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THE IMPACT OF WORKING CAPITAL MANAGEMENT ON PROFITABILITY OF LARGE FIRMS IN SERBIA

ABSTRACT: Short term firms' decisions about working capital influence the firms value and profitability. This study aims to find new empirical evidence of the influence of managing working capital on profitability, measured by ROA, with application to 367 large non-financial firms in Serbia during a four-year period (2016-2019) using panel-corrected standard error model. The results show that after controlling the characteristics of the firm and macroeconomic conditions, working capital management has statistically significant and non linear influence to firm profitability. This suggests the existence of an optimal level of net working capital of analysed firms, while optimal level working capital has positive and above optimal level working capital has negative effects on the firms' profitability.

Key words: working capital, profitability, large firms in Serbia

INTRODUCTION

Management of working capital is important to ensure continous operating cycle in all firms regardless their type or nature. Working capital management means balancing between level of cash, receivables and inventories on one side and source of financing on the other side with minimized cost and has significant imapct on firms' worth. Finding optimal

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level of working capital and source of current liabilities financing is trade-off between profitability and risk (Van Horne & Wachowicz, 2008, p. 216). Lower level of working capital creates risk of default but increases profitability which is basic business goal and a measure of firms' long term performance. Simultaneous maximal profitability and optimal working capital needs to be estabilshed.

In yearly Working Capital Report of the largest global listed companies in the last 5 years PWC (2019, p. 2) concludes that there is still plenty of opportunity for creating value through optimising working capital levels (receivables and inventory are mayor sources of opportunity). The Report notes several trends: while net working capital increased by €360bn in 2018 and sales increase by 10% in 2017, operating cash flow (OCF) declined in 2018. Firms are facing operating challenges in converting revenue into cash (PWC, 2019, p. 3). In the same period capital expenditures continued to decline, suggesting that firms are maniging cash levels by cutting investments.

Firms can have different startegies about level of working capital (Brigham & Houston, 2015 p. 523). A company should have its own working capital policies on the management of stocks, debtors, cash and short-term investments considering sector activity of the firm, competition and the firm's requirements in order to minimize the possibility of managers making decisions which are not in the best interest of the company (Watson & Head, 2017, p.68). Restrictive working capital strategy implies aggressive approach with lower level of working capital for a given level of activity or sales based on the principle of quick conversion of receivables and inventory into cash and delays of payment to suppliers. An aggressive strategy will increase profitability but will also increase risk for cash shortages or stockouts and missing sales (Brigham & Houston, 2015; Watson & Head, 2017). A conservative working capital strategy is more flexible and the given level of turnover would be associated to higher level of cash and short term securities, approved longer credit terms to customers and higher levels of inventory. Such strategy will decrease default risk and losing sales but will also decrease profitability (Watson & Head, 2017). A moderate working capital strategy is between the aggresive and the conservative strategies.

Any deviation from optimal level of working capital decreases a firm's profitability. Efficient strategy of working capital management is simply an optimal startegy of working capital management (Kornet & Orsag, 2020, p. 49). Firms in real sector in Serbia have low liquidity, both liquidity ratios are below 1 (common and quick ratios), which means that working capital of real sector is constantly below short term liabilities (Serbian Business Registers Agency, 2020, p. 36). Lead by research conducted by Deloof (2003), the aim of this paper is to answer to following questions: what is the impact of working capital management on profitability of large non-financial firms in Serbia and

is there a statistically significant effect of working capital management to profitability of large firms in Serbia? Statistically significant relation of ratio of working capital and sales to profitability of large firms in Serbia is analyzed with panel-corrected standard error according to the methodology of Anton & Nucu (2020). Indicators for managing working capital are ratios of working capital to sales.

The rest of the study is organized as follows. Section 2 describes main theoretical and empirical literature that has approached the relationship between management of working capital and firm profitability. Section 3 presents analysis of large firm profitability in Serbia and relevant market trends as the basis for constructing the hypothesis. Section 4 presents the database and methodological background for analysis, defining variables, and the model estimation approach. Section 5 presents analysis and discussion and Section 6 presents conclusions.

LITERATURE REVIEW

In the last two decades the idea that working capital management influences a firm's profitability and risk is widely accepted and has generetad significant interest. Most studies of influence of working capital management on profitability at the beginig show linear effect in which negative effect prevails and these studies support agrresive working capital strategy. Other studies show that working capital management has positive effect to profitability and they support conservative strategy. Summarized review by a chronological order of most recent empirical papers is presented in Table 1.

Table 1. – Literature review

Author/s	Sample	Period	Dependent variable	Conclusion
		Methodolgy	Independent variable	
Deloof (2003)	**Belgium** large firms	1991-1996	**Gross operating income**	Negative effect
		FE OLS	ARday INVday APday CCC LnSales SalesGr Finandebt FAR	
Marchinez-Solano & Garcia-Teruel (2006)	**Spain** SME	1996-2002	**ROA**	Negative effect
		FE	ARday INVday APday CCC Assets Salesgr DR GDPgr	
	Greece	2001-2004	**Gross profit**	Negative effect

Lazridis & Tryfonidis (2006)	Listed firms	Regression	FixedFA, Finandebt, LNSales, CCC and industrial dummy variab	
Goncalves, Gaio & Robles (2018)	**United Kingdom** Non listed firms	2006-2014 Regression	**ROA** CCC, DR, Sales DDdummy DBdummy	Negative effect
Barjaktarović Rakočević, Latinović & Milosavljević (2014)	**Serbia** Listed firms	2010 Correlation	**ROA** CCC, ARday, APday, INVday, Size, Growth, Leverage, CR	CCC doesn't have statistically significant effect APday and ARday negative and INVday positive effect
Muscettola (2014)	**Italy** production SME	2007-2010 OLS	**Ebitda/ Net Sales** ARday INVday APday CCC, FAR, CR, IR, ARR	Positive effect
Anton & Nucu (2020)	**Poland** Listed firms	2007-2016 OLS FE PCSE	**ROA OROA** WKCR $WKCR^2$ DR CR SalesG Size	Concave relationship – up to optimal level positive and below optimal negative
Botoc & Anton (2017)	**13 EE countries** Fast growthing firms	2006-2015 OLS FE RE GMM	**ROA** WKCR $WKCR^2$ SalesG GDP DR CR	Concave relationship – up to optimal level positive and below optimal negative
Bjorkman & Hillergren (2014)	**Sweden** wholesale SME	2012 OLS	**GPM** CCC, dSmall, dMedium	Positive effect
Korent & Orsag (2018)	**Croatia** Software companies	2014-2020 GMM	**ROA** ROAt-1 wNOCTR wsqNOCTR	Concave relationship – up to optimal level positive and below optimal negative
El-Ansary and Al-Gazzar (2020)	**MENA (Africa)** Listed firms	2013-2019 GMM	**ROA ROE** ROA/ROEt-1 NWCR sqNWCR Size SalesGr LEV GDP	Concave relationship – up to optimal level positive and below optimal negative with ROA With ROE relationship not confirmed

Source: Authors' work based on the literature review

Most of the studies which focus on quantifying the connection between working capital management and profitability used panel data analysis, with GMM, FE or OLS estimation techniques, but their results are contradictory.

Intitial studies find statistically significant, linear and negative relationship between working capital management and profitability of large firms in Belgium (Deloof, 2003), smal and medium firms in Spain (Marchinez-Solano & Garcia-Teruel, 2006), listed firms in Greece (Lazridis & Tryfonidis, 2006), non listed firms in the United Kingdom (Goncalves, Gaio & Robles, 2018). The mentioned studies support aggresive working capital strategy.

Some authors did not find negative effect of working capital management on profitability. Barjaktarović Rakočević, Latinović & Milosavljević (2010) researching listed firms in Serbia find that cash conversion cycle (CCC) doesn't have statistically sigificat effect on profitability while days of sales and days of payables have outstanding negaive and days inventory outstanding positive effect.

Positive and linear effects of working capital management on profitability are found in small and medium production firms in Italy (Muscetolla, 2014), as well as small and medium wholesale firms in Sweden (Bjorkman & Hillergren, 2014).

Some recent studies (Gomes, 2013; Botoc & Anton 2017; Anton & Nucu, 2020; Korent & Orsag 2020; El-Ansary & Al-Gazzar, 2020) find non linear relationship between working capital management and profitability. Results of these studies imply the existance of an optimal level of working capital which maximizes a firm's profitability.

PROFITABILITY OF LARGE FIRMS IN SERBIA

In 2019 profitability of real sector in Serbia, measured by Return on Asset (ROA) was slightly disturbed compared to previous year and amounted 3,12%. According to the Statistical Office of the Republic of Serbia (2020, p. 40) the positive trend from 2014 to 2018 was interrupted in 2019. ROA was 1.56%, 2.17%, 3.43%, 3.64% and 3.12% in the period from 2015 to 2019 respectively.

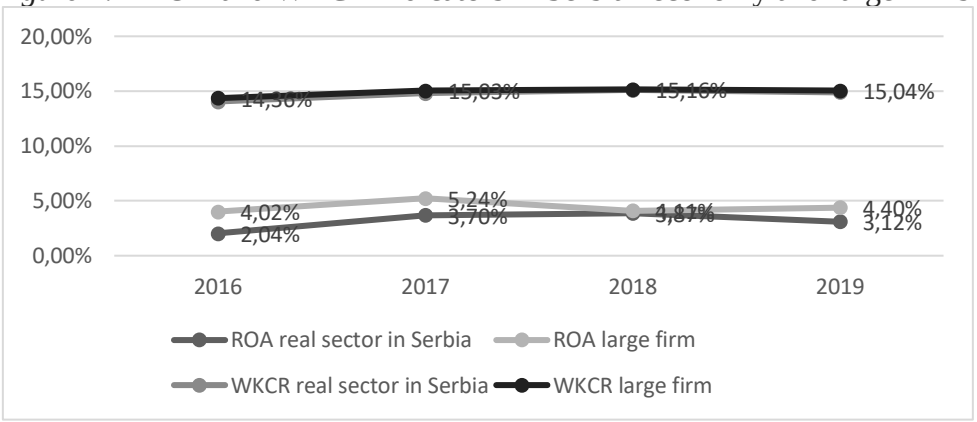
Decrease in business profitability was the main cause of decreased profitability. Similar trends are present in US economy and economies in Western Europe (Jugović, Ribić & Živanović, 2020, p. 57).

According to the Serbian Business Registers Agency [hereinafter SBRA] (2020, p. 24) large firms participate with 42.1% in total revenues in Serbian economy in 2019. Profitaility of 367 large firm in Serbia, measured by ROA varies in the observed period and are higher than average ROA of

real sector (SBRA, 2020) which can indicate that size can influence a firm's profitability.

Working capital in Serbian economy amounts to 6.3 billion dinars in 2019, mayority of current assets are invested in inventory (34%) and account for receivables (33%) which record increse comparing to the previous years of 10.2% and 11.8% respectively (SBRA, 2020, p13). Business activity is mostly financed from borrowed short term sources (69% of total assets), majority of short-term borrowings account for payable obligations (SBRA, 2020, p. 14).

Figure 1. – ROA and WKCR indicators in Serbian economy and large firms



Source: Authors' calculation based on SBRA data

Figure 1 presents comparable relationship of return on assets (ROA) and working capital ratio (WKCR) of Serbian economy and 367 large firms for the period from 2016 to 2019. Working capital ratio, analized as percentage of working capital (account receivables + inventory – account payables) and sales, on economy level is 14.72% on average, while the same ratio for large firms in Serbia is very similar and is 14.90% on average. In 2019 Serbian economy had low profitability (average ROA 3.12%) and demanded high level of working capital ratio (average WKCR was 14.91% from sales), while large firms with similar level of working capital (15.04% from sales) achieved higher profitability of 4.40%.

DATA AND METHODOLOGY

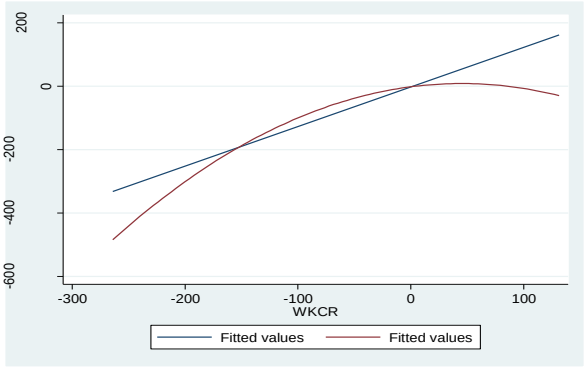
The subject of the paper is the analysis of the impact of working capital management on profitability of large firms in Serbia in a four-year period (2016-2019). The goal is to determine if the ratio of working capital to sales influences profitability of the observed firms in the presented period. The

research sample consists of active, non-financial firms with the existing financials during the period from 2016 to 2019 which are classified as large firms in 2019 according to article 6 of Accounting Law (Accounting Law, Sluzbeni glasnik RS, 2019, article 6). Large firms are firms which meet two of the following three criteria: average employee number 250, Revenue 40,000,000 euros in rsd counter value and Total Asset value on Balance date 20,000,000 euros in rsd counter value. According to Serbian Business Registers Agency data there were 415 large firms in 2019 in Serbia, but listed criteria was met by 367 firms, so the sample in this paper consists of 367 large firms. This group of companies was selected because of its importance for Serbian economy. Large firms participated in 42.1% of total real economy revenues in 2019 (SBRA, 2020, p. 24).

The data collection was done using the database SBRA. However, the final database was put together manually, computed, and constructed by the author, including manual calculation of ratios. The sample consists of 367 firms (N=367) which are studied over a four-year period (T=4) which resulted in total of maximum 1,468 observations for the basis of the study.

The selection of dependent and independent variables was based on literature analysis. Profitability is a dependent variable in this research and is usually measured by Return on Equity (abbreviated ROE) and Return on Assets (abbreviated ROA). In this research ROA is chosen. It is simple measurement of firm profitability and determines the firm's ability to generate profit based on asset management. This study will use a common and well-known measure of ROA: Return on Assets (ROA) = Net profit / Total Asset. The study is based on working capital ratio (WKCR) as an independent variable of primary interest and is defined as (Inventory + Account Receivables – Account Payables) / Sales in line with referrenced studies (Botoc & Anton, 2017; Korent & Orsag, 2018; El-Ansary & Al-Gazzar, 2020). The study analizes a variable which reflects the amount of money necessary in operating cycle, i.e. working capital ratio (Anton & Nucu 2020: Botoc & Anton, 2017), and not variable which reflects a length of time like (CCC) cash converision cycle (Marchinez-Solano & Garcia-Teruel, 2006, Bjorkman & Hillergren, 2014; Zariyawati at al., 2010).

Figure 2. – Curve estimation regression model between the level of working capital (WKCR) and profitability (ROA).



Source: Authors' calculation in STATA Statistics v.12.0

According to previous studies (Banos-Caballero, Garcia-Teruel & Marchinez-Solano, 2015; Anton and Nucu, 2020) quadratic model is analyzed. Figure 2 displays the Curve estimation regression model and shows the relationship between the level of working capital (WKCR) and profitability (ROA). We notice a non-linear (inverted U-shape) relationship, suggesting that inclusion of WKCR square in the model is necesary. This motivates the inclusion of WKCR square in the model (WKCRsq).

Based on previous studies of this model, control variables are included to improve the model and to help explaining the profitability of large firms in Serbia that are not captured by working capital. The indicator of growth potential is a one-year growth of a firm (SalesGr) which is defined as follows ((Sales $_{n+1}$ – Sales $_{n}$) / Sales $_{n}$), debt ratio (DR) which is defined as ratio of total debt and total assets, cash ratio (CR) which is defined as percentage of cash and cash equivalents to total assets. Firm size (Size) is logarithm of assets and indicates influence of Assets size to firm profitability. Growth of real gross domestic product (GDPGr) is used as external control variable and the data are taken form World Bank (World Bank data, 2021).

Results in many studies find that relationships between firm size (Size) and profitability (Anton & Nucu, 2020; Afrifa & Padachi, 2016; Mansoor & Muhammad, 2012), relationships between real growth of gross domestic product (GDPGr) and profitability (Mansoori & Muhammad, 2012; Marchinez-Solano & Garcia-Teruel, 2006; Nazir & Afza, 2009) and relationships between cash ratio (CR) and profitability (Muscetolla, 2015; Anton & Nucu, 2020; Nazir & Afza, 2009) are positive.

Debt ratio (DR) also represents a variable used in many studies to find relationships between working capital management and profitability. The results are mostly consistent - authors (Botoc and Anton, 2017; Charitou, Elfani & Lois, 2010; Marchinez-Solano & Garcia-Teruel, 2006, Gomes, 2013)

find negative relationships. Some authors (Zariyawati, Annuar, Taugiq & Sazali 2010) find that debt does not have statistically significant influence on profitability of listed firms in Malesia.

Relationship of Sales growth (SalesGr) and profitability is negative (Gomes, 2013; Pais & Gama, 2015) showing that Sales increase led to decrease in profitability when firms invest in inventory to support expected sales growth. While some authors (Mansoori & Muhammad, 2012; Charitou at al., 2010) show that the relationship between sales growth and profitability is statistically significant and positive.

Based on the results of these studies, the research hypothesis is formulated: ***Hypothesis 1:*** *There is non linear and statistically significant relationship between working capital and profitability with optimal level of working capital which maximizes profitability.*

Research approach intends to assess the relationship between working capital and profitability of the firm, takong in consideration large firms in Serbia. In statistical notation, the regression model can be described as follows:

$$\mathbf{ROA}_{i,t} = \beta_0 + \beta_1 \mathbf{WKCR}_{i,t} + \beta_2 \mathbf{WKCRsq}_{i,t} + \beta_3 \mathbf{SalesGr}_{i,t} + \beta_4 \mathbf{DR}_{i,t} + \beta_5 \mathbf{CR}_{i,t} + \beta_6 \mathbf{Size}_{i,t} + \beta_7 \mathbf{GDPGr}_{i,t} + \varepsilon_{i,t} \quad (1)$$

where: ROA – dependent variable, WKCR and WKCRsq – independent variables SalesGr, DR, CR, Size, GDPGr – control independent variables, β – regression coefficient with independent variables, ε – error term and $_i$ number of observed large companies in Serbia (i=1, …367) and $_t$ time from 2016 to 2019 (t=1, ...4).

RESULT AND DISCUSSION

The research considered the period from 2016 to 2019. The source of data are Financial Statements collected from database SBRA. However, the final database was put together manually, computed, and constructed by the author, including manual calculation of ratios.

Descriptive statistics for the sample are showed in Table 2. The table describes means, standard deviation, minimum values, and maximum values for the included variables. These variables comprise data from 1,468 observations. ROA acts as the dependent and is a central variable for answering the research question. Most theories consider that good level profitability is above 10%. Statistics show that the mean of ROA for firms included in this study is approximately 0.0444 or 4.44% which can be consider as low profitability. The mean ROA is partly reduced by the negative ratios of some observations, including lowest ROA at -0.1558 as seen in the minimum

column. The mean ROA is positively affected by the limit set on the most negative observations after adjusting for outliers in the 5th percentile. It is further reduced as an effect of limiting the max ROA value at 0.2223 after adjusting the outliers in the 95th percentile. The value for ROA is comparable with those reported for listed consumer goods firms in the MENA region 4% (El-Ansary & Al-Gazzar (2020), 5.0% for Czech, 5.1% for Slovak and 5.1% for Polish fast-growing firms (Botoc & Anton, 2017).

Average value of working capital ratio for large Serbian firms is 14.89% with standard deviation of 0.1933. Mean values of WKCR are reduced as effect of limiting maximum values to 0.5665 after adjusting outliers in the 95th percentile and are similarly positively adjusted for limiting negative outliers in the 5th percentile to -0.1942. The sales of the observed firms were in average growth by 14.26% per year, indebtedness was on the level of 62.01% and cash was on the level of 6.67% from total assets. Mean value for SalesGr is also adjusted for outliers using the Winsorize method in STATA. The pre-adjusted values can be found in Appendix 1.

Table 2. – Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA_wi	1468	.044164	.081478	-.1558831	.2223371
WKCR_wi	1468	.1489746	.1933456	-.1942392	.5665348
DR	1468	.6201953	.5471871	.0293719	8.609257
CR	1468	.0667062	.1016032	0	.9313446
Size	1468	15.54126	1.237213	10.76855	20.72844
GDPGr	1468	.0354585	.0093906	.0210116	.0449512
SalesGr_wi	1468	.142667	.2625175	-.207758	.886844

Source: Authors' calculation in STATA Statistics v.12.0

The correlation analysis reveals the trend and levels of interrelatedness between the two variables.

The Pearson correlation matrix for the variables is presented in Table 3. Analyzing the correlation matrix, all the statistically sugnificant correlations are with low intensity. In relation to ROA, there is statistically significant, positive and low correlation with working capital ratio (WKCR) and statistically significant, negative and low correlation with squared working capital ratio (WKCRsq), which is in line with the author's assumption about the negative influence of WKCR on firm profitability above optimal level. There is statistically significant, negative and moderate correlation to debt ratio (DR); significant, positive and low correlation to cash ratio (CR) and firm size (Size), positive and weak correlation to sales growth (SalesGr) while growth of gross domestic product (GDPGr) has negative impact on profitability.

Table 3. – Correlation matrix – Pearson correlation coefficient

	ROA_wi	WKCR_wi	WKCRsq	DR	CR	Size	GDP Gr	SalesGr_wi
ROA_wi	1.0000							
WKCR_wi	0.1459*	1.0000						
	0.0000							
WKCRsq	-0.1118*	-0.0379	1.0000					
	0.0000	0.1466						
DR	-0.3813*	-0.2089*	-0.0344	1.0000				
	0.0000	0.0000	0.1883					
CR	0.1730*	-0.1729*	0.0269	-0.0404	1.0000			
	0.0000	0.0000	0.0304	0.1221				
Size	-0.0791*	0.1154*	0.0364	-0.0639*	-0.2821*	1.0000		
	0.0024	0.0000	0.1632	0.0144	0.0000			
GDPGr	-0.0460	0.0038	-0.0460	-0.0098	-0.001	0.0557*	1.0000	
	0.0782	0.8858	0.0780	0.7973	0.9654	0.0330		
SalesGr_wi	0.0261	-0.0712*	0.0574*	0.0495	0.1424*	-0.1927*	-0.0484	1.0000
	0.3167	0.0063	0.0279	0.70581	0.0000	0.0000	0.0638	

Source: Authors' calculation in STATA Statistics v.12.0 Note: * Statistical significance on level of 5%.

Precondition for the usage regression model is the absence of multicollinearity between the independent variables. Although it is shown in Pearson correlation matrix, in order to test multicollinearity the author chose to construct a correlation matrix and to conduct VIF test in STATA. As there are no correlations between two variables that exceed 10 and 1/VIF is not below 0.2 (Menard, 1995) it can be concluded that there is no multicollinearity in the model.

Table 4. – VIF test of multicollinearity

Variable	**VIF**	**1 / VIF**
CR	1.15	0.872962
Size	1.13	0.888531
WKCR_wi	1.09	0.918547
DR	1.06	0.934558
SalesGr_wi	1.07	0.942994
WKCRsq	1.01	0.988394
GDPGr	1.01	0.992798
Mean VIF	1.07	

Source: Authors' calculation in STATA Statistics v.12.0

There is a problem of serial correlation (DW=1,047274), heteroskedasticity (BP Prob > F= 0,000 and F (7, 1460) = 6,95) and cross section dependence (Pasaran test = 13.959, Pr = 0.000) in the model. In line with Beck & Katz (1995) model panel-corrected standard error (PCSE) is used

to correct the level of heteroskedasticity and cross section dependence in firms.

The results of regression coefficients conducted by PCSE are presented in table 5. Dependent variable is ROA. In line with defined hypothesis, the results show non linear relationship between firm profitability and working capital. The coefficient of WKCR is postive ($\beta_{1>}$ 0) and indicates positive working capital – profitability relationship. Coefficient of its square WKCRsq is negative ($\beta_{2<}$ 0) and indicates negative working capital – profitability relationship.

Positive and negative trends, as well as optimal level of working capital which has inverted U-shape prove the research hypothesis. The results are statistically significant and consistant with the results of listed firms in Poland (Anton & Nucu, 2020), software firms in Croatia (Kornet & Orsag, 2018), fast growthing firms in 13 countries from Central, East and Southeast Europe (Botoc & Anton, 2017) SME firms in the United Kingdom (Afrifa & Padachi, 2016) and listed firms for consumer goods in MENA region (El-Ansary & Al-Gazzar, 2020). Above the optimal level, working capital has negative effect and harms firm profitability because of opportunity and financing costs.

The results of regression analysis show that the above otpimal level working capital has negative effects on profitability of the observed firms in Serbia and are consistent with recent results in other countries.

The results for the control variables show that the debt ratio (DR) has statistically significant and negative effect to profitability and are in line with Pecking Order Theory of capital structure and the results of listed firms in Poland (Anton & Nucu, 2020), listed firms in Cyprus (Charitou at al., 2010), non listed firms in the United Kingdom (Gonclaves at al., 2018), SME in Portugal (Pais & Gama, 2015) and fast growthing firms in 13 countries from Central, East and Southeast Europe (Botoc & Anton, 2017). Pecking Order Theory (Myers & Maluf 1984) indicates that internal financing leads to decreasing indebtednes and negative relationship between debt and profitability.

Growth of gross domestic product (GDPGr) has statisitically significant and negative effect on profitaility. While studies from Korent & Orsag (2018) and Banos-Caballero at al. (2010) show negative but not statisticlly significant relationship.

Cash ratio (Muscetolla, 2015; Anton & Nucu, 2020) is an important factor allowing firms to improve profitability as it has positive and statistically signifiant effect to profitability. Sales growth (SaleGr) and firm size (Size) have positive but not statistically significant impact (Mansoori & Muhammad, 2012; Charitou at al., 2010).

Table 5. – Results PCSE model

ROA_wi	**Model PCSE**		
Independent variable	**Coef.**	**Panel-corrected Std. Err.**	**P> | z |**
WKCR_wi	**.0349731**	(0.0108433)	0.001**
WKCRsq	**-4.57e-06**	(1.39e-06)	0.001**
DR	**-.0578688**	(.0100515)	0.000***
CR	**.1209495**	(.0293455)	0.000***
Size	.0027195	(.0019981)	0.173
GDPGr	**-.5333699**	(.1048582)	0.000***
SalesGr_wi	.0013999	(.0069595)	0.841
Constant	.0430995	(.0252795)	0.088
No of observations	**1468**	Wals chi2 (7)	**199.64**
R-squared	**0.3077**	Prob > chi 2	**0.0000**

Source: Authors' calculation in STATA Statistics v.12.0

Note: WKCR and WKCRsq measures working capital. Control variables are DR, CR, Size, GDPGr and SalesGr. * p< .05; ** p < .01; *** p < .001. Panel corrected standard errors are reported in brackets.

CONCLUSION

In empirical studies, conclusions for optimal relationship of working capital and profitability are not consistent. However, most recent studies confirm optimal level of working capital and nonlinear relationship. The main purpose of this study was to investigate the relationship between working capital and profitability of large non-financial firms operating in Serbia in the period of 4 years (2016-2019). The results show that managing working capital, measured by ratio of working capital in sales has statistically significant and nonlinear impact on profitability. That is implied by the fact that the relationship proved to be inverted U-shaped. The empirical results highlight that at low level working capital there is a significantly positive influence on corporate profitability. However, a further increase in working capital above its optimum level has significantly negative influence on corporate profitability trend. Managers should avoid high net investment in working capital and prevent negative effects on profitability. Generated funds should be oriented towards profitable investment opportunities. As a result of decreasing unnecessary surpluses of working capital, financial flexibility of firms will increase.

Statistically significant and positive relation has been found between cash ratio and profitability and statistically significant but negative relation

between debt ratio and GDP growth and profitability. There is no relationship between Sales growth and profitability and size and profitability. Many internal factors influence a firm's business performance and their recognitions can significantly improve the firm's performance.

Large firms in Serbia are important as they participated with 42% of total revenues in Serbian economy in 2019 and engaged 31% of employees (SBRA, 2020, p. 10). Large firms in the observed period of 4 years had an average ROA of 0.041, which means that da 4.41% of Assets is retained as net profit of the firms.

Further research might take into consideration more determinations of profitability since the value of R^2 is 0.3077, which implies that there are more important variables which have not been included in this model. Also, future research can take into consideration sectorial analysis and a longer period. As economy is influenced by Covid-19 (Corona virus), future researchers can examine the speed of adjustment and/or recovery managing working capital during financial crisis or the period of pandemic.

REZIME
UTICAJ UPRAVLJANJA OBRTNIM KAPITALOM NA PROFITABILNOST VELIKIH PREDUZEĆA U SRBIJI

Kratkoročne odluke preduzeća o obrtnom kapitalu utiču na profitabilnost i vrednost preduzeća. Cilj rada je analiza odnosa pokazatelja upravljanja obrtnim kapitalom na profitabilnost. Istraživanje je sprovedeno za period od 2016. do 2019. godine, na uzorku 367 velikih nefinansijskih preduzeća iz Srbije. Primenom metoda panel korigovane standardne greške (PCSE) ispitan je uticaj obrtnog kapitala na profitabilnost preduzeća izražene kroz ROA pokazatelj. Rezultati pokazuju da postoji statistički značajna nelinearna korelacija kod velikih firmi u Srbiji. Do optimalnog nivoa obrtni kapital ima pozitivan uticaj na profitabilnost, nakon optimalnog nivoa obrtni kapital ima negativan uticaj na profitabilnost.

Ključne reči: obrtni kapital, profitabilnost, velika preduzeća u Srbiji

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Apendix 1. – Minimum and maximum values before and after Windsorized adjustment

	All observations		Extreme values excluded	
	Min	Max	Min	Max
ROA	-2368.35	4.62747	-.155883	.222337
WKCR	-264.054	131.291	-.194239	.566535
DR	.029372	8.60926	.029372	8.60926
CR	0	.931345	0	.931345
Size	10.7685	20.7184	10.7685	20.7284
GDPGr	.021012	.044951	.021012	.044951
SalesGr	-.999479	2652.95	-.207758	.886844

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