

ΟΙΚΟΝΟΜΙΚΟ  
ΠΑΝΕΠΙΣΤΗΜΙΟ  
ΑΘΗΝΩΝ



ATHENS UNIVERSITY  
OF ECONOMICS  
AND BUSINESS

*Does Working Capital Management Affect Profitability Of  
U.K. Firms?*

ΜΑΚΡΗΣ ΓΕΩΡΓΙΟΣ

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**Εγκρίνουμε την εργασία του**

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***01/09/2017***

## **ΒΕΒΑΙΩΣΗ ΕΚΠΟΝΗΣΗΣ ΔΙΠΛΩΜΑΤΙΚΗΣ ΕΡΓΑΣΙΑΣ**

«Δηλώνω υπεύθυνα ότι η συγκεκριμένη πτυχιακή εργασία για τη λήψη του Μεταπτυχιακού Διπλώματος Ειδίκευσης στη Λογιστική και Χρηματοοικονομική έχει συγγραφεί από εμένα προσωπικά και δεν έχει υποβληθεί ούτε έχει εγκριθεί στο πλαίσιο κάποιου άλλου μεταπτυχιακού ή προπτυχιακού τίτλου σπουδών, στην Ελλάδα ή στο εξωτερικό. Η εργασία αυτή έχοντας εκπονηθεί από εμένα, αντιπροσωπεύει τις προσωπικές μου απόψεις επί του θέματος. Οι πηγές στις οποίες ανέτρεξα για την εκπόνηση της συγκεκριμένης διπλωματικής αναφέρονται στο σύνολό τους, δίνοντας πλήρεις αναφορές στους συγγραφείς, συμπεριλαμβανομένων και των πηγών που ενδεχομένως χρησιμοποιήθηκαν από το διαδίκτυο».

**[ΟΝΟΜΑΤΕΠΩΝΥΜΟ ΦΟΙΤΗΤΗ/ΤΡΙΑΣ]**

**[ΥΠΟΓΡΑΦΗ]**

**ΜΑΚΡΗΣ ΓΕΩΡΓΙΟΣ**

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ABSTRACT: The purpose of this assignment is to extend of the findings of Deloof(2003) and his work relative with working capital management . This will be done by applying various analysis methods for the period 2005-2015 for a selected number of companies that are listed to the London Stock Exchange. The purpose of this assignment is to examine the potential effects that working capital management can have on the profitability on corporations. For this purpose we utilized regression analysis. Models were constructed by both using the fixed effects method and the plain ordinary least squares method.

## INTRODUCTION

The purpose of this assignment is to extend of the findings of Deloof(2003) and his work relative with working capital management . This will be done by applying various analysis methods for the period 2005-2015 for a selected number of companies that are listed to the London Stock Exchange.

Working capital management is essentially the financial management process that revolves around the short term financial accounts of the firm whether they belong to the assets side or the liabilities side of the basic accounting equation. Since working capital management has evolved into a core process of financial management then it is essential to further shed light on working capital optimal practices. For analysis purposes , working capital management effectiveness is approximated by the use of the cash conversion cycle which is the time it takes for a company to realize earnings ,from the time it first purchased the relevant resource inputs.

The structure of this assignment is as follows. In the first part various academic papers will be presented in an effort to contextualize working capital management advances. The second part contains the results and methodology of plain ordinary least squares regression models and fixed effects regression models. The third part will contain the relevant conclusions.

## BIBLIOGRAPHY REVIEW

This part of the assignment refers to the relevant academic advances that concern the issue of working capital management and how it can possibly affect company operational and profitability figures. Various research efforts will be presented along with the relevant findings.

Researchers point out that the nature of working capital includes a substantial amount of cash and cash related instruments such as receivables or government debt, as well as short term payables that can be considered as source of short term financing. If it is taken into account that according to the national bank of Belgium , Belgian firms included , had accounts receivable figures that reached the proportion of 17% of total assets while inventories amounted to 10% and accounts payable to 13% (Deloof,2003). If we add up the aforementioned percentage values we come up with a total of 40% of total assets for values concerning working capital as a concept.

One can therefore safely argue that the efficient and effective working capital management is a vital operation for the majority of business entities regardless of the scope of operations and it should come as no surprise considering the above that globally speaking ,companies have highlighted working capital management as one of the core processes of financial management.

As part of the financial management process ,executives must determine a balance between working capital and less liquid values represented in the balance sheet. Having too much working capital might tie in resources that can be allocated for investing activities

while diminished levels of working capital can result in disruption of daily operations due to shortages and disruptions in the supply chain cycle.

There are various paradigms mentioned in academic bibliography that describe the association and interconnection between working capital individual elements and firm performance. A frequently mentioned value is inventory. It is underlined that higher inventory values are associated with higher revenue figures because the possibility of a stock out is minimized due to sufficient merchandise and as a result enhanced company value (Long , Malitz and Ravid, 1993). Lenient credit policies are also associated with high sales figures. This approach towards credit policy increases the amounts represented by accounts receivable .

Worth mentioning is the fact that granting credit to customers is another way of utilizing available credit as far as the customer is concerned and this direct approach can be favoured against obtaining credit from a financial institution (Petersen and Rajan, 1997). It can be argued that both factors , while being a positive component of sales growth, both exert an influence on committed resources due to the fact that the larger they get the more assets are tied in to working capital.

Analysis conducted on another constituent part of working capital, with that being accounts payable, reveals that trade credit obtained in the form of delayed payments to suppliers is a rather frequently utilized means of financing operations for Belgian firms. (Svenson, 1997).

This is evident by the fact that while the majority of Belgian firms , with the percentage reaching 75% , offered an average discount 3% for payments that occurred



within 10 days after the respective invoice had been received, customers preferred to pay for their purchases at a later point in time. Specifically , the average payment period was 61 days while the recorded contractual period was 41 days. This signifies that Belgian firms did not only not take advantage of the 3% average offered discount but preferred to delay their payments and in essence extend their credit via this approach.

Researchers point out that the payment periods between American firms and Belgian firms differ considerably with the Belgian payment periods being more extended. In essence companies that belong to the above groups both seek credit. The difference is that the American companies do so by utilizing financial institutions, while the Belgian firms fulfil this objective , for the most part , by extending credit from their suppliers. This difference in approaches can be partially explained by the fact that Belgian capital markets along with the majority of capital markets operating in continental Europe countries , can be characterized as underdeveloped (La Porta et.al ,1997). This characterization is a product of the fact that this group of countries do not have laws in practice that enable a sufficient degree of investor protection leading to agency and information deficiencies. The underdeveloped capital markets are a factor that enables trade credit to be the first among alternative solutions of financing.

The financing methods that are a result of trade credit expansion, can be characterized as informal (Fisman&Love ,2001). This informal nature stems from the fact that suppliers , being able to bridge the gap of informational asymmetry between their customers and banks , act in essence as agents of risk mitigation. Moreover they offer better trade protection as compared to formal institutional lenders.

Researchers have frequently utilized the cash conversion cycle as metric directly applicable to the evaluation of working capital management. The cash conversion cycle is the time period that begins with purchasing raw materials and ends with collecting the cash from the associated sales. The greater the time period the higher is the amount of resources that have to be tied up to working capital. However , it ought to be mentioned that a higher cash conversion cycle is often associated with higher sales figures. It is immediately pointed out that there is a cost benefit relationship that should be examined. The higher sales figures have to produce benefits that will outweigh the costs of investing in working capital.

Research on this topic indicates that if the cash conversion cycle is kept near the industry lower values then this condition is associated with higher profitability figures and increased wealth for the stockholders (Shin & Soenen ,1998). This research was conducted on a large sample of American listed companies. For the period of 1975-1994 , researchers come to the conclusion that there is a strong negative relationship between corporate profitability and the length of the cash conversion cycle.

The empirical results presented above are verified directly and indirectly by a number of other relevant academic papers. Under a research attempt of a similar scope, It was found that Belgian firms have the ability to increase their profitability figures if they are able to reduce the debtors collection period and the days-in-inventory period (Deloof, 2003). The same research also demonstrated that the less profitable firms are the same firms in their vast majority that delay paying their bills and therefore taking full advantage of the informal credit extension offered by various suppliers.

Japanese and Taiwanese firms were also put under scrutiny in order to examine the relationship between working capital management and profitability (Wang, 2003). This study revealed that a shorter cash conversion cycle can be directly related with increased levels of profitability.

The results of this study are indirectly verified by a similar study conducted ,that had as a main reference point small and medium sized Spanish firms for the period spanning from 1996 up until 2002 (Teruel&Solano, 2007). This study highlighted the fact that by reducing the days in inventory period and the debtors collection period , the company can promote value creation. The results of this study are essentially similar to the results relevant with the study concerning the Belgian firms. Both these studies indirectly verify the finding that the length of the cash conversion cycle is inversely related to the potential height of corporate profitability figures. The characterization indirectly stems from the fact that both studies come to the same conclusion , that is reducing the days in inventory period and the debtors collection period both increase profitability. Both of these elements and integral parts of the cash conversion cycle calculation process .

At this point of this assignment , it should be mentioned that there are researchers who take an opposite position as far as the relationship between the length of the cash conversion cycle and corporate profitability figures is concerned.

The argument is made that tying up resources to elements relevant to the cash conversion cycle and thereby increase the cash conversion cycle length , can lead to enhanced profitability figures and better performance in general. This result can be accomplished for instance, due to the positive influence that is exerted to sales by keeping a

comparatively large inventory. A policy that is oriented towards maintaining adequate inventory levels can also lead reduction of supply costs , reduction of the possibility that a possible disruption will occur , and protection from any possible price fluctuation (Blinder &Maccini, 1991).

The higher debtors collection period is also a metric that can present positive correlation with corporate profitability , due to the fact that by offering a more lenient credit policy , the supplier can attract customers and increase associated revenues. As it was presented above , working capital associated accounts take up a big percentage of total assets. If the fact that more than 80 % of business to business related trade is taking place with the form of provided credit (Summers & Wilson ,2000), is taken under consideration, then it can be argued that profitability can indeed be enhanced by opting for a more lenient credit policy since credit related transactions are the taking up the lions share.

## ANALYSIS METHODS UTILIZED

At the following part of the analysis , the most frequently used measures in academic bibliography that represent liquidity and its association with corporate profitability , will be presented. The two measures presented, will be the cash conversion cycle and the net trade cycle.

- CASH CONVERSION CYCLE

Introductory and widely utilized measures of corporate liquidity figures include the current ratio and the quick ratio. The informational content of these two measures can be characterized as insufficient and their use can be limited to a supplementary role. This happens because of the inadequacy to examine the firms efficiency in managing working capital due to their static nature and the misleading inferences that can be made if research attempts rely heavily on both (Kamath, 1989).

Referring to liquidity and the way it is measured , it should also be highlighted that liquidity is largely relevant with the operating cash flow that can be generated by the assets that the company owns and as the possible liquidation value of these assets.

The explanatory inadequacy of the current ratio and the quick ratio along with the misinterpretation of liquidation value confusing it with liquidity ,underlined the need for more detailed measures of liquidity that can be connected with corporate profitability. Important steps towards this direction were taken with the introduction of cash cycle concept as a concept directly related with working capital management (Gitman, 1974). The concept is rather simple as it measures the time interval between transforming inputs into gains for the company. The total cash conversion cycle can be simply defined as the number of days a firm pays for its purchases until the company collects for the sale of the finished product.

The aforementioned concept was further operationalized by reflecting the net time interval between cash expenditures on purchases and the ultimate recovery of cash receipts from the sales of final products ( Richards& Laughlin, 1980). The cash conversion cycle is an

additive measure of the number of days funds are committed to inventories and receivables less the number of days payments are deferred to suppliers.

A more detailed version of the cash conversion cycle was later developed. This more detailed version of the cash conversion cycle is termed the weighted cash conversion cycle and intends to scale the timing by the amount of funds in each step of the cycle (Gentry et.al, 1990). For the calculation of the respective weights that have to be used , the amount of cash that has been tied up in each component , is divided by the final value of each component. As a result , the weighted cash conversion cycle includes both the number of days and the amount of funds that are tied up at each stage of the cash cycle.

- The net trade cycle

The net trade cycle has a great degree of similarity with the cash conversion cycle with the main difference being that all three components are expressed in terms of revenues. In other words ,and operating under the assumption that every other condition remains unchanged ,the net trade cycle indicates the number of the amount of sales that occur within a day, that the company has to commit in order to finance the working capital.

By utilizing the net trade cycle inferences can be made about estimations concerning additional financing needs with regard to working capital , expressed as a function of the projected sales growth. Again the length of the net trade cycle can be used as an evaluation tool relevant with working capital management efficiency with smaller values pointing towards increased managerial efficiency .

The net trade cycle can also be connected with issues relevant with firm valuation and creation of shareholder value. The shorter the net trade cycle ,the lower the value of the denominator that is used for present value calculations and as a result the value of the fraction representing net cash flows generated by the company's assets , in present value terms , will be higher. The shorter net trade cycle can signify , as mentioned above ,managerial efficiency and as a result lower financing needs relative to working capital the working capital management process.

The informational content of the weighted cash conversion cycle is more appropriate for making detailed and logically based inferences about working capital management related decisions , as compared to the net trade cycle. One would expect that weighted cash conversion cycle would have been the main tool for decision making and analysis. But this is not the case. There are plenty of instances that practitioners and academics would favour the use of the net trade cycle of weighted cash conversion cycle.

The main drawback of the weighted cash conversion cycle is that it , as a measurement tool , requires a great deal of inputs that cannot easily be available to a third party , outside the corporate entity. For example , we can consider that inventory is broken down into work in progress ,raw materials and finished goods , and then it becomes evident that the most accessible figure of inventory that is utilized in calculations is the one appearing in the financial statements. Moreover the cash conversion cycle is an additive component and by adding the three constituent elements, conclusion can be derived up to a point. As mentioned above the net trade cycle presents figures as a percentage of sales which allowing for comparative conclusions.

## WORKING CAPITAL MANAGEMENT PAPERS

At this point of the assignment, various research efforts will be presented. The methodology utilized as well as the main conclusions of each research effort will be briefly mentioned .

- Shin, H. H., & Soenen, L. (1998). Efficiency of working capital management and corporate profitability

The authors of this paper recognize the importance of the working capital management process as a basic part of the financial operations of the company. They utilize the net trade cycle in order to examine the relationship between working capital management and profitability. They conduct their research based on a sample of nearly 60000 companies for a time period of 20 years , from 1975- 1994. They use regression analysis and find that there is a strong negative association between the net trade cycle and corporate profitability. Consequently they also find there is a negative correlation between stock returns and the net trade cycle. They point out that keeping the net trade cycle to a minimum level , should be a top priority for financial executives.



- Charitou, M. S., Elfani, M., & Lois, P. (2010). The effect of working capital management on firm's profitability: empirical evidence from an emerging market

The authors of this study attempt to empirically investigate whether working capital management can have an effect on the financial performance of the firm. This analysis concerns companies that base their operations on an emerging economy, Cyprus. Their data include companies that they have been listed in the Cyprus stock exchange for the period of 1998 until 2007. They use multivariate regression analysis and they find that there is a significant negative relationship between the cash conversion cycle and corporate profitability.

- Deloof, M. (2003). Does working capital management affect profitability of Belgian firms?.

The author of this paper investigates the relationship between working capital management and corporate profitability for 1009 Belgian firms for the period that starts at 1992 and ends at 1996. He uses the cash conversion cycle in order to accurately represent working capital management. For inventory policies and trade credit measures he uses the following variables , number of days accounts receivable , number of days inventories and number of days accounts payable. The dataset that he has worked upon does not contain firms that belong to the banking and finance industry as well as utility providers. For the purposes of his research he uses regression analysis. He produces results based on the fixed effects estimation process and based on plain ordinary least squares models. His results are

similar to the majority of research efforts relevant with the working capital management process .

He concludes by mentioning that corporate profitability can be increased by managers if the latter can achieve a minimization of the cash conversion cycle. He also points out the fact that the reduction should be mostly targeting number of days accounts receivable and number of days inventories. Further explanation is provided regarding the negative relationship between accounts payable and gross operating income by stating that firms that are less profitable are much more likely to refrain from paying their bills.

- Lazaridis, I., & Tryfonidis, D. (2006). Relationship between working capital management and profitability of listed companies in the Athens stock exchange.

This research effort tries to shed light on the relationship between corporate profitability and working capital management. The authors utilize a sample of 131 companies that are listed on the Athens stock exchange. The paper covers the period that starts from 2001 and ends during 2004 and examines whether there is a statistically significant relationship between profitability figures of the listed companies and working capital management as described by the cash conversion cycle. The results of this study indicate that there is statistically significant relationship between corporate profitability and the cash conversion cycle , which is also negative. Worth mentioning is the fact that researchers use regression analysis in order to complete their task.

- Raheman, A., & Nasr, M. (2007). Working capital management and profitability—case of Pakistani firms.

The authors of the paper have selected a sample of 94 firms that are listed on the Karachi stock exchange , for a period of 6 years ranging from 1999 to 2004. They have examined the possible effect that various variables , that are directly related to working capital management, can have on the profitability of Pakistani firms , with those sample of variables including , current ratio , the cash conversion cycle , the average payment period ,the average collection period and inventory turnover in days. They have used three control variables . The first control variable is the size of the firm which is approximated by the natural logarithm of sales. The debt ratio and the financial assets to total assets ratio are the second and third control variable.

For their regression analysis they utilize pooled least squares and general least squares with cross section weight models. Their results indicate that there is a strong negative association between variables directly related to working capital management concepts and profitability. They conclude on the issue by stating that the cash conversion cycle has to be kept to a minimum level. They also find a significant negative relationship between profitability and liquidity. Moreover they highlight that there is a strong positive relationship between profitability and firm size.

- Gill, A., Biger, N., & Mathur, N. (2010). The relationship between working capital management and profitability: Evidence from the United States

The authors of this paper try to extend Lazaridis and Tryfonidis study by adding 88 companies that are listed on the New York stock exchange. The sample contains observations concerning a period of 3 years, beginning in 2005 up until 2007. They approximate profitability by using gross operating profit. Their findings depict a strong negative relation between the length of the cash conversion cycle and corporate profitability. They suggest that practitioners should aim towards handling the cash conversion cycle properly and optimizing the levels of accounts receivable. Worth mentioning is the fact that the sample utilized in this study contains companies that belong only to the American manufacturing industry

- Baños-Caballero, S., García-Teruel, P. J., & Martínez-Solano, P. (2014). Working capital management, corporate performance, and financial constraints

The authors of this study examine the potential impact that working capital management practices can have on corporate profitability. For the purposes of this study they utilize a data set of 258 listed, non-financial firms. The study concerned the period

2001-2007. They utilize the general method of moments process in order to control for endogeneity.

This study contributes to the already existing body of literature by claiming that there is an inverted u-shaped relationship between working capital values and firm performance. In other words the firm can benefit in 2 instances. When it has minimized the level of working capital , which is what researchers have been claiming so far , but also when it has maximized working capital values.

The authors also examine the concept of the accurate level of working capital being misrepresented due to the existence of various financial constraints. For example the existence of an agreed upon divided pay-out ratio, or various other restrictions that can be related with external financing agreements. This covenants impose restrictions on the levels of working capital that a firm possesses . As a result the authors argue that such possibilities should be taken into account for any future working capital related analysis.

- Baños-Caballero, S., García-Teruel, P. J., & Martínez-Solano, P. (2010).

#### Working capital management in SMEs

The same authors set to investigate the effect of working capital management on small and medium sized enterprises. They investigated this effect based on a sample of 8872 Spanish companies for the period 1996-2002. For the purposes of their research they use regression analysis. They found that the number of days accounts receivable and days of inventory , had a negative impact on the profitability levels of small and medium sized enterprises.

They cannot conclude however that the number of days accounts payable , also has a negative impact on the profitability of small and medium size enterprises. Their conclusion is based on the fact that when they control for endogeneity then the relation between small and medium size enterprises profitability levels and number of days accounts payable , loses its significance.

- Mathuva, D. (2015). The Influence of working capital management components on corporate profitability.

This study examines the potential impact of working capital management decisions on corporate profitability. For the purposes of this study a sample of 30 firms that were listed on the Nairobi stock exchange was utilized. The sample contained data relative with the period 1993-2008. The authors used pooled ordinary least squares regression analysis and fixed effects regression analysis in order to effectively build their models.

The first finding of the research is relative with account collection period. The author argues that profitable companies collect cash in from their customers in a more efficient way than their less profitable counterparts.

Another finding concerns the level of inventories . The author argues that more profitable firms maintain sufficient level of inventories , protecting themselves from price fluctuations and various shortages.

The third finding concerns the average payment period that it takes for corporations to pay back their creditors . While other research results point to the direction that there is a tendency for more profitable firms to pay their obligations in time , the results of this study highlight the fact that more profitable firms tend to delay payments regarding their obligations.

## METHODOLOGY

The purpose of this assignment is to examine the potential effects that working capital management can have on the profitability on corporations. For this purpose we utilized regression analysis. Models were constructed by both using the fixed effects method and the plain ordinary least squares method. This assignment will follow DeLoof (2003) and the methodology he has applied with some modifications

The variability of the dependent variable ,which is gross income/total assets would be examined by a set of explanatory variables. These variables are : days accounts receivable , days in inventories , days accounts payable, cash conversion cycle ,size , sales growth , debt ratio and liquidity ratio.Size , sales growth , debt ratio and liquidity ratio, are the control variables of the model.

The regressed equation can be described by the following representation:

- i. 
$$\text{Gross income/total assets}_{it} = \text{constant} + b_1 * \text{days accounts receivable}_{it} + b_2 \text{ size}_{it} + b_3 \text{ sales growth}_{it} + b_4 \text{ debt ratio}_{it} + b_5 \text{ liquidity ratio}_{it} + e_i$$
- ii. 
$$\text{Gross income/total assets}_{it} = \text{constant} + b_6 * \text{days in inventories}_{it} + b_2 \text{ size}_{it} + b_3 \text{ sales growth}_{it} + b_4 \text{ debt ratio}_{it} + b_5 \text{ liquidity ratio}_{it} + e_i$$
- iii. 
$$\text{Gross income/total assets}_{it} = \text{constant} + b_7 * \text{days accounts payable}_{it} + b_2 \text{ size}_{it} + b_3 \text{ sales growth}_{it} + b_4 \text{ debt ratio}_{it} + b_5 \text{ liquidity ratio}_{it} + e_i$$
- iv. 
$$\text{Gross income/total assets}_{it} = \text{constant} + b_8 * \text{cash conversion cycle}_{it} + b_2 \text{ size}_{it} + b_3 \text{ sales growth}_{it} + b_4 \text{ debt ratio}_{it} + b_5 \text{ liquidity ratio}_{it} + e_i$$



In both the plain ordinary least squares models and the fixed effects models it is attempted to in essence isolate and study the effects of each one of the components of the cash conversion cycle

The following part of the discussion revolves around the rationale under which the abovementioned variables were selected. The calculation process relevant with each variable will also be presented.

Gross income/total assets: Gross income was chosen over net income for various reasons. The first has to do with deferred or accrued quantities that are a result of previous years actions. The second reason is that different companies might belong to different tax brackets. The third reason has to do with the financial assets that companies might possess and affect the income account before net income has been calculated. The approach that Deloof (2003) took , of dividing gross income figures with total assets was followed.

Days accounts receivable: this variable is calculated by multiplying accounts receivable figures by 365 and then dividing the product by sales. This variable is the part of the cash conversion cycle . This variable represents the days required for a company to collect credit sales already invoiced.

Days in inventory: this variable is calculated by multiplying inventory values by 365 and the diving the product by the respective cost of sales. This variable is used because it is a component of the cash conversion cycle. This variable represents the days that are required for the company in order to sell its full inventory as measured by cost of sales.

Days accounts payable: this variable is calculated by multiplying accounts payable figures for each company by 365 and then dividing the product by the correspondent number of purchases. The number of purchases is calculated by subtracting the previous years inventory from the current inventory and adding the cost of goods sold. This variable is part of the cash conversion cycle. It represents the number of days required for each company to pay its suppliers.

Firm size: this variable is calculated by calculating the natural logarithm of sales for each company. This variable is utilized in that particular manner by Deloof (2003 ) as well. It is hypothesized that firm size will have a positive relationship with gross income, since bigger companies generate more sales and take advantage of economies of scale.

Sales growth: This variable is calculated by finding the arithmetic growth rate for each year of sales. It is hypothesized that this variable will have appositive relationship with gross income since increased sales might lead to extra profitability figures for the company.

Debt ratio: This ratio is calculated by dividing total debt values by the total asset values. It is hypothesized that debt ratio will be negatively associated with gross income since companies that appear to be more leveraged have extra financial obligations

Liquidity ratio: this variable is calculated by dividing short term financial asset values by the total assets. It is hypothesized that this variable will have a positive relationship with gross income as increased liquidity can be the result of successful past company operations.

## THE SELECTED SAMPLE

The initial sample downloaded from DATASTREAM contained 209 companies of various sectors. There is representation of sectors of various size and risk profiles like mining ,industrial engineering , aerospace and defence, retailers , technology and hardware, tobacco , oil production and exploration. Companies from the financial sector were not chosen for the purposes of this analysis. The period that will be examined is 2005-2015.

By checking the downloaded quotes , it was evident that a lot of information were missing or had the value 0, which could not be used for calculations , as it would create a series of outliers. Missing values can also be the result of the company recently going public and having a limited amount of publicly available data.

The companies that had those kinds of values in the associated data series were removed from the sample. The companies removed were 89 leaving a total of 120 companies remaining in the sample. From these 120 companies ,the companies representing the highest and the lowest 2% of gross income values were also removed from the sample. The final number of companies is 116.

The 2% figure is an arbitrary level of the number of companies that are excluded from the sample. In order to produce a model that its results would have been less sensitive to outlying values this figure could have been increased. It was also taken into consideration that a great part of the initial sample had to be removed because of data shortages. The gross income array was chosen as the relevant category because outlying gross income values , is hypothesized to be strongly associated with outlying values existing in other categories of downloaded data.

## DESCRIPTIVE STATISTICS

The following table presents the descriptive statistics of the sample variables used.(Figure 1)

<i>GROSS INCOME</i>		<i>DAYS ACCOUNTS RECEIVABLE</i>	<i>DAYS IN INVENTORIES</i>	<i>NUMBER ACCOUNTS PAYABLE</i>	<i>CASH CONV CYCLE</i>
Mean	1028960.857	59.5644977	121.9025867	70.1687623	111.2983221
Standard Error	65376.10518	1.069354553	6.928204581	2.592878258	6.886500558
Median	258484	58.85802988	75.46568108	55.9950052	76.94262768
Mode	409700	#N/A	54.6	0.273531175	#N/A
Standard Deviation	2335309.15	38.19856604	247.483381	92.62057295	245.9936657
Sample Variance	5.45367E+12	1459.130447	61248.02389	8578.570534	60512.88356
Kurtosis	25.7318307	12.36204796	513.6408583	98.28812163	456.102679
Skewness	4.6339686	2.239149481	18.8145527	-3.269359256	17.25192632
Range	21629868	422.5898811	7155.91989	2206.753834	7511.86099
Minimum	-340908	0.387301845	0.072665738	-1365.768613	-622.9831158
Maximum	21288960	422.977183	7155.992556	840.9852217	6888.877875
Sum	1312954053	76004.29906	155547.7007	89535.3407	142016.659
Count	1276	1276	1276	1276	1276
	<i>SIZE</i>	<i>SALES GROWTH</i>	<i>DEBT RATIO</i>	<i>LIQUIDITY RATIO</i>	
Mean	13.86816899	0.095480221	0.218292497	0.099116254	
Standard Error	0.04454715	0.011318958	0.004458283	0.002398594	
Median	13.69407417	0.053584629	0.202806405	0.071009833	
Mode	13.19950959	0.054104114	0	#N/A	
Standard Deviation	1.591275063	0.404326121	0.159254959	0.085680515	
Sample Variance	2.532156326	0.163479612	0.025362142	0.007341151	
Kurtosis	-0.067654366	214.451902	5.543686123	3.739976776	
Skewness	0.1814041	12.28595939	1.576421544	1.759521535	
Range	10.25572529	8.849410068	1.330936495	0.676981605	
Minimum	7.731492029	-0.740151621	0	0	
Maximum	17.98721732	8.109258447	1.330936495	0.676981605	
Sum	17695.78364	121.8327622	278.5412265	126.4723397	
Count	1276	1276	1276	1276	

The mean value is the average value of the observations that belong to each of the variables. It takes a firm that is included in this analysis , 59.5 days on average in order to collect receivables and 121 days in order to turn-over inventory values. It also takes on average 70 days for a firm included in the sample to pay its suppliers. The above mentioned figures result in an average cash conversion cycle value of 111 days.

The median value refers to the observation that belongs to the 50<sup>th</sup> percentile of the sample and effectively divides the sample in two equal parts. In a normal distribution the median value is supposed to coincide with the mean value but here this is not a case as the mean value for the cash conversion cycle is 111 and the median value for the same

category, is 76.9. the median is a more representative metric for making inferences as compared to the mean because the mean is influenced by outlying values. The median for days accounts receivable is 57.8 , for days in inventories 75.4 and for days accounts payable 55.9.

Standard deviation is depression metric that effectively measures how spread are the observations relative with the sample mean. For the group of data relevant with the cash conversion cycle , it is observed that standard deviation is 245. This value can partially explain the distance between the sample median and the sample mean.

The range value refers to the difference between the highest and the minimum and maximum observation values. The minimum value for the cash conversion cycle is a negative number. A negative cash conversion cycle figure depicts that the deferral period is longer than the operating cycle (Moss, 1993) .This is a desirable state for companies although , it can only be achieved by non manufacturing firms which carry small inventories.

Skewness is a metric that describes data symmetry around the mean. Positive skewness values describe a distribution where values are skewed to the right, meaning that the right tail of the distribution is longer and there is a heavier concentration of values on the left side. Negative skewness values describe a distribution where the left tail is longer and there is a heavier concentration of values on the right side. The cash conversion cycle has a skewness value of 17 which means that the majority of outliers were on the higher scales of the distribution while the majority of values was at lower levels. This makes sense as many firms try to minimize their cash conversion cycle and this results at a heavier

concentration of values on the left side , while there are few who operate under an expanded cash conversion cycle.

Kurtosis is a metric describing the concentration of values at the tails of the distribution. A distribution can be categorized as leptokurtic if the kurtosis value is a negative number and this condition would be associated with greater distribution of observations around the sample mean and fewer observations around the tails. The opposite analysis can be made for platokurtic characterizations . The kurtosis value of the cash conversion cycle exceeds 400 , and as a result its distribution can be characterized as highly platokurtic.

As a result of the above, the distribution of observations relevant with cash conversion cycle values , has most of its weight allocated towards the portion of values that minimizes the cash conversion cycle duration , a practice which is consistent with suggestions made by researchers. It is also observed that due to the high positive kurtosis value and the skewness value , that the sample contains a lot of positive values that are much distant from the sample mean.

Worth mentioning is the fact that this condition exists after the initial sample was greatly reduced.

## CORRELATION MATRIX

The following table presents the produced correlation matrix (figure 2).

	<i>GROSS INCOME</i>	<i>DAYS ACCOUNTS RECEIVABLE</i>	<i>DAYS IN INVENTORIES</i>	<i>NUMBER ACCOUNTS PAYABLE</i>	<i>CASH CONV CYCLE</i>	<i>SIZE</i>	<i>SALES GROWTH</i>	<i>DEBT RATIO</i>	<i>LIQUIDITY RATIO</i>
GROSS INCOME	1.00								
DAYS ACCOUNTS RECEIVABLE	-0.13	1.00							
DAYS IN INVENTORIES	-0.05	0.00	1.00						
NUMBER ACCOUNTS PAYABLE	-0.02	0.07	0.22	1.00					
CASH CONV CYCLE	-0.06	0.13	0.92	-0.14	1.00				
SIZE	0.63	-0.30	-0.07	-0.14	-0.07	1.00			
SALES GROWTH	-0.06	0.31	0.04	0.06	0.06	-0.22	1.00		
DEBT RATIO	0.06	0.02	-0.11	0.02	-0.11	0.06	-0.06	1.00	
LIQUIDITY RATIO	-0.05	0.05	-0.08	0.06	-0.09	-0.12	0.09	-0.11	1.00

Correlation is a metric that denotes the degree to which the values of two variables move in tandem. Correlation values range from +1 to -1 with +1 denoting perfect positive and -1 perfect negative correlation.

Generally it is observed that we have low values of correlations in general. This condition can be partially explained by the distribution of sample values that is analysed above. Size is positively correlated with gross income. This correlation is in accordance with arguments that mention that bigger firms tend to be more profitable. Size is negatively correlated with days accounts receivable . This shows that for this sample of companies , bigger companies tend to be more profitable and collect receivables faster.

Sales growth is positively correlated with days accounts receivable. This positive correlation value is in agreement with arguments presented in the bibliography review that mentioned that companies can create more sales if they have a lenient credit policy. It should also be mentioned that sales growth has a negative correlation with size , signifying that mature companies find a decreased number of profitable investment opportunities.

The cash conversion cycle is strongly positive correlated with days in inventory. The correlation value is 0.92. It is ought to be mentioned though that of the three components of the cash conversion cycle , days in inventory has the greater standard deviation value far exceeding the other two. As a result the extreme prices exert influence in driving the correlation value so high. This dispersion of days in inventory values might be the result of the sample containing companies that have different specialization and vastly different inventory management approaches.



## REGRESSION ANALYSIS

- OLS MODEL:  $\text{Gross income/total assets}_{it} = \text{constant} + b_1 * \text{days accounts receivable}_{it} + b_2 \text{ size}_{it} + b_3 \text{ sales growth}_{it} + b_4 \text{ debt ratio}_{it} + b_5 \text{ liquidity ratio}_{it} + e_i$

### SUMMARY OUTPUT

<i>Regression Statistics</i>				
Multiple R		0.215614318		
R Square		0.046489534		
Adjusted R Square		0.042735556		
Standard Error		0.219447015		
Observations		1276		

  

<i>ANOVA</i>				
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Regression	5	2.981898136	0.596379627	12.38407132
Residual	1270	61.15938021	0.048156992	
Total	1275	64.14127835		

  

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.617054645	0.062319996	9.901390964	2.57699E-22
DAYS ACCOUNTS RECEIVABLE	-	0.000175327	-5.291467925	1.42798E-07
SIZE	0.021156341	0.004119899	-5.135159782	3.25939E-07
SALES GROWTH	0.028911868	0.01623699	-1.780617408	0.075213964
DEBT RATIO	0.118350844	0.038997095	3.034863103	0.002455383
LIQUIDITY RATIO	0.163876857	0.07283476	2.249981433	0.024620747

The variability of the dependent variable is explained at percentage reaching 4.2 percent as the value of adjusted r square represents. The f statistic moves in the range of highly statistically significant values at 12.5 and therefore the hypothesis that all the

variables are 0 and statistically insignificant can be rejected. The days accounts receivable variable is statistically significant at the 5% level of uncertainty having a p-value of 1.42798E-07. The relevant coefficient describes a negative relationship between days accounts receivable and profitability. This result verifies the corresponding result of DeLoof (2003) , who suggests that efforts should be made for the reduction of the cash conversion cycle through the reduction of accounts receivable. The coefficient of the variable size is statistically significant with a p- value of 3.25939E-07. It also has a negative influence on profitability figures. The coefficient of sales growth is statistically insignificant having a p-value of 0.075213964 and is negatively affecting profitability. The intercept coefficient is 0.61 but it has no effect on the analysis conducted , as it is highly unlikely for firms to remain active for the length of the period under examination, when they constantly produce 0 gross income

- OLS MODEL:  $\text{Gross income/total assets}_{it} = \text{constant} + b_0^* \text{ days in inventories}_{it} + b_2 \text{ size}_{it} + b_3 \text{ sales growth}_{it} + b_4 \text{ debt ratio}_{it} + b_5 \text{ liquidity ratio}_{it} + e_i$

#### SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.166396075
R Square	0.027687654
Adjusted R Square	0.023859652
Standard Error	0.221600046
Observations	1276

#### ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Regression	5	1.77592151	0.355184302	7.232926844
Residual	1270	62.36535684	0.04910658	
Total	1275	64.14127835		

  

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.50549399	0.058775305	8.60044855	2.30357E-17
DAYS IN INVENTORIES	-4.32785E-05	2.54147E-05	-1.702893155	0.088832749
SIZE	0.016158921	0.00403664	-4.003061997	6.6147E-05
SALES GROWTH	0.051289845	0.015801434	-3.245898153	0.001201351
DEBT RATIO	0.098412442	0.039557901	2.487807502	0.012980801
LIQUIDITY RATIO	0.151369116	0.073942177	2.047128204	0.04085092

This regression equation explains 2.3 % of the variability of the dependent variable. Due to the f-statistic value at least one variable will be statistically significant and different than 0. The days in inventories variable coefficient is statistically insignificant with a p-value of 0.088 .It describes a negative relationship between gross profit and days in inventories.Even though the relationship is statistically insignificant, still the relationship is in accordance with the majority of academic bibliography findings. Size and sales growth are both statistically significant and they both exert a negative influence on profitability figures. The debt ratio as well as the liquidity ratio are both statistically significant at the 5% level of uncertainty with the respective p-values being 0.012980801and 0.04085092.

- OLS MODEL:  $\text{Gross income/total assets}_{it} = \text{constant} + b_1 \text{ days accounts payable}_{it} + b_2 \text{ size}_{it} + b_3 \text{ sales growth}_{it} + b_4 \text{ debt ratio}_{it} + b_5 \text{ liquidity ratio}_{it} + e_i$

## SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.160380572
R Square	0.025721928
Adjusted R Square	0.021886187
Standard Error	0.221823937
Observations	1276

ANOVA				
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Regression	5	1.649837327	0.329967465	6.705857221
Residual	1270	62.49144102	0.049205859	
Total	1275	64.14127835		

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.497174412	0.059299042	8.384189639	1.34064E-16
NUMBER ACCOUNTS PAYABLE	-3.90859E-05	6.78741E-05	-0.575858313	0.564812979
SIZE	0.015973772	0.004064932	-3.929653457	8.96519E-05
SALES GROWTH	0.051677653	0.015818949	-3.266819569	0.001116692
DEBT RATIO	0.106682578	0.039368261	2.709862592	0.0068217
LIQUIDITY RATIO	0.166003162	0.073680793	2.253004559	0.024428937

The adjusted r square value is 0.02 , which is similar to the same values calculated in the previous 2 regressions. The f-statistic value denotes that the hypothesis of no statistically significant coefficients is rejected. The number accounts payable variable , which represents the number of days it takes for a firm to pay its debtors ,relevant coefficient is statistically insignificant. The coefficient's sign is positive. This result agrees

with academic findings which state that profitable firms tend to pay on time. Size and sales growth coefficients are both statistically significant and negative.

- OLS MODEL:  $\text{Gross income/total assets}_{it} = \text{constant} + b_8 * \text{cash conversion cycle}_{it} + b_2 \text{ size}_{it} + b_3 \text{ sales growth}_{it} + b_4 \text{ debt ratio}_{it} + b_5 \text{ liquidity ratio}_{it} + e_i$

#### SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.171384547
R Square	0.029372663
Adjusted R Square	0.025551296
Standard Error	0.221407947
Observations	1276

ANOVA				
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Regression	5	1.884000154	0.376800031	7.686427242
Residual	1270	62.2572782	0.049021479	
Total	1275	64.14127835		

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.508635233	0.058614987	8.677562833	1.21779E-17
CASH CONV CYCLE	-5.78972E-05	2.56132E-05	-2.260442304	0.023962541
SIZE	0.016216056	0.004030167	-4.023668878	6.06816E-05
SALES GROWTH	0.050009535	0.015806105	-3.163937911	0.00159342
DEBT RATIO	0.09556837	0.039542847	2.416830784	0.015796495
LIQUIDITY RATIO	0.144486476	0.074008133	1.952305381	0.051121428

The adjusted r square value is 0.025 , which is similar to same values calculated in the previous 2 regressions. The f-statistic value denotes that the hypothesis of no

statistically significant coefficients is rejected. The cash conversion cycle variable, which represents the number of days it takes for a firm to realize earnings from the time it has made the relevant purchases, relevant coefficient is statistically significant. The coefficient's sign is negative. The negative sign represents an inverse relationship between the cash conversion cycle and profitability. Size and sales growth coefficients are both statistically significant and negative.

- **FIXED EFFECTS MODEL:**  $\text{Gross income/total assets}_{it} = \text{constant} + b_1 * \text{days accounts receivable}_{it} + b_2 \text{ size}_{it} + b_3 \text{ sales growth}_{it} + b_4 \text{ debt ratio}_{it} + b_5 \text{ liquidity ratio}_{it} + e_i$

#### SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.277122549
R Square	0.076796907
Adjusted R Square	0.051572779
Standard Error	0.087161937
Observations	189

  

ANOVA				
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Regression	5	0.115651512	0.023130302	3.044581214
Residual	183	1.390288198	0.007597203	
Total	188	1.50593971		

  

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.007912718	0.007321636	1.080730761	0.281239082
LIQUIDITY	0.008102827	0.112955398	0.071734747	0.942891341
debt ratio	0.141121066	0.051664469	2.731491659	0.006922089
sales growth	0.061822761	0.029890487	2.068308949	0.040017302
SIZE	-0.00470932	0.01500613	-0.31382643	0.754010311
DAYS RECEIVABLES	-0.00033014	0.00042898	-0.76959397	0.442533013

The variability of the dependent variable that is explained by the model is 4% which is a rather low figure, meaning that our model should be re-specified. The f statistic value leads to assuming that one at least variable will be significantly different from zero. The variable days accounts receivable has a negative sign, verifying Deloof (2003), that days accounts receivable is inversely related with profitability and should therefore be minimized to a reasonable level. It should also be noted that this relationship is statistically insignificant. Sales growth has a positive value and is the only control variable which presents a statistically significant relationship with profitability at the 5% level of uncertainty.

➤ **FIXED EFFECTS MODEL:**  $\text{Gross income/total assets}_{it} = \text{constant} + b_6 * \text{days in}$

$\text{inventory}_{it} + b_2 \text{ size}_{it} + b_3 \text{ sales growth}_{it} + b_4 \text{ debt ratio}_{it} + b_5 \text{ liquidity ratio}_{it} + e_i$

#### SUMMARY OUTPUT

<i>Regression Statistics</i>				
Multiple R		0.280093804		
R Square		0.078452539		
Adjusted R Square		0.053273647		
Standard Error		0.087083746		
Observations		1276		

  

ANOVA				
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Regression	5	0.118144794	0.023628959	3.115805802
Residual	1270	1.387794916	0.007583579	
Total	1275	1.50593971		

  

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
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Intercept	0.007908209	0.00731232	1.081491159	0.280901787
LIQUIDITY	0.013718342	0.1118597	0.122638823	0.902527688
debt ratio	-0.13898861	0.051620227	2.692522276	0.007749696
sales growth	0.053188209	0.026329338	2.020111854	0.044829975
SIZE	0.004735246	0.014851214	0.318845732	0.750207127
days inventory	-1.02502E-05	1.06743E-05	0.960267018	0.338187878

The variability of the dependent variable that is explained by the model is 4%. The F statistic value points towards rejecting the hypothesis that no variable will be significantly different from zero. The variable days in inventory has a negative sign, agreeing with DeLoof (2003), that days in inventory is inversely related with profitability. It should be noted that this relationship is statistically insignificant. Sales growth has a positive value and is again the only control variable which presents a statistically significant relationship with profitability at the 5% level of uncertainty.

➤ **FIXED EFFECTS MODEL:**  $\text{Gross income/total assets}_{it} = \text{constant} + b_6 * \text{number}$

$\text{accounts payable}_{it} + b_2 \text{ size}_{it} + b_3 \text{ sales growth}_{it} + b_4 \text{ debt ratio}_{it} + b_5 \text{ liquidity ratio}_{it}$

$+ e_i$

#### SUMMARY OUTPUT

<i>Regression Statistics</i>	
Multiple R	0.278988451
R Square	0.077834556
Adjusted R Square	0.052638779
Standard Error	0.08711294
Observations	1276



ANOVA				
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Regression	5	0.117214149	0.02344283	3.089190521
Residual	1270	1.388725562	0.007588664	
Total	1275	1.50593971		

  

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.009794291	0.007529218	1.300837763	0.194949603
LIQUIDITY	0.040084442	0.105681788	0.379293753	0.704909487
debt ratio	0.142176361	0.051668733	2.751690474	0.006525394
sales growth	0.039981938	0.028878916	1.384468106	0.167900984
SIZE	0.008135928	0.014640288	0.555721865	0.579079771
days payables	0.000102974	0.000115211	0.893788887	0.372608791

The variability of the dependent variable that is explained by the model is 4%.

The f statistic value leads us to reject the hypothesis that no variable will be significantly different from zero. The variable number accounts payable has a positive sign, suggesting that more profitable companies delay their payments to creditors. It should be noted that this relationship is statistically insignificant. Sales growth has a positive value and presents a statistically insignificant relationship with profitability at the 5% level of uncertainty.

➤ **FIXED EFFECTS MODEL:**  $\text{Gross income/total assets}_{it} = \text{constant} + b_1 \text{ cash}$

$\text{conversion cycle}_{it} + b_2 \text{ size}_{it} + b_3 \text{ sales growth}_{it} + b_4 \text{ debt ratio}_{it} + b_5 \text{ liquidity ratio}_{it}$

$+ e_i$

SUMMARY OUTPUT

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*Regression Statistics*

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Multiple R	0.28248779
R Square	0.079799351
Adjusted R Square	0.054657257
Standard Error	0.087020087
Observations	189

## ANOVA

	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Regression	5	0.120173012	0.024034602	3.173934149
Residual	183	1.385766698	0.007572496	
Total	188	1.50593971		

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	0.008040858	0.007302618	1.101092432	0.272302603
LIQUIDITY	-0.01962458	0.111990012	0.175235091	0.861088649
debt ratio	0.139047043	0.05157784	2.695867911	0.007675285
sales growth	0.052728424	0.02625196	2.008551871	0.046054853
SIZE	0.004308084	0.014853277	0.290042686	0.772111968
ccc	-1.19529E-05	1.09512E-05	1.091468053	0.276501909

The variability of the dependent variable that is explained by the model is 5%.

The f statistic value leads us to reject the hypothesis that no variable will be significantly different from zero. The variable cash conversion cycle has a negativesign , suggesting that there is a negative relationship between profitability and the number of days that are required for respective earnings to be realized. It should be noted that this relationship is statistically insignificant. Sales growth has a positive value and remains the only control variable which presents a statistically significant relationship with profitability at the 5% level of uncertainty.

## CONCLUSION

The majority of academic papers support the opinion of Deloof (2003) that supports the idea of minimizing components of the cash conversion cycle in order for increased profitability to be realized. There are very few studies that talk about optimizing the levels of working capital instead of minimizing.

The findings of this research effort agree at a basic level with Deloof (2003) . Specifically the fixed effects regression models support the idea that minimizing working capital values will lead to profit maximization. This happens because the signs of the used variables are in accordance with those of Deloof(2003). It ought to be mentioned though that these relationships were statistically insignificant and that the models as whole produce a considerably low explanatory power since the adjusted r square values rarely exceeded 5%.

The ordinary least squares models produced statistically significant relationships. Days accounts receivable and days accounts payable had a significant negative relationship with profitability , contrasting arguments that mention that a lenient credit policy boost sales and profitability and that more profitable firms tend to delay payments to debtors. This argument is aligned with the direction of minimizing cash conversion cycle components.

In reference to the above statements, it can be said that , working capital management practices should aim towards minimizing related values but in a way that does not disrupt company operations and operates under a case by case assumption. Financing needs of an SME and a conglomerate are considerably different. It cannot be said with certainty that strict minimization is the way to go for both categories of firms.

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## APPENDIX

FIGURE 1- DESCRIPTIVE STATISTICS

<i>GROSS INCOME</i>		<i>DAYS ACCOUNTS RECEIVABLE</i>	<i>DAYS IN INVENTORIES</i>	<i>NUMBER ACCOUNTS PAYABLE</i>	<i>CASH CONV CYCLE</i>
Mean	1028960.857	59.5644977	121.9025867	70.1687623	111.2983221
Standard Error	65376.10518	1.069354553	6.928204581	2.592878258	6.886500558
Median	258484	58.85802988	75.46568108	55.9950052	76.94262768
Mode	409700	#N/A	54.6	0.273531175	#N/A
Standard Deviation	2335309.15	38.19856604	247.483381	92.62057295	245.9936657
Sample Variance	5.45367E+12	1459.130447	61248.02389	8578.570534	60512.88356
Kurtosis	25.7318307	12.36204796	513.6408583	98.28812163	456.102679
Skewness	4.6339686	2.239149481	18.8145527	-3.269359256	17.25192632
Range	21629868	422.5898811	7155.91989	2206.753834	7511.86099
Minimum	-340908	0.387301845	0.072665738	-1365.768613	-622.9831158
Maximum	21288960	422.977183	7155.992556	840.9852217	6888.877875
Sum	1312954053	76004.29906	155547.7007	89535.3407	142016.659
Count	1276	1276	1276	1276	1276
	<i>SIZE</i>	<i>SALES GROWTH</i>	<i>DEBT RATIO</i>	<i>LIQUIDITY RATIO</i>	
Mean	13.86816899	0.095480221	0.218292497	0.099116254	
Standard Error	0.04454715	0.011318958	0.004458283	0.002398594	
Median	13.69407417	0.053584629	0.202806405	0.071009833	
Mode	13.19950959	0.054104114	0	#N/A	
Standard Deviation	1.591275063	0.404326121	0.159254959	0.085680515	
Sample Variance	2.532156326	0.163479612	0.025362142	0.007341151	
Kurtosis	-0.067654366	214.451902	5.543686123	3.739976776	
Skewness	0.1814041	12.28595939	1.576421544	1.759521535	
Range	10.25572529	8.849410068	1.330936495	0.676981605	
Minimum	7.731492029	-0.740151621	0	0	
Maximum	17.98721732	8.109258447	1.330936495	0.676981605	
Sum	17695.78364	121.8327622	278.5412265	126.4723397	
Count	1276	1276	1276	1276	

FIGURE 2 – CORRELATION MATRIX

	<i>GROSS INCOME</i>	<i>DAYS ACCOUNTS RECEIVABLE</i>	<i>DAYS IN INVENTORIES</i>	<i>NUMBER ACCOUNTS PAYABLE</i>	<i>CASH CONV CYCLE</i>	<i>SIZE</i>	<i>SALES GROWTH</i>	<i>DEBT RATIO</i>	<i>LIQUIDITY RATIO</i>
GROSS INCOME	1.00								
DAYS ACCOUNTS RECEIVABLE	-0.13	1.00							
DAYS IN INVENTORIES	-0.05	0.00	1.00						
NUMBER ACCOUNTS PAYABLE	-0.02	0.07	0.22	1.00					
CASH CONV CYCLE	-0.06	0.13	0.92	-0.14	1.00				
SIZE	0.63	-0.30	-0.07	-0.14	-0.07	1.00			
SALES GROWTH	-0.06	0.31	0.04	0.06	0.06	-0.22	1.00		
DEBT RATIO	0.06	0.02	-0.11	0.02	-0.11	0.06	-0.06	1.00	
LIQUIDITY RATIO	-0.05	0.05	-0.08	0.06	-0.09	-0.12	0.09	-0.11	1.00