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Impact of Inventory Management on the Profitability of Low Technology Industry: Case of Furniture Manufacturing Industry in Bosnia and Herzegovina

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Abstract

Considering the significant effect of the furniture manufacturing sector on B&H economy, this research provides an important insight into the investigation of the relationship between the inventory management and the financial performance. This study was conducted on the Bosnian market and targeted a sample of 128 furniture manufacturing firms. Multiple regression analysis is applied in SPSS software using the audited financial statements for five years period (2014–2018). It can be concluded that the results of this research are supporting hypothesis and that there is a positive relationship between efficient inventory management and the furniture manufacturing industry's profitability. Contributions can be observed from the empirical aspect, as well as for companies in transition countries, where the paper determines the impact of liquidity on the level of profitability based on hypothesis testing and the conclusions reached can serve as guidelines for future analyzes of the level of profitability.

Keywords: manufacturing, furniture, WCC, inventory management, profitability.

1. Introduction

Does proper inventory management have a direct impact on the profitability of the company? If the previous is true for most industries, will the same hold true for a low technology sector such as the furniture manufacturing industry? The main purpose of establishing any business entity is to gain profit from its operations. The company sets certain aims and objectives of their operations that they want to meet, but achieving those goals is impossible without profit. The profitability of every company relies on the ability to handle receivables, inventories, and payables effectively. This is critical both from the point of view of liquidity and profitability. Where there is weak management of working capital, the funds can needlessly be tied up in unused cash. This would reduce the company's value, and the company will still not invest in profitable assets such as plant and equipment. It would affect the sustainability of the company. It has been shown that, in most situations, unnecessary funds are connected to inventories, which is one of the main elements of current assets. It is, therefore, necessary to handle inventories effectively to prevent excessive expenditure. A business that neglects inventory management may have to face severe long-term sustainability issues and will not succeed. A business can reduce the amount of inventory with the assistance of improved inventory management. Financial theory and practice have developed many models for monitoring financial indicators, and thus such models have gained importance for their use. Namely, based on various data and indicators, the management wants to make the right decisions about investing, financing, and savings. This applies to all branches of the economy,

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including the furniture manufacturing industry. Inventory management attracts huge attention from both researchers in the academy and the industries themselves who have realized the importance of this aspect of successful working capital management. Therefore, it is also evident that significant funds are invested in researching the various impacts of control of the inventories on the firms' accounting statements. Inventory is among the most precious assets that one firm can own since the inventory's efficient turnover generates most of a company's revenue, which ultimately leads to profit-making. The administration of inventories that must be specifically connected to their forms for several purposes is a manufacturing organization's fundamental logistic functions. The goal of maintaining stocks and WIP (working-in-progress) materials is to secure that circular production practices, economies of scale, and uncertainties associated with the frequency and scheduling volatility of deliveries are preserved and minimize seasonal effect fluctuations on production and availability. On the other hand, to ensure continuity in sales, finished products are held in stock; inability to do so causes reduced revenues and hurts the firm's fame and strategic place.

A successful inventory management strategy's fundamental goal is to provide the highest available customer experience under the constraints of the lowest realistic inventory costs. Good service is the product of buying the correct products and amount of stock at the right time. Having these right decisions rapidly increases productivity and sustainability by forecasting potential demand and growing economic holdings. Reducing the amount of stock kept at any given time has a massive effect on the capital investment that the company has to make. However, this must be weighed against the need to preserve customer loyalty by the supply of stock. This analysis is primarily intended to examine the inventory scale in the selected companies of the B&H furniture manufacturing industry, the structure and distribution of those inventories, and to assess the essence of the link between the transfer cycle and the financial performance of the company. The purpose of this research is to answer the next research question: What is the importance of the successful management of inventory? Is there a relationship between efficient inventory management and profitability of the furniture manufacturing industry in Bosnia and Herzegovina? This research paper's main contributions are to examine the relationship between inventory management and the profitability of furniture manufacturing industries in Bosnia and Herzegovina. Also, contributions can be observed from the empirical aspect for furniture manufacturing industries in Bosnia and Herzegovina, as well as for companies in other transition countries, where the paper determines the impact of liquidity on the level of profitability based on hypothesis testing and the conclusions reached can serve as guidelines for future analyzes of the level of profitability. This study was conducted on the market of Bosnia and Herzegovina and targeted furniture manufacturing companies. According to the Qualifications of activities in B&H (*Klasifikacija djelatnosti...*, 2020), this group belongs to area C of activity, area 31 Furniture production, Branch 31.0.

2. Discussion

Either overstocking and too little management or under-stocking and too much management have always been correlated with the role of inventory management (Sunday, Joseph, 2017). Inventory management directly affects revenue by triggering sales and/or reducing expenses (Awad, Jayya, 2013). Through the investigation of the literature, it is evident that most of the researchers find out that efficient inventory management has a substantial effect on the financial results of the business entities. The main focus of previous research is about the productivity of the management of working capital and. Moreover, they also pay attention to other elements of the WCM, such as accounts payables and accounts receivables (Deloof, 2003; Juan García-Teruel, Martínez-Solano, 2007). However, it is evident that researchers pay less attention to causal relationships between profitability and successful inventory management; they do that by researching the overall working capital management. Although most find that extending the days of stock ratios has a detrimental impact on financial performance (Cannon, 2008; Koumanakos, 2008; Capkun et al., 2009; Obermaier, Donhauser, 2009; Eroglu, Hofer, 2011), few of them do not confirm or find the connection ambiguous (Vastag, Whybark, 2005; Karim et al., 2018). What is also evident is that investigations of the relationship between the inventory and profitability mostly include total inventories while failing to understand their structure. As stated by (Eroglu, Hofer,

2011), the impacts of aggregated inventories' financial results are the aggregation of the impacts of distinct inventory categories. So it can be concluded that it is important to examine the effect of each inventory category individually and whole stocks. As this sector is internationally recognized as the 'growth engine, a competitive and rising manufacturing sector is crucial for growth (Meyer, Hassan, 2020). The wood industry has the greatest tradition of all in Bosnia and Herzegovina, and the results it records rank it at the very top of the B&H economy. Its potential is huge, and judging by the latest trends, it could mark the coming years. In Bosnia and Herzegovina, more than 1,400 active companies in this industry employ more than 30,000 workers with the lowest staff turnover. According to statistics, the category of wood and wood products has the largest foreign trade surplus. Apart from the fact that the wood industry of B&H has a decades-long tradition and is the oldest industry, and that it is traditionally export-oriented and environmentally friendly, it is important to emphasize that the development of the wood industry in B&H is based on the use of domestic resources and experts. Of particular importance is attracting investment in the wood processing sector and strengthening the competitiveness and productivity of wood industry companies. It must be emphasized with special respect that the industry has selfless help from the Foreign Trade Chamber of B&H. They actively communicate within the sector through the association of the wood processing industry. Also, the practice has shown that furniture designers from B&H are side by side with world designers, and there is a huge potential in this segment.

Research methodology

The specifics of the approach used to analyze the association between successful inventory management and profitability are described in this chapter. The chapter contains information on the research sample, variables, research hypothesis, and data analysis sections. For this research, a sample of 128 furniture manufacturing companies (out of 352) has been selected. The selection was based on the availability of the financial data for the period of 2014–2018. Based on that sample, data for five years, 2014–2018, will be analyzed using secondary sources (audited financial statements). Editing, classification, and tabulation of financial data obtained from the above-mentioned sources have been carried out in compliance with the research requirements. The major variables used to research the effects of efficient management of the inventory on B&H furniture production companies include the Inventory turnover in days (ITID), net operating profitability (NOP), Current ratio (CR), Size of the company (Sales), and Sale growth ratio (SGR). The independent variable is the Inventory turnover in days (ITID), and the dependent variable is the Net operating profitability (NOP). The remaining variables are control variables. In the following table, followed by a description of the relationship, the form, predicted coefficient sign and rationale or relationship between variables (dependent and independent), and control variables are presented.

Table 1. Main variables and forecasted impact on net operating profitability

Variable	Type	Expected coefficient sign	Rationale
Inventory turnover in days (ITID)	Independent	Negative	ITID \uparrow = NOP \downarrow
Current ratio (CR)	Control	Positive	CR \uparrow = NOP \uparrow
Size of the company (S)	Control	Positive	S \uparrow = NOP \uparrow

Inventory turnover in days can be seen as the average number of days a company needs to convert its inventory in sales. According to the previous research in this area, the expected relationship between ITID and NOP is negative; if inventory turnover in days comparatively decreases over a certain period of time, it will result in higher turnover in sales and an increase in NOP. The current ratio represents the company liquidity ratio, which tells the stakeholders in interest what the company's ability to close their short term obligations, or specifically those that are due within a year. When it comes to the relationship with the dependent variable NOP, the expected relationship is positive. This implies that an increase in the firm's CR or liquidity will result in a higher NOP. The company's size in this research is represented by the Sales of the company over one

accounting year. As stated in the table above, the association among the company size expressed in sales and net operating profitability is positive. An increase in S will increase NOP. Based on mentioned objectives of this study earlier, the following hypotheses were created:

H01: There is no relationship between efficient inventory management and profitability of the furniture manufacturing industry in Bosnia and Herzegovina.

H11: There is a positive relationship between efficient inventory management and the furniture manufacturing industry's profitability in Bosnia and Herzegovina. Firms more efficient in managing their inventory are expected to pose a high profitability level and vice versa.

Estimation technique (Regression analysis)

Regression analysis is used to conclude a series of random variables Y_1, \dots, Y_n , which depend on the independent variable x . Conclusions are made based on a series of paired measurements $(x_1, y_1), \dots, (x_n, y_n)$, where x_1, \dots, x_n values of the independent variable x , and y_1, \dots, y_n corresponding values of random variables Y_1, \dots, Y_n . By applying the regression model in the SPSS software, the authors will try to present empirical findings on the relationship between ITID and NOP of the selected furniture manufacturing companies in Bosnia and Herzegovina. To investigate mentioned relationship, a model that is used for regression analysis is generally presented as:

$$NOP = f(ITID, CR, S)$$

As it can be concluded from the equation above, NOP is the dependent variable of this research, and it is affected by independent/control variables ITID, CR, S.

Regression model

ITID – Inventory turnover in days negatively affects the NOP, meaning that if the number of days increases, the NOP decreases and vice versa. In this model, the coefficient is negative (-ce).

$$NOP = \alpha_0 + \alpha_1 CR_{it} + \alpha_2 S_{it} + \alpha_3 ITID_{it}$$

Where, $\alpha_0, \alpha_1, \alpha_2, \alpha_3, \alpha_4$, and α_5 are regression parameters that represent coefficients for the independent variables. Furthermore, the “i” means a number of the observations, and “t” equals the number of years.

3. Research model

The conceptual framework is presented in the figure below:

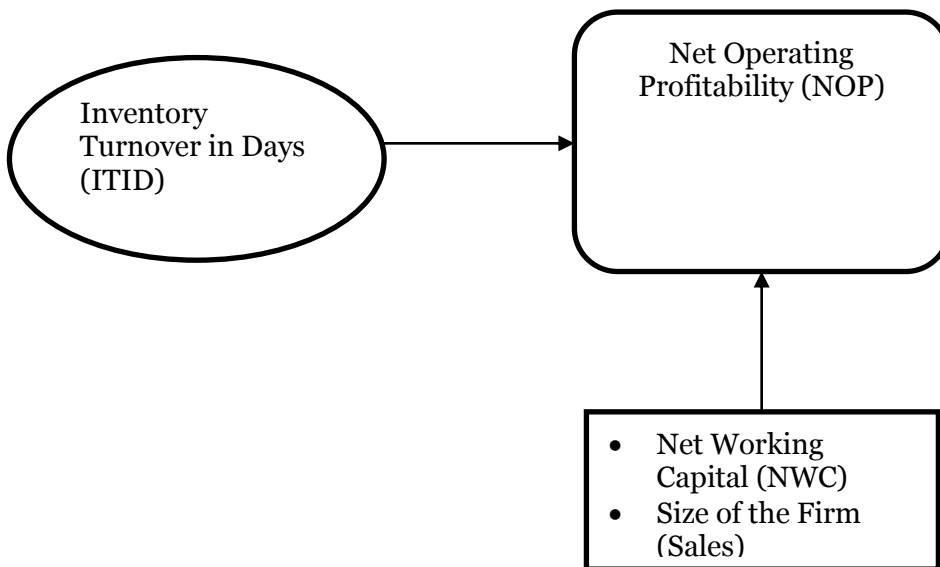


Fig. 1. Research model

3. Results and discussion

Correlation between variables

Analysis of correlation is used to determine the connection between ITID and NOP used in this research model mentioned in the first part of the manuscript to examine the path of the impact

of ITID on the financial performance of furniture production companies in Bosnia and Herzegovina. For this purpose, the authors decided to apply the Pearson Correlation coefficient to identify the association between ITID and NOP of the selected companies. As mentioned earlier in this research, if inventory turnover in days comparatively decreases over a certain period of time, it will result in higher turnover in sales and an increase in net operating profitability. The relation predicted should therefore be negative. Besides, the relationship between NOP and control variables is also determined, and ITID and control variables. This is because alteration in the ITID impacts control variables. In the following table, the estimated relationship between the two variables along with control variables is presented.

Table 2. Correlation analysis

		Correlations			
		NOP	IDIT	CR	S
NOP	Pearson Correlation	1	-.083*	.122**	.369**
	Sig. (2-tailed)		.036	.002	.000
	N	640	640	640	640
IDIT	Pearson Correlation	-.083*	1	-.034	-.119**
	Sig. (2-tailed)	.036		.391	.003
	N	640	640	640	640
CR	Pearson Correlation	.122**	-.034	1	.028
	Sig. (2-tailed)	.002	.391		.479
	N	640	640	640	640
S	Pearson Correlation	.369**	-.119**	.028	1
	Sig. (2-tailed)	.000	.003	.479	
	N	640	640	640	640
*. Correlation is significant at the 0.05 level (2-tailed).					
**. Correlation is significant at the 0.01 level (2-tailed).					

Source: Data generated by SPSS

Based on the correlation analysis of the variables used in this research, the following observations can be noted:

- The correlation between ITID and NOP is -0.083. This shows that the expected relationship between these two variables is per the expected relationship mentioned earlier. The decrease in ITID will increase the NOP and vice versa.
- The correlation between ITID and CR is -0.034. This result means that a decrease in ITID will increase CR.
- The correlation between ITID and S is -0.119. This result means that a decrease of ITID will increase S.

Multiple regression analysis

This section of the research presents empirical findings of the relationship between successful inventory management and the profitability of the furniture manufacturing companies in Bosnia and Herzegovina. As proved by other reviewed researchers in the literature review, the expected relationship between ITID and NOP should be negative. Meaning, that if inventory turnover in days decreases over a specific period of time, the net operating profitability should increase. When it comes to the control variables, their relationship is also examined, with both ITID and NOP, and it is presented in the following tables:

Table 3. Multiple regression analysis (ANOVA)

ANOVA ^b						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5,708E14	3	2,855E13	37,424	,000 ^a
	Residual	4,851E14	636	7,628E11		
	Total	8,564E13	639			
a. Predictors: (Constant), S, CR, IDIT						
b. Dependent Variable: NOP						

Source: Data generated by SPSS

When it comes to the output result of ANOVA, we can conclude that the displayed probability level of significance value is 0.000. The probability (0.000) is much smaller than 0.05, so we can conclude that the multiple regression model can be used to predict the net operating profit of the furniture manufacturing companies in Bosnia and Herzegovina. Meaning that ITID (Inventory Turnover in Days) has a significant effect on the NOP (Net Operating Profitability).

Regression SS (Sum of Squares) represents the total of the square of the difference among the anticipated value and average value of all the considered data points.

$$\sum (\hat{y} - \bar{y})^2$$

If we take a look at the output result of ANOVA, we can see that the regression SS is 5.70, and the total value of Sum of Squares is 8.56, from the mentioned it could be concluded that this regression model explains about 5.70/8.56 (approximately 67 %) of all of the variability of this set of data. Residual SS (Sum of Squares) can be defined as the sum of the variation in this model's dependent variable, unresolved by this specific regression model.

$$\sum (y - \hat{y})^2$$

Results of the ANOVA output indicate the value of the Residual SS of 4.85. The regression model describes the variation in the data set better if the Residual SS's value is lower. Researchers generally like this error to be reduced.

Table 4. Multiple regression analysis (Coefficients)

Coefficients ^a								
Model		Unstandardized Coefficients		Stand Coeffs	t	Sig.	95,0 % Conf Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	49002.280	43550.328		1.125	.261	-36517.542	134522.101
	IDIT	-58.849	60.065	-.036	-9.80	.328	-176.800	59.101
	CR	15404.239	5112.824	.110	3.013	.003	5364.181	25444.296
	S	.043	.004	.362	9.827	.000	.034	.051
a. Dependent Variable: NOP								

Source: Data generated by SPSS

Based on the SPSS analysis and the results interpreted above, we can conclude that the hypothesis of this research is accepted:

H11: There is a positive relationship between efficient inventory management and the furniture manufacturing industry's profitability in Bosnia and Herzegovina. Firms more efficient in managing their inventory are expected to pose a high profitability level and vice versa.

4. Conclusion

Various studies have studied the association between inventory control and businesses of different sizes in diverse markets. The findings obtained are very distinct because they are affected by both the market in which the corporation exists and its scale. Much of the studies into the management of working capital have been done in the most developed countries. In transition and post-transition countries, the management of working capital has been insufficiently studied. Bosnia and Herzegovina belong to the community of transition countries. As a result, the study is not sufficiently open to expanding to other transition and post-transition countries and, in particular, not to the region and, thus, to Bosnia and Herzegovina. Based on the research performed in this manuscript, it can be inferred that the results of this research applied on the ground of Bosnia and Herzegovina and specific furniture manufacturing industries are very similar to the previous investigations done in this field. As it was concluded earlier, the relationship between the inventory management expressed as ITID (Inventory Turnover in Days) and the firm's profitability expressed as NOP (Net Operating Profitability) is negative. Results stated that a decrease in ITID would increase the firm's NOP and vice versa.

The results of this study are really significant and important to be considered by furniture manufacturing firms in Bosnia and Herzegovina because a decrease in the ITID increases the profit of these companies by 0.36 %. Moreover, control variables in this study (current ratio & size of the firm) implied additional interesting results. The relationship between net operating profitability and the current ratio was found to be positive. This result leads to the conclusion that an increase in CR will lead to an increase in NOP. In other words, higher liquidity of the furniture manufacturing companies will result in higher profitability. And finally, the relation among the company size expressed in sales and net operating profitability was positive. An increase in the company's size in terms of sales will lead to a 36 % increase in the profitability of the selected companies.

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