EFFECTS OF WORKING CAPITAL MANAGEMENT ON SME PROFITABILITY

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Abstract:

Purpose: The objective of the research presented here is to provide empirical evidence about the effects of working capital management on the profitability of a sample of small and medium-sized Spanish firms.

Design/methodology/approach: We have collected a panel of 8,872 SMEs covering the period 1996-2002. We tested the effects of working capital management on SME profitability using the panel data methodology.

Findings: The results, which are robust to the presence of endogeneity, demonstrate that managers can create value by reducing their firm's number of days accounts receivable and inventories. Equally, shortening the cash conversion cycle also improves the firm's profitability.

Originality/value: This work contributes to the literature in two ways. First, no previous such evidence exists for the case of SMEs. The second contribution is that, unlike the previous studies by Shin and Soenen (1998) and Deloof (2003), in the current work we have conducted tests robust to the possible presence of endogeneity problems. The aim is to ensure that the relationships found in the analysis carried out are due to the effects of the cash conversion cycle on corporate profitability and not *vice versa*.

Keywords: Working capital, profitability, SMEs.

Article type: Research Paper.

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EFFECTS OF WORKING CAPITAL MANAGEMENT ON SME PROFITABILITY

1. INTRODUCTION

The corporate finance literature has traditionally focused on the study of long-term financial decisions. Researchers have particularly offered studies analyzing investments, capital structure, dividends or company valuation, among other topics. But the investment that firms make in short-term assets, and the resources used with maturities of under one year, represent the main share of items on a firm's balance sheet. In fact, in our sample the current assets of small and medium-sized Spanish firms represent 69.48 percent of their assets, and at the same time their current liabilities represent more than 52.82 percent of their liabilities.

Working capital management is important because of its effects on the firm's profitability and risk, and consequently its value (Smith, 1980). On the one hand, maintaining high inventory levels reduces the cost of possible interruptions in the production process, or of loss of business due to the scarcity of products, reduces supply costs, and protects against price fluctuations, among other advantages (Blinder and Manccini, 1991). On the other, granting trade credit favors the firm's sales in various ways. Trade credit can act as an effective price cut (Brennan, Maksimovic and Zechner, 1988; Petersen and Rajan, 1997), incentivizes customers to acquire merchandise at times of low demand (Emery, 1987), allows customers to check that the merchandise they receive is as agreed (quantity and quality) and to ensure that the services contracted are carried out (Smith, 1987), and helps firms to strengthen long-term relationships with their customers (Ng, Smith and Smith, 1999). However, firms that invest heavily in inventory and trade credit can suffer reduced profitability. Thus, the greater the

investment in current assets, the lower the risk, but also the lower the profitability obtained.

On the other hand, trade credit is a spontaneous source of financing that reduces the amount required to finance the sums tied up in the inventory and customer accounts. But we should bear in mind that financing from suppliers can have a very high implicit cost if early payment discounts are available. In fact the opportunity cost may exceed 20 percent, depending on the discount percentage and the discount period granted (Wilner, 2000; Ng, Smith and Smith, 1999). In this respect, previous studies have analyzed the high cost of trade credit, and find that firms finance themselves with seller credit when they do not have other more economic sources of financing available (Petersen and Rajan, 1994 and 1997).

Decisions about how much to invest in the customer and inventory accounts, and how much credit to accept from suppliers, are reflected in the firm's cash conversion cycle, which represents the average number of days between the date when the firm must start paying its suppliers and the date when it begins to collect payments from its customers. Some previous studies have used this measure to analyze whether shortening the cash conversion cycle has positive or negative effects on the firm's profitability. Specifically, Shin and Soenen (1998) analyze the relation between the cash conversion cycle and profitability for a sample of firms listed on the US stock exchange during the period 1974-1994. Their results show that reducing the cash conversion cycle to a reasonable extent increases firms' profitability. More recently, Deloof (2003) analyzes a sample of large Belgian firms during the period 1992-1996. His results confirm that Belgian firms can improve their profitability by reducing the number of days accounts receivable are outstanding and reducing inventories. Moreover, he finds that less profitable firms wait longer to pay their bills.

These previous studies have focused their analysis on larger firms. However, the management of current assets and liabilities is particularly important in the case of small and medium-sized companies. Most of these companies' assets are in the form of current assets. Also, current liabilities are one of their main sources of external finance in view of their difficulties in obtaining funding in the long-term capital markets (Petersen and Rajan, 1997) and the financing constraints that they face (Whited, 1992; Fazzari and Petersen, 1993). In this respect, Elliehausen and Woken (1993), Petersen and Rajan (1997) and Danielson and Scott (2000) show that small and medium-sized US firms use vendor financing when they have run out of debt. Thus, efficient working capital management is particularly important for smaller companies (Peel and Wilson, 1996).

In this context, the objective of the current work is to provide empirical evidence about the effects of working capital management on profitability for a panel made up of 8,872 SMEs during the period 1996-2002. This work contributes to the literature in two ways. First, no previous such evidence exists for the case of SMEs. We use a sample of Spanish SMEs that operate within the so-called continental model, which is characterized by its less developed capital markets (La Porta, López-de-Silanes, Shleifer, and Vishny, 1997), and by the fact that most resources are channeled through financial intermediaries (Pampillón, 2000). All this suggests that Spanish SMEs have fewer alternative sources of external finance available, which makes them more dependent on short-term finance in general, and on trade credit in particular. As Demirguc-Kunt and Maksimovic (2002) suggest, firms operating in countries with more developed banking systems grant more trade credit to their customers, and at the same time they receive more finance from their own suppliers. The second contribution is that, unlike the previous studies by Shin and Soenen (1998) and Deloof (2003), in the

current work we have conducted tests robust to the possible presence of endogeneity problems. The aim is to ensure that the relationships found in the analysis carried out are due to the effects of the cash conversion cycle on corporate profitability and not *vice versa*.

Our findings suggest that managers can create value by reducing their firm's number of days accounts receivable and inventories. Similarly, shortening the cash conversion cycle also improves the firm's profitability.

From this point, the work is structured as follows: in Section 2, we describe the sample and variables used; in Section 3 we outline the methodology employed, in the fourth section, we present the analyses carried out and our findings; finally, we end by discussing our main conclusions.

2. DATA AND VARIABLES

2.1 Data

We obtained the data used in this study from the AMADEUS database. This database was developed by Bureau van Dijk, and contains financial and economic data on European companies.

The sample comprises small and medium-sized firms from Spain. The selection of SMEs was carried out according to the requirements established by the European Commission's recommendation 96/280/CE of 3rd April, 1996, on the definition of small and medium-sized firms. Specifically, we selected those firms meeting the following criteria for at least three years: a) have fewer than 250 employees; b) turn over less than €40 million; and c) possess less than €27 million of total assets.

In addition to the application of those selection criteria, we applied a series of filters. Thus, we eliminated the observations of firms with anomalies in their accounts, such as negative values in their assets, current assets, fixed assets, liabilities, current liabilities, capital, depreciation, or interest paid. We removed observations of entry items from the balance sheet and profit and loss account exhibiting signs that were contrary to reasonable expectations. Finally, we eliminated 1 percent of the extreme values presented by several variables. As a result of applying these filters, we ended up with a sample of 38,464 observations.

In order to introduce the effect of the economic cycle on the levels invested in working capital, we obtained information about the annual GDP growth in Spain from Eurostat.

2.2 Variables

In order to analyze the effects of working capital management on the firm's profitability, we used the return on assets (ROA) as the dependent variable. We defined this variable as the ratio of earnings before interest and tax to assets.

With regards to the independent variables, we measured working capital management by using the number of days accounts receivable, number of days of inventory and number of days accounts payable. In this respect, number of days accounts receivable (AR) is calculated as 365 × [accounts receivable/sales]. This variable represents the average number of days that the firm takes to collect payments from its customers. The higher the value, the higher its investment in accounts receivable.

We calculated the number of days of inventory (INV) as 365 × [inventories/purchases]. This variable reflects the average number of days of stock held

by the firm. Longer storage times represent a greater investment in inventory for a particular level of operations.

The number of days accounts payable (AP) reflects the average time it takes firms to pay their suppliers. We calculated this as 365 × [accounts payable/purchases]. The higher the value, the longer firms take to settle their payment commitments to their suppliers.

Considering these three periods jointly, we estimated the cash conversion cycle (CCC). This variable is calculated as the number of days accounts receivable plus the number of days of inventory minus the number of days accounts payable. The longer the cash conversion cycle, the greater the net investment in current assets, and hence the greater the need for financing of current assets.

Together with these variables, we introduced as control variables the size of the firm, the growth in its sales, and its leverage. We measured the size (SIZE) as the logarithm of assets, the sales growth (SGROW) as $(Sales_1 – Sales_0)/Sales_0$, the leverage (DEBT) as the ratio of debt to liabilities. Dellof (2003) in his study of large Belgian firms also considered the ratio of fixed financial assets to total assets as a control variable. For some firms in his study such assets are a significant part of total assets. However our study focuses on SMEs whose fixed financial assets are less important. In fact, companies in our sample invest little in fixed financial assets (a mean of 3.92 percent, but a median of 0.05 percent). Nevertheless, the results remain unaltered when we include this variable.

Furthermore, and since good economic conditions tend to be reflected in a firm's profitability, we controlled for the evolution of the economic cycle using the variable GDPGR, which measures the annual GDP growth.

2.3 Description of sample

Current assets and liabilities have a series of distinct characteristics according to the sector of activity in which the firm operates. Thus, Table I reports the return on assets and number of days accounts receivable, days of inventory, and days accounts payable by sector of activity. The mining industry and services sector are the two sectors with the highest return on their assets, with a value of 10 percent. Firms that are dedicated to agriculture, trade (wholesale or retail), transport and public services, are some way behind at 7 percent.

With regard to the average periods by sector, we find, as we would expect, that the firms dedicated to the retail trade, with an average period of 38 days, take least time to collect payments from their customers. Construction sector firms grant their customers the longest period in which to pay – more than 145 days. Next, we find mining sector firms, with a number of days accounts receivable of 116 days. We also find that inventory is stored longest in agriculture, while stocks are stored least in the transport and public services sector. In relation to the number of days accounts payable, retailers (56 days) followed by wholesalers (77 days) pay their suppliers earliest. Firms are much slower in the construction and mining sectors, taking more than 140 days on average to pay their suppliers. However, as we have mentioned, these firms also grant their own customers the most time to pay them. Considering all the average periods together, we note that the cash conversion cycle is negative in only one sector – that of transport and public services. This is explained by the short storage times habitual in this sector. In this respect, agricultural and manufacturing firms take the longest time to generate cash (95 and 96 days, respectively), and hence need the most resources to finance their operational funding requirements.

Table I

Table II offers descriptive statistics about the variables used for the sample as a whole. These are generally small firms, with mean assets of more than €6 million; their return on assets is around 8 percent; their number of days accounts receivable is around 96 days; and their number of days accounts payable is very similar: around 97 days. Together with this, the sample firms have seen their sales grow by almost 13 percent annually on average, and 24.74 percent of their liabilities is taken up by debt. In the period analyzed (1996-2002) the GDP has grown at an average rate of 3.66 percent in Spain.

Table II

Table III shows the correlation matrix for the variables defined in the previous section. We find a significant negative correlation between the return on assets and the number of days accounts receivable, days of inventory and days accounts payable. In the same way, the correlation with the cash conversion cycle is negative and significant. This demonstrates that paying suppliers and collecting payments from customers earlier, and keeping products in stock less time, are all associated with an increase in the firm's profitability. Considering the three periods jointly, the negative correlation obtained indicates that shortening the cash conversion cycle is associated with higher profitability, which could justify the effect that a more efficient management of working capital has on corporate profitability.

With regard to the correlations between the independent variables, we find high values only between the cash conversion cycle and number of days accounts receivable

(0.45) and number of days of inventory (0.70). We needed to take this into account in subsequent analyses in order to avoid potential multicolinearity problems.

Table III

3. METODOLOGHY

We tested the effects of working capital management on SME profitability using the panel data methodology. Specifically, we estimated the following equations:

$$ROA_{it} = \beta_0 + \beta_1 AR_{it} + \beta_2 SIZE_{it} + \beta_3 SGROW_{it} + \beta_4 DEBT_{it} + \beta_5 GDPGR_{it} + \eta_i + \lambda_t + \varepsilon_{it} \quad (1)$$

$$ROA_{it} = \beta_0 + \beta_1 INV_{it} + \beta_2 SIZE_{it} + \beta_3 SGROW_{it} + \beta_4 DEBT_{it} + \beta_5 GDPGR_{it} + \eta_i + \lambda_t + \varepsilon_{it} \quad (2)$$

$$ROA_{it} = \beta_0 + \beta_1 AP_{it} + \beta_2 SIZE_{it} + \beta_3 SGROW_{it} + \beta_4 DEBT_{it} + \beta_5 GDPGR_{it} + \eta_i + \lambda_t + \varepsilon_{it} \quad (3)$$

$$ROA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 SIZE_{it} + \beta_3 SGROW_{it} + \beta_4 DEBT_{it} + \beta_5 GDPGR_{it} + \eta_i + \lambda_t + \varepsilon_{it} \quad (4)$$

Where ROA measures the return on assets, AR the number of days accounts receivable, INV the number of days inventories, AP the number of days accounts payable, CCC the cash conversion cycle, SIZE the company size, SGROW the sales growth, DEBT the debt level, and GDPGR the annual GDP growth. η_i (unobservable heterogeneity) measures the particular characteristics of each firm. The parameters λ_t are time dummy variables that change over time but are equal for all the firms in each of the periods considered.

This methodology presents important benefits. These include, panel data suggestions that individuals, firms, states or countries are heterogeneous. Time-series and cross-section data studies not controlling for this heterogeneity run the risk of obtaining biased results. Furthermore, Panel data give more informative data, more variability, less collinearity among variables, more degree of freedom and more

efficiency (Baltagi, 2001)

Estimating models from panel data requires us first to determine whether there is a correlation between the unobservable heterogeneity η_i of each firm and the explanatory variables of the model. If there is a correlation (fixed effects), we would obtain the consistent estimation by means of the within-group estimator. Otherwise (random effects) a more efficient estimator can be achieved by estimating the equation by Generalized Least Squares (GLS). The normal strategy to determine whether the effects are fixed or random is to use the Hausman (1978) test under the null hypothesis $E(\eta_i/x_{it}) = 0$. If the null hypothesis is rejected, the effects are considered to be fixed, and the model is then estimated by OLS. If the null hypothesis is accepted, we would have random effects, and the model is then estimated by GLS. In this way we achieve a more efficient estimator of β.

4. RESULTS

4.1 Univariate analysis

We first conducted a univariate analysis in order to determine if there are significant differences in the variables studied between the most and least profitable firms. Table IV reports the average value of the variables of the study for each quartile of the variable ROA. We calculated the quartiles annually, so the range of variation of ROA overlaps between quartiles. Subsequently, we carried out a parametric difference of means test based on Student's t, to determine whether the average values of the fourth quartile are significantly different from those of the first. The t statistic appears in the final column of Table IV.

Table IV

In general, the mean values of the variables studied are significantly different between the most profitable (fourth quartile) and least profitable (first quartile) firms. Thus, in the most profitable firms, we observe shorter number of days accounts receivable, days of inventory and days accounts payable, as well as shorter cash conversion cycles. These firms are also larger, and have superior sales growth and lower leverage. These results are consistent with the correlations presented in Table III.

However, the average values of many of these variables do not vary monotonically when passing from one quartile to the next. This implies that comparing the first and fourth quarter is not sufficient to describe the relation between return on assets and the independent variables considered here.

4.2 Multivariate analysis

Table V presents the results obtained after regressing the equations 1, 2, 3 and 4. The sign and significance of the relations found is similar to that found in the previous analyses. An SME's return on assets is reduced by lengthening the number of days accounts receivable, number of days of inventory and number of days accounts payable. This aspect, which is consistent with the results found by Deloof (2003) for large firms, underlines the importance of working capital management for firms. Lengthening the deadlines for clients to make their payments, although it may improve profitability because greater payment facilities may raise sales, also negatively affects profitability. Thus a more restrictive credit policy giving customers less time to make their payments improves performance. The firm's profitability can also be improved by reducing the number of days of inventory, so that keeping inventory for less time can also improve profitability. Lengthening the number of days accounts payable negatively affects

profitability. This result could be explained by the high implicit cost of vendor financing to the firm, since the firm forgoes discounts for early payment. However, this explanation does not make sense if we take into account that the dependent variable used, the return on assets, does not include financial costs. Deloof (2003) justifies this result by arguing that less profitable firms tend to delay payment of their bills. The integrated analysis of the number of days accounts receivable, days of inventory and days accounts payable was carried out using the cash conversion cycle. In contrast to Deloof's (2003) findings for large Belgian firms, we find that shortening the cash conversion cycle improves an SME's profitability.

Table V

With reference to the control variables, all of these are significant. Corporate profitability is positively associated with size, so that large size seems to favor the generation of profitability. The results do not change if we use the logarithm of sales to measure the size. Growth, which could be an indicator of a firm's business opportunities, is an important factor allowing firms to enjoy improved profitability, as we see in the positive sign for the variable SGROW. At the same time, as we would expect, it improves in periods of higher economic growth.

Given that operational financing requirements differ from one sector to another, all regressions in this paper were also estimated controlling for the sector of activity in which the firms operate. Since we conducted the analysis using panel data methodology it was not possible to introduce sector dummy variables. Thus, and in order to carry out these estimations, we considered that the number of days accounts receivable, days of inventory and days accounts payable and the cash conversion cycle are sectorial

characteristics, and so we subtracted their respective sectorial means from the variables AR, INV, AP and CCC. The results presented do not differ when controlling for possible sectorial effects, and they are not presented here because of their similarity.

Finally, we carried out tests robust to the possible presence of endogeneity problems. It was important to ensure that the relation found in the analysis carried out here was due to the effects of the cash conversion cycle on corporate profitability and not *vice versa*.

Indeed, as Deloof (2003) points out, the results obtained may be affected by potential endogeneity problems, insofar as the number of days accounts receivable, days of inventory and days accounts payable may be influenced by the firm's return on assets, the dependent variable of the work. In this respect, the negative relation between profitability and the number of days accounts receivable and days of inventory could be explained if less profitable firms incentivize their customers by granting them longer payment deadlines, or if firms with falling sales and consequently declining profits find their stock levels rising. Likewise, the negative relation found between profitability and number of days accounts payable could be a consequence of firms with more problems, and hence lower profits, delaying their payments. Deloof (2003) in his article discusses the endogeneity problems that might exist, but he does not specifically control for them. To avoid the possible effect of this endogeneity problem, Table VI reports the results obtained after regressing equations 1, 2, 3 and 4 using instrumental variables. Specifically, we used the first lag of the variables AR, INV, AP and CCC as instrument.

Table VI

In general, all the results are similar to those of Table V, except those for the variable AP, which now loses significance. This result casts doubt on the effect that delaying payments to suppliers may have on SME profitability.

5. CONCLUSIONS

Working capital management is particularly important in the case of small and medium-sized companies. Most of these companies' assets are in the form of current assets. Also, current liabilities are one of their main sources of external finance. In this context, the objective of the current research has been to provide empirical evidence about the effects of working capital management on the profitability of a sample of small and medium-sized Spanish firms. For this purpose, we collected a panel consisting of 8,872 SMEs covering the period 1996-2002.

According to previous studies focus on large firms (Shin and Soenen, 1998; Deloof, 2003), the analyses carried out confirm the important role of working capital management in value generation in small and medium-sized firms. We find a significant negative relation between an SME's profitability and the number of days accounts receivable and days of inventory. We cannot, however, confirm that the number of days accounts payable affects an SME's return on assets, as this relation loses significance when we control for possible endogeneity problems.

Finally, SMEs have to be concerned with working capital management because they can also create value by reducing their cash conversion cycle to a minimum, as far as that is reasonable.

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Table I
Mean Values, by Sector

ROA measure return on assets, AR number of days accounts receivable, INV number of days inventories, AP number of days accounts payable, and CCC cash conversion cycle.

	ROA	AR	INV	AP	CCC
Agriculture	0.07	71.45	106.38	83.00	95.15
Mining	0.10	116.14	83.77	141.37	58.54
Manufacturing	0.08	108.12	96.93	108.33	96.81
Construction	0.08	145.06	55.76	145.66	55.48
Retail trade	0.07	38.00	68.51	56.87	49.55
Wholesale trade	0.07	97.92	73.33	77.78	93.49
Transport and public services	0.07	94.97	15.27	110.86	-0.79
Services	0.10	86.47	40.51	120.42	6.94

Table II
Descriptive Statistics

ROA measure return on assets, AR number of days accounts receivable, INV number of days of inventory, AP number of days accounts payable, CCC cash conversion cycle, ASSETS value of assets in thousand euros, SGROW sales growth, DEBT financial debt level, and GDPGR annual GDP growth.

Variable	Obs.	Mean	SD	Median	10^{th} Perc.	90^{th} Perc.
ROA	38464	0.0792	0.0834	0.0678	0.0041	0.1768
AR	38464	96.8299	55.7682	96.2962	22.0945	165.2533
INV	38452	77.2140	70.0499	59.3042	6.8692	166.6171
AP	38371	97.8090	57.3568	93.8075	24.5344	174.9668
CCC	38371	76.3117	90.6413	64.7704	-19.6907	190.2017
ASSETS	38464	6955.1090	4461.3940	13308	2718.5	5541
SGROW	32674	0.1299	0.3105	0.0862	-0.0928	0.3492
DEBT	35237	0.2474	0.1839	0.2306	0.0098	0.5021
GDPGR	38464	0.0366	0.0075	0.0420	0.0240	0.0430

Table III
Correlation Matrix

ROA measure return on assets, AR number of days accounts receivable, INV number of days of inventory, AP number of days accounts payable, CCC cash conversion cycle, SIZE company size, SGROW sales growth, DEBT financial debt level, and GDPGR annual GDP growth.

	ROA	AR	INV	AP	CCC	SIZE	SGROW	DEBT	GDPGR
ROA	1								
AR	-0.0419***	1							
INV	-0.0908***	0.0805***	1						
AP	-0.0324***	0.3555***	0.1793***	1					
CCC	-0.075***	0.4523***	0.7087***	-0.2757***	1				
SIZE	0.006	0.273***	0.1537***	0.1168***	0.214***	1			
SGROW	0.1236***	0.0168***	-0.0673***	0.0211***	-0.0545***	0.0607***	1		
DEBT	-0.216***	0.0776***	0.1198***	-0.0026	0.1423***	0.0581***	0.0116**	1	
GDPGR	0.0306***	-0.0063	-0.0103**	0.0076	-0.017***	0.0425***	0.0672***	-0.0112**	1

*Significant at 90 percent. ** Significant at 95 percent. *** Significant at 99 percent.

Table IV
Mean Values by ROA Quartiles

Comparison of mean values of variables in function of return on assets quartiles. ROA quartiles created annually. Median values in parentheses. ROA measure return on assets, AR number of days accounts receivable, INV number of days of inventory, AP number of days accounts payable, CCC cash conversion cycle, SIZE company size, SGROW sales growth, DEBT financial debt level. *t* statistic tests difference of means between 4th and 1st quartile. **P-value** in parentheses.

	1st Quartile	**2nd Quartile**	**3rd Quartile**	**4th Quartile**	***t***
Range ROA	-0.75 to 0.03	0.03 to 0.07	0.06 to 0.12	0.10 to 1.05	
ROA	-0.0060	0.0506	0.0890	0.1851	187.36
	(0.0116)	(0.0504)	(0.0875)	(0.1626)	(0.00)
AR	97.4920	99.4343	96.2155	93.6672	-4.37
	(93.3828)	(98.5074)	(97.4100)	(95.2741)	(0.00)
INV	81.8856	83.2270	75.5572	65.5583	-15.04
	(61.7877)	(65.5985)	(58.3610)	(49.6316)	(0.00)
AP	97.0031	102.4277	98.3873	94.1914	-3.09
	(92.0959)	(100.1461)	(95.0237)	(88.7961)	(0.00)
CCC	82.4314	80.2427	73.4145	65.1350	-12.03
	(66.6797)	(67.0962)	(62.9043)	(57.7468)	(0.00)
SIZE	8.6663	8.7104	8.7123	8.6890	2.29
	(8.6523)	(8.6910)	(8.6799)	(8.6704)	(0.00)
SGROW	0.0844	0.1177	0.1379	0.1789	17.91
	(0.0442)	(0.0766)	(0.0978)	(0.1225)	(0.00)
DEBT	0.2635	0.2992	0.2545	0.1627	-35.69
	(0.2483)	(0.3012)	(0.2420)	(0.1227)	(0.00)

Table V
Effect of Working Capital Management on Return on Assets (I)

ROA is dependent variable, AR measures number of days accounts receivable, INV number of days of inventory, AP number of days accounts payable, CCC cash conversion cycle, SIZE company size, SGROW sales growth, DEBT financial debt level, and GDPGR annual GDP growth. Results obtained using fixed-effects estimation. Coefficients of time dummy variables not presented.

	1	**2**	**3**	**4**
AR	-0.0002***			
	(-14.93)			
INV		-0.0001***		
		(-11.98)		
AP			-0.0002***	
			(-16.55)	
CCC				-0.0001***
				(-6.05)
SIZE	0.0186***	0.0128***	0.0181***	0.0113***
	(9.06)	(6.42)	(8.92)	(5.68)
SGROW	0.0207***	0.0203***	0.0210***	0.0215***
	(17.09)	(16.59)	(17.35)	(17.64)
DEBT	-0.1337***	-0.1354***	-0.1534***	-0.1331***
	(-30.12)	(-30.49)	(-34.20)	(-29.04)
GDPGR	0.5408*	0.8345***	0.4902	0.9307***
	(1.63)	(2.52)	(1.48)	(2.80)
C	-0.0476**	-0.0212	-0.0379*	-0.0203
	(-2.42)	(-1.08)	(-1.94)	(-1.04)
Hausman	0.00	0.00	0.00	0.00
Obs.	30041	30041	30041	30041

t statistic in parentheses.
*Significant at 90 percent. ** Significant at 95 percent. *** Significant at 99 percent.
Hausman is *p-value* of Hausman (1978) test. If null hypothesis rejected, only within-group estimation is consistent. If accepted, random-effects estimation is best option, since not only is it consistent, but it is also more efficient than within-group estimator.

Table VI
Effect of Working Capital Management on Return on Assets (II)

ROA is dependent variable, AR measures number of days accounts receivable, INV number of days of inventory, AP number of days accounts payable, CCC cash conversion cycle, SIZE company size, SGROW sales growth, DEBT financial debt level, and GDPGR annual GDP growth. Results obtained from estimation using instrumental variables. Instrument used is first lag of variables AR, INV, AP, and CCC respectively. Coefficients of time dummy variables not presented.

	1	**2**	**3**	**4**
AR	-0.0008***			
	(-4.19)			
INV		-0.0010***		
		(-12.47)		
AP			-0.0018	
			(-1.38)	
CCC				-0.0006***
				(-10.47)
SIZE	0.0332***	0.0254***	0.0766	0.0154***
	(4.69)	(8.60)	(1.48)	(5.87)
SGROW	0.0368***	0.0236***	0.0253	0.0314***
	(11.64)	(8.49)	(1.55)	(12.52)
DEBT	-0.1133***	-0.1080***	-0.2532***	-0.0600***
	(-16.68)	(-19.06)	(-2.90)	(-6.89)
GDPGR	-0.2457	0.3695	-2.8906	0.9547***
	(-0.5)	(0.97)	(-0.97)	(2.57)
C	-0.0929***	-0.0553**	-0.2223	-0.0322
	(-2.75)	(-2.29)	(-1.28)	(-1.37)
Obs.	25483	25483	25483	25483

z statistic in parentheses.
*Significant at 90 percent. ** Significant at 95 percent. *** Significant at 99 percent.