Effect Of Working Capital Management And Solvency On Profitability: Case Of Bist Basic Metal Sector Companies

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Abstract

In this research, effect of WCM (known for optimization of liquidity and efficiency) and solvency on profitability has been analyzed for basic metal sector companies listed in BİST in 2018-2022.

This research also includes comparison of financial ratios of companies that had initial public offering in 2022 and companies that had initial public offering before 2022.

Research findings show that working capital management has positive effect on profitability, as liquidity has effect on all of the studied profitability ratios.

Solvency also has positive effect on profitability, as solvency has positive effect on ROE.

No effect of recency of initial public offering (except for account receivable turnover) has been found.

This research should not be considered as investment advice.

Keywords: Borsa İstanbul; efficiency; liquidity; profitability; solvency; working capital management

INTRODUCTION

Basic metal sector is a general name for companies in the sector of welding or refining metals from unrefined earth or waste material and emerging alloys and super-alloys. ("Basic metal production sector", n.d.)

There are some analyses on financial position of Polish basic metal companies. (Pomykalski, Bakalarczyk, & Samolejova, 2014; Pomykalski, 2016)

Pomykalski et al. (2014) suggested that US subprime crisis caused decrease in profitability and asset turnover in basic metal companies in Poland in 2009 and 2010. Pomykalski et al. (2014) also suggests that the decrease in profitability and asset turnover in basic metal sector is significantly larger than all of the manufacturing companies in Poland, Pomykalski (2016) suggest that profitability has not recovered in 2014. Pomykalski et al. (2014) suggests that there is a need for continuous analysis of financial position for basic metal companies of Poland.

In Turkey, there have been researches on financial position of basic metal sector in 2016-2020 (Yetik, 2022), a comparative research of financial performance of BİST-100 basic metal and accomodation sectors in 2017-2021 (Gürdal, 2022).

There are also researches on effect of CCC on profitability of BİST-100 companies. (Mutlu, 2019; Aygül, 2022)

Buğdaypınarı (2019) has analyzed effect of Liquidity, Efficiency and Solvency on Profitability of BİST-100 hospitatily and food&beverage companies in 2012-2017.

To our knowledge, no research on effect of WCM and solvency of BİST basic metal companies on profitability in year span 2018-2022 exists. This paper aims to fill this research gap.

Worldwide Economic Situation In 2018-2022

One of the most significant incidences between 2018-2022 is the COVID-19 outbreak. COVID-19 outbreak

- started in Wuhan in end of 2019,
- eventually spread to the world in 2020
- resulted in declaration of a pandemic in 11 March 2020. ("COVID-19 pandemic", n.d.)

"The pandemic has triggered severe social and economic disruption around the world, including the largest global recession since the Great Depression… Widespread supply shortages, including food shortages, were caused by supply chain disruptions…" ("COVID-19 pandemic", n.d., para. 4)

Effects Of Pandemic On Businesses Worldwide

Chebbi, Ammer, & Hameed (2021) found "negative relationship between COVID-19 (as measured by the daily growth in the numbers of cases and deaths) and stock liquidity, implying that the COVID-19 pandemic decreases firm liquidity." (p. 134)

According to Tarkom (2022, p. 8), pandemic "rendered firms inefficient in managing the WC [working capital]."

Tarkom (2022) also states that COVID-19 exposure causes an increase in cash conversion cycle, but firms that have more investment opportunities and deferred taxes and investment tax credit usually have lower cash conversion cycle.

Effects Of Pandemic On Turkish Businesses

The pandemic caused a spike in insolvencies in Turkish companies (Global Restructuring Trends, 2021).

According to "Global Restructuring Trends" (2021, p. 79), Turkish businesses has focused on

- "liquidity",
- "cash preservation"
- "working capital management"

as response to pandemic.

As a response to pandemic, lending institutions such as banks announced loan packs. ("Salgın Destek Kredisi Bilgi Notu", 2021)

Working Capital Management

Working capital is "part of capital (money) which is required for running day-to-day operations of a business or industry without a break." (Gupta & Gupta, 2021, p. 27)

Working capital management, ″is the ...science... of organizing a company′s short - term resources to sustain ongoing activities, mobilize funds, and optimize liquidity.″ (Sagner, 2014, p. xiii)

According to Jaworski & Czerwonka (2022), there are three theories to explain WCM and profitability: Linear negative relationship, linear positive relationship, and non-linear dependence.

Short-term financial policies may be flexible or restrictive. (Ross, Westerfield, & Jordan, 2002, pp. 648-649)

Companies that have flexible policies are expected to have larger current ratios. (Ross, Westerfield, & Jordan, 2002, p.648)

Operating Cycle

Operating cycle is "the time period between the acquisition of inventory and the collection of cash from receivables." (Ross, Westerfield, & Jordan, 2002, p. 642)

Cash Conversion Cycle

Cash conversion cycle (CCC) is obtained by subtracting accounts payable period from operating cycle. (Ross, Westerfield, & Jordan, 2002)

CCC is usually known to be negatively related with profitability. (Jaworski & Czerwonka, 2022).

In Belgian companies, there is evidence that CCC has insignificant effect on profitability. (Deloof, 2003)

In state-owned Chinese companies, CCC has shown no effect on profitability, but in non-state owned Chinese companies, CCC has negative effect on profitability. (Ren, Liu, Yang, Xiao, & Hu, 2019)

According to Aygül (2022), CCC and profitability had negative relation in BİST-100 companies in 2000-2018.

According to Vuran & Adiloğlu (2018), there is no relationship between CCC and ROA for manufacturing and merchandising companies in BİST in 2017.

Initial Public Offering

Initial Public Offering is first issue of a company's equity to "sale to the general public on a cash basis." (Ross et al., 2002, p. 557)

One of the problems during initial public offering is determining a good offering price to investors, as an overpriced offering may result in investors not investing, and underpriced offerings may result in opportunity loss due to shares being sold at a price less than their worth. (Ross et al., 2002)

According to Pastusiak, Miszczyńska, & Krzeczewski, (2016), small or medium companies that offer IPO are expected to have financial performance decline on a pace greater than large companies that offer IPO due to the fact that large companies having standard procedures.

Financial Ratio Analysis

Ratio analysis is used for making inferences on financial standing of a company (Bloomenthal, 2022), and is a crucial tool for WCM analysis. (Sagner, 2014)

Some ratios that are useful for working capital management are liquidity ratios, activity utilization ratios, and leverage ratio. (Sagner, 2014, pp. 19-21)

Liquidity

Liquidity and profitability usually have negative relation. (Szymańska & Lukoszová, 2021; Smith, 1980; Shin & Soenen, 2000)

Szymańska & Lukoszová (2021, p.137) have reported "a positive relationship between the liquidity and profitability of meat enterprises" in Poland in 2007-2018.

Miroslav, Vapa Tankosić, Miletić, & Ivaniš (2021) has found no relation between "liquidity and profitability of meat processing" (p. 792) companies of Serbia in 2016-2019.

Efficiency

Efficiency ratios are useful to evaluate the degree of success of a company utilizing the assets and resources they have. (Schmidt, 2023)

Kušter (2022) has found negative association of efficiency on ROA in manufacturing companies of Belgrade Stock exchange.

Solvency

Solvency differs from liquidity by the analysis time frame, while liquidity analyzes short-time financial position of a company, solvency analyzes long-term financial situation of a company. (Subramanyam, 2014)

There is evidence that solvency has significant positive relation to profitability in meat processing companies of Serbia in 2016-2019 (Miroslav et al., 2021)

According to Dalci (2018, p. 426), there is "inverted U-shaped relationship" between short term loans/total assets and leverage ratio and DV's ROE and ROA in listed manufacturing companies in China in 2008-2016.

Jang & Tang (2009) has found leverage and profitability to have curvilinear relationship. Jang & Tang (2009) used LTD ratio to measure leverage and ROA to measure profitability. Dalci (2018, p. 410) points that this relation found in his work and Jang & Tang (2009) may be explained by "…positive impact of financial leverage on profitability could be attributed to tax shield, whereas the negative impact might be because of bankruptcy cost, financial distress..."

Summary of previous findings on foreign stock exchanges and BİST have been compiled in Tables 1 and 2, where +: Positive relation, -: Negative relation, 0: No relation.

The findings of the researches in the literature will be considered when forming hypotheses.

Source and Nature of Data

All of the data are obtained from KAP, the companies analyzed are companies under Basic Metal Sector in years 2018-2022, which are provided in Table 3.

Research Questions

1) What are the factors influencing return on assets on basic metal companies in BİST?

2) What are the factors influencing return on equity on basic metal companies in BİST?

3) What are the factors influencing net profit margin on basic metal companies in BİST?

4) Is there a difference between performance of companies which had recent initial public offerings and companies that did not have recent initial public offerings?

Research Hypotheses

To address the research questions, following hypotheses were formed:

H1: CR and ROA has positive relationship on basic metal companies in BİST.

H2: CR and NP has positive relationship on basic metal companies in BİST.

H3: CR and ROE has positive relationship on basic metal companies in BİST.

H4: ART and ROA has negative relationship on basic metal companies in BİST.

H5: ART and NP has negative relationship on basic metal companies in BİST.

H6: ART and ROE has negative relationship on basic metal companies in BİST.

H7: APT and ROA has negative relationship on basic metal companies in BİST.

H8: APT and NP has negative relationship on basic metal companies in BİST.

H9: APT and ROE has negative relationship on basic metal companies in BİST.

H10: IT and ROA has negative relationship on basic metal companies in BİST.

H11: IT and NP has negative relationship on basic metal companies in BİST.

H12: IT and ROE has negative relationship on basic metal companies in BİST.

H13: CCC and ROA has negative relationship on basic metal companies in BİST.

H14: CCC and NP has negative relationship on basic metal companies in BİST.

H15: CCC and ROE has negative relationship on basic metal companies in BİST.

H16: LTD and ROA has negative relationship on basic metal companies in BİST.

H17: LTD and NP has negative relationship on basic metal companies in BİST.

H18: LTD and ROE has positive relationship on basic metal companies in BİST.

H19: Companies that had recent initial public offerings have lower performance than companies that did not have recent initial public offerings.

RESULTS

Both of the correlation analyses and VIF analyses show no multicollinearity, therefore all of the variables will be included in regression analysis. (See Tables 4 and 5)

Panel regression analyses for each dependent variable has been done using EViews 11.

Decision on running the model by fixed effects or OLS is made by two criteria:

- Maximizing R2, therefore maximizing explanatory power and accuracy of models.
- Results of redundant FE test.

As can be seen from Table 11, using fixed effect for both cross section and period maximizes adjusted R2 for all models, satisfying first criteria.

The redundant fixed effects test for all models for both period and cross section are significant (see Table 6), these findings from both adjusted R2 values and redundant FE tests give strong reason to continue with fixed effects model, as it will increase the explanatory power of the model and accuracy of model results.

The redundant fixed effects test for all models for both period and cross section are significant (see Table 7), satisfying second criteria.

In Table 8,

- CR has
    - positive relationship with ROA,
    - positive relationship with NP,
    - positive relationship with ROE,
- LTD ratio

  - has positive relationship with ROE,
  - does not have any relationship with ROA.
  - does not have any relationship with NP.
- ART, CCC, IT, APT does not have any relationship with ROA, NP and ROE

Therefore, relationships H1, H2, H3 and H18 are supported.

Relationships hypothesized between H4 to H17 are not supported.

According to the SPSS output (see Table 10), t value under equal variances is 0.276 and $p=0.785>0.05$. Therefore, there is no difference between 2022 IPO companies and before 2022 IPO companies in terms of ROA.

Table 11 shows only statistically significant difference ($p<0.05$) is for ART ratio.

Therefore, H19 is not supported.

DISCUSSION

From the results of research, working capital management has shown to make BİST basic metal production companies more profitable.

Companies that have more liquidity are shown to be more profitable from the research results, as current ratio has positive relation with all of the profitability ratios, which gives similar results to the PwC report "Global Restructuring Trends" (2021,p. 79) on Turkish businesses, as well as previous findings (KENDİRLİ & KONAK, 2014; Vuran & Adiloglu, 2018) in literature on BİST for different sectors, for results on Polish meat enterprises (Szymańska & Lukoszová, 2021); but contradicts results of Saudi Arabian enterprises (Eljelly, 2004), and Serbian meat enterprises (Miroslav, et al., 2021).

APT, ART, IT, and CCC has shown no effect on ROA, NP and ROE, contradicting Belgrade manufacturing companies (Kušter, 2022), Warsaw Stock Exchange firms (Jaworski & Czerwonka, 2022), giving mixed results in BİST by analysis time frames, index and sector (contradicting Aygül, 2022 on BİST-100 firms, while giving similar results to Vuran & Adiloglu, 2018), and giving similar results to Belgian nonfinancial companies (Deloof, 2003).

CONCLUSION

The results of relationships between liquidity and efficiency on profitability suggest that companies that have flexible strategy (as discussed in theoretical framework) are more

profitable, remembering that companies that have flexible strategy should theoretically have higher current ratios, and liberal credit terms. Our results have shown that selected profitability ratios of this research can be increased by increasing the current ratio; and efficiency and CCC has shown no effect on profitability, so the length of time period until receivables and inventories are realized in cash does not have any effect on profitability, so liberal credit terms may be employed. This research suggests that one of the ways to make companies more profitable is to employ a flexible strategy.

Solvency has shown positive effect on return on equity, therefore basic metal enterprises may increase their return on equity by taking out loans. This may be due to the ability of long term loans to stimulate production and operating capacities of the companies. This finding is similar to findings on Mining Companies in Indonesian Stock Exchange (Dwilaksono & others, 2010), but contradicts findings on Companies in Bucharest Stock Exchange (Vătavu, 2015); and also contradicts previous findings on BİST (Dasuki, 2016). The contradiction between this research and of Dasuki (2016) may be due to the analyzed company group (Basic Metal Sector companies vs. Manufacturing Companies in general on BİST) or the analysis time frame (2004-2013 vs. 2018-2022), and also new entrants (companies that were private in time frame of Dasuki, 2016 but went public during time of this this research)

This research is in no means an investment advice.

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Tables and Figures

Table 1

Researches on foreign stock exchanges

RESEARCH	**FINDINGS**	**RESEARCH SCOPE**	**IV**	**DV**

(Szymańska & Lukoszová, 2021)	+	Meat processing companies in Poland, 2007-2018	Quick ratio	ROA
Miroslav et al. (2021)	0	Meat processing companies in Serbia, 2016-2019	Current ratio	ROA
(Eljelly, 2004)	-	Joint stock companies of Saudi Arabia, 1996-2000		Pretax margin
(Kušter, 2022)	-	Manufacturing companies in Belgrade Stock Exchange	Inventory turnover	ROA
(Amanda, 2019)	0	Basic Chemical Sector of Indonesian Stock Exchange, 2013-2017		
(Kušter, 2022)	-	Manufacturing companies in Belgrade Stock Exchange	Accounts payable turnover	
(Amanda, 2019)	0	Basic Chemical Sector of Indonesian Stock Exchange, 2013-2017	Accounts receivable turnover	ROA

(Kušter, 2022)	-	Manufacturing companies in Belgrade Stock Exchange		
Miroslav et al. (2021)	+	Meat processing companies in Serbia, 2016-2019	LTD ratio	
(Jang & Tang, 2009)	Curvilinear	Hotels listed in NAICS, 1990-2004		
Dwilaksono et al (2010)	+	Mining companies listed in Indonesian Stock Exchange	LTD ratio	ROE
(Vătavu, 2015)	0	Companies in Bucharest Stock Exchange		
(Dalci, 2018)	Curvilinear	Manufacturing firms listed in China, 2008-2016	Leverage ratio	ROA
(Jaworski & Czerwonka, 2022)	-	Warsaw Stock Exchange firms, 1998-2016	Cash conversion cycle	
(Deloof, 2003)	0	Belgian nonfinancial companies, 1992–1996	Cash conversion cycle	Operating income

Table 2

Researches on BİST

RESEARCH	**FINDINGS**	**RESEARCH SCOPE**	**IV**	**DV**
Kuzucu (2019)	0	BİST logistics companies, 2009-2018	Current ratio	ROE
Kendirli & Konak (2014)	+	BİST food and beverage companies, 2008-2012		ROA
(Vuran & Adiloglu, 2018)	+	BİST merchandising and manufacturing companies, 2017		
(KUZUCU, 2019)	-	BİST logistics companies in 2009-2018	Leverage ratio	
(Vuran & Adiloglu, 2018)	-	BİST manufacturing and merchandising companies in 2017		
(Kendirli & Konak, 2014)	-	BİST food and beverage companies in 2008-2012		

(Dasuki, 2016)	0	Borsa İstanbul Manufacturing companies in 2004-2013	LTD ratio	
(Vuran & Adiloglu, 2018)	0	BİST merchandising and manufacturing companies, 2017	Cash conversion cycle	ROA
(Aygül, 2022)	-	BİST-100 firms, 2000-2018		Operating margin

Table 3

Basic Metal Companies Listed in KAP

NO.	CODE	IPO in 2022
1	AYES	no
2	BRSAN	no
3	BURCE	no
4	BURVA	no
5	CELHA	no
6	CEMAS	no
7	CEMTS	no
8	CUSAN	no
9	DMSAS	no
10	DOKTA	no
11	ERBOS	no
12	EREGL	no
13	ISDMR	no
14	IZMDC	no

15	KRDMA, KRDMB, KRDMD	no
16	SARKY	no
17	TUCLK	no
18	YKSLN	no
19	PNLSN	no
20	BMSTL	yes
21	BMSCH	yes
22	ERCB	yes
23	KCAER	yes

Note. Adapted from KAP, company numbers and order are changed as there are companies that had recent initial public offerings, IPO section added by author

Table 4

Correlations

		CR	ART	LTD	ROA	ROE	NP	IT	APT	CCC
CR	Pearson Correlation	1	-0.113	-.370**	.596**	.208*	.736**	-.216*	-0.037	0.18
	Sig. (2-tailed)		0.274	0.000	0.000	0.043	0.000	0.036	0.720	0.07
ART	Pearson Correlation	-0.113	1	-0.126	0.021	-0.142	-0.092	.376**	.551**	-0.00
	Sig. (2-tailed)	0.274		0.224	0.839	0.169	0.374	0.000	0.000	0.96
LTD	Pearson Correlation	-.370**	-0.126	1	-.387**	0.011	-.261*	-0.085	-.205*	-0.14
	Sig. (2-tailed)	0.000	0.224		0.000	0.918	0.011	0.415	0.046	0.17
ROA	Pearson Correlation	.596**	0.021	-.387**	1	.692**	.741**	-0.035	0.157	.269
	Sig. (2-tailed)	0.000	0.839	0.000		0.000	0.000	0.738	0.129	0.00
ROE	Pearson Correlation	.208*	-0.142	0.011	.692**	1	.444**	0.082	0.098	0.16
	Sig. (2-tailed)	0.043	0.169	0.918	0.000		0.000	0.431	0.342	0.10

NP	Pearson Correlation	.736**	-0.092	-.261*	.741**	.444**	1	-0.175	-0.048	.225
	Sig. (2-tailed)	0.000	0.374	0.011	0.000	0.000		0.089	0.641	0.02
IT	Pearson Correlation	-.216*	.376**	-0.085	-0.035	0.082	-0.175	1	.359**	-.294
	Sig. (2-tailed)	0.036	0.000	0.415	0.738	0.431	0.089		0.000	0.00
APT	Pearson Correlation	-0.037	.551**	-.205*	0.157	0.098	-0.048	.359**	1	-0.00
	Sig. (2-tailed)	0.720	0.000	0.046	0.129	0.342	0.641	0.000		0.98
CCC	Pearson Correlation	0.186	-0.005	-0.141	.269**	0.169	.225*	-.294**	-0.002	
	Sig. (2-tailed)	0.071	0.963	0.174	0.008	0.102	0.028	0.004	0.986	

Table 5

Centered VIF values

IV	Centered VIF
Constant	--
CR	1.080747
ART	1.105001
CCC	1.177454
LTD	1.185913
IT	1.279842
APT	1.165583

Table 6

R^2 and F values of OLS and FE models

	Companies	Year	Adjusted R^2	F (ANOVA)	p (ANOVA)
Model 1 (ROA)	OLS	OLS	39.70%	11.32	0.000000
	OLS	Fixed	51.40%	10.957	0.000000
	Fixed	OLS	47.80%	4.069	0.000000
	Fixed	Fixed	59.70%	5.35	0.000000

Model 2 (NP)	OLS	OLS	52.00%	17.998	0.000000
	OLS	Fixed	66.80%	16.96	0.000000
	Fixed	OLS	64.80%	7.185	0.000000
	Fixed	Fixed	71.30%	8.283	0.000000
Model 3 (ROE)	OLS	OLS	12.10%	3.166	0.007360
	OLS	Fixed	20.80%	3.48	0.000719
	Fixed	OLS	43.90%	3.63	0.000000
	Fixed	Fixed	50.76%	4.029	0.000000

Table 7

Results of Redundant FE

MODEL	EFFECT	dof	p
Model 1 (ROA)	Cross section	(22,62)	0.0391*
	Period	(4,62)	0.0004**
	Both	(26,62)	0.0008**
Model 2 (NP)	Cross section	(22,62)	0.0115*
	Period	(4,62)	0.0022**
	Both	(26,62)	0.0001**
Model 3 (ROE)	Cross section	(22,62)	0.0001**
	Period	(4,62)	0.0165*
	Both	(26,62)	0.0000**

Table 8

Results of Panel Regression Analyses (coefficients)

β	ROA	NP	ROE
CR	0.032695**	0.104934**	0.085072*
ART	0.00116	0.000143	0.008386
CCC	-4.86E-06	-3.69E-05	-0.000332
LTD	0.152246	-0.180387	1.721051*
IT	-0.003077	-0.008803	0.006635
APT	-6.27E-05	-0.000396	0.000353

Table 9

Shapiro-Wilk Test for Group 1 and Group 2

Shapiro-Wilk Test Results		
Ratio	Group 1	Group 2
	2022 IPO	Before 2022 IPO
CR	0.502	0.000
ART	0.002	0.000
LTD	0.802	0.013
ROA	0.151	0.136
ROE	0.663	0.029
NP	0.770	0.000
IT	0.096	0.000
APT	0.004	0.000
CCC	0.462	0.009

Table 10

Independent Samples t-test for ROA

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
ROA	Equal variances assumed	1.199	0.286	0.276	21	0.785	0.02005	0.07257	-0.13086	0.17097
	Equal variances not assumed			0.466	12.221	0.650	0.02005	0.04307	-0.07360	0.11371

Table 11

Comparison of Group tests and results (Nonparametric)

Test type	Ratio	p-value
Wilcoxon Rank Sum Test	CR	0.907
	ART	0.044*

	LTD	0.907
	ROE	0.725
	NP	0.907
	IT	0.138
	APT	0.725
	CCC	0.456