The Impact of Working Capital Management on Profitability of Croatian Software Companies

Dina Korent [*]
Silvije Orsag [**]

Abstract: *The idea that working capital management impacts profitability and risk of a company is generally accepted and in last 10-15 years has acquired a substantial interest. Accordingly, from the aspect of the measure of efficiency of working capital management, the objective of this paper is to evaluate working capital management impact on profitability of Croatian software companies. This impact was examined using descriptive and correlation as well as panel regression analysis for six-year period (2008-2013). The results show that after controlling for characteristics of the company and macroeconomic conditions working capital management significantly affects the profitability of Croatian software firms. Moreover, the results imply the existence of a nonlinear, concave quadratic relationship between the net working capital and return on assets. This suggest the existence of an optimal level of net working capital that balances costs and benefits and maximizes profitability of analysed companies.*

Keywords: working capital management; net working capital; company's profitability; return on assets; Croatian software companies

JEL Classification: G30; G39

Introduction

Working capital management is one of the most important and sensitive aspects of overall financial management that requires careful consideration in all companies, regardless of their type or nature (Deloof, 2003; Dinku, 2013). The importance of working capital management primarily stems from the fact that most companies invest large amounts of money into current assets and use considerable amounts of cur-

[*] Dina Korent is at University of Zagreb, Faculty of Organization and Informatics, Varaždin, Croatia.
[**] Silvije Orsag is at University of Zagreb, Faculty of Economics and Business, Zagreb, Croatia.

rent liabilities as their source of financing (Deloof, 2003; Moyer, McGuigan, & Kret-low, 2006; Brealey, Myers, & Allen, 2011; Koralun-Bereźnicka, 2014). In addition, due to the dynamic nature of doing business, decision making about the investment in and financing of current assets and their components is frequent, repetitive, lengthy, and also very time-consuming for company managers (Richards & Laughlin, 1980; Appuhami, 2008; Koralun-Bereźnicka, 2014). Furthermore, as a component of over-all company strategy aimed at value creation, working capital management is im-portant because of the significant influence it has on a company's liquidity (Kim & Chung, 1990; Opler, Pinkowitz, Stulz, & Williamson, 1999), solvency (Peel & Wil-son, 1996), profitability (Shin & Soenen, 1998; García-Teruel & Martínez-Solano, 2007; Afrifa, 2015) and, consequently, a company's worth (Kieschnick, Laplante, & Moussawi, 2013; Baños-Caballero, García-Teruel, & Martínez-Solano, 2014; Af-rifa, 2015). Finally, it needs to be stressed that the significance of working capital management in a particular company depends on the surrounding macroeconomic conditions, which greatly influence its investments and the manner of their financing. As much as working capital management (i.e., liquidity management) is important in good times, it gains even more importance in bad times (Eljelly, 2004). Accordingly, economic crises emphasize the issues of business sector liquidity and put pressure on working capital positions (Enqvist, Graham, & Nikkinen, 2012). Precisely for this reason, the current economic crisis, characterized by a significant decrease in sales, increased credit risk and increasingly difficult access to the banking system, has em-phasized the importance of and renewed the interest in working capital management in companies all over the world (Chiou, Cheng, & Wu, 2006; Şen & Oruç, 2009; Archavli, Siriopoulos, & Arvanitis, 2012; Enqvist et al., 2012).

Regardless of the macroeconomic and other conditions, working capital manage-ment should generally strive to achieve optimal levels of working capital components and optimal level of working capital that contributes the most to achieving the ba-sic business goal of a company—the maximization of its net present value (Deloof, 2003). Since the stated goal implicitly entails maximizing the profitability and, at the same time, reaching the optimal level of liquidity of a company, it is understandable that the goal of entire working capital management is precisely the maximization of profitability, along with the simultaneous minimization of the risk of company's failure to meet its current liabilities or service its fixed assets (Raheman & Nasr, 2007; Singhania, Sharma, & Rohit, 2014). Although the maintenance of required or optimal levels of liquidity in conducting daily business activities is an immanent goal of working capital management (Eljelly, 2004), in the last 10-15 years it has increasingly been emphasized for its role in contributing to companies' profitability and success.

However, it is necessary to note that the mentioned dual goal of simultaneous maximal profitability and optimal liquidity often cannot be reached. According to numerous authors (Smith, 1980; Orsag, 2003; Raheman & Nasr, 2007; Van Horne

& Wachowicz, 2008), and in terms of an assumed linear nature of the relationship between working capital management and the stated goals, those decisions that enhance profitability usually do not increase the chances of reaching the adequate level of liquidity. Conversely, those decisions that focus entirely on enhancing liquidity commonly tend to decrease profitability. Given the importance of each of these goals, reaching one goal at the cost of not reaching the other should not be an option and one should rather strive to strike a balance between the two (Raheman & Nasr, 2007). This is exactly the reason why, among various strategies of working capital management, for the working capital management that strives to establish a balance between profitability and liquidity, a trade-off between profitability and liquidity needs to be established, as initially noted by K. Smith (1980).

According to the traditional view, the linearity of the relationship between a company's working capital management and its profitability entails that an aggressive strategy of working capital management would result in lower liquidity, but higher risk, profitability and market value of the company. Therefore, an aggressive strategy is considered to be a profit maximizing strategy of working capital management that represents what is usually meant when speaking about efficient working capital management, based on the principle of quick conversion of inventories and accounts receivables into money and on delays in making payments to suppliers, which shortens the money gap and increases its availability (Nobanee, 2009; Nwankwo & Osho, 2010a; Enqvist et al., 2012).

However, the existence of both the positive and the negative impact of investing into working capital on a company's profitability suggests that the process of deciding about working capital investments involves making a compromise between the costs that rise and the costs that fall in accordance with the level of working capital investments (Baños-Caballero, García-Teruel, & Martínez-Solano, 2012a; Baños-Caballero et al., 2014; Kwenda & Holden, 2014; Afrifa, 2015). If the reasoning about the efficiency of the strategy of working capital management is widened—within the context of compromising between the positive and the negative impacts of investing into working capital—when the benefits of these investments are greater than their costs, additional working capital investments will have a positive effect on profitability and vice versa. In the first case, in the context of a positive impact on profitability, a conservative strategy of working capital management would be more efficient, whereas an aggressive strategy would be more efficient in the opposite situation.

Therefore, there is an optimal level of working capital that balances a company's costs and benefits, and maximizes profitability (Baños-Caballero et al., 2012a; Kwenda & Holden, 2014), while also achieving an adequate level of liquidity. Since any deviation from the optimal level of working capital investments, whether upwards or downwards, decreases a company's profitability, it follows that the efficient strategy of working capital management is simply an optimal strategy of working capital management.

Literature Review and Hypotheses

The very idea that working capital management influences a company's profitability and risk is widely accepted (Brealey, Myers, & Marcus, 2001; Brealey et al., 2011; Moyer et al., 2006; Brigham & Daves, 2007; Van Horne & Wachowicz, 2008) and in the last 10-15 years it has generated considerable interest. Accordingly, and in terms of finding the ultimate gauge of the efficiency of working capital management, numerous studies have been evaluating the management of working capital in an effort to determine its effect on companies' profitability and success.

Initial studies on this subject assume a linear relationship between these concepts and provide a strong statistical support for its significance. Due to the way in which the measures of working capital management influence a company's profitability, these studies can be divided into two groups: those more numerous, which point out the negative impact of working capital management and support an aggressive strategy of working capital management, and those that point out the positive impact of working capital management on companies' profitability and success, thus supporting a conservative strategy.

To date, the majority of empirical studies (Jose, Lancaster, & Stevens, 1996; Shin & Soenen, 1998; Deloof, 2003; Eljelly, 2004; Lazaridis & Tryfonidis, 2006; Raheman & Nasr, 2007; Ganesan, 2007; García-Teruel & Martínez-Solano, 2007; Nobanee & AlHajjar, 2009; Uyar, 2009; Zariyawati, Annuar, Taufiq, & Rahim, 2009; Mathuva, 2010; Mohamad & Saad, 2010; Silva, 2011; Archavli et al., 2012; Bhunia & Das, 2012; Quayyum, 2012; Vural, Sökmen, & Çetenak, 2012; Enqvist et al., 2012; Karadagli, 2012; Dinku, 2013; Singhania et al., 2014; Pais & Gama, 2015) on the linear relationship between working capital management and profitability suggest the existence of a negative impact of working capital management on a company's profitability. This is in line with the thesis about a significantly positive impact of an aggressive strategy of working capital management. Although a greater number of empirical studies on the linear relationship between working capital management and profitability support the thesis that an aggressive strategy of working capital management positively influences a company's profitability, there is nevertheless a notable number of studies (Afza & Nazir, 2008; Nazir & Afza, 2009; Nobanee, 2009; Gill et al., 2010; Valipour, Shooshtarian, & Ostovari, 2012; Ani, Okwo, & Ugwunta, 2012; Charitou, Lois, & Santoso, 2012; Akoto, Awunyo-Vitor, & Angmor, 2013; Ahmad, Nadeem, & Hamad, 2014; Angahar & Alematu, 2014; Muscettola, 2014; Tahir & Anuar, 2015) whose results suggest otherwise (Afza & Nazir, 2008; Nazir & Afza, 2009; Nobanee, 2009; Gill et al., 2010; Valipour et al., 2012; Charitou et al., 2012; Akoto et al., 2013; Ahmad et al., 2014; Angahar & Alematu, 2014; Muscettola, 2014; Tahir & Anuar, 2015).

When summarizing the results of various studies, one can generally conclude that the companies which invest less into working capital are more profitable. However, regardless of this general conclusion, there are certain contradictions which still

remain in the research results regarding the linear relationship between the strategies of working capital management and profitability. Those contradictions could be attributed to the inconsistency and volatility of economic and other conditions in different countries and environments where the studies were conducted, the analysis of different industries, the differences in the distribution of company types within samples, different methods and approaches used in analysis, etc. Nevertheless, it is more viable and rational to conclude that these contradictions stem from the fact that working capital investments can have both positive and negative impacts on companies' profitability, which ultimately positively or negatively reflect on their owners' wealth (Gill et al., 2010).

With respect to the costs and benefits related to aggressive and conservative strategies of working capital management, as well as both positive and negative effects of working capital investments, one can assume that the relationship between working capital investments and a company's profitability is non-monotonic and non-linear, contrary to the initial assumption of linearity (Baños-Caballero et al., 2012a, 2014). Thus, if both the positive and the negative effects are strong enough, the relationship between working capital investments and profitability can be better described by a concave quadratic function. Unlike the majority of studies on the impact of working capital management on a company's profitability, which discuss the existence of an optimal level of working capital but nevertheless assume a linear relationship between the studied concepts, a very small number of recent studies (Silva, 2011; Baños-Caballero et al., 2012a; Baños-Caballero, García-Teruel, & Martínez-Solano, 2012b; Baños-Caballero et al., 2014; Gomes, 2013; Afrifa, 2015; Pais & Gama, 2015) on the aforementioned relationship assume and suggest its non-linearity. The results of these studies, except the one conducted by (Pais & Gama, 2015), imply the existence of an optimal level of working capital which maximizes a company's profitability.

In accordance with the initial empirical studies of the impact of working capital management on a company's profitability, this paper first tests the hypothesis about the existence of a linear relationship between working capital management and the profitability of Croatian companies classified under Group 62.0 of the 2007 National Classification of Activities (NACE 2007, 62.0): Computer Programming, Consulting and Related Activities. Concretely, in line with the results of most studies, it is assumed that an aggressive strategy of working capital management has a significant positive impact on the profitability of analysed companies:

H1: Aggressive working capital management has a significant positive impact on the profitability of Croatian companies classified into the group of Computer Programming, Consulting and Related Activities.

Next, in line with the studies exploring the non-linear relationship, the second hypothesis assumes the existence of a concave quadratic relationship between working capital management and the profitability of Croatian companies classified into the group of Computer Programming, Consulting and Related Activities:

H2: A significant concave quadratic relationship exists between working capital management and the profitability of Croatian companies classified into the group of Computer Programming, Consulting and Related Activities.

Methodological Research Framework

Sample

The research sample consists of Croatian companies classified into Group 62.0 of the 2007 National Classification of Activities (Computer Programming, Consulting and Related Activities) that were logged in Financial Agency's database, existing in the market and gaining revenues and profits during the period of 2008-2013. This group of companies was selected because of its importance in the context of growth and employment potentials, which additionally stresses the need for adequate working capital management in the said companies. Namely, according to the Industrial Strategy of the Republic of Croatia 2014-2020 (Republika Hrvatska, 2014), this sub-industry has been classified into a group of „instigators" of Croatian industry, along with 21 other sub-industries. This group is characterized by high exports, a positive EBITDA and significant employment numbers.

Financial Agency's data set provided the data on 3.287 companies. A balanced sample of 442 companies was formed after the companies that exited or entered the market between 2008 and 2013 were excluded from the analysis, along with those companies that had no employees for more than a year in that period (based on work hours), or had no revenue or profits. According to Financial Agency's data for 2008, the structure of these companies according to size is the following: 1 large company, 7 medium companies, 91 small companies and 343 micro companies.

Data and Variables

The data used in this research was that on Croatian companies from Group 62.0 (Computer Programming, Consulting and Related Activities), together with the macroeconomic data and variables. Company data included basic information about particular companies and certain quantitative (financial and non-financial) data that were needed for calculating variable measures at the company level which could be grouped into panel data. This basic data on the companies and the data used for calculating variable measures are secondary in nature and were obtained from the databases of the Financial Agency and Croatian Bureau of Statistics.

The selection of variable measures was determined by the availability of the data needed for their calculation and their frequency and significance in previous studies. Variable measures at the company level were defined for each company and each year

in observation. Macroeconomic variables were defined on an annual level. A company's profitability was used as a dependent variable, measured by its return on assets (ROA), which represents the ratio of net income to total assets of a company multiplied by 100. The independent variables that were used include the independent variables of primary interest and independent control variables. As the independent variables of primary interest, net working capital (wNOCTR) and its square value (wsqNOCTR) were used. The variable of net working capital was calculated as a relative figure—the percentage of net working capital in the total revenue of a company. Net working capital represents the difference between a company's current assets and current liabilities. To control for the other potential influences on a company's profitability, independent control variables are used, such as following internal control variables: the size of a company (SA), the age of a company (AGE), the growth of a company (GR), the percentage of fixed assets in a company's total assets (FATA), a company's financial leverage (L), a company's market power (MP), and the growth of real gross domestic product (GDPr) as external control variable. The size of a company is defined by its total assets, and its age is determined by the number of years that have passed since its founding. A company's growth was calculated as the percentage of annual changes in its total revenue, and a company's fixed asset investments were defined as the percentage of fixed assets in its total assets. Financial leverage equals the percentage of total liabilities in a company's total assets. Finally, a company's market power was defined as the percentage of its revenue in the total revenue of Group 62.0 (Computer Programming, Consulting and Related Activities). The data on the growth rates of real gross domestic product were taken from the database of Croatian Bureau of Statistics. Lastly, the variables with extreme values (ROA, the percentage of net working capital in relation to total revenue, revenue growth) were winsorized at the 1% level (see (Eljelly, 2004; Baños-Caballero et al., 2014)).

Methods and Regression Models Specification

In addition to descriptive statistics which is primarily used to describe the sample, to test the impact of working capital management on the profitability of Croatian software companies the methods of inferential statistics, in particular correlation and panel regression analysis are used. In order to test the first (1) and the second (2) hypothesis the following dynamic panel regression models are estimated using Arellano-Bond estimator:

$$ROA_{it} = \beta_0 + \beta_1 * ROA_{i,t-1} + \beta_2 * wNOCTR_{it} + \sum_{k=3}^{7} \beta_k$$
$$* \text{ internal control variable}_{it} + \beta_8 * GDPgr_t + \varepsilon_{it} \qquad (1)$$

$$ROA_{it} = \beta_0 + \beta_1 * ROA_{i,t-1} + \beta_2 * wNOCTR_{it} + \beta_3 * wNOCTR_{it}^2 \sum_{k=4}^{8} \beta_k$$
$$* \text{ internal control variable}_{it} + \beta_9 * GDPgr_t + \varepsilon_{it} \qquad (2)$$

Dynamic specification of panel regression model and Arellano-Bond estimator are chosen for two reasons. First, as shown by the previous studies, is very likely that the profitability of the company is a dynamic category that persists. Second, taking into account theoretical findings of the subject area and previous studies it is evident that in models testing the impact of working capital management on the company's profitability, there may be a problem of endogeneity resulting from the existence of reverse causality and/or bias caused by omitted variables. In fact, not only working capital management affects the profitability of the company but also the profitability of the company may affect the management of working capital. Furthermore, there is a possibility of unobserved individual effects correlated with the independent variables in the model. The dynamic panel data model therefore seems appropriate considering that recognizes the dynamic nature of the company profitability and controls for potential endogeneity problem. The presence of the lagged dependent variable as independent variable in dynamic panel model allows to control for reverse causality and bias due to omitted variables. In this paper consequent endogeneity problem is solved using Arellano-Bond estimator which by first order differencing eliminates unobservable individual effects and includes in model internal instrumental variables that control for correlation between dependent variable difference and error term.

Finally, the coefficients of net working capital and the square of the latter allows us to determine the breakpoint in the net working capital-profitability relation as: $\dfrac{-\beta_2}{2\beta_3}$. To verify our second hypothesis, this should be a maximum, since this would indicate that there is concave quadratic relationship between working capital and profitability and, hence, companies have an optimal net working capital level that maximizes their profitability.

Empirical Results

Descriptive Statistics

Table 1 (in Appendix) presents the results of descriptive statistics of variables that are included in the regression analysis. Since the distribution of variables is asymmetric, as a representative measure of central tendency we observe median. Results of descriptive statistics show that the median return on assets is 13.99%, and median of percentage of net working capital in the total revenue of a company is 18.51%. The median average size of company measured by its total assets is 837,009 Kunas indicating that 50% of companies in the sample have total assets less than the specified value, and 50% of them greater. Furthermore, the median age of the company is 11 years, and median annual revenue growth is 1.15%. The median of percentage of fixed assets in total assets is 23.49%. Percentage of fixed assets in total assets clearly

indicates the importance of current assets, or gross working capital in the structure of total assets. The median value of financial leverage as one of the control variables is 43.41%, and the median value of company's market power is 0.06%. In the end, median of real gross domestic product growth rate is 1.4%.

Correlation Analysis

Results of the correlation analysis are presented in Table 2 (in Appendix). The correlation results indicate a significant and positive association between return on assets on one side and net working capital and company's annual revenue growth on the other at 5% significance level. The correlation between return on assets and company's size, company's age, percentage of fixed assets in a company's total assets, company's financial leverage, and company's market power is negative and significant at the same significance level. Net working capital is positively and significantly correlated with company's size, company's age and company's market power and negatively and significantly with percentage of fixed assets in a company's total assets and company's financial leverage. The correlation between the other control variables is evident from the correlation matrix.

Regression Analysis

Table 3 (in Appendix) shows the results of testing the first hypothesis for a total of 4 dynamic panel regression models: Arellano-Bond with default standard errors, Arellano-Bond with default standard errors and financial leverage as explanatory variable, Arellano-Bond with robust standard errors, Arellano-Bond with robust standard errors and financial leverage as explanatory variable. Results of testing the first hypothesis suggests that in the dynamic panel regression models that do not involve financial leverage as one of the explanatory variables, at the level of significance of 1 and 5%, depending on the model, 1 percentage point increase of net working capital increases the company's profitability on average by 0.0652 percentage points. However, after financial leverage is introduced in the same models, relationship between net working capital and company's profitability has become inverse and high statistically significant at 0.1% level. Onwards, it can be concluded that increase in net working capital by one percentage point reduces the company's profitability by 0.128 percentage points. These results suggest that after inclusion of financial leverage as one of the explanatory variables H1 hypothesis cannot be rejected. The latter results are consistent with most previous researches conducted in different countries, times and samples (Richards & Laughlin, 1980; Kieschnick et al., 2013; Baños-Caballero et al., 2014).

Results of testing second hypotheses are shown in Table 4 (in Apppendix). As for the first hypothesis 4 dynamic panel regression models have been estimated. After

examining the results it is evident that the net working capital and its square statistically significantly affect company's return on assets. The regression coefficients for the net working capital and its square are statistically significant at 0.1, 1, and 5% respectively depending on the model. Consistent with predictions, results confirm a large and statistically significant concave quadratic relation between net working capital and company's profitability, since the coefficient on the square of net working capital is negative. These findings indicate that there is an optimal level of net working capital which maximizes company's profitability. According to the results of the observed models assessment that exclude financial leverage as explanatory variable optimal level of net working capital in the total revenue of a company amounts to 50.23%. So, with other things being equal the maximum profitability of Croatian software companies is achieved when the company holds the net working capital equal to half of the value of company total revenue. In other words, the annual turnover ratio of net working capital is 2, and software companies need to ensure financing of the net working capital for an average of 183.341 "days of sales". The optimal level of net working capital in the total revenue of a company according to the results of the evaluation of dynamic panel regression models that include financial leverage as explanatory variable is -11.34%. The above result indicates that the optimal level of net working capital after taking into account the company's financial leverage is achieved when the company realizes a deficit of working capital in the amount of about 11.34% of company's total revenue. The presented results suggest that one cannot reject the hypothesis H2.

Discussion and Conclusion

The aim of this paper is to analyse and provide empirical evidence about the nature of the relationship between working capital management and profitability of Croatian companies from Group 62.0 (Computer Programming, Consulting and Related Activities). The study was conducted on a balanced sample of 442 companies over a six-year period (2008 – 2013). The paper employs panel data regression analysis which allows for the unobserved heterogeneity and endogeneity control.

Results of testing the first hypothesis are twofold. Namely, results indicate that after controlling the impact of net working capital on company's profitability by the company's size, company's age, company's annual revenue growth, percentage of fixed assets in a company's total assets, company's market power and the growth of real gross domestic product, increase in the level of net working capital increases profitability of the company. The above speaks in favour of a conservative strategy of working capital management. However, after controlling the impact of net working capital on company's profitability for financial leverage also, relationship between net working capital and company's profitability becomes inverted, indicating that on

average companies with lower levels of net working capital in relation to total revenue are more profitable.

Results of testing the second hypotheses point to the existence of significant concave quadratic relationship between working capital management and profitability of the company and suggest the existence of an optimal level of net working capital in relation to company's total revenue. In addition, net working capital below the optimal level increases profitability, and contrariwise, net working capital above the optimal level causes a reduction in company's profitability. Therefore, at net working capital levels below the optimal, the conservative strategy will predominate, and so an increase in net working capital will lead to increase in company's profitability. On the other hand, at net working capital levels above the optimal, the aggressive strategy will predominate, and so an increase in net working capital will lead to lower profitability. The presented results are consistent with the results obtained in following researches (Eljelly, 2004; Uyar, 2009; Nwankwo & Osho, 2010b; Archavli et al., 2012).

Furthermore, the fact that after taking into account the financial leverage the optimal level of net working capital in relation to company's total revenue is achieved at a lower level, may be, in accordance with the pecking order theory. Companies with significant amounts of total liabilities in the structure of total assets, in order to avoid costly external financing choose more aggressive strategy of working capital management. This finding shows that the optimum is sensitive to financial constraints of the company.

There are several implications of this research that could be important and relevant for managers and for future research and development of the theory of working capital management. The results of this study suggest that managers in order to maximize profitability should aim at keeping as close as possible to the optimal net working capital level and try to avoid any deviation. In addition, the results of this study extend the research on the relevance of a good working capital management and suggests that the relationship between working capital management and company's profitability is concave quadratic, rather than linear. Accordingly it is recommended to use quadratic relationship in subsequent studies.

APPENDIX

Table 1 Descriptive statistics

ROA, Winsorized fraction .01			
	Percentiles	Smallest	
1%	.0714458	.0714458	
5%	.3578106	.0714458	
10%	.9746016	.0714458	Obs	2,652
25%	4.115356	.0714458	Sum of Wgt.	2,652
50%	13.99195		Mean	21.60626
		Largest	Std. Dev.	21.64865
75%	32.73489	84.80907	
90%	56.2661	84.80907	Variance	468.664
95%	67.65227	84.80907	Skewness	1.127754
99%	84.80907	84.80907	Kurtosis	3.395866
wNOCTR			
	Percentiles	Smallest	
1%	-65.23521	-65.23521	
5%	-16.20768	-65.23521	
10%	-4.49552	-65.23521	Obs	2,652
25%	6.036894	-65.23521	Sum of Wgt.	2,652
50%	18.50547		Mean	22.76879
		Largest	Std. Dev.	29.55227
75%	35.88213	133.3934	
90%	57.59187	133.3934	Variance	873.3368
95%	76.23523	133.3934	Skewness	.7825544
99%	133.3934	133.3934	Kurtosis	5.630752
SA			
	Percentiles	Smallest	
1%	43848	24596	
5%	89801	27622	
10%	125978	28087	Obs	2,652
25%	287587.5	32230	Sum of Wgt.	2,652
50%	834009		Mean	4380527
		Largest	Std. Dev.	1.80e+07
75%	2808363	3.05e+08	
90%	7988431	3.08e+08	Variance	3.25e+14
95%	1.63e+07	3.42e+08	Skewness	13.45312
99%	5.87e+07	3.72e+08	Kurtosis	227.2341

Table 1 - Continued

AGE				
	Percentiles	Smallest		
1%	1	0		
5%	2	0		
10%	4	0	Obs	2,652
25%	7	0	Sum of Wgt.	2,652
50%	11		Mean	9.997738
		Largest	Std. Dev.	4.408164
75%	13	18		
90%	15	18	Variance	19.43191
95%	16	18	Skewness	-.3498353
99%	17	18	Kurtosis	2.142408
GR, Winsorized fraction .01				
	Percentiles	Smallest		
1%	-59.99018	-59.99018		
5%	-39.19073	-59.99018		
10%	-27.8452	-59.99018	Obs	2,210
25%	-12.96599	-59.99018	Sum of Wgt.	2,210
50%	1.149002		Mean	6.688577
		Largest	Std. Dev.	38.2639
75%	16.44009	207.0829		
90%	42.06457	207.0829	Variance	1464.126
95%	71.5806	207.0829	Skewness	2.36862
99%	207.0829	207.0829	Kurtosis	12.02309
FATA				
	Percentiles	Smallest		
1%	0	0		
5%	.3344067	0		
10%	1.838386	0	Obs	2,652
25%	7.567275	0	Sum of Wgt.	2,652
50%	23.49276		Mean	31.50785
		Largest	Std. Dev.	27.33239
75%	51.04853	98.64194		
90%	75.1458	99.55278	Variance	747.0593
95%	83.43553	99.95849	Skewness	.6740268
99%	94.15246	100	Kurtosis	2.263976
L				
	Percentiles	Smallest		
1%	3.771825	.4276035		
5%	8.688955	.502475		
10%	13.39734	.9869909	Obs	2,652
25%	23.21751	1.551943	Sum of Wgt.	2,652

Table 1 - Continued

50%	43.41312		Mean	45.72423
		Largest	Std. Dev.	26.39371
75%	66.12755	216.0139		
90%	82.61897	221.3892	Variance	696.6279
95%	88.78722	233.834	Skewness	.686634
99%	96.46149	238.4684	Kurtosis	5.147613
	MP			
	Percentiles	Smallest		
1%	.0030964	.0003889		
5%	.0072046	.000498		
10%	.0111792	.0008452	Obs	2,652
25%	.0210067	.0010523	Sum of Wgt.	2,652
50%	.0607346		Mean	.2262443
		Largest	Std. Dev.	.635392
75%	.1689731	7.764909		
90%	.4269506	7.788253	Variance	.403723
95%	.8687955	8.313305	Skewness	7.034982
99%	3.385443	9.296902	Kurtosis	67.33131
	GDPr			
	Percentiles	Smallest		
1%	-7.4	-7.4		
5%	-7.4	-7.4		
10%	-7.4	-7.4	Obs	2,652
25%	-2.2	-7.4	Sum of Wgt.	2,652
50%	-1.4		Mean	-1.766667
		Largest	Std. Dev.	2.872049
75%	-.3	2.1		
90%	2.1	2.1	Variance	8.248666
95%	2.1	2.1	Skewness	-.8277279
99%	2.1	2.1	Kurtosis	3.028596

Source: Authors calculation

Table 2 Correlation matrix

	wROA	wNOCTR	SA	AGE	wGR	FATA	L
wROA	1.0000						
wNOCTR	0.2180*	1.0000					
SA	-0.0866*	0.1459*	1.0000				
AGE	-0.0610*	0.0553*	0.0200	1.0000			
wGR	0.2040*	-0.0279	-0.0024	-0.1363*	1.0000		
FATA	-0.1091*	-0.3282*	0.0512*	-0.0091	-0.0438*	1.0000	
L	-0.4967*	-0.5707*	-0.0436*	-0.0940*	-0.0254	0.0307	1.0000
MP	-0.0739*	0.0767*	0.8805*	0.0333	0.0283	0.0362	-0.0220
GDPr	0.0146	0.0230	0.0013	0.0066	-0.0306	-0.4006*	-0.0128
	MP	GDPr					
MP	1.0000						
GDPr	0.0000	1.0000					

Source: Authors calculation

Table 3 Panel regression results for H1

	(1)	(2)	(3)	(4)
	AB1_default	AB1_default_with_L	AB1_robust	AB1_robust_with_L
L.wROA	0.0510*	0.0292	0.0510	0.0292
	(2.03)	(1.30)	(1.77)	(1.17)
wNOCTR	0.0652**	-0.128***	0.0652**	-0.128***
	(3.27)	(-6.22)	(2.08)	(-4.06)
SA	-0.000000194*	-5.05e-08	-0.000000194	-5.05e-08
	(-2.06)	(-0.60)	(-1.92)	(-0.84)
AGE	-0.143	-0.0710	-0.143	-0.0710
	(-0.69)	(-0.38)	(-0.54)	(-0.30)
wGR	0.0991***	0.0912***	0.0991***	0.0912***
	(13.07)	(13.41)	(9.44)	(10.01)
FATA	0.00749	-0.0441**	0.00749	-0.0441**
	(0.42)	(-2.76)	(0.43)	(-2.61)
MP	1.570	-0.579	1.570	-0.579
	(0.54)	(-0.22)	(0.56)	(-0.30)
GDPr	0.172	-0.217	0.172	-0.217
	(1.17)	(-1.64)	(1.19)	(-1.65)
L		-0.436***		-0.436***
		(-19.56)		(-12.75)
_cons	20.32***	44.95***	20.32***	44.95***
	(7.72)	(16.82)	(6.02)	(11.54)
N	1768	1768	1768	1768
t statistics in parentheses				
* p<0.05, ** p<0.01, *** p<0.001				

Source: Authors calculation

Table 4 Panel regression results for H2

	(1)	(2)	(3)	(4)
	AB2_default	AB2_default_with_L	AB2_robust	AB2_robust_with_L
L.wROA	0.0544*	0.0323	0.0544	0.0323
	(2.20)	(1.44)	(1.92)	(1.92)
wNOCTR	0.218***	-0.0288	0.218***	-0.0288
	(8.24)	(-1.04)	(5.54)	(-0.83)
wsqNOCTR	-0.00217***	-0.00127***	-0.00217***	-0.00127***
	(-8.41)	(-5.33)	(-5.20)	(-3.44)
SA	-0.000000127	-1.88e-08	-0.000000127	-1.88e-08
	(-1.37)	(-0.22)	(-1.49)	(-0.34)
AGE	-0.0527	-0.0222	-0.0527	-0.0222
	(-0.26)	(-0.12)	(-0.20)	(-0.09)
wGR	0.0895***	0.0859***	0.0895***	0.0859***
	(11.87)	(12.58)	(8.76)	(9.49)
FATA	0.0151	-0.0370*	0.0151	-0.0370*
	(0.87)	(-2.32)	(0.88)	(-2.28)
MP	0.0337	-1.358	0.0337	-1.358
	(0.01)	(-0.52)	(0.01)	(-0.70)
GDPr	0.236	-0.160	0.236	-0.160
	(1.63)	(-1.21)	(1.63)	(-1.23)
L		-0.413***		-0.413***
		(-18.26)		(-12.77)
_cons	18.91***	42.80***	18.91***	42.80***
	(7.29)	(15.93)	(5.75)	(11.52)
N	1768	1768	1768	1768
t statistics in parentheses				
* p<0.05, ** p<0.01, *** p<0.001				

Source: Authors calculation

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