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Full Length Research Paper

Effects of capital investment on working capital management: Evidence on Tunisian export small and medium enterprises (SMEs)

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The main objective of this study is to investigate empirically the impact of companies' capital investment on working capital management. For this purpose, data of 386 small and medium companies were collected from the Tunisian Export Center over the period 2001 to 2008. Capital, financial and operating expenditures are principally used to explain working capital management measured by net liquidity balance and working capital requirement. The statistical analyses included descriptive statistics and regressions on panel data. The findings indicate that net liquidity balance and working capital requirement have respectively positive and negative relationship with companies' capital investment.

Key words: Capital investment, capital expenditure, operating expenditure, working capital management, Tunisian export small and medium enterprises (SMEs).

INTRODUCTION

In the recent economic climate, acquiring external funds is difficult and costly due to the last crisis that has spread from 2007 and continued to date. Thus, maintaining the required level of investments can be achieved either by the increase of operating cash flow or through the reduction of current assets levels'. The company cannot completely control the cash flows and the change in current investments may influence the daily operations. In this sense, Fazzari and Petresen (1993) argue that working capital is a source of liquidity that can be used to smooth company's investments with regards to cash flow in case of financial constraints. Following this reasoning, internal funds locked in working capital can be considered as reserves that may be used in capital investment. As a result, working capital management becomes an important issue to corporations.

The management of working capital is crucial for corporate solvency and survival. The company has to react quickly and efficiently to face unexpected changing in the environment. From the corporate perspective, many ambiguities are detected in managing working capital. Therefore, researchers have to dress a knowledge base of working capital determinants in order to help companies in managing it appropriately. Consequently, they can liberate the cash tied up in stock and receivables to fund capital extension and simulate growth.

Many scholars have tried to determine the factors explaining the company's working capital (Bellouma, 2011; Shahid and Khan, 2011; Baños-Caballero and García-TerueUyar, 2010; Deloof, 2003; Lazaridis and Tryfonidis, 2006). These authors include essentially factors related to companies' characteristics (size, leverage…), industry features (demand-supply dyna-mics), legal and financial environment. Besides, instead of developing a working capital decision model, academics limit their investigation on recognizing the scarcity of theory concerning the financial resources management.

Though the existing literature highlights the link between capital investment and liquidity (Chava and Roberts, 2008; Stein, 2003; Charlton et al., 2002; Kaplan and Zingales, 1997; Fazzari et al., 1988), the relationship

Abbreviations: CAPI, Capital Investment; **OPEX,** operating expense; **FIEX,** financial expense; **SIZE,** size of the company; **TND,** Tunisian dinars; **LEVER,** leverage of the company; **WRCR,** working capital requirement.

between working capital management and capital investment is not sufficiently addressed (Fazzari and Petersen, 1993; Appuhami, 2008).

Moreover, researchers have almost focused on companies operating in developed countries (USA, European countries). Lessons from these studies are not relevant to an emerging market economy like Tunisia. Many challenges are faced by the Tunisian small and medium enterprises (SMEs.) and notably those having export activities. Indeed, they have to compete globally, to face successive financial crisis and to overcome impediments in acceding to capital markets. Bellouma et al. (2005) argue that small and medium Tunisian companies have to draw funds from internal and personal sources or informal investment. As they grow, SMEs require additional capital and may be vigilant in investment activities.

Generally, small and medium Tunisian companies are considered as the main economic operator. In fact, the increase of Tunisian SMEs number (324 879 in 2003 versus 589 534 in 2010) had played a significant role in reducing unemployment rate (15.4% in 2003 versus 13.3% in 2010)[1]. As well, Tunisian SMEs are characterized by their capacity to respond to market changes due to their flexibility. Thus, the focus on their development increases in order to promote the general growth of the country. As recognized by many researchers, one of the best ways to ensure the value creation is developing an efficient working capital management (Bellouma, 2011). Thus, the profitability of the company increases if the components of working capital (accounts payable, accounts receivable and inventories) are optimally mixed (Deloof, 2003). Higher level of working capital may increase the company's sales, and consequently the corporate profitability. However, investing in working capital also has an opportunity cost.

LITERATURE REVIEW

Working capital management is an important strand in corporate finance literature. Traditionally, research has been focusing more on capital structure, capital budgeting, investment and financing. However, an apparent neglect can be detected for the working capital management and its link with capital investment. Over forty years ago, Smith (1973) stressed that company need to consider dual finance goals of profitability and liquidity in order to manage efficiently their day to day decision-making. Management of short term assets and liabilities warrants a specific attention since the working capital management plays an important role in company's value and viability (Ben, 2011). Working capital entails with current assets and current liabilities of the company. More precisely, it is the difference between short term assets and liabilities (Deloof, 2003). As noted by Wang (2002), the net working capital indicates the liquidity level of the company. In other words, when the investment in current assets is high, the company has a great liquidity. However, when current liabilities increase, the company's liquidity decreases (Keown et al., 2001).

The main objective of working capital management is to maintain an optimal mix between inventories, receivables and payables. In fact, companies can minimize their financing costs or increase their available funds by reducing the amount of current assets. The money locked in working capital is costly since it does not generate return (Kim et al., 1998). Thus, an efficient management of working capital may both increase growth opportunities and avoid liquidity shortage in day to day processes (Ross et al., 2005).

To ensure their growth and viability, all companies have to invest in profitable investments. Nevertheless, the access and the availability of funds differ with companies and their characteristics. Thus, the level of corporate investments is influenced largely by internal funds. In this sense, Boyle and Guthrie (2003) show that companies may be unable to invest in profitable projects if internal funds are unavailable. Thus, lack of liquidity may be an impediment for company in undertaking current investment opportunities. This idea is also strengthen by the fact that internal funds have lower costs than external funds due to market imperfections as agency problems or asymmetric information (Cleary, 1999; Smith, 1986; Boyle and Guthrie, 2003).

Cash holding allows the company to face its daily transactions, to meet unpredicted eventualities or to undertake future investment opportunities (Keynes, 1936). In an asymmetric context, Jensen (1986) suggests that companies have to use all available funds to finance profitable projects. Thus, high level of liquidity stimulates companies to invest. In turn, the company may have advantages of the increase in cash resulting from the growth opportunities of the investments (Kim et al., 1998). Correspondingly, a decrease in liquidity holding may be anticipated if the investment chosen affects negatively the growth of the company (Opler et al., 1999).

A relevant concern to the above discussion is the ability of the company in increasing cash holding. In fact, if cash flows are tied up in receivables and inventories, the reduction of financial risk and the investment in growth opportunities are difficult (Gundavelli, 2006). Managing efficiently short term assets and liabilities allows the company to use the hidden cash and to limit working capital requirement. In other words, the company may increase the level of its liquidity by the postponement of payables and the acceleration of receivables. As a consequence, the company becomes more able to invest when growth opportunities are available.

Hypothesis

On the basis of the different arguments and findings of the existing literature, it can be hypothesized that:

[1] http://www.indexmundi.com/fr/tunisie

Table 1. Sample description.

Variable	No (%)
No. of employees	
Up to 50	205.4 (53.2)
50-100	180.6 (46.8)
Type of the company	
Limited liability	261.7 (67.8)
Limited corporation	124.3 (32.2)

Table 2. Distribution of SMEs by sector of activity.

Activity sector	No. of companies
Food industry	136
Construction	96
Metal retail	24
Textile	104
Service	22
Total	386

H_1: The level of liquidity is positively related to the capital investment

H_2: The working capital management is negatively related to the capital investment.

METHODOLOGY

Data selection

The study uses data of unlisted small and medium Tunisian companies supported by the Tunisian export center (CEPEX). As noted by Bellouma (2011): "The CEPEX is a governmental institution which provides assistance for small and medium sized export companies in Tunisia operating in the private sector. Its principal aim is to promote the expansion and development of Tunisian exports. It supports Tunisian export SMEs abroad by providing adequate information, organizing promotional activities and programs of meetings between potential partners. The use of a sample of Tunisian firms SMEs is an appropriate choice since Tunisia is an emerging market with a great need of liquidity to undertake profitable corporate investments.

Companies with missing data are excluded from the study. After eliminating outliers, the sample is composed of 386 export Tunisian SMEs observed from 2001 to 2008. The study is mainly based on financial data; as a result, the main source of data was financial statements (note to financial statements, income statements, balance sheets and cash flow statements). As shown in Table 1, limited liability companies present 67.8% versus 32.2% limited corporations. 53.2% of the SMEs of the sample employ less than 50 workers. Thus, they are considered as small and medium-sized companies.

The distribution of the sample by considering the sector in which companies operate is illustrated on Table 2.

Variables

The study proposes to identify the factors that affect working capital management by including the capital investment.

Independent variables

Capital investment (CAPI) is measured by the capital expenditure supported by the company when acquiring or improving physical assets. It includes the cost of asset, insurance and legal costs. Decisions on capital investment are expensive and permanent. The companies operating in manufacturing industry have generally larger capital investment and usually support more costs of assets maintenance than service companies. A company with low capital investment may have fewer costs, but this will be a signal for its low growth opportunities. This measure is considered in cash basis.

Operating expense (OPEX) is a continuing cost supported by the company. It includes sales and administration, research and development expenditures, depreciation of plants and equipment used in the production procedure. This measure is reported in accrual basis.

Financial expense (FIEX) is the sum of the costs related to debts capital such as interest and related charges. This measure is reported in accrual basis.

The size of the company (SIZE) is measured by sales expressed in Tunisian dinars (TND) (1USD = 1.3617 TND). Small and mid-sized companies may face more limited financing resources than larger companies and therefore, they present lower growth perspective.

The leverage of the company (LEVER) is measured by the report of long term debt and equity. It gives an idea about the potential risk of the company and its capacity to meet obligations. A high leverage indicates low financial health of the company and its inability to rely on its internal funds.

Dependent variables

Traditionally, working capital is calculated by the difference between short term assets and liabilities. This measure does not reflect an accurate understanding of company's liquidity. In fact, net working capital varies with the level of the liquidity of its components. Therefore, as proposed by Shulman and Cox (1985), components of working capital that have financial nature are more liquid than nonfinancial ones. By considering this suggestion, the working capital is the sum of the net liquidity balance (the difference between financial current assets and financial current liabilities) and the working capital requirement (the difference between nonfinancial current assets and nonfinancial current liabilities). These two measurements are interdependent (Chiou and Cheng, 2006). For instance, by reducing the amount of accounts payable, the company reduces its cash holding simultaneously. Thus, the reduction of working capital requirement leads to a decrease in the net liquidity balance.

Model specification

Two models are tested in this study using the regression on panel data analysis. Unlike cross section or time series data, panel data takes into account the specific effect of each companies included in the sample. The models applied are as follows:

$$NLBL_{it} = \beta_i + \psi_i\, OPEX_{it} + \pi_i\, CAPI_{it} + \rho_i\, FIEX_{it} + \theta_i\, SIZE_{it} + \rho_i\, LEVER_{it} + \varepsilon_{it} \quad (1)$$

Table 3. Descriptive statistics.

Variable	Mean	Standard deviation	Minimum	Maximum
NLBL	27.213	9.366	-13.14	48.33
WRCR	49.582	14.139	-7.679	67.764
CAPI	78.928	30.183	7.668	148.650
OPEX	38.316	13.287	11.144	61.345
FIEX	30.501	18.721	19.413	39.113
LEVER	0.283	0.132	0.04	0.493
SIZE	0.886	0.492	0.412	2.33

$$WRCR_{it} = \alpha_i + \varphi_i\ OPEX_{it} + \delta_i\ CAPI_{it} + \xi_i\ FIEX_{it} + \mu_i\ SIZE_{it} + \lambda_i\ LEVER_{it} + v_{it} \quad (2)$$

Where:

i: 1, 2…..386 companies
t: from 2001 to 2008
NLBL = Net liquidity balance = (cash and cash equivalents + short term investment) - (short term debt + commercial paper payable + long-term debt a year term)
WRCR = Working capital requirement = (accounts receivable + inventories) - (accounts payable + accrued expenses +other payable)
β and α= Constants of the regression
OPEX = Operating expenditure
FIEX = Financial expenses
CAPI= Capital investment
LEVER = Leverage
SIZE = Size of the Company
v = Error terms

RESULTS AND ANALYSES

Descriptive statistics

The descriptive analysis illustrated on Table 3 report the mean, the standard error, the minimum and the maximum of the variables included in the study are illustrated in the following table. The variables (NLBL, WRCR, OPPEX, CAPI and SIZE are expressed in thousand Tunisian dinars).

Means value of NLBL and WRCR are correspondingly 27.213 and 49.582 thousand Tunisian dinars. We note that nonfinancial components of working capital are higher than financial items. This suggests that the companies included in the sample suffer of shortage liquidity. In fact, as reported by the negative sign of minimum values of NLBL and WRCR, some companies prove difficulties in their working capital management.

The different expenses supported by the Tunisian export SMEs in the sample analyzed differ from company to company. Principally, the minimum value of financial expenses exceeds both minimum values of capital investment and operating expenditures. The maximum of capital investment is 148.650. This low amount may results from financial constraints faced by small and medium companies or their limited size as shown by the statistics of LEVER and SIZE.

Table 4. The results of Hsiao's test by sector.

Regression with dependent variable	NLBL (1)	WRCR (2)
F_1	37.30 (0.006)	44.94 (0.000)
F_2	16.04 (0.7980)	23.13(0.5532)
F_3	57.67 (0.004)	32.84 (0.03)

Statistic Fisher between parentheses.

Findings of model regressions

The estimation of panel data imposes the verification if the data used is homogenous or heterogeneous by testing the equality of the coefficients of the model. As proposed by Hsiao (1986), the null hypothesis of equal constants and coefficients is checked in the first stage. The p-value of fisher test (F_1) is lower than critical value of 5%. The rejection of the null hypothesis implies the verification of the second stage of Hsiao process which tests the null hypothesis of equal coefficients. The statistic F_2 calculated in Table 4 indicates that the null hypothesis is accepted. Thus, the panel structure can be adopted and the equality of constants will be checked in the third step of Hsiao procedure. The p-value of the statistic F_3 is lower than critical value of 5%. Then, the individual effects should be introduced in the model for the two specifications retained.

After validating the panel structure of the data used, we have to check the appropriate model of estimation. In other words, we must test the individual effect of each company to specify whether the fixed effect model or the random effect model generates efficient estimators. In order to choose between fixed and random effects, the Hausman test (1978) is run.

As reported in Table 5, the null hypothesis of Hausman test is rejected (p-value < 5%) and the fixed effect model is more appropriate to estimate both specifications.

According to Table 6, capital investment influences

Table 5. The results of Hausman's test for the two specifications.

Specification	(1)	(2)
Hausman test	78.54 (0.008)	135.92 (0.003)

Statistic Chi^2 (7) between parentheses.

Table 6. Fixed effects results (dependent variable: NLBL).

Variable	Fixed effect regression		
	Coefficient	t-student	P>|t|
CAPI	0.695	7.07	0.000
OPEX	-0.31	-4.14	0.000
FIEX	-0.451	-15.76	0.000
LEVER	-0.958	-2.36	0.019
SIZE	0.063	0.07	0.543
Constant	3.796	67.57	0.000
R^2		54.81%	

positively the net liquidity balance. As shown by the coefficient of CAPI, the level of net liquidity balance increases by 0.695 as capital investment increases. These findings are consistent with the first hypothesis and suggest that investment decision undertaken by Tunisian export SMEs are sources of increasing cash holding. This relationship supports the results of Mayer (1990), Boyle and Guthrie (2003) and Fazzari et al. (1988).

The coefficient of OPEX and FINEX are negatively related to the net liquidity balance. More precisely, the level of net liquidity decreases with 31 and 45.1% respectively as the operational and financial expenses rise. This result is reported by Appuhami (2008) and reveals that the impact of financial expenditures is higher than operational expenditures. The argument that can be advanced is the high cost of debts such as bank loans in Tunisia. Thus, as argued by (Bellouma et al., 2009), the rate of credit bank applied for small and medium companies is prohibitive due to the problem of asymmetric information. This explanation is also confirmed by the significant coefficient of the variable leverage (LEVER). In fact, the ratio debt to assets is negatively linked to the net liquidity balance. As a result, the companies relying on debts find difficulties to generate cash from their activities.

Concerning the results of the regression on working capital requirement (WRCR), the coefficient of capital investment is significant and negative (-0.0215) (Table 7). This result supports our second hypothesis and the findings of Hawawini et al. (1986). More precisely, Tunisian exports SMEs manage efficiently their working capital requirement to increase their net liquidity balance and to undertake profitable investments. Operational expenditures are negatively correlated to the working

Table 7. Fixed effects results (dependent variable: WRCR).

Variable	Fixed effect regression		
	Coefficient	t-student	P>|t|
CAPI	-0.0215	-1.88	0.060
OPEX	0.092	5.15	0.000
FIEX	0.015	0.47	0.637
LEVER	-0.047	-0.43	0.669
SIZE	0.064	0.17	0.862
Constant	1.728	5.94	0.003
R^2		38.21%	

capital requirement (-0.092). This result is evident, since the increase of any source of cost affects the required liquidity to cover it. In other words, companies need more cash holding when they need to meet obligations.

Among the three insignificant variables (SIZE, LEVER and FINEX), it is interestingly to highlight that financial expenditure has not any effect on the working capital requirement. This finding results from nonfinancial items that compose the working capital requirement with comparison to the net liquidity balance.

CONCLUSIONS AND MANAGERIAL IMPLICATIONS

The main objective of this paper is to identify the relationship between capital investment and working capital management with reference to Tunisian export SMEs. While managers give an important attention to working capital management, financial management literature lacks of evidence focusing in this topic. Several studies in recent times have examined the determinants of working capital management; however, the link between corporate investments and working capital is still not addressed. This study uses two components of working capital: The net liquidity balance and the required working capital as suggested by Shulman and Cox's (1985). Regressions on panel data estimation by fixed effects models show that corporate investment influence positively the cash holding of the company and diminish the level of working capital required. Even these results support previous studies focusing on the relationship between investment and liquidity, the main contribution of our paper is the dual effect of investment on working capital (the increase of the liquidity available and so the decrease of the required fund). Therefore, the study strongly recommends that Tunisian export SMEs may overcome the shortage of liquidity by understanding how capital investment affects the two components of working capital. Thus, by highlighting the role of investments on managing working capital, companies may generate profit from growth opportunities and avoid costly interruptions of operational activities.

Limitations and areas for further study

Further investigations may enhance this study by including other factors influencing working capital management as the social aspects. In fact, managers may influence the investment decision or the process of allocating the cash of the companies. Besides, the model can be replicated for large sized companies or samples from developed countries to check differences of working capital management.

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