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Résumé de l'article

Le fond de roulement est un composant important dans la décision financière. Une gestion optimale du fond de roulement est atteinte à travers une conciliation entre la profitabilité et la liquidité. Cette étude fournit une vérification empirique des effets de la gestion du fond du roulement sur la profitabilité de 386 PME exportatrices en Tunisie observées de 2001 à 2008.

Les résultats des modèles à effets fixes et aléatoires montrent une relation négative entre la profitabilité de l'entreprise et les différentes composantes du fond de roulement. Ainsi, les PME exportatrices tunisiennes augmentent leur profitabilité en réduisant leur cycle de conversion du cash à travers la restriction du nombre de jours de recouvrement des créances clients et la limitation de la période de stockage.

The Impact of Working Capital Management on Profitability: The Case of Small and Medium-Sized Export Companies in Tunisia

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RÉSUMÉ

Le fond de roulement est un composant important dans la décision financière. Une gestion optimale du fond de roulement est atteinte à travers une conciliation entre la profitabilité et la liquidité. Cette étude fournit une vérification empirique des effets de la gestion du fond du roulement sur la profitabilité de 386 PME exportatrices en Tunisie observées de 2001 à 2008.

Les résultats des modèles à effets fixes et aléatoires montrent une relation négative entre la profitabilité de l'entreprise et les différentes composantes du fond de roulement. Ainsi, les PME exportatrices tunisiennes augmentent leur profitabilité en réduisant leur cycle de conversion du cash à travers la restriction du nombre de jours de recouvrement des créances clients et la limitation de la période de stockage.

Mots clés : Gestion du fond de roulement, Profitabilité de l'entreprise, Données de Panel, PME exportatrices tunisiennes.

ABSTRACT

Working capital is an important component in the financial decision of the company. An optimal working capital management is reached through a trade off between profitability and liquidity. This study aims to provide empirical evidence about the effects of working capital management on the profitability of 386 Tunisian export SMEs observed from 2001 to 2008.

The results of fixed and random effects models show a negative relationship between corporate profitability and the different working capital components. This reveals that Tunisian export SMEs should shorten their cash conversion cycle by reducing the number of days of accounts receivable and inventories to increase their profitability.

Keywords: Working capital management, Corporate profitability, Panel data, Tunisian export SMEs.

RESUMEN

El capital circulante es un componente importante en la decisión financiera de la empresa. Una gestión óptima del capital circulante está alcanzada a través del compromiso entre rentabilidad y liquidez. Este estudio trata de proveer evidencia empírica acerca de los efectos de la gestión del capital circulante sobre la rentabilidad de 386 pequeñas y medianas empresas exportadoras en Túnez observadas desde 2001 hasta 2008.

Los resultados de los modelos a efectos fijos y aleatorios muestran la existencia de una relación negativa entre la rentabilidad empresarial y los diferentes componentes del capital circulante. Dicha relación revela que las PYME exportadoras tunecinas tienen que acortar sus ciclos de conversión en efectivo a través de la reducción del número de días de cuentas por cobrar y de inventarios para aumentar su rentabilidad.

Palabras claves: Gestión del capital circulante, Rentabilidad Empresarial, Datos de Panel, PYME Exportadoras Tunicinas.

Traditionally, the corporate finance literature has studied long-term financial decisions like investments, capital structure, company valuation or dividends… However, management of short-term assets and liabilities deserves a careful analysis since the working capital management has an important effect on the firm's profitability as well as its risk (Smith, 1980). In general, the manager of business entity considers that working capital management ensures the ability of the company to fund the difference between short term assets and liabilities (Harris, 2005). Actually, working capital management covers all the company's activities relating to supplier, customer, product (Hall, 2002). Consequently, to minimize risk and to improve the overall performance, financial executives have to monitor continuously each of working capital components, i.e., receivables, inventories and payables.

An optimal level of working capital management would be reached by achieving a balance between liquidity and profitability. In fact, if the company adopts a working capital management policy with an excessive level of current assets, the risk of liquidity may be reduced. Conversely, the company bears the opportunity cost of funds that may have been invested in long term assets.

Though the effect of working capital management on profitability is important, only a few empirical studies have been conducted to observe this relationship. All the existing papers use data from the US (Filbeck and Kreuger, 2005) and Europe (Deloof 2003; Lazaridis and Tryfonidis, 2006 and Uyar, 2009). Hence, researchers have almost focused on large companies operating in developed countries. Lessons from these studies are not directly applicable to an emerging market economy like Tunisia[1]. In fact, Tunisian companies are relatively small sized and rely greatly on

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1. The Tunisian capital market appears to be relatively little developed and SMEs suffer from credit rationing (Bellouma and al., 2009).

internal financing, short term debt and trade credit to finance their working capital requirement (Saccurato, 1994 and Chittenden and al., 1998). Particularly, they are characterized by short liquidity and a high level of current assets. They adopt an informal working capital management which may increase the probability of their default[2].

Even if working capital management concerns all businesses, it is more important for small and medium-sized export companies. In fact, they must be able to face international changes and competition especially in the context of the financial crisis that has spread from 2007 and continued to date[3]. Besides, not only the lack of timely and appropriate working capital does present additional costs but also an internal barrier for export activity. Thus, small and medium-sized export companies in Tunisia must pay more attention to manage their working capital.

Keeping this in view, this study is the first attempt to identify the impact of working capital management on corporate profitability from a Tunisian dataset. In addition to this contribution of this paper, the econometric approach is based on panel data analysis to control Tunisian export SMEs in both individual and temporal sides.

The paper is organized as follows. Section two briefly provides the literature review and the hypotheses. Section three describes the methodology adopted. Section four exposes the findings. Finally, section five presents the conclusion.

Literature review and derivation of hypotheses

Working capital management is the management of company's short-term assets and short term liabilities (Deloof, 2003). It intends to guarantee the sufficient ability of the company to continue its activity and to face operational expenses. More explicitly, the working capital is the investment required from the time lag between the purchase cost of raw materials and the sale of finished products. Its management involves accounts receivable and payable, inventories and cash. Thus, the non synchronous nature of flows makes managing working capital essential for understanding liquidity needs.

In this section, the literature for the relevant theoretical and empirical research on working capital components (inventories, accounts payable and receivable) and their effects on corporate profitability is first exposed. Then, existing literature on the influence of the liquidity on corporate profitability is presented. On the basis of this overview, testable hypotheses are derived.

THE INTERACTION BETWEEN WORKING CAPITAL MANAGEMENT COMPONENTS: THE VECTOR OF ENHANCING PROFITABILITY

The crucial factor of working capital management concerns the management of inventories, accounts receivable and payable. As stressed by Ganesan (2007), working capital management must provide an efficient mix between working capital components to ensure the capital adequacy of the company.

Inventory and corporate profitability

In the sphere of inventory managing, the company aims to hold a minimal acceptable level of inventory with regard to its costs (Toomey, 2000, Guariglia and Mateut, 2006). Indeed, maintaining a large inventory implies using capital to finance it and to cover different costs (transport, insurance, storage, obsolescence, spoilage…) (Long and al., 1993; Deloof and Jegers, 1996). However, keeping a low inventory level may lead to lost sales and stock-out (Deloof, 2003). Thus, inventory flexibility is the crucial dimension in the supply chain management (Koste and Malhotra, 1999)[4]. It reflects the ability of the company to include customer's demand fluctuation on time and quantity into the planning cycles. Such practice requires an effective coordination between the company and its suppliers, especially in case of an increasing demand. Consequently, inventory flexibility must be observed from an integrative perspective. Robinson and al. (1986) argue that inadequate inventory planning is the major source of SME failure since the incapacity to send required goods to customer handicaps the company's long-run viability.

From an empirical view, Deloof (2003) points that managers of Belgian firms can enhance profitability and create value for their shareholders by decreasing the period of turning raw materials into cash. Similarly, Gaur and Kesavan (2006) propose a model explaining inventory behavior of retailing companies. They found that inventory turnover is negatively associated with gross margins. Recently, Ganesan (2007) advocates that short inventories allow American companies operating in telecommunication equipment to rely less on external financial market. In fact, they may invest daily operation funds in growth projects.

This discussion yields the following hypothesis:

H1: More profitable Tunisian export SMEs maintain low level of inventory.

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2. The main reasons of SMEs failure are short-term liquidity problems and insufficient working capital (Larsen and Lewis, 2007).

3. Slowly growth in exports of all Tunisian industries (21.8% in 2008 vs. 24.8.% in 2007) was due mainly to the impact of the world financial crisis. Source: Report of Central Bank of Tunisia (P.125).

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4. The supply chain encompasses activities of planning and supervising raw materials, components and finished products from suppliers to final customers (Giunipero and al., 2008).

Accounts payable and corporate profitability

Based on trade credit theory, suppliers collect additional information over traditional financing channels. Accordingly, trade credit is a cheaper substitute to bank credit (Petersen and Rajan, 1994). Besides, by delaying payments to suppliers, the manager allows the firm to beneficiate from a flexible source of financing and a low probability of receiving poor quality materials.

Conversely, trade credit deprives the company of early payment discount which can be considered as an implicit cost. Thus, the company uses credit from suppliers when other financing sources are not available. Furthermore, trade credit may damage the company reputation in case of non payment of the supplier. According to those disadvantages related to lengthening the payable period, Deloof (2003) and Lazaridis and Tryfonidis (2006) find a negative relationship between profitability and the number of days of accounts payable. This result is consistent with the view that more profitable companies pay their bills in a short period.

This discussion yields the following hypothesis:

H2: Less profitable Tunisian export SMEs wait longer to pay their suppliers.

Accounts receivable and corporate profitability

Accounts receivable are an important component of the current assets. As a result, any change in their magnitude can influence the financial viability of the company. Trade credit decision depends on many factors such as: market competition, offered goods or services, price, customer… Moreover, as pointed by Grzergorz (2008), the decision of granting trade credit is a compromise between limiting the risk resulting from untrustworthy buyers and gaining new customers. Therefore, it is imperative for the company to consider the customer's capabilities in trade credit decision.

A flexible trade credit policy with an interest on receivables may increase sales (Long and al., 1993; Deloof and Jegers, 1996). However, such practice can be expensive due to the lock up of money in working capital (Guariglia and Mateut, 2006). Besides, if the manager chooses to reduce the accounts receivable, he limits sales through credits to customers. Then, this strict collection policy leads to loose purchasers and reduces profits. In this respect, Pike and Cheng (2003) stressed that working capital management looks for creating a high quality accounts receivable portfolio in order to improve corporate value.

Evidence provided by Deloof (2003) shows a significant negative relationship between gross operating income and the period that the company takes to receive payment on accounts receivable. Recently, Ganesan (2007) supports that long receivable cycle makes telecommunication equipment American companies more dependent on external financing.

This discussion yields the following hypothesis:

H3: Less profitable Tunisian export SMEs spend more time in receiving payment from customers.

LIQUIDITY AND PROFITABILITY: THE DILEMMA IN WORKING CAPITAL MANAGEMENT

Apart from the efficient mix between working capital components, the fundamental role of working capital management is maintaining the company's liquidity in day-to-day operation. Thus, working capital decision is time consuming, intermittent and recurring. Besides, its management depends on information production, transaction costs and available resources and varies across industries (Filbeck and al., 2007). It involves the planning and the control of current assets and current liabilities.

Current assets contain all assets that are converted to cash within a short timely basis. The company's liquidity depends on the operating cash flows generated by those assets and not their value (Rahman and Nasr, 2007). However, current liabilities include obligations that the company has to pay in a short period of time.

The current assets should cover the current liabilities to provide a margin of security. If the company is unable to match properly current assets and current liabilities, it will face financial distress and bankruptcy (Zariyawati and al., 2009). As argued by Beaver (1966) "*the firm is viewed as a reservoir of liquid assets … The solvency of the firm can be defined in terms of the probability that the reservoir will be exhausted, at which point the firm will be unable to pay its obligations as they mature*" (p. 80).

Liquidity and profitability are the main financial issues for all types of businesses. Smith (1980) suggests that the management of working capital affects these two aspects. Beaumont and Begemann (1997) particularly emphasize that understanding the link between profitability and working capital facilitates the comprehension of the relationship between liquidity and profitability. Indeed, if the company does not have an adequate working capital to sustain sales activity (purchase the materials, pay expenses…), it will face problems of insolvency.

Referring to the theory of risk and return, more risky investment leads to more return (Eugene and Michael, 2008). Put differently, low liquidity would decrease the company's risk and profitability simultaneously. In other words, the decrease of profitability can be explained by the opportunity cost of funds invested in long-term assets (Kalcheva and Lins, 2007, Dittmar and Mahrt-Smith, 2007).

However, excess of liquidity indicates inefficient funds and negatively influences the corporate profitability (Cooper, 2003 and Vishnani and Shah, 2007). Thus, the balance between profitability and liquidity is the dilemma of working capital management. In assessing the profitability-liquidity trade-off, three basic assumptions are presented by Pramod and Khan (2007):

– The company operates in the manufacturing sector (the trade cycle is relatively longer than the service cycle).

– Fixed assets are more profitable than current assets;

– Long-term funds are more expensive than short-term funds.

To find out the relationship between efficient working capital management and company's profitability, Shin and Soenen (1998) used the cash conversion cycle as a measure of the length of time between the purchase of raw materials and the collection of accounts receivable. They found that a long cash conversion cycle negatively influences the corporate profitability. They suggest that the company can create shareholder value by reducing their financial needs with regard to liquidity.

The result of Shin and Soenen (1998) was consistent with the finding of Deloof (2003) who concludes to a negative relationship between gross operating income as a measure of the profitability and the cash conversion cycle. Recently, Eljelly (2004) reports a negative relationship between profitability and liquidity. He considers that planning the level of current assets and current liabilities avoids the firm excessive

short – lived investments and neutralizes the risk of its incapacity to pay obligations.

This discussion yields the following hypothesis:

H4: The amount of liquidity generated by Tunisian export SMEs negatively influences their profitability.

The theoretical review and studies presented above and synthesized in Table 1 give results and conclusions on working capital management for different countries. In the next section, the methodology conducted on the same area for Tunisian export SMEs is exposed.

Methodology

In this section, the companies included in the sample, the variables used and the statistical techniques applied in the investigation are presented.

DATA COLLECTION AND SAMPLE CHARACTERISTICS

The data were collected from Tunisian Export Promotion Center (CEPEX)[5] and are based on the financial statements

TABLE 1

Summary of main studies on working capital management

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

5. 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 (www.cepex.nat.tn)

of small and medium-sized export companies in Tunisia[6]. The yearly data of good sales' costs, receivables, payables, inventories, and operating incomes are extracted from the financial states and have been manually entered into the database of STATA software.

The quota method is used to make a more representative sample of the population of Tunisian export SMEs. Thus, the distribution of this population by sector of activities was replicated. The sample is composed of 386 export Tunisian SMEs observed from 2001 to 2008. This period corresponds to a mix of Structural Adjustment Plans[7] and reflects the continuity of economic reforms (incentives to exports, subventions to exporting companies….) and policies likely to promote exports and to consolidate the share of Tunisia on foreign markets.

As shown in Table 2, the panel is mainly composed of limited liability companies (67.8%). The limited corporations represent only 32.2%. 20.2% of companies in the sample export over 50% of their products towards four foreign markets (U.S, Asia, Europe and Arabic Maghreb union). 53.2% employ less than 50 workers. Thus, they are considered as small and medium-sized companies[8].

Table 3 shows the distribution of Tunisian export SMEs by industry. Specifically, 136 companies work at the food industry, 96 product construction materials, 104 run textile business, 24 operate in metal industry and 22 have a service activity. The null hypothesis of the test of homogeneity is verified. It implies that the population and the sample have homogeneous distribution among the five sectors of activity at the confidence level of 95%.

VARIABLES OF THE ANALYSIS

In order to identify the influence of working capital management on the profitability of Tunisian export SMEs, the following measure of the dependant variable is retained:

GOP_{it}: The corporate profitability is measured by the gross operating profit. It is calculated by subtracting cost of goods sold from total sales and divided by total assets minus financial assets (Deloof, 2003). Contrary to the use of earnings before interest tax depreciation and amortization (Ramachandran and Janakiraman , 2009), the financial activity is separated from operational activity to

associate operating results with the operating variables relating to working capital management.

The independent variables included in the study concerning the working capital management are:

DSO_{it}: The collection policy is reflected by the days of sales outstanding and measured by [accounts receivable x 365]/sales. A low DSO shows that the company collects its accounts receivable in few days. A high DSO means that the company sells its product to customers by credit (Petersen and Rajan, 1997).

TABLE 2

Sample description

Characteristics	n	Percentage
Number of employees		
Up to 50	205,4	53,2%
50-100	180,6	46,8%
Company age		
0-10	70,3	18,2%
10-30	74,5	19,3%
30-50	136,2	35,3%
50 and more	105	27,2%
Export sales ratio		
Less than 10%	40,1	12,4%
10-25%	98,4	25,5%
25-50%	102,3	26,5%
Over 50%	144,2	37,36%
Type of the company		
Limited liability	261,7	67,8%
Limited corporation	124,3	32,2%
Number of foreign markets		
1	55	11,91%
2	218,48	56,60%
3	105,11	27,23%
4	16,44	4,26%

(n=386)

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6. At the national level, there is no official definition of Tunisian SMEs. Two alternative definitions are used with particular financing programs:

– The Decree 94-814, relative to eligibility criteria for financing under the FONAPRAM (*Fonds National de Promotion de l'Artisanat et des Petits Métiers*), defines small enterprises as those having a total investment cost (including working capital) not exceeding 50.000 TD (about 35.408 US$).

– The Decree 99-484, relative to the promotion of SMEs through the FOPRODI (*Fonds de Promotion et de Décentralisation Industrielle*), defines a small and medium enterprise in the industrial and services

sectors as having a total investment of less than 3 million TND (nearly 2.1 million US$)

(web site of Ministry of development and international cooperation: www.tunisie.gov.tn).

7. 9th plan (1996- 2001) - 10th plan (2002- 2006) -11th plan (2007-2011).

8. "*A wide consensus among national officials seems to exist on a non-official definition of SMEs as those enterprises employing between 10 and 100 workers. This definition, however, is not stated clearly, nor it appears in any official document*" Di Tommasso and Rubini (2001) (p. 44).

TABLE 3

Distribution of SMEs by sector of activity and homogeneity test

Activity sector	Population		Sample	
	Companies Number*	Percentage	Companies Number	Expected Number**
Food industry	984	34.53%	136	133.3
Construction	747	26.21%	96	101.2
Metal retail	202	7.09%	24	27.4
Textile	757	26.56%	104	102.5
Service	160	5.61%	22	21.7
Total	**2850**	**100%**	**386**	**386**
Homogeneity Test	Chi (2) calculated= 4.878; χ^2 (degree of freedom = 4) = 9.488 (from Chi Square distributions) Chi(2) observed $< \chi^2$ from table at 5%			

* Data from CEPEX – Statistics of 2008
** Expected number = Sample size X (percentage)
Chi (2) calculated = $\sum$ (residues)^2/ Expected number

Companies may improve collection process by offering discounts to customers who reimburse immediately. Alternatively, they may charge interest for the one who pays later. As noted by Pike and Cheng (2003), a high quality portfolio of accounts receivable has significant implications for corporate value. In fact, the increase of accounts receivable implies management expenses and additional working capital, both of them decrease the value of the company.

DIO_{it}: The inventory policy reflected by the days of inventory outstanding is measured as [inventories x 365]/ cost of sales. When the company maintains a moderate level of inventories it can respond to higher demand. This can be improved by the synchronization between raw materials delivery by suppliers and the need in the production process (Deloof, 2003). Thus the low level of inventories will have a positive effect on profitability since it will liberate working capital resources (Lazaridis and Tryfonidis, 2006).

DPO_{it}: The payment policy is measured by the days of payable outstanding. It is calculated as [accounts payable x 365]/purchases. Generally, delaying reimbursement to suppliers helps the company in releasing additional resources and enhancing working capital management (Uyar, 2009). However, prompt payment of suppliers allows the company to receive a significant discount (Deloof, 2003).

CCC_{it}: The Cash Conversion Cycle is a comprehensive measure of working capital and a dynamic view of liquidity. It presents "*the time lags between expenditure for the purchases of raw materials and the collection of sales of finished goods*" (Padachi, 2006, p. 49).

In the literature, many definitions of cash conversion cycles are used. For instance, Bodie and Merton (2000) consider "*the number of days between the date the firm must start to pay cash to its suppliers and the date it begins to receive cash from its customers*" (P. 89). Eljelly (2004) defines the cash gap as "*the length of time between actual cash expenditures on productive resources and actual cash receipts from the sale of products or services*" (P. 50). In this study, the measure of Keown and *al*. (2003), Deloof (2003) and Uyar (2009) is used. These authors express cash conversion cycle with the following equation:

Cash Conversion Cycle (CCC)
=
Days of Sales Outstanding (DSO)
+
Days of Sales in Inventory (DIO)
−
Days of Payables Outstanding (DPO)

A positive cash conversion cycle indicates the number of days a company must be waiting the payment from its customer. However, a negative result shows the number of days a company has before paying its suppliers (Hutchison and *al*., 2007). A shorter CCC reflects an efficient cash flow management.

The export dimension is considered through these variables:

$EXPR_{it}$: The experience is measured by the number of years that a company has in export activity. As the company matures, it may build its capabilities to compete in the international market. However, younger companies may be

FIGURE 1

The cash conversion cycle
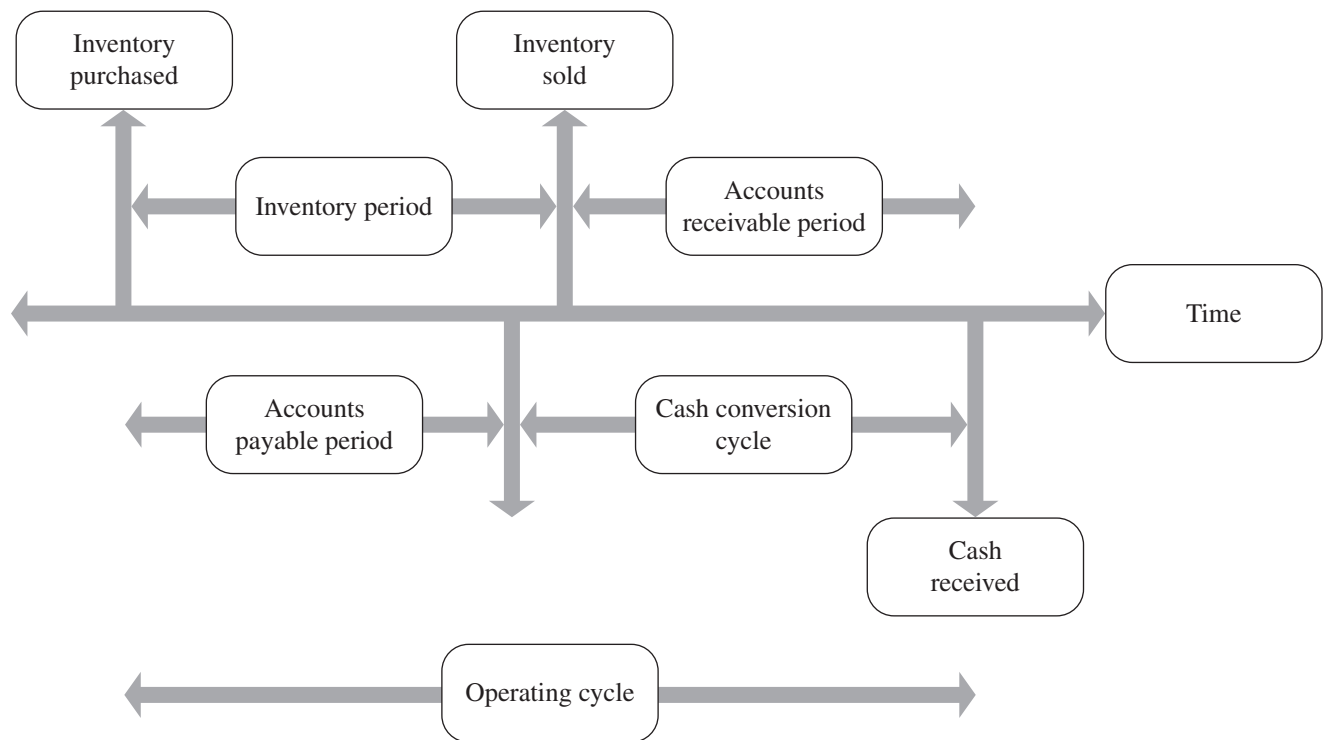
Source : Jordan, 2003, p.643

more flexible and proactive in facing foreign customers (Lefebvre and Lefebvre, 2001). Tunisian export SMEs are expected to exhibit a low profitability during the first years of export activity.

MARKT$_{it}$: The number of foreign markets is an ordinal variable. It takes the value 1 if the company exports to one foreign market, 2 if it exports to two markets, 3 if it exports to three markets and 4 if it exports to four markets. The companies retained in the sample export principally to US, Asia, Europe and Arabic Maghreb union. They use many techniques in selecting export target markets such as systematic and formalized international market research activities, visits of foreign markets before entry, exploitation of published information about differentiating foreign markets… (Yip and al., 2000). When the Tunisian export SME is able to enter more markets it may export a large share of its products and then enhance its profitability.

INTSTY$_{it}$: The intensity of export is defined as the ratio of export sales over total turnover (Lu and Beamish, 2006). Two dimensions of firm level export performance have been used in the previous studies: export propensity and export intensity. Export propensity is more prominent in the literature[9]. It is defined as whether or not a company is an exporter. As explained by Helpman and al. (2008), export intensity and export propensity decisions are simultaneously taken by the company. In this investigation, export intensity is retained to highlight the participation of the company in the foreign markets. Thus, Tunisian export SMEs will be more efficient if they have a high level of export intensity.

The other dependent variables related to the characteristics of Tunisian export SMEs are:

CR$_{it}$: The current ratio is calculated by the ratio of current assets on current liabilities. Working capital management implies the determination of the amount and the composition of current assets and their financing. A high current ratio means an important investment in current assets which represents a low return on investment (Vishnani and Shah, 2007).

SIZE$_{it}$: The size of the company is measured by the log of sales in million Tunisian dinars (TND) (1USD = 1.3169

9. Hiep and Nishijima (2009) review over ninety micro-data studies of export decision making and find that about ten percent of them use export intensity.

TND). Financial and organizational constraints faced by small companies may restrict their available resources to invest in working capital management (Howorth and Westhead, 2003). Thus, larger companies are more able to reduce cash gaps which may enhance their profitability (Raheman and Nasr, 2007).

DR$_{it}$: The debt ratio is measured by the ratio of the sum of short and long term loans on total assets. It presents the proportion of company's debt relatively to its assets. It gives an idea about the leverage of the company and its potential risks. A high level of debt ratio indicates low financial health of the company and its inability to rely on its internal funds (Bellouma and al., 2005). Therefore, companies with an important debt ratio are expected to have a low level of profitability (Raheman and Nasr, 2007).

SECTR$_{it}$: The sector is a dummy variable with five modalities: Sectr $_{it\,1}$ = 1 if the company belongs to the food industry and 0 otherwise, Sectr $_{it\,2}$ = 1 if it operates in construction sector and 0 otherwise, Sectr $_{it\,3}$ = 1 if it has metal trade and 0 otherwise, Sectr $_{it\,4}$ = 1 if it works in textile industry and 0 otherwise and Sectr $_{it\,5}$ = 1 if it provides a service and 0 otherwise (this modality is eliminated from the estimation because it represents the reference modality). These sectors can influence the company decision about working capital management and practices. In fact, the current assets of a distribution company are very important compared to the manufacturing company (Deloof, 2003). Besides, the economic environment (the production factors, the production process, supply and demand, taxes, interest rate…) influences differently the profitability of the company according to the sector in which it operates.

Data analysis and results

To understand the relevant aspects of working capital management, a descriptive analysis is conducted. Table 4 reports the average, the standard deviation, the minimum and the maximum values of the variables included in the study.

The mean value of gross operating profitability is 13.8%. For the sample at hand, the value of the profitability can deviate from the mean by 1.3%. The minimum gross operating profitability is 10.51% while the maximum is 17.75%. All the companies under studies have a positive profitability. Thus, it seems interesting to see whether this characteristic is due to the working capital management practices or can be explained by the concern of the Tunisian government to support export companies.

The cash conversion cycle appears sometimes negative and sometimes positive (the minimum is -52 days and the maximum is 397 days). To be efficient, the company must have the lowest cash conversion cycle and if possible a negative one. Thus, exporters may spend ample time and effort to search partners in the target market. They have to build relationships in foreign markets and to reinforce them in order to reduce their cash conversion cycle.

In the sample, small and medium-sized Tunisian export companies collect their cash from receivables after an average of 100 days with a standard deviation of 41 days and a minimum of 16 days. Besides, they pay their purchases after an average of 98 with a deviation of 38 days and a minimum of 26 days. They take an average 79 days to convert inventory into sales with a deviation of 21 days and a

TABLE 4
Descriptive statistics

Variables	Mean	Standard Deviation	Minimum	Maximum
GOP	13.78622	1.345761	10.51	17.75
DPO	97.57389	38.13956	25.60069	199.7384
DSO	99.4908	40.61152	15.54618	199.4852
DIO	78.79916	21.28989	32.11484	261.5365
CCC	80.76511	47.19741	-51.94004	397.0503
DR	0.382873	0.1349612	0.1	0.93
SIZE	0.8862776	0.4921105	-0.4123387	2.336128
CR	0.0224313	0.0062306	0.0075	0.04
INTNSTY	0.3221277	0.177106	0.168	1
EXP	8.66721	4.591	2	25
MARKT	2.238	0.7106	1	4

N. OBS = 3055

minimum of 32 days. As observed, the companies in the sample follow a flexible collecting policy in order to capture foreign customers. However, they are unable to postpone payment to suppliers due to their small and medium size. In fact, the mean value of the company size is 0.88 with a standard deviation of 0.49. The minimum value is -0.41 and the maximum value is 2.33.

The average current ratio of Tunisian export SMEs is 0.22 and divert from this mean value to both sides by 0.006. The lowest current ratio for a company is 0.04 times. The average of debt ratio is 38.28% with a standard deviation of 13.5%. The minimum level of debt is 10% which explains the incapacity of Tunisian export SME to access to external financing. This result can also reflect its repugnance to rely on bank credit since it is in general a family business.

When considering the export dimensions, it is noted that on average the companies included in the sample have considerable export intensity. In fact, they sell 32.21% of their output overseas. Summary statistics on export markets shows that an exporter has access to two countries only. Finally, the companies have, on average, an important length of export experience (8.667 years) with a minimum of two years which reflects their knowledge regarding exporting activities.

After presenting the descriptive statistics of the variables considered in the analysis, these variables are subjected to correlation measurement. Pearson's correlation analysis allows the identification of the relationship between working capital management and the corporate profitability.

Table 5 illustrates that there is a negative relationship between gross operating profitability and the cash conversion cycle (-0.0382). This is consistent with the idea that the insufficient level of liquidity makes the export company unable to cover the different costs. In this context, any liquidity shock on the foreign market will influence the exporting company abilities to face competition. Thus, the decrease of the time lag between purchases expenses and sales collection enhances the company's profitability.

Pearson correlation result indicates that cash flows locked in inventory may adversely affect profitability (-0.0408). By considering this finding, it appears that Tunisian export SMEs can improve their profitability by reducing the period of selling their inventory. Exporting companies bear additional costs due to transport costs, foreign regulations or adoption of products. Therefore, these costs are one reason for maintaining an adequate inventory to cover the eventual demand. As pointed by Bougheas and al. (2009), the corporate profitability might increase if the benefits of keeping low

TABLE 5

Pearson's Correlation Coefficients

		GOP	DPO	DSO	DIO	CCC	DR	SIZE	CR	EXPR	INTNSTY
GOP	Pearson C Sig.	1									
DPO	Pearson C Sig.	0.0263 0.1485	1								
DSO	Pearson C Sig.	0.0013 0.9422	0.4271 0.0000	1							
DIO	Pearson C Sig.	-0.0408 0.0247	0.1895 0.0000	0.1547 0.0000	1						
CCC	Pearson C Sig.	-0.0382 0.0349	-0.3593 0.0000	0.5927 0.0000	0.4353 0.0000	1					
DR	Pearson C Sig.	0.0314 0.0827	-0.1085 0.0000	-0.1125 0.0000	-0.0158 0.3844	-0.0158 0.3839	1				
SIZE	Pearson C Sig.	0.1659 0.0000	0.1153 0.0000	0.1062 0.0000	0.0232 0.2019	0.0133 0.4624	-0.0293 0.1051	1			
CR	Pearson C Sig.	0.0030 0.8693	-0.0169 0.3515	0.0004 0.9824	-0.0130 0.4738	0.0084 0.6419	-0.0179 0.3232	-0.0139 0.4435	1		
EXPR	Pearson C Sig.	0.0139 0.4422	0.0280 0.1241	0.0162 0.3693	0.0469 0.0097	0.0123 0.4763	-0.0266 0.1409	-0.0054 0.7673	-0.0199 0.27080	1	
INTNSTY	Pearson C Sig.	0.156 0.0000	-0.1400 0.0000	-0.2377 0.0000	-0.1037 0.000	-0.1435 0.0000	-0.0192 0.2889	0.0202 0.2654	-0.0011 0.9513	0.0040 0.4151	1

level of inventory rise faster than related costs. This result is coherent with the positive link between the days of inventory outstanding and the cash conversion cycle (0.4353). In other words, export companies that turn their input to sales slowly have a long inventory cycle. Thus, they must cover this cycle by additional funds which explains the deterioration of their profitability.

In addition to that, Pearson's correlation presents a positive relationship between the days of sales outstanding and the cash conversion cycle (0.5927). This means that Tunisian export SMEs provide more time for their customers to assess the quality of their products because of the competitive international environment. Thus, spending more time to collect cash will increase the time of working capital.

The debt ratio is positively linked to the corporate profitability which suggests that levered companies are more efficient. Indeed, to get access to external credit companies acquire a healthy financial situation. The monitoring exerted by stakeholders may improve the efficiency of the companies due to their capacity of collecting information and minimizing adverse selection and moral hazard problems (Bellouma and Omri, 2008). Besides, facilities provided by Tunisian banks help exporters suffering from internal liquidity to fulfill orders.

The increase of the size of the company improves its profitability. This may be explained by the information opacity of small companies and their informal management. Thus, large exporters are able to stabilize cash flow problems and to grow competitively in the foreign market.

From the export dimension view, the export intensity of a company is significantly correlated with its export experience. Indeed, large export experience in offshore markets enhances the company's reputation and leads to increase its share of export sales.

Finally, it is worth noting that all the working capital components are negatively related to export intensity. This negative correlation shows that turning inventories into a cash flow requires usually many steps related to the type of industry (storage, manufacturing and distribution). Those steps lead to a long cash conversion cycle and may handicap the transactions of the company and the level of its sales.

In order to capture the impact of working capital management on the profitability of Tunisian export SMEs, a regression analysis on panel data is used. Contrary to cross section or time series data, panel data allows the detection of dynamics effects of working capital management on profitability. The model applied for each sector is as follows:

$$GOP_{it} = \alpha_i + \pounds_i\, WC_{it} + {}^j\delta_i\, CC^j_{it} + {}^f\rho_i\, ED^f_{it} + \varepsilon_{it} \qquad (1)$$

Where: GOP_{it}: Gross Operating Profitability of company i at time t;

α_i: The intercept of equation

WC_{it} :The working capital Management variable of company i at time t. We introduce the four variables (DPO, DSO, DIO and CCC) one by one in order to identify their effects on corporate profitability.

$\pounds_i$: Coefficient of the working capital management variable

CC^j_{it}: The variables related to the company's characteristics (j: size, dr…)

${}^j\delta_i$: Coefficient of the company's characteristics variables

${}^fED_{it}$: The variables related to the export dimensions (f: MARKT, INTNSTY…)

${}^f\rho_i$: Coefficient of the export dimensions variables

i = 1, 2, …, 386

t: Time = 2001…..2008

ε: The error term= $u_i + w_t + w_{it}$ (u_i: is the individual effect, v_t: is the temporal effect and w_{it}: is a composed effect).

Equation (1) is transformed into a vector form:

$$GOP_{it} = \alpha_i + \beta'_i\, X_{it} + \varepsilon_{it} \qquad (2)$$

Where $\beta'_i = (\pounds_i, {}^j\delta_i, {}^f\rho_i)$ and $X_{it} = (WC_{it}, CC^j_{it}, {}^fED_{it})$

Before estimating the model, the homogeneity or heterogeneity of the data is checked. Econometrically, the equality of the coefficients of the model studied is tested to verify if the model is perfectly identical to all companies, or inversely, each one has its own specificities.

In order to distinguish between these cases and validate the use of panel structure, the following procedure presented by Hsiao (1986) should be employed:

In the first step, the null hypothesis of equal constants and coefficients (perfectly homogeneous structure) is tested:

$H^1_0 : \beta_i = \beta \quad \alpha_i = \alpha \quad \forall i \in [1, N]$

$H^1_a : \exists\, (i, j) \in [1, N] \;\; / \;\; \beta_i \neq \beta_j \text{ or } \alpha_i \neq \alpha_j$

The classical Fischer test[10] is used. The results of the test are:

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10. If the β vector includes K parameters, then the total number of parameters is KN (N is the number of companies in the panel).

When the N vectors β are equal, we must impose KN – K restrictions. In the same way, if N constants α_i are equal, the number of restrictions is N – 1. Then, we have (K + 1)(N – 1) linear restrictions.

– If H_0^1 is accepted, the pooled model is perfectly homogenous:

$$GOP_{it} = \alpha + \beta' X_{it} + \varepsilon_{it} \qquad (3)$$

– If the null hypothesis H_0^1 is rejected, the second stage (the heterogeneity comes from coefficients) has to be checked.

Let F_1 the statistic associated to H_0^1

$$F_1 = \frac{(SSR_{1,c} - SSR) / (N-1)(K+1)}{SSR_1 / [NT - N(K+1)]}$$

Where $SSR_{1,c}$ is the sum of squared residuals of the constraint model (3) and SSR is sum of squared residuals of equation (2). If calculated F_1 statistic is higher than theoretical value, the null hypothesis of homogeneity is rejected.

The results of the statistic F_3 presented in Table 6 show that the p-value of the data is lower than critical value of 5%. Then, the null hypothesis H_0^3 is rejected and the individual effects should be introduced in the model.

The correlation between the dependant variable (GOP) and the individual effect of each company u_i may be checked. In case of correlation, the fixed effect model is more appropriate to generate consistent estimation by the within group estimator. Otherwise, the random effect model is used to obtain efficient estimators by means of generalized least squares (Greene, 2003). The generally accepted strategy of choosing between fixed and random effects is running a Hausman test (1978) under the null hypothesis $E (\alpha_i/x_{it}) = 0$. If the null hypothesis is rejected, the effects are considered fixed. However, if it is accepted, the effects are random.

TABLE 6

The results of Hsiao's test by sector

N. Obs	(I)	(II)	(III)	(IV)	(V)
	1088	768	192	832	176
F_1	48.10 (0.000)	37.78 (0.000)	31.12 (0.038)	46.76 (0.000)	23.72 (0.0080)
F_2	26.05 (0.8760)	25.33 (0.8721)	45.16 (0.769)	39.83 (0.89)	7.05 (0.9801)
F_3	32.76 (0.007)	42.98 (0.004)	51.33 (0.003)	26.82 (0.03)	54.71 (0.032)

Statistic: Fisher between parentheses

STATA directly provides the p-value of the test. The results obtained in Table 6 show that p-value of the data is lower than critical value of 5%. Then, the null hypothesis of homogeneity is rejected. By rejecting the null hypothesis H_0^1, the second stage of the process of Hsiao (1986) is tested. Principally, the null hypothesis of equal coefficients β_i is verified:

$H_0^2 : \beta_i = \beta \forall i \in [1, N]$

$H_a^2 : \exists (i, j) \in [1, N] \ / \ \beta_i \neq \beta_j$

The statistic F_2 calculated in Table 6 indicates that the null hypothesis H_0^2 may be accepted[11]. Thus, the panel structure can be adopted and the equality of α_i will be tested in the third step of the process of Hsiao (1986) under the hypothesis of $\beta_i = \beta$:

$H_0^3 : \alpha_i = \alpha \forall i \in [1, N]$

$H_a^3 : \exists (i, j) \in [1, N] \ / \ \alpha_i \neq \alpha_j$

TABLE 7

The results of Hausman's test for each specification by sector

	DPO	DSO	DIO	CCC
Food industry	69.69 (0.000)	117.77 (0.000)	53.12 (0.000)	102.78 (0.000)
Construction	30.75 (0.000)	45.67 (0.000)	35.86 (0.000)	65.89 (0.000)
Metal retail	35.76 (0.000)	6.46 (0.3733)	0.82 (0.9972)	1.64 (0.9495)
Textile	2.40 (0.8792)	0.00 (1.00)	7.42 (0.987)	6.76 (0.889)
Service	8.57 (0.2849)	11.81 (0.1070)	14.40 (0.0446)	8.86 (0.2626)

Statistic: Chi2 (7) between parentheses

As illustrated in Table 7, the fixed effect model is more appropriate to estimate the data of food industry, construction and metal retail when DPO is the exogenous variable. However, the random effect model may be considered for the other regressions related to metal retail (when DSO, DIO and CCC are the exogenous variables), textile and service sectors.

By introducing the working capital components one by one, it is noted that days of inventory outstanding are negatively linked to the corporate profitability (significance at level 1%). Thus, a supply chain with a high level of inventory is in position to decrease the profitability of Tunisian export SMEs working in food industry, construction, metal retail and textile. This finding is consistent with the first hypothesis.

11. There are no restrictions on the constants α_i. There are $(N-1) K$ linear restrictions.

In the same way, the statistic F with $(N-1) K$ and $NT - N (K+1)$ degree of freedom is calculated.

TABLE 8

Regressions' results for food industry (Nbr. OBS: 1088)

	FE (1)	RE (1)	FE (2)	RE (2)	FE (3)	RE (3)	FE (4)	RE (4)
Working Capital Management Variables								
DPO	-0.0012 (-1.89)*	-0.0003 (-0.567)	-	-	-			
DSO	-	-	0.003 (-4.82)***	-0.002 (-3.04)***	-			
DIO	-	-	-	-	-0.004 (-3.55)***	-0.004 (-3.29)***		
CCC	-	-	-	-	-		-0.0021 (-4.06)***	-0.0018 (-3.62)***
Companies' characteristics Variables								
DR	0.270 (1.53)	0.2776 (1.56)	0.217 (1.24)	0.2451 (1.39)	0.325 (1.86)*	0.317 (1.80)*	0.305 (1.75)*	0.296 (1.69)*
SIZE	0.451 (9.27)***	0.457 (9.34)***	0.483 (10.06)***	0.485 (10.02)***	0.461 (9.62)***	0.471 (9.77)***	0.4615 (9.65)***	0.4713 (9.81)***
CR	0.793 (0.21)	0.721 (0.19)	1.266 (0.34)	0.916 (0.24)	0.8853 (0.23)	0.566 (0.15)	1.352 (0.36)	1.034 (0.27)
Export dimensions Variables								
EXPR	0.0057 (1.11)	0.0061 (0.238)	0.006 (1.25)	0.0068 (1.32)	0.007 (1.30)	0.007 (1.39)	0.006 (1.21)	0.0067 (1.31)
MARKT	0.121 (3.63)***	0.1171 (0.001)***	0.128 (3.88)***	0.12229 (3.67)***	0.1213 (3.65)***	0.117 (3.50)***	0.128 (3.88)***	0.123 (3.70)***
INTSTY	1.254 (9.29)***	1.205 (0.000)***	1.402 (10.25)***	1.304389 (9.50)***	1.296 (9.72)***	1.267 (9.45)***	1.309 (9.80)***	1.272 (9.47)***
Constant	13.476 (78.99)***	13.375 (78.11)***	13.655 (80.66)***	13.514 (79.65)***	13.64 (75.89)***	13.618 (75.29)***	13.477 (85.01)***	13.456 (84.31)***
Rsq	0.552	0.558	0.603	0.614	0.625	0.626	0.625	0.626

FE: Fixed Effect Model / Statistic t between parentheses
RE: Random Effect Model / P- value between parentheses
*** Significance at 1% . ** Significance at 5% . Significance at 10%

Particularly, Tunisian export SMEs have to conciliate between inventory costs and response time to their customer in order to face foreign environment. In this study, the results show that regardless of the particular nature of each sector, inventories must be handled at a minimum level to be effectively and efficiently managed. In other words, given the volatile nature of foreign demand, Tunisian export SMEs must continually be alerted to unpredictable difficulties. *Cf table 8 and 11.*

From the results of the regressions presented in Table 8 and 11, it is noted that longer days of payables outstanding negatively affect the corporate profitability which is consistent with the second hypothesis. The models are statically significant when considering food industry and textile (significance at level 10%, 1% respectively). This negative relationship between the accounts of payable and the corporate profitability implies that most profitable companies reimburse their bills quickly and take advantage from the

TABLE 9

Regressions' results for construction industry (Nbr. OBS: 768)

	FE (1)	RE (1)	FE (2)	RE (2)	FE (3)	RE (3)	FE (4)	RE (4)
Working Capital Management Variables								
DPO	-0.0006 (-0.88)	-0.0004 (-0.57)	-	-	-	-	-	
DSO	-	-	-0.0017 (-2.90)***	-0.0018 (-3.04)***	-	-	-	
DIO	-	-	-	-	-0.003 (-2.92)***	-0.004 (-3.29)***	-	
CCC	-	-	-	-	-	-	-0.0016 (-3.10)***	-0.0018 (-3.62)***
Companies' characteristics Variables								
DR	0.303 (1.70)*	0.278 (1.56)	0.278 (1.58)	1.39 (0.166)	0.3451 (1.96)**	0.3171 (1.80)**	0.3255 (1.86)**	0.296 (1.69)*
SIZE	0.463 (9.47)***	0.457 (9.34)***	0.486 (10.08)***	0.4846 (10.02)***	0.4726 (9.83)***	0.470 (9.77)***	0.4732 (9.87)***	0.4712 (9.81)***
CR	0.738 (0.19)	0.006 (1.18)	0.937 (0.25)	0.9158 (0.24)	0.619 (0.16)	0.5662 (0.15)	1.037 (0.27)	1.0341 (0.27)
Export dimensions Variables								
EXPR	0.0061 (1.19)	0.006 (1.18)	0.0067 (1.30)	0.0068 (1.32)	0.007 (1.36)	0.0072 (1.39)	0.0066 (1.29)	0.0067 (1.31)
MARKT	0.111 (3.30)***	0.117 (3.48)***	0.116 (3.49)***	0.122 (3.67)***	0.112 (3.34)***	0.117 (3.50)***	0.117 (3.52)***	0.1231 (3.70)***
INTSTY	1.184 (8.74)***	1.205 (-8.88)***	1.2705 (9.26)***	(1.3044) (9.50)***	1.234 (9.21)****	1.2673 (9.45)***	1.235 (9.19)***	1.272 (9.47)***
Constant	13.387 (78.38)***	13.375 (78.11)***	13.495 (79.72)***	13.514 (79.65)***	13.575 (75.07)***	13.618 (75.29)***	13.425 (84.19)***	13.456 (84.31)***
Rsq	0.558	0.558	0.613	0.614	0.625	0.626	0.625	0.606

FE: Fixed Effect Model / Statistic t between parentheses
RE: Random Effect Model / P- value between parentheses
*** Significance at 1% . ** Significance at 5% . Significance at 10%

early payment discount. However, unprofitable ones postpone payment to suppliers since they generate less cash from their operation. *Cf table 8, 9, 10, 11 and 12*

As shown by all the regressions, the number of days of sales outstanding is negatively linked to the corporate profitability as expected by the third hypothesis. This result indicates that managers can improve profitability by decreasing the credit period granted to their customers. This finding is inconsistent with the predictions of trade-credit theory and implies that companies offer shorter trade credit as an instrument to boost profitability. In fact, when small and medium-sized Tunisian export companies transform their sales into cash in a short period, they may enhance their profitability. In others words, high quality of the portfolio of accounts receivable improves the corporate value. Thus, Tunisian export SMEs have to assess the foreign market by collecting sufficient information about the behavior of the customers. Indeed, export sales differ from domestic ones because of transactions with foreign agents, transport expenses and insurance costs.

TABLE 10

Regressions' results for Metal retail industry (Nbr. OBS: 192)

	FE (1)	RE (1)	FE (2)	RE (2)	FE (3)	RE (3)	FE (4)	RE (4)
Working Capital Management Variables								
DPO	-0.0004 (-0.70)	-0.0003 (-0.57)	-	-	-	-	-	-
DSO	-	-	-0.0018 (-3.00)***	-0.0018 (-3.04)***	-	-	-	-
DIO	-	-	-	-	-0.0038 (-3.35)***	-0.0037 (-3.29)***	-	-
CCC	-	-	-	-	-	-	-0.0018 (-3.55)***	-0.0018 (-3.62)***
Companies' characteristics Variables								
DR	0.268 (1.50)*	0.2776 (1.56)*	0.2418 (1.37)*	0.24496 (1.39)*	0.310 (1.76)*	0.317 (1.80)*	0.294 (1.68)*	0.2961 (1.69)*
SIZE	0.4524 (9.18)***	0.4574 (9.34)***	0.4810 (9.85)***	0.4846 (10.02)***	0.465 (9.57)***	0.4708 (9.77)***	0.4697 (9.69)***	0.4712 (9.81)***
CR	0.7904 (0.21)	0.7212 (0.19)	0.96720 (0.25)	0.9158 (0.24)	0.653 (0.17)	0.566 (0.15)	1.0563 (0.28)	1.0341 (0.27)
Export dimensions Variables								
EXPR	0.0063 (1.21)	0.0061 (1.18)	0.0068 (1.33)	0.007 (1.32)	0.0073 (1.42)	0.0071 (1.39)	0.0067 (1.32)	0.0067 (1.31)
MARKT	0.1184 (3.52)***	0.117 (3.48)***	0.123 (3.69)***	0.122 (3.67)***	0.118 (3.53)***	0.117 (3.50)***	0.1235 (3.71)***	0.1232 (3.70)***
INTSTY	1.1991 (8.82)***	1.205 (8.88)***	1.298 (9.42)***	1.304 (9.50)***	1.259 (9.37)***	1.267 (9.45)***	1.2693 (9.40)***	1.2723 (9.47)***
Constant	13.383 (78.05)***	13.375 (78.11)***	13.510 (79.56)***	13.514 (79.65)***	13.623 (75.28)***	13.617 (75.29)***	13.454 (84.17)***	13.456 (84.31)***
Rsq	0.558	0.543	0.614	0.597	0.612	0.626	0.608	0.634

FE: Fixed Effect Model / Statistic t between parentheses
RE: Random Effect Model / P- value between parentheses
*** Significance at 1% . ** Significance at 5% . Significance at 10%

The above discussion treats the three components of working capital one by one. In order to have a more precise idea about working capital management and its effect on corporate profit, it is interesting to consider them jointly. That is the cash conversion cycle is included as an independent variable to measure the level of the company's liquidity. This variable is negatively related to the profitability of the companies operating in food industry, construction, metal retail and textile with the significance level of 1%. Thus, shorter cash conversion cycle may increase profitability because it implies a higher level of liquidity. The result is incoherent with the fourth hypothesis but it is driven by the strict receivable and inventory policies of Tunisian export SMEs. More precisely, the aggressive working capital management resulting from limiting the cash conversion cycle and hence the time that the cash is tied up in working capital improves the company's profitability. From this finding, efficient working capital management relies on speeding up liquidity collections and maintaining a short inventory. *Cf table 8, 9, 10 and 11*

TABLE 11

Regressions' results for Textile industry (Nbr. OBS: 832)

	FE (1)	RE (1)	FE (2)	RE (2)	FE (3)	RE (3)	FE (4)	RE (4)
Working Capital Management Variables								
DPO	-0.0014 (-2.19)**	-0.0004 (-0.57)	-	-	-			
DSO	-	-	-0.0032 (-5.16)***	-0.0018 (-3.04)***	-			
DIO	-	-	-	-	-0.0041 (-3.66)***	-0.004 (-3.29)***		
CCC	-	-	-	-	-	-	-0.0021 (-4.11)***	-0.00183 (-3.62)***
Companies' characteristics Variables								
DR	0.2657 (1.50)	0.2776 (1.56)	0.207 (1.18)	0.2449 (1.39)	0.3265 (1.87)	0.3171 (1.80)*	0.304 (1.74)*	0.2961 (1.69)*
SIZE	0.4362 (8.94)***	0.4574 (9.34)***	0.46298 (9.64)***	0.4846 (10.02)***	0.4428 (9.21)***	0.4708 (9.77)***	0.443 (9.25)***	0.4712 (9.81)***
CR	1.16 (0.31)	0.7213 (0.19)	1.7765 (0.47)	0.9158 (0.24)	1.2429 (0.33)	0.566 (0.15)	1.7562 (0.47)	1.034 (0.27)
Export dimensions Variables								
EXPR	0.0061 (1.19)	0.00612 (1.18)	0.0067 (1.32)	0.0068 (1.32)	0.007 (1.36)	0.007 (1.39)	0.0065 (1.27)	0.0067 (1.31)
MARKT	0.1243 (3.71)***	0.1171 (3.48)***	0.1314 (3.98)***	0.1223 (3.67)***	0.1239 (3.73)***	0.117 (3.50)***	0.1307 (3.95)***	0.1231 (3.70)***
INTSTY	1.1282 (8.33)***	1.2054 (8.88)***	1.2627 (9.27)***	1.3044 (9.50)***	1.173 (8.76)***	1.2673 (9.45)***	1.1824 (8.80)***	1.272 (9.47)***
Constant	13.453 (78.87)***	13.375 (78.11)***	13.635 (80.65)***	13.514 (79.65)***	13.610 (75.73)***	13.618 (75.29)***	13.437 (84.70)***	13.456 (84.31)***
Rsq	0.547	0.449	0.592	0.614	0.571	0.569	0.623	0.573

FE: Fixed Effect Model / Statistic t between parentheses
RE: Random Effect Model / P- value between parentheses
*** Significance at 1% . ** Significance at 5% . Significance at 10%

Regarding the other variables included in the study, debt ratio is positively related to the corporate profitability in food industry, construction, metal retail and textile sectors. Thus, this result holds that profitable Tunisian export SMEs use debt to save taxes by deducing interest costs. Therefore, the leverage level can be used like a signalizing tool to expect the financial health of the company and its capacity to contract credits. Also, it may be informative about the efficient use of the credit granted. *Cf table 8, 9, 10, 11 and 12*

Moreover, all the regressions show that larger companies have an important gross operating profitability with a very high level of significance (1%). More precisely, a large-sized company is able to adopt suitable export structure with the requirements of international trade by reducing costs due to the advantages of economies of scale, experience and reputation.

Concerning the export dimension, both the export intensity and the number of foreign market seem to have positive effect on corporate profitability. The Tunisian Government

TABLE 12

Regressions' results for Service sector (Nbr. OBS: 176)

	FE (1)	RE (1)	FE (2)	RE (2)	FE (3)	RE (3)	FE (4)	RE (4)
Working Capital Management Variables								
DPO	-0.0004 (*-0.79*)	-0.0005 (*-1.18*)	-	-	-	-	-	-
DSO	-	-	-0.0015 (*-1.99*)**	-0.00162 (*-2.07*)**				
DIO	-	-	-	-	0.00036 (*0.83*)	0.00044 (*1.02*)		
CCC	-	-	-	-	-	-	0.00011 (*0.32*)	0.00025 (*0.73*)
Companies' characteristics Variables								
DR	0.1386 (*1.23*)	0.1485 (*1.31*)	0.1636 (*1.46*)	0.1728 (*1.54*)	0.1633 (*1.46*)	0.1719 (*1.54*)	0.16179 (*1.44*)	0.1722 (*1.53*)
SIZE	0.4577 (*17.58*)***	0.4528 (*17.39*)***	0.4560 (*17.97*)***	0.4504 (*17.75*)***	0.4654 (*18.08*)***	0.4602 (*17.87*)***	0.45608 (*17.95*)***	0.4502 (*17.73*)***
CR	-0.0383 (*-0.02*)	-0.08474 (*-0.04*)	-0.0712 (*-0.03*)	-0.1433 (*-0.06*)	-0.3378 (*-0.14*)	-0.4298 (*-0.18*)	-0.10727 (*-0.05*)	-0.1778 (*-0.08*)
Export dimensions Variables								
EXPR	-0.0012 (*-0.39*)	-0.00114 (*-0.36*)	-0.0018 (*-0.59*)	-0.00182 (*-0.57*)	-0.0014 (*-0.44*)	-0.00134 (*-0.42*)	-0.0018 (*-0.57*)	-0.0017 (*-0.55*)
MARKT	-0.0289 (*-1.28*)	-0.03135 (*-1.38*)	-0.0290 (*-1.30*)	-0.03097 (*-1.38*)	-0.0307 (*-1.38*)	-0.0324 (*-1.45*)	-0.0279 (*-1.25*)	-0.0307 (*-1.37*)
INTSTY	0.1969 (*2.41*)**	0.18478 (*2.25*)**	0.2244 (*2.79*)***	0.2138 (*2.65*)***	0.1839 (*1.38*)***	0.1718 (*2.07*)***	0.22675 (*2.82*)***	0.2179 (*2.70*)***
Constant	12.357 (*110.78*)***	12.388 (*111.33*)***	12.275 (*116.32*)***	12.277 (*115.99*)***	12.445 (*104.94*)***	12.462 (*104.89*)***	12.302 (*123.11*)***	12.303 (*122.74*)***
Rsq	0.2451	0.2450	0.2497	0.2496	0.2520	0.2473	0.2492	0.2491

FE: Fixed Effect Model / Statistic t between parentheses
RE: Random Effect Model / P- value between parentheses
*** Significance at 1% . ** Significance at 5% . Significance at 10%

initiative through ground level knowledge of overseas markets is detected to be very important for small and medium companies in food industry, metal retail, construction and textile sectors (coefficients with significance level of 1%). More precisely, the Tunisian governmental institutions intervene at the company's level to facilitate exporter's entry to new foreign markets. The exporter has to target the best foreign market and to focus on specific opportunities after evaluating regulatory problems, standards, cultural sensi-

tivities, distribution channels, pricing, competitors, transportation, insurance or stocking costs.

Particularly, the high export intensity may result from the negotiation ability of Tunisian export SMEs with foreign customers. If the positive impact of export intensity is related to the collection policy, then the capacity of the Tunisian export SMEs in limiting the days of sales outstanding increases the share of export and boosts the profitability. Globally, the positive relationship between the

export performance (measured by the export intensity and number of markets) and profitability implies that companies in emerging economies like Tunisia have to sell goods overseas in order to respect international norms and managerial rules as a strategy to improve their performance.

Conclusion

The present study investigates the impact of working capital management on profitability of 386 small and medium-sized export companies in Tunisia observed from 2001 to 2008. This relationship has been examined using panel data regression models. I find a negative relationship between gross operating profitability and the days of sales outstanding, the days of inventory outstanding, the days of payable outstanding and the cash conversion cycle. The results of the fixed and the random effects model suggest that Tunisian export SMEs must reduce the number of days of accounts receivable and inventory to improve their profitability. In fact, it seems more interesting to finance growth strategies with the additional funds instead of investing them in inventory or receivable. The negative correlation between the days of payables outstanding and the corporate profitability is consistent with the view that less profitable companies postpone the payments of their bills than more profitable ones. Thus, the first category of companies neutralizes the risk of incapacity to meet obligations but at the same time may verify the quality of the products received.

Apart from the effect of the three components of working capital management on the corporate profitability, I find a negative relationship between the cash conversion cycle and the profitability of Tunisian export SMEs. This shows that a longer cash conversion cycle will hurt the profitability since a low level of liquidity affects the company's risk.

In addition to these factors, the role played by export measures in the success of the company is clearly identified. In fact, the export intensity and the number of foreign markets positively influence the corporate profitability.

The results obtained show that efficient working capital management enhances the value of the company. Therefore, managers can create profits for their companies by keeping accounts receivable, accounts payable and inventories to a suitable level. Besides, Tunisian export SMEs are advised to get adequate working capital to enhance their profitability and international competitiveness.

On the whole, even if this analysis emphasizes the consequence of working capital management on the corporate profitability, it has been constrained by the retained variables. Thus, the nature and the role of social interactions between suppliers and buyers should be captured by means of more detailed variables. Besides, different cultural aspects may be introduced in order to enhance export transactions and working capital management.

Bibliography

BEAUMONT, S.M and E. BEGEMANN (1997), "Measuring Association between Working Capital and Return on Investment", *South African Journal of Business Management*, Vol. 28, pp.73-84.

BEAVER W.H. (1966), "Financial Ratios as Predictors of Failure" *Journal of Accounting Research*, Vol. 4, pp. 71-111.

BELLOUMA M., OMRI, A. and OMRI, M.A. (2005), "The determinants of lending relationship in Tunisian context", *Journal of Emerging Market Finance*, Vol.4, pp. 135-150.

BELLOUMA M., et OMRI, A. (2008), " L'impact de la qualité de la relation banque-entreprise sur la prime de risque exigée des entreprises tunisiennes", *Revue Sciences de Gestion*, Vol. 329, pp. 95, 102.

BELLOUMA M., BENNACEUR S. and OMRI, A. (2009), "The impact of lending relationship on risk premium and credit availability: evidence from Tunisia", *Afro-Asian Journal of Finance and Accounting*, Vol. 1, pp. 235-250.

BODIE, Z. and MERTON, R. C., (2000). "*Finance"*, International Edition, Prentice-Hall, New Jersey.

BOUGHEAS S. SIMONA M. and MIZEN, P, (2009), "Corporate trade credit and inventories: New evidence of a trade-off from accounts payable and receivable", "Journal of Banking and Finance, Vol. 33, pp. 300–307.

CHITTENDEN, F., P. POUTZIOURIS and N. MICHAELAS (1998), "*Financial Management and Working Capital Practices in UK SMEs*, Manchester Business School, Manchester.

COOPER, R. (2003), "*Corporate treasury and cash management*", Edition: Palgrave Macmillan.

DELOOF, M. (2003), "Does working capital management affect profitability of Belgian firms?", Journal of Business Finance and Accounting, Vol. 30, pp. 573-587.

DELOOF, M., and JEGERS, M. (1996), "Trade credit, product quality, and intra group trade: Some European evidence", Financial Management, Vol. 25, pp. 945-968.

DI TOMMASSO, M.R. and RUBINI L. (2001), "*Support to SMEs in the Arab region: the case of Tunisia*", United NIDO.

DITTMAR, A. and MAHRT-SMITH, J. (2007), "Corporate governance and the value of cash holdings", *Journal of Financial Economics,* Vol. 83, pp. 599-634.

ELJELLY, A. M. A. (2004), "Liquidity-profitability trade off: An empirical investigation in an emerging market", *International Journal of Commerce and Management,* Vol.14, pp. 48–61.

EUGENE F. B. and MICHAEL C.E. (2008), "*Financial Management: Theory and Practice*", Twelfth Edition.

FILBECK, G. and KRUEGER, T. M. (2005), "An analysis of working capital management results across industries", *American Journal of Business*, Vol. 20, pp. 11-18.

FILBECK, G., KRUEGER T. M. and PREECE D, (2007), "CFO magazine' working capital survey: Do selected firms work for shareholders?", Quarterly Journal of Business and Economics, Vol. 46, pp.5-22

GANESAN, V., (2007), "An analysis of working capital management efficiency in telecommunication equipment industry", *Rivier academic journal*, Vol. 3, pp.1-10.

GAUR, V., and S. KESAVAN. (2006), "*The Effects of Firm Size and Sales Growth Rate on Inventory Turnover Performance in the U.S. Retail Sector*", in N. Agrawal and S.Smith (editors). Retail Supply Chain Management, Kluwer Publishers.

GIUNIPERO, L.C., R. HOOKER, S. JOSEPH-MATTHEWS, T.E. YOON, and S. BRUDVIG. (2008), "A Decade of SCM Literature: Past, Present and Future Implications," *Journal of Supply Chain Management*, Vol.44, pp.66-86.

GREENE, W.H. (2003), "*Econometric Analysis*", 5th ed. Upper Saddle River, NJ: Prentice Hall.

GRZERGORZ, M. (2008), "A portfolio Management Approach in Accounts Receivable Management", South East European Journal of Economic and Business, Vol.3, 86-98.

GUARIGLIA, A. and MATEUT, S. (2006), "Credit channel, trade credit channel, and inventory investment: Evidence from a panel of UK firms", *Journal of Banking and Finance*, Vol. 30, pp. 2835–2856.

HALL, C. (2002), "Total Working Capital Management", *AFP Exchange*, Vol. 22, pp.26-32.

HARRIS, A. (2005), "Working Capital Management: Difficult but Rewarding", *Financial Executive*, Vol. 21, pp.52-53.

HAUSMAN J.A. (1978), "Specification Tests in Econometrics", *Econometrica*, Vol.46, pp.1251-1271.

HELPMAN, E., M. MELITZ and Y. RUBINSTEIN, (2008), "Estimating Trade Flows: Trading Partners and Trading Volumes," *Quarterly Journal of Economics*, 123, pp. 441-487.

HIEP, N. and S. NISHIJIMA (2009), "Export Intensity and Impacts from Firm Characteristics, Domestic Competition and Domestic Constraints in Vietnam: A Micro-data Analysis, Paper presented at the RIEB.

HOWORTH, C., and WESTHEAD P. (2003), "The focus of working capital management in UK small firms", *Management Accounting Research*, 14, pp 97-111, Blackwell Publishing.

HSIAO, C., (1986), "*Analysis of Panel Data*", Econometric society Monographs, Cambridge Universirty Press.

HUTCHISON, P. D., FARRIS II, M. T. and ANDERS, S. B., (2007), "Cash-to-cash analysis and management", *The CPA Journal*, Vol. 77 No. 8, pp. 42-47

JORDAN, R. W., 2003. *Fundamentals of Corporate Finance*, 6th ed., McGraw-Hill Companies, Boston.

KALCHEVA, I. and LINS, K. (2007), "International evidence on cash holdings and expected managerial agency problems", *Review of Financial Studies* Vol. 20, pp. 1087-1112.

KEOWN, A. J., MARTIN, J. D., PETTY, J. W. and SCOTT, D. F., 2003. *Foundations of Finance*, 4th ed., Pearson Education, New Jersey.

KOSTE, L.L. and M.K. MALHOTRA (1999), "A Theoretical Framework for Analyzing the Dimensions of Manufacturing Flexibility", *Journal of Operations Management*, Vol. 18, pp.75-93.

LARSEN, P., and LEWIS, A. (2007), "How Award-Winning SMEs Manage the Barriers to Innovation". *Creativity and Innovation Management*, Vol.16, pp.142-151.

LAZARIDIS, I. and TRYFONIDIS D. (2006), "Relationship between working capital management and profitability of listed companies in the Athens stock exchange", *Journal of Financial Management and Analysis,* Vol.19, pp. 26-35.

LEFEBVRE, E. and LEFEBVRE A. (2001), "*Innovative Capabilities as Determinants of Export Performance and Behavior: A longitudinal Study of Manufacturing SMEs*" in Innovation and Firm Performance: Econometric Explorations of Survey Data, Palgrave (MacMillan Press), London and Basingstoke.

LONG MS, MALITZ IB and RAVID S.A. (1993), "Trade credit, quality guarantees, and product marketability", *Financial Management*, Vol. 22, pp 117-127.

LU, J.W. and BEAMISH, P.W. (2006) SME internationalization and performance: growth and profitability, *Journal of International Entrepreneurship*, Vol. 4, 27-28.

PADACHI, K., 2006. "Trends in working capital management and its impact on firms' performance: an analysis of Mauritian small manufacturing firms", *International Review of Business Research Papers,* Vol.2, pp. 45-58.

PETERSEN M, A and RAJAN, R,G, (1994), "The Benefits of Lending Relationships: Evidence from Small Business Data", Journal of Finance, 1994, 49(1), pp. 3-37.

PETERSEN M, A and RAJAN, R,G, (1997), "Trade credit: theories and evidence", The Review of Financial Studies, Vol., 10, pp. 661-691.

PIKE R., and CHENG, N.S. (2003), "Credit management: An examination of policy choices, practices and late payment in UK companies", *Journal of Business Finance and Accounting*, Vol. 28, pp. 1013-1028.

PRAMOD, K. J. and M.Y. KHAN (2007), "Theory of working capital management" in Basic Financial Management, Tata McGraw Hill Publishing Company.

RAHEMAN A. and NASR M. (2007), "Working capital management and profitability: Case of Pakistani firms", International Review of Business Research Papers, Vol.3, pp.279 – 300.

RAMACHANDRAN A. and JANAKIRAMAN M. (2009), "The Relationship between working capital management efficiency and EBIT", Managing Global Transitions, Vol. 7, pp. 61-74.

ROBINSON, R.B., Jr., LOGAN, J. E., and SALEM, M. Y. (1986), "Strategic versus optional planning in small retail firms", *American Journal of Small Business*, Vol. 10, pp.7-16.

SACCURATO, F. (1994), "The study of Working Capital", *Business Credit*, Vol. 96, pp.36-47.

SHIN, H.H. and SOENEN L.A. (1998), "Efficiency of working capital management and corporate profitability", Financial Practice and Education, Vol. 8, pp37-45.

SMITH, K., (1980) "*Profitability versus Liquidity Tradeoffs in Working Capital Management*", Readings on the Management of Working Capital, West Publishing Company, New York, St. Paul.

TOOMEY J. W. (2000), "*Inventory Management: Principles, Concepts and Techniques*" Kluwer Academic Publishers.

UYAR, A. (2009), "The Relationship of cash conversion cycle with firm size and profitability: An empirical investigation in Turkey", *International Research Journal of Finance and Economics*, Vol.24, pp.186-193.

VISHNANI, S. and SHAH, B.Kr (2007), "Impact of working capital management: policies on corporate performance: An empirical study", *Global Business Review*, Vol. 8, pp.267-281.

YIP, G., J. BISCARRI, and J. MONTI (2000), "The Role of the Internationalization Process in the Performance of Newly Internationalizing Firms", *Journal of International Marketing*, Vol. 8, pp. 10-35.

ZARIYAWATI, M.A., M. N. ANNUAR, H. TAUFIQ, A.S. ABDUL RAHIM (2009), "Working capital management and corporate performance: Case of Malaysia", *Journal of Modern Accounting and Auditing,* Vol.5, pp. 47-54.