on profitability it will not be as significant as the credit sales, since total sales may not be that significant.

According to the results for hypothesis 6, only GPM can be predicted by a change in trade payables for both the total sample and for other retailing firms. The adjusted R^2 was high for both of the samples, 29% for the total sample and 32% for other retailing firms.

4.3 CONCLUSION

The hypothesis testing was performed for the total sample and for general retailing firms. The results for both of the groups were similar, with the coefficient of determination being stronger for the other retailing firm's hypotheses testing. This was expected due to the smaller sample included as part of the other retailing firms.

The results found for the total sample and general retailing firms were similar. It appears that South African retailing firms are managing their working capital by reducing selling prices, which has a positive effect on the profitability of a firm. The statistical power in prediction of profitability, as measured with the adjusted R^2 , were strong for CCC, inventory and trade payables but not for trade receivables.

In this study CCC was used as the parameter for working capital, and the effect on changes in the CCC were tested on four profitability measures (ROA, ROE, GPM and EVA). In table 26 is a comparison of similar studies and the different results found in each study. For each of the other studies listed below, the effect of a change in CCC was tested using one profitability measure.

Table 27
Comparison of present study to previous studies performed

Authors and date	Sample	Period	Results
Current study	18 South African retail firms	2004-2012	Positive relationship between CCC, AAI, AAR and AAP with GPM. Negative relationship between CCC, AAI, AAR and AAP with ROE and EVA.
Bolek <i>et al.</i> (2012)	40 Polish firms	1997-2009	Negative relationship between CCC and EVA.
Deloof (2003)	1009 non-financial Belgian firms	1992-1996	Negative relationship between CCC, AAI, AAR and AAP with profitability (gross operating margin).
Erasmus (2010)	319 South African industrial firms	1989-2007	Negative relationship between NTC and ROA.
Garcia and Martinez (2007)	8872 Small and medium sized Spanish firms	1996-2002	Negative relationship between AAI and AAR with ROA.

Most of the results found in this study were similar to those of the previous studies. One of the differences between this and previous studies was that in this study a positive relationship was identified between CCC and GPM, where in Deloof's study a negative relationship was identified between CCC and GPM. The reason may be that GPM was calculated differently in the two studies. In this study it was calculated as: $(\text{Sales} - \text{Cost of sales}) \div \text{Sales}$, where Deloof used gross operating income, and the calculation thereof was: $(\text{Sales} - \text{Cost of sales}) \div (\text{Total assets} - \text{financial assets})$. Furthermore, Deloof included all non-financial firms where in this study only retail firms were included. Deloof's study is the only other study that used GPM as the profitability measure. For the rest of the studies it is clear that working capital is negatively correlated with profitability, as was confirmed in the current study.

The core business of a retailer is to resell inventory items, and therefore the inventory management is very important. As seen from the results the management of inventory will have a strong statistically significant effect on profitability, and

should be managed accordingly. The results confirm that, by reducing the investment in inventory, profitability will increase.

Large retailers included in this study (i.e., Checkers, Massmart, Spar and Pick n Pay) have predominantly cash sales. For this reason trade receivable management is not as important as inventory management. This explains the weak explanatory power of AAR on the profitability of a firm.

The results from both the total sample and other retailing firms suggest that, if retailing firms extend the payment time to creditors, their gross profit will increase. It does however not have statistically significant effects on the value of the firms, as measured by ROE and EVA.

In the next chapter, conclusions on the study and the impact on future research will be discussed.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter will draw conclusions on the study performed. It will also highlight contradictions and confirmations between this study and existing literature and make recommendations for future research.

This study had as objective to investigate the relationship between working capital management and profitability of South African retail firms. The expectation was that if the investment in working capital could be reduced, profitability would increase. The effect on profitability was tested with regards to net working capital (measured with CCC), and the three components of CCC, namely inventory (measured with AAI), trade receivables (measured with AAR) and trade payables (measured with AAP). Profitability was measured with ROA, ROE, GPM and EVA. The descriptive statistics technique was used to test the hypotheses for both the total sample and general retailing firms.

5.2 SUMMARY OF RESULTS

A change in net working capital had the most significant effect on ROE and GPM of the profitability measures for the total sample as well as for other retailing firms. Based on the coefficient of determination, the statistical power in predicting profitability was the strongest for working capital management in total and inventory management. The coefficient of determination was weak for trade receivables and trade payables management, suggesting a weak explanatory power in predicting profitability.

For both samples, working capital was positively correlated to GPM, implying that working capital levels could be managed by reducing selling prices or cost prices, which could result in GPM to decrease. This reduction will result in an increase of profitability as measured by ROA, ROE and EVA. CCC is negatively correlated with

ROE and EVA for the total sample and negatively correlated with ROA, ROE and EVA for the general retailing firms, confirming the hypothesis that if the investment in working capital can be decreased, profitability will increase.

From the hypothesis testing it was noted that South African retail firms could reduce their CCC by reducing their selling prices and/or cost prices and this reduction causes profitability to increase. The reduction in CCC can be accomplished by reducing the investment in inventory and trade receivables, and increasing the investment in trade payables. From the results it was noted that a reduction of inventory levels will have the highest statistical significant impact on a firm's profitability (as measured with ROE) and appears to be a useful strategy, emphasising the importance of inventory management of a retail firm. However, a reduction in trade receivables does not have such a high impact on a firm's profitability. The reason for this may be that retail firms predominantly sell goods for cash, and even though the effect of reducing the investment in trade receivables will result in profitability increasing, it will not be as significant. Also, by increasing the investment in trade payables, only the gross profit margin will increase but none of the other profitability measures will be affected. A possible reason why the gross profit margin will be affected may be that the direct effect of the cost of items (which is used to calculate the gross profit margin) on trade payables. The level of trade payables does however not have statistically significant results on the other profitability predictors. It could be that the firms included in this study did not necessarily negotiate better credit terms with their suppliers, or that terms were set to benefit all parties within the supply chain. It can therefore be concluded that South African retail firms manage their CCC by focusing mainly on inventory management and do so by reducing the inventory levels to a minimum. By decreasing the levels of inventory, profitability will increase.

5.3 SYNTHESIS WITH LITERATURE REVIEW

Various studies have been done with regards to the relationship between working capital and profitability (Deloof, 2003:573; Bolek *et al.*, 2012:1; Erasmus, 2010:2; and Garcia & Martinez, 2007:164). These studies were performed in different countries and different profitability measures were used. In the present study, as well as the

previous studies listed above, it was found that if firms can decrease their investment in net working capital, profitability will increase. The only other study found which used GPM as one of the profitability measures was the study by Deloof (2003:585), and he found a negative relationship between working capital management and gross profit. However in the present study a positive relationship was found between working capital management and gross profit. The reason for this is attributable to the different calculation of GPM in the two studies and the type of industry included in the sample being different. Deloof (2003:573) studied non-financial Belgian firms where the present study only studied retail firms. As explained in Chapter 4, inventory management is one of the main operating activities of a retail firm, and in order to increase sales firms could use the method of reducing their selling prices. This could result in AAI decreasing due to inventory being sold faster, and even though GPM decreases it was noted from the results presented in Chapter 4 that other profitability measures such as ROE and EVA would increase.

From the literature review it was noted that supply chain management should play an important role in working capital management. Losbichler and Rothboeck (2006:281) found in their study that firms that reduce their CCC by extending the payment time to creditors would have a negative impact on their suppliers. Results found by Lazaridis and Tryfonidis (2006:27) indicated if firms delay their payments to creditors beyond the agreed credit terms, their profitability would decrease. In the present study it was found that if the payment time to creditors increases, so will profitability, as measured by GPM. Therefore, retail firms included in the present study were found to manage trade payables in such a way that profitability increases. It can therefore be concluded that South African retail companies are not managing trade payables in such a way that other firms within the supply chain are affected negatively. However, the effect of trade payables management on profitability did not indicate strong statistically significant results. Due to the results not indicating a strong relationship between trade payables management and profitability, it appears that South African retail companies manage their investment in working capital by means of inventory and trade receivables management, and not necessarily trade payables management.

Hypothesis 8 tested the impact on profitability depending on the financing approach a firm follows. Firms following an aggressive financing approach will have high levels of short-term liabilities relative to total liabilities. The total liabilities of firms following a conservative financing approach will predominantly consist of long-term liabilities. Firms having neither high nor low levels of short-term financing are following a neutral financing approach. Firms following the aggressive financing approach will delay payments to creditors to a maximum and invest available cash resources in more profitable investments and/or productive assets. Therefore the expectation of this hypothesis was that firms having high levels of short-term liabilities as a percentage of total liabilities would be more profitable. Results from this study suggested that, if a firm follows an aggressive financing approach, ROA will increase but both ROE and EVA will decrease. This indicates that firms following an aggressive financing approach manage to reduce CCC by lowering their investment in working capital resulting in total assets decreasing but return increasing which results in ROA increasing. However the use of an aggressive financing approach negatively affects value creation as measured with ROE and EVA, which can be due to the associated risk anticipated by shareholders when a firm follows an aggressive financing approach. Firms following the aggressive approach will have higher levels of short-term financing, and therefore the investment in trade payables for such firms will be higher. Results from hypothesis 6 suggested that higher levels of trade payables would result in profitability to increase, confirming the results from hypothesis 8 that firms with higher levels of short-term financing will be more profitable.

Results from this study indicated that firms following a conservative financing approach will have a decrease in ROA, and if firms follow a neutral approach, ROA, ROE and GPM will decrease and only EVA will increase. The results do therefore not necessarily indicate the best approach to follow but it does confirm hypothesis 8, namely that firms following an aggressive financing approach will be more profitable than firms following a conservative financing approach.

The results from the present study correspond with those of previous studies, and where there were differences reasonable reasons were presented. Also the results

found between the two different sample groups (total sample and general retailing firms) did not present any contradicting results.

5.4 RECOMMENDATIONS FOR FUTURE RESEARCH

Based on the results found in the present study the following recommendations could be made for future research. Gross profit was included as one of the profitability measures, which was also used in the study performed by Deloof (2003). None of the other previous studies used gross profit as a profitability measure. The reason why gross profit was used as one of the measures in the present study was due the importance of cost of sales and gross profit to a retail firm. Gross profit can be used in future research in measuring profitability in industries other than the retail industry, to get an understanding of the effect on changes in the management of working capital on the gross profit of a firm. From the results of this study it is clear that inventory management has a significant effect on profitability. Further studies should focus specifically on the effectiveness of inventory management and its possible effects on profitability of firms in other industries.

This study focused on working capital management of the retail sector as opposed to Erasmus (2010:2) who included industrial firms in his study. Future research could focus on other sectors within a South African context, for instance the manufacturing or the service sector, such as software and healthcare providers. A comparison can then be made of working capital management techniques between the retail- and other sectors. The effect of working capital management on profitability can also be established for other sectors than the retail sector.

In the literature review it was noted that supply chain management should play an important role in working capital management. Results from this study indicated that if firms delay payments to creditors it has a positive effect on profitability, and not negative as previous studies focusing on the supply chain has found (Lazaridis & Tryfonidis 2006:34). Further studies should be performed in this area and could be done in other industries such as manufacturing firms. The value of this would be to investigate the effect of working capital management not only on the profitability of

these firms, but also to determine the effect of managing trade payables on other firms within the supply chain.

The effect on profitability as a result of the financing approach followed by a firm should be analysed in future research based on a larger sample of firms and could be done for other industries than the retail industry.

5.5 CONCLUSION

The objective of the study was to investigate the relationship between working capital management and profitability of South African retail firms. The study did succeed in its aim, and it was determined that if a firm can reduce its investment in net working capital its profitability will increase. The importance of working capital management was therefore confirmed in this study, as it would influence a firm's profitability. The effective management of working capital will not only improve a firms' profitability, but also increase shareholders' wealth, which is the ultimate goal of any firm.

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