Determinants of Working Capital Requirements: Evidence from Selected Non-financial Firms Listed on the Johannesburg Securities Exchange

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Abstract: Working Capital is an important aspect of corporate financial management because it affects profitability, liquidity and firm value (Smith, 1973; Deloof, 2003; Nazir and Afza, 2008).For this reason, firms try to keep an optimal (desirable) level of working capital that maximizes their value. In essence, working capital management is vital for the survival of businesses, regardless of their size.Previous studies suggest that working capital requirement of an enterprise is influenced by numerous factors such as firm size, GDP growth rate, inflation, foreign exchange rates, among others.

The study analysed the key endogenous (internal) and exogenous (external) factors influencing working capital requirements and WCM of a sample of 5large non-financial firms listed on the JSE. Data for the study was collected using a semi-structured questionnaire. The result revealed that sales growth, capital expenditure and debtors' management are the three most important endogenous factors influencing working capital requirement of the sampled firms. Other factors identified are inventory ordering efficiency, board requirements, centralization of supply, operating expenditure and products offered. The study further revealed that interest rates, foreign exchange rate, economic growth and inflation rate are the four key exogenous factors influencing working capital requirements of the sampled firms. Additionally, 40% of the sampled firms indicate that sales affect WCM to a very high extent while 60% indicate that capital expenditure affect WCM to a high extent. Finally, 60% indicate that debtors' terms affect WCM to a high extent. 60% of respondents indicate that economic growth some extent to a very high extent affect WCM while 80% indicate that interest rates affects WCM from to some extent to a high extent. 20% are of the view that exchange rates affect WCM to a very high extent.

Keywords: Johannesburg Securities Exchange, Non-financial firms, South Africa, Working Capital Management.

1 Introduction

Corporate finance theory contends that the primary objective of the firm is shareholders' wealth maximization (SWM) (Fabozzi and Drake, 2010). An often ignored mechanism by which shareholder wealth can be realized is working capital management (Smith, 1980; Chan, 2010).This neglect exists, in spite of the fact that working capital comprises a significant portion of total assets and managers spend more than half of their time in managing working capital (Richards and Laughlin, 1980; Laux, 2012). More importantly, inefficient working capital management (WCM) has been cited as a major cause of business failure (Altman, 1968; Altman; Shin and Soenen, 1998).

Working capital management involves the application of economic and management principles to managing short-term assets and short-term liabilities, as well as the management of all the relationships that exist between them in order to enhance liquidity, profitability and concomitantly firm value. Generally, WCM

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entails two vital decisions. The first focuses on determining the optimum (desirable) level of investment in short-term assets, while the second entails determining the appropriate mix of short-term and long-term financing needed to finance this investment in short-term assets (Jain, 2004; Moyer; Brigham and Ehrhardt, 2006; Chandra, 2007; Parrino and Kidwell, 2009; McGuigan and Kretlow; 2009; Mole, Parrino and Kidwell, 2011). Despite its vital role in the success of businesses, most studies addressing the key factors affecting working capital requirements (WCR) tend to focus on developed economies with a dearth of research on emerging economies. This study attempts to fill this gap by examining the key factors that influence working capital requirement and WCM of a sample of JSE-listed non-financial firms..

1.1 Research questions

The following research questions were addressed in the study:

- What are the endogenous (internal) factors that influence working capital requirement of JSE listed firms?
- What are the exogenous (external) factors that influence working capital requirement of JSE listed firms?
- To what extent do both endogenous and exogenous factors influence WCM of JSE listed non-financial firms?

1.2 Objectives

The objectives of the present study are:

- To determine the endogenous factors that influence working capital requirement of JSE listed firms
- To determine exogenous factors that influence working capital requirement of JSE listed firms

To analyse the extent to which both endogenous and exogenous factors influence WCM of JSE listed non-financial firms.

2. Literature review

Previous studies suggestthe existence of endogenous and exogenous factors that affect a company’s working capitalrequirements and their effect on working capital management. Theinternal (firm-specific) factors include, but not limited to, company size and growth rates, organizational structure, and borrowing and investing positions/activities/capacities. The exogenous factors include banking services, inflation, interest rates, new technologies and new products, state of the economy, and competitors, among others. According to Moussawi, LaPlante, Kieschnick and Baranchuk (2006) there is strong evidence that industry practice, firm size, future firm sales growth, proportion of outside directors on a board, executive compensation, and CEO share ownership significantly influence the efficiency of large non-financial listed US firms. In another study, Chiou and Cheng (2006) analysed the effect of the key factors influencing working capital management in Taiwanese firms. The results show that factors such as type of industry, operating cash flow, growth opportunitiesand firm size have effect on working capital management. The results further show that leverage and operating cash flow has significant relationship with net liquidity balance and working capital requirement.

Using data from a panel of U.S. corporations from 1990 to 2004, Kieschnick, Laplante and Moussawi (2006) found that industry practices, company size, future sales growth, number of outside directors on the board, executive compensation (current portion), and CEO share ownership have a significant impact on the efficiency of working capital management of companies.

In a recent study, Zariyawati et al. (2010) examined important factors, which affect working capital management in Malaysian firms. The results suggest that firm size, debt ratio, and sales growth have a negative relationship with working capital management (represented by the cash conversion cycle). In addition, the study revealed that firms with more debts have less working capital since the cost of external financing is higher for these firms. A negative relationship was found to exist between CCC and sales growth indicating that firms use short-term financing to supply future demands. The positive relationship that was reported between economic growth and working capital indicated that firms expanded their investment on working capital during the economic boom. Finally, the study found no evidence for the impact of corporate governance variables on working capital management.

Hill, Kelly, & Highfield (2010) examined the key factors which affect working capital management in US firms. The results show that Working Capital Requirement (WCR) is positively related to the operating cash flow, and negatively correlated to financial distress and market-to-book ratios. The study found no evidence for relationship between gross margin profit, market share, and WCR. Manoori and Muhammad (2012) use panel data analysis including Pooled OLS, random effects and fixed effects estimations, to determine the determinants of WCM in Singapore. The findings revealed that firm size, operation cash flow, capital expenditures, and gross domestic products are negatively correlated to working capital management. Moreover, they found that firms with more profitability have longer cash conversion cycle. The study, however, did not find any significant relationship between cash conversion cycle and debt ratio.

Valipour, Moradi and Farsi (2012) used correlation and multiple regression technique to determine the effect of company characteristics on working capital management. The sample comprised 83 firms listed on Tehran Stock Exchange for the period of 2001 to 2010. Company characteristics include profitability, operating cash flow, company size, sale growth, current ratio, quick ratio and debt ratio. The analysis was conducted in two stages. In the first stage the relationship between the company characteristics with cash conversion cycle were assessed in all companies and the result indicated that profitability, operating cash flow, company size, sale growth and debt ratio affect the company's working capital management. In the second stage, the companies were divided into 3 categories: large, medium and small. Then the relationship between company characteristics with cash conversion cycle was assessed separately. The results indicated that the effective factors in large firms were profitability, operating cash flow, debt ratio and sale growth. In medium firm, the effective factors were profitability, company size, sale growth and debt ratio, and small firms were affected by profitability, sale growth, current ratio, quick ratio and debt ratio. This study clearly reveals that, in Tehran, profitability, sales and debt are the key factors that affect WCR for firms regardless of their size.

Smith and Fletcher (2009) use net liquid balance (NLB) and working capital requirements as proxies for working capital management to examine the factors influencing working capital management in South African industrial companies. These proxies were tested for influence of industry, turnover, debt ratio, cash flow and return on assets on the measures. The study found no significant industry effect on working capital management.

In a recent study, Gill (2011) use panel data, OLS regression and correlational techniques to analyse a sample of 166 Canadian firms listed on Toronto Stock Exchange for the period 2008-2010 to determine the factors that influence the working capital requirements. The results indicate that operating cycle (OC), return on assets (ROA), internationalization of firm, firm's growth, and firm size influence the WCR in Canada. The study also found that OC, ROA, leverage, internationalization of the firm, Tobin's Q, and firm size influence the working capital requirements in the Canadian manufacturing industry, while OC, ROA, sales growth, and firm size affect the WCR in the Canadian service industry**.** In a similar study, Nazir and Afza (2008) used regression analysis on panel data for 204 non-financial firms over a span of nine years. Researchers found evidence that operating cycle, leverage, return on assets and Tobin's q significantly influence working capital requirements.

Chiou, Cheng and Wu (2006) explored the key factors of working capital management, using 19,180 company-quarter data from Taiwan Stock Exchange in the period from 1996 to 2004. Their study suggested that debt ratio and operating cash flow affected the working capital of companies. On the other side, no evidence was found to support the impact of business cycle, industry effect, company growth, company performance and company size on working capital management. Nazir and Afza (2008) studied the key factors on the requirements of working capital management, using 204 manufacturing companies from 16 industrial groups listed at Karachi Stock Exchange, Pakistan, in the period from 1998 to 2006. The authors found that operating cycle, leverage, ROA and Tobin'sQ had a significant impact on working capital requirements. Appuhami (2008) investigated the impact of corporate capital expenses on working capital management, using data collected from listed companies in the Thailand Stock Exchange, from 2000 to 2005. The study found a negative relation with capital expenses, suggesting that companies tended to manage working capital efficiently when they could find opportunities to grow by investing in fixed assets. The study also found a positive, significant relation between working capital requirements and operating and finance expenses, suggesting that companies tended to increase their working capital levels as debt and interest expenses increased.

3. Methodology

A semi-structured questionnaire was used to collect data on a sample of non-financial firms listed on the main market of the JSE Securities Exchange over the period, 2003 to 2012. A combination of Likert scale and open-ended questions were asked to elicit respondents’ view. The questionnaire is a 7-page document that contains 31 questions, divided into three major parts: A, B and C. Part A focused basically on company information. Part B asked questions related to aggregate working capital management with emphasis placed on working capital policy, the use of technology in managing working capital, and factors determining working capital requirement. Lastly, Part C dealt with inventory (supply chain) management, accounts receivable (revenue) management, and accounts payable (expenditure) management. Data was collected on a sample of 5 non-financial firms.

4. Data analysis

The first question addressed here is: What are the internal factors influencing WC requirements of non-financial listed firms?Table 1 shows the key internal factors (by rank).

Table 1. endogenous factors affecting WCR of JSE-listed non-financial firms

<table>
<tr><th>Firm</th><th>Industry sub-sector</th><th>Factors</th><th>Rank of the key factors</th></tr>
<tr><td>1</td><td>Industrials</td><td>Sales/Growth
Debtors terms
Debtors collection efficiency
Inventory ordering efficiency</td><td rowspan="5">Factor Rank %

Firm growth/sales 1 (80%)
Capital expenditure 2 (60%)
Debtors terms 3 (40%)

Other factors identified as affecting WCR are: gearing, loan terms, investment activities, and dividend policy.</td></tr>
<tr><td>2</td><td>Consumer Services</td><td>Board requirements
Firm growth rate
Capital expenditure
Service requirements
Products offered</td></tr>
<tr><td>3</td><td>Consumer Services</td><td>Sales
Capital investment
Debt repayment
Centralization of supply
Financial position</td></tr>
<tr><td>4</td><td>Consumer services</td><td>Growth rate</td></tr>
<tr><td>5</td><td>Consumer services</td><td>Gearing
Capital Investment
Capital Expenditure
Dividend Policy</td></tr>
</table>

According to table1, the sampled firms ranked sales (1st), capital expenditure (2nd) and debtors (3rd) as the three most important internal factors affecting their WC requirements.

Table two presents results of the analysis regarding the second research question: *What are the external factors affecting WC requirements?* The rankings given by the sampled firms are shown in table 2.

Table 2. Exogenous factors affecting WCR of JSE-listed non-financial firms

<table>
<tr><th>#</th><th>Industry sub-sector</th><th>Factors</th><th>Rank of the 4 key external factors</th></tr>
<tr><td>1</td><td>Industrials</td><td>Retail cycle
Exchange rate
Interest rates
Creditors’ terms</td><td rowspan="5">Factor Rank %
Interest rates 1 (100%)
Exchange rates 2 (60%)
GDP growth 2 (60%)
Inflation 4 (40%)</td></tr>
<tr><td>2</td><td>Consumer Services</td><td>State of economy
Seasonal factors
Exchange rate
Regulatory factors
Interest rates</td></tr>
<tr><td>3</td><td>Consumer Services</td><td>Interest rates
Exchange rate
Inflation
GDP
Consumer demand</td></tr>
<tr><td>4</td><td>Consumer services</td><td>Interest rate</td></tr>
<tr><td>5</td><td>Consumer services</td><td>Economic growth
Inflation
Interest rates</td></tr>
</table>

The four key exogenous factors (by rank order) are interest rate (1st), exchange rates and GDP (both 2nd), inflation rate (4th) positions respectively.

Table 3 and 4 provide further analysis to answer the third question: *What are the effects of the endogenous and exogenous factors on WCM?*

Table 3. Impact of endogenous factors on WCM

Factor	To a very high extent	To a high extent	To some extent	To a low extent	Not all
Sales	2 (40%)				
Capital expenditure/investment		3 (60%)		1 (20%)	
Debtors repayments/terms		3 (60%)			

Table 3 shows that 40% of the sampled firms indicate that sales affect WCM to a very high extent while 60% indicate that capital expenditure affect WCM to a high extent. Also 60% indicate that debtors' terms affect WCM to a high extent.

Table 4. Impact of exogenous factors on WCM

Factor	To a very high extent	To a high extent	To some extent	To a low extent	Not all
Economic growth	1 (20%)	1 (20%)	1 (20%)		
Inflation			2 (40%)		
Interest rate		1 (20%)	3 (60%)	1 (20%)	
Exchange rate	1 (20%)		2 (40%)		

According to table 4, 60% of respondents indicate that economic growth affects WCM from to some extent to a very high extent, while 80% indicate that interest rates affects WCM from to some extent to a high extent. 20% are of the view that exchange rates affect WCM to a very high extent.

5. Conclusions

The study analysed the key endogenous (internal) and exogenous (external) factors influencing working capital requirements and WCM of a sample of 5 large non-financial firms listed on the JSE. The result revealed that sales growth, capital expenditure and debtors' management are the three most important endogenous factors influencing working capital requirement of the sampled firms. Other factors identified are inventory ordering efficiency, board requirements, centralization of supply, operating expenditure and products offered. The study further revealed that interest rates, foreign exchange rate, economic growth and inflation rate are the four key exogenous factors influencing working capital requirements of the sampled firms. Additionally, 40% of the sampled firms indicate that sales affect WCM to a very high extent while 60% indicate that capital expenditure affect WCM to a high extent. Finally, 60% indicate that debtors' terms affect WCM to a high extent. 60% of respondents indicate that economic growth some extent to a very high extent affect WCM while 80% indicate that interest rates affects WCM from to some extent to a high extent. 20% are of the view that exchange rates affect WCM to a very high extent.

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