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THE INFLUENCE OF WORKING CAPITAL MANAGEMENT ON THE PROFITABILITY OF MANUFACTURING ENTERPRISES - THE CASE OF CROATIA

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Abstract

The aim of this research is to examine the relationship between working capital management and the profitability of Croatian manufacturing enterprises and to provide empirical evidence on the effects of working capital management on the level of profitability of manufacturing enterprises in the Republic of Croatia in the period from 2018 to 2021. The collected data were analyzed through multiple regression analysis, using a panel regression model with random effects. By analyzing panel data, the impact of receivables from customers, inventories, liabilities to suppliers, sales growth and GDP growth on the profitability of Croatian manufacturing companies was examined. The analysis of panel data examined the impact of trade receivables, inventories, payables, sales growth and GDP growth on the profitability of Croatian manufacturing enterprises. The obtained results also suggest that the variables the days sales outstanding, the days inventory outstanding and GDP growth are not statistically significant.

Keywords: *working capital management, profitability, Croatian manufacturing enterprises*

JEL *classification: G32, G39*

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1. INTRODUCTION

Working capital as a part of current assets is necessary in business in order to cover current liabilities until there is an inflow of cash, respectively, until supplies or services are sold. The main objectives of working capital management are to increase the profitability of the enterprises and to ensure liquidity in order to meet due short-term obligations, and the company should manage working capital by making a compromise between liquidity and profitability. Working capital management should increase the present value of the enterprise (Shin and Soenen 1998; Deloof, 2003), where a reasonable working capital policy will increase profitability and create value for owners (Pham, Nguyen and Nguyen 2020; Prša 2020).

In daily business, it is necessary to have adequate current assets to settle current liabilities, but it is not acceptable to have too much working capital (Uremadu, Egbide and Enyi 2012) because it represents surplus cash that does not bring profit (Chakraborty 2008). Investing in working capital will pay off until its optimal size because then it will positively affect profitability, and after the optimal size is reached, the risk increases and financial difficulties may arise (Milošev 2021; Hernandez et al. 2022).

Smith (1980) was among the first to point out the importance of working capital management due to its effects on the profitability and risk of the enterprise, and accordingly on its value. After him, many other authors appeared who indicated the importance of working capital management.

In relevant studies, the Cash Conversion Cycle is used to measure the efficiency of working capital management, which represents the time when money is tied up in business activities. The Cash Conversion Cycle consists of three basic components, namely: the Days Inventory Outstanding, the Days Sales Outstanding and the Days Payable Outstanding, where the duration of the money conversion cycle is determined by adding the the Days Inventory Outstanding and the Days Sales Outstanding and subtracting the Days Payable Outstanding. In addition to these basic components, there are also some other items of working capital that can significantly affect the effective management of working capital, such as payments received on account or payments in advance. It is necessary to maintain an optimal level between the basic components (Deloof 2003), which implies a balance between risk and business efficiency (Afza and Nazir 2007).

Based on consideration of the interdependence of risk and profitability and according to risk preferences, enterprises are defined as those that implement an aggressive, conservative or moderate working capital management strategy. The characteristics of an aggressive strategy are relatively small investments in current assets, relatively high amounts of short-term financing, higher returns but also the risk (Moyer, McGuigan and Kretlow 2003). In contrast to an aggressive strategy, the characteristics of a conservative strategy are relatively large investments in current assets, relatively small amounts of short-term financing, high net working capital, lower risk and lower return (Moyer, McGuigan and Kretlow 2003). A moderate funding strategy lies between an aggressive and a conservative strategy and includes moderate investments in current assets and moderate short-term borrowing. The macroeconomic environment determines in a way which strategy the enterprise will use. If the macroeconomic environment is stable, enterprises are more inclined to apply an aggressive strategy, while enterprises that operate in an uncertain market environment are more likely to apply a conservative strategy (Baveld 2012).

The influence of working capital on the profitability of companies is more pronounced in times of crisis (Enqvist, Graham and Nikkinen 2014), which confirms the research of Fernandez-Lopez, Rodeiro-Pazos and Rey-Ares (2020), where it is stated that the most important studies (over 60%) on this topic are published after 2010.

Various studies have analyzed the relationship between working capital management and profitability of enterprises of different sizes, in different economies, using different approaches and samples from many sectors or industries The focus of research on working capital management and its impact on profitability was small and medium-sized enterprises (Peel and Wilson 1996; Garcia-Teruel and Martinez-Solano 2007; Gul et al. 2013; Afrifa 2016; Aytac et al. 2020; Prša 2020 ; Fernandez-Lopez, Rodeiro-Pazos and Rey-Ares 2020; Arnaldi et al. 2021; Hernandez et al. 2022 and others); companies listed on the stock exchanges (Opler et al. 1999; Perković 2012; Uremadu, Egbide and Enyi 2012; Iqbal and Zhuquan 2015; Mathuva 2015; Utia, Dewi and Sutisna 2018; Olaoye, Adekanbi and Oluwadare 2019; Pham, Nguyen and Nguyen 2020 ; Azzaddine and Ibrahim 2021 and others) or companies that are not listed on the stock exchange (Goncalvez, Gaio and Robles 2018).

An analysis of the literature, which comprises research that includes the analysis of working capital management in certain industries, diagnosed that the most prevalent is the manufacturing industry (Chakraborty 2008; Perković 2012; Uremadu, Egbide, and Enyi 2012; Almazari 2014; Jakpar et al. 2017; Iqbal et al. 2017; Utia, Dewi, and Sutisna 2018; Kafeel Ali et al. 2020; Aytac et al. 2020; Prša 2020; Amponsah-Kwatiah and Asiamah 2020; Hossain 2020; Golas 2020; Pham, Nguyen, and Nguyen 2020; Olaoye and Okunade 2020; Arnaldi et al. 2021; Hameer, Ramakrishnan and Gillani 2021; Fejzullachi and Govori 2021; Aldubhani et al. 2022; Kušter 2022 and others).

In the Republic of Croatia, as in the countries of the region, there is a small number of publicly disclosed papers and researches on the impact of working capital management on the level of profitability of enterprises in the manufacturing industry. A review of the scientific literature found a paper by Perković (2012) on the influence of working capital on the profitability of manufacturing enterprises in Bosnia and Herzegovina, where it was determined that the money conversion cycle, days sales outstanding, days

inventory outstanding and days payable outstanding negatively affect profitability measured by gross operating profit. Kušter (2022) on a sample of 79 enterprises from the manufacturing sector that were listed on the Belgrade Stock Exchange established a negative and statistically significant correlation between the days inventory outstanding, days sales outstanding and the days payable outstanding with the profitability indicator measured by return on assets (ROA). In the case of manufacturing enterprises in Kosovo, Fejzullachu, and Govori (2021) found a positive correlation between the days sales outstanding, days inventory outstanding and revenue growth, while a negative correlation was found between days payable outstanding and profitability indicator measured by return on assets (ROA). In Croatia, Prša (2020) analyzed the influence of working capital determinants on the profitability of small and medium-sized manufacturing enterprises, where the negative influence of inventories and payables on the level of profitability and the positive influence of the sales growth variable on profitability were confirmed, while the effect of receivables and GDP on profitability measured by return on assets (ROA) was not statistically significant.

Scientists Korent and Orsag recently gave their contribution to the scientific literature on the impact of working capital management on the profitability of Croatian enterprises from different industries. In their study of the impact of working capital management on the profitability of Croatian software enterprises, they pointed out the existence of a significant concave quadratic relationship between working capital management and profitability. They recommend the calculation of the optimal level of net working capital in relation to the total revenues of the company, where net working capital below the optimal level increases profitability, and net working capital above the optimal level causes a decrease in the profitability of the enterprise. When the net working capital is below the optimum, a conservative strategy will prevail, so an increase in the net working capital will lead to an increase in the profitability of the enterprise. An aggressive strategy will prevail at levels of net working capital above optimal, so an increase in net working capital will lead to lower profitability (Korent and Orsag 2018). They also determined a significant convex quadratic dependence between working capital management and profitability in Croatian enterprises classified in the Computer programming, consulting and related activities and recommend that enterprises, in order to increase profitability, be as close as possible to the optimal level of net working capital and avoid deviations from it (Korent and Orsag 2023).

A contribution to research in working capital management is the research conducted by Korent (2021), where the determinants of the money conversion cycle in Croatian enterprises from the processing, trading and information and communication activities for the period 2008 - 2015 are investigated, and where the emphasis is on examining the significance and the speed of the adjustment process of the money conversion cycle of the observed enterprises by activity and company size criterion (small, medium and large companies). The results of the research show that enterprises are gradually adjusting their current money conversion cycles to their targets due to adjustment costs, that this adjustment is slow and that it differs by industry and size of the enterprise.

In research on the identification of the determinants of working capital management in Croatian enterprises from the processing, trading and information and communication activities, Korent and Orsag (2022) conclude that profitability, financial constraints and working capital have a positive effect on working capital cycles and thus support a conservative working capital strategy. In contrast, the size, growth, fixed investment, annual GDP growth and industrial indicators that were significantly negative ratios of the money conversion cycle and the net trade cycle support an aggressive working capital strategy. Based on the research, the authors recommend that the analyzed enterprises use an aggressive strategy for managing working capital.

The manufacturing industry is important for creating added value and employment in the economy, for increasing the productivity of other industries, and thus for the growth of the economy and increasing its competitiveness. It is characteristic of the Croatian manufacturing industry that in the 1990s it was affected by war events, poorly implemented privatization, inadequate industrial policy and late inclusion in European and world economic integration.

The manufacturing industry is one of the most important sectors in the Croatian economy. It employs the largest number of employees (about 25%) and, along with trade, is the activity that generates the largest revenues, which make up a quarter of the income of the real sector, has the largest share in total exports (more than 80%) and contributes the most to the growth of the gross domestic product.

If we evaluate the Croatian manufacturing industry with the help of the OECD's division of industries according to technological complexity, it is characterized by the dominance of low-tech industries, where the food industry and low-medium-tech industries are especially emphasized, while high-tech industries are less represented.

The share of the Croatian manufacturing industry in the gross domestic product continuously decreased in the period from 1995 to 2021. In 1995, it amounted to 18% of the gross domestic product, in 2008 it was 15.1% of the gross domestic product, and in 2021 it was 11%. According to the data of the World Bank for the year 2021, the share of manufacturing enterprises in the gross added value in the countries of the European Union amounted to 15% in 2021, while some countries such as Ireland had a share of 35%, Germany 19% or Slovenia 20% in the gross domestic product.

The greater contribution of the manufacturing sector to the total employment of the economy than the contribution of the gross domestic product indicates the labor intensity of the Croatian manufacturing industry. In contrast to the Croatian manufacturing sector, the share of industry in the total employment decreased in the European Union countries in the past period, while its added value in the gross domestic product increased, which means that structural changes took place within the industry using knowledge and technologies of intensive activities. Investing in research and development of new technologies has a significant impact on the development of the manufacturing industry because industries with a higher technological intensity create greater added value in the economy. The role of the state is also important here, which should significantly increase investments in research and development and which, according to Eurostat data, amounted to EUR 100 per person in Croatia in 2021, while in the countries of the European Union it was EUR 250 per person and in, for example Germany EUR 470 per person or even 700 EUR per person in Norway.

On the manufacturing industry in Croatia, there are studies on, for example, its competitiveness and structural features (Rašić Bakarić and Vizek 2010; Prester and Rašić Bakarić 2017), factors affecting the level of profit (Škuflić, Mlinarić, and Družić 2016), on export competitiveness (Stojčić , Bečić and Vojinić 2012; Stojčić 2020), on the determinants of the profitability of Croatian manufacturing enterprises (Pervan and Mlikota 2013; Pervan, Pervan, and Ćurak 2019; Raguž Krištić, Družić, and Logarušić 2020), on working capital management (Prša 2020; Korent 2021; Korent and Orsag 2022). As the topic of this paper is working capital, in the following text a more detailed description of the research is provided along with the determinants of working capital in manufacturing enterprises in Croatia and in the world.

In order to study the relationship between the determinants of working capital (days inventory outstanding, days sales outstanding and the days payable outstanding) and profitability, all large Croatian manufacturing enterprises that operated in the period 2018-2021 were taken as a sample.

The paper is structured in such a way that after the introduction, the second chapter presents a literature review and research hypotheses on the determinants of working capital. The third chapter states the applied research methodology, as well as the results of the empirical research. And in the last part of the paper, the conclusion, the obtained results are synthesized and recommendations for further research are given.

The following is a review of the literature that studied the influence of working capital determinants on the profitability of enterprises from the manufacturing industry in order to propose research hypotheses.

2. Literature review and setting up hypotheses

Various studies have analyzed the correlation between the determinants of working capital and the profitability of the enterprises. However, the results are different and contradictory because they are influenced by the market in which enterprises operate, the size of the enterprise, the use of different variables for the correlation analysis, as well as different methodologies such as linear regression, correlation and multiple regression.

2.1. Business performance measurement

The scientific literature that deals with the measurement of business performance provides different conceptualizations of business performance, but does not provide an unequivocal definition of which measures would be the best in determining business performance. Business performance was observed from different academic disciplines such as accounting, entrepreneurship, strategic management and human resources management, which resulted in a multitude of indicators, either quantitative or qualitative. The analysis of business performance was traditionally based on the observation of various financial indicators, whereby non-financial indicators such as market share, customer satisfaction, achievement of strategic goals and similar were neglected.

In their research, Venkatraman and Ramanujam (1986) apply a two-dimensional classification scheme that provides different approaches to the measurement of performance in strategic research. The first dimension refers to the use of financial versus operational criteria, while the second focuses on two alternative data sources (primary versus secondary). In

addition to financial criteria that refer to the entire financial operation based on data from accounting and that measure economic performance such as increase in sales and profitability, operational criteria such as customer and employee satisfaction, product quality, market share or new product development also affect the increase in financial performance.

Using operational criteria in their research, Gonzalez - Benito and Gonzales Benito (2005) suggest their use in the field of marketing and management, considering that they are more flexible and reliable than financial criteria, that they can be used in the absence of financial criteria (Dess and Robinson 1984) and, according to Ittner and Larcker (2003), most enterprises failed to connect the effects of customer loyalty or employee satisfaction with the financial result achieved.

The modern information age requires enterprises to create future value by investing in customers, employees, business processes, technology and innovation (Kaplan and Norton 1992). New methods that supplement financial data of past performance with factors of future success with the help of set goals and strategies such as the Balanced Scorecard method or Value Based Management indicators that are better for monitoring the profitability of enterprises on the capital market appear in the research. Research by Debuska and Crabtree (2006) and Hoque (2014), which showed conflicting results in assessing the effectiveness of the Balanced Scorecard method, showed that it is necessary to continue conducting empirical research in order to determine the effectiveness of the methods.

Accounting performance measures due to the use of different accounting policies and a number of management objectives limit the reliability of accounting information as a reliable indicator of business performance. Despite their potential shortcomings, they provide a valuable source of information on business performance and provide a basis for management and business decision making (Brozović, Sever Mališ, and Žager 2019). In terms of financial analysis, the profitability ratio is important for a complete business analysis (Subramanyam and Wild 2009), and the most commonly used indicators are return on assets (ROA), return on capital (ROE), net profit margin (Žager et al. 2017), EBIT and EBITDA (Brozović, Sever Mališ, and Žager 2019).

The scientific literature does not provide an unequivocal definition of which measures would be more appropriate when determining the level of business performance of an enterprise. Ittner and Larcker (2003), Ogunsiji and Ladanu (2017) and Korent (2021) believe that business performance should be observed using financial and non-financial data, Korent and Orsag (2018) and Korent and Orsag (2023) recommend the use of a quadratic relationship in research, while Bukvić (2016) states that no measure of enterprise performance is ideal.

In the researches, many substitute indicators were used to measure the profitability of the enterprise, such as return on assets ROA, return on equity ROE (Wang 2002), return on capital employed ROCE (Edi et al. 2010; Hogerle et al. 2020) and cash conversion cycle (Perković 2012; Banos-Caballero, Garcia-Teruel and Martinez Solano 2014; Golas 2020; Aytac et al. 2020; Olaoye and Okunade 2020).

The dependent variable that is most often used to measure profitability is return on assets ROA (Garcia-Teruel and Martinez-Solano 2007; Uremadu, Egbide, and Enyi 2012; Gul et al. 2013; Enqvist, Graham, and Nikkinen 2014; Iqbal, et al. 2017; Pham, Nguyen, and Nguyen 2020; Amponsah-Kwatiah and Asiamah 2020; Fernandez-Lopez, Rodeiro-Pazos, and Rey-Ares 2020; Hossain 2020; Golas 2020; Kafeel Ali et al. 2020; Hameer, Ramakrishnan and Gillani 2021; Kušter 2022 and others). Different variables are used to calculate return on assets (ROA) indicator. For example, Pham, Nguyen and Nguyen (2020) and Fejzullahu and Govori (2020) calculate return on assets ROA as the ratio of net profit to total assets, while Fernandez-Lopez, Rodeiro-Pazos and Rey-Ares (2020) and Prša (2020) calculated it as the ratio of earnings before interest and taxes (EBIT) to total assets.

In this research, as a measure of profitability was used the rate of return on assets (ROA), which shows how much profit is made from used assets, regardless of how much was financed from own sources and how much from other sources. Operating profit or earnings before interest and taxes (EBIT) was used in the calculation in order to avoid the impact of taxes on the operating result and to better compare indicators between countries.

Korent and Orsag (2018) emphasize that a problem of bias may arise because different variables are used in working capital testing models, but also that deliberately avoiding a certain variable can affect the result.

2.2. Days inventory outstanding and the profitability of manufacturing enterprises

The days inventory outstanding shows the average time from the ordered material to the further sale to the customer, respectively the time the goods are kept in the warehouse, where it is desirable to keep the stock as short as possible. The goal of

inventory management is to ensure sufficient inventory to ensure continuity of production and reduce inventory holding costs (Brigham and Houston 2009). In the research conducted by Uremadu, Egbide and Enyi (2012), Olaoye, Adekanbi, and Oluwadare (2019), Amponsah-Kwatiah and Asiamah (2020), Kafeel Ali et al. (2020), Pham, Nguyen, and Nguyen (2020), Alvarez, Sensini, and Vazquez (2021), Azzaddine and Ibrahim (2021) and Fejzullahu and Govori (2021), a positive correlation between days inventory outstanding and profitability of manufacturing companies was found, while Perković (2012), Seyoum, Tesfay and Kassahun (2016), Iqbal et al (2017), Aytac et al. (2020), Golas (2020), Hogerle et al. (2020), Hossain (2020), Fernandez-Lopez, Rodeiro-Pazos, and Rey-Ares (2020), Kayani, De Silva and Gan (2020), Prša (2020), Arnaldi et al. (2021), Hameer, Ramakrishnan and Gillani (2021) and Kušter (2022) found a negative correlation between the observed variables. But there were also authors who failed to find any significant correlation between inventory and profitability, for example Olaoye and Okunade (2020).

Due to the different results on the influence of the days inventory outstanding on the profitability of manufacturing enterprises obtained in previous studies, the following hypothesis was set:

H1: There is a significant and negative impact of the days inventory outstanding on the profitability of enterprises in the manufacturing industry

It is expected that a longer time of inventory retention in the warehouse will affect the decrease in the profitability of the enterprise.

2.3. Days sales outstanding and the profitability of manufacturing enterprises

Trade receivables represent the amount of money owed to the company by customers who purchased goods or services, while days sales outstanding represent the period in which the company will charge for the sold goods or services. There are different findings about the impact of receivables on the profitability of the enterprise. Most studies show a negative correlation between receivables and the profitability of enterprises from the manufacturing industry, such as Perković (2012), Iqbal et al (2017), Hossain (2020), Goncalvez, Gaio, and Robles (2018), Hameer, Ramakrishnan, and Gillani (2021), Kušter (2022). But there were also authors who, in their research, determined a positive correlation between days sales outstanding and the profitability of enterprises in the manufacturing industry, such as Jakpar et al. (2017), Golas (2020), Amponsah-Kwatiah and Asiamah (2020), Pham, Nguyen and Nguyen (2020), Fejzullahu and Govori (2021), Alvarez, Sensini, and Vazquez (2021). Some authors failed to find any significant correlation between receivables and profitability in their research, such as Kayani, De Silva and Gan (2020), Olaoye and Okunade (2020), Prša (2020), Arnaldi et al. (2021).

Due to the different results obtained in previous studies on the influence of the days sales outstanding on the profitability of manufacturing enterprises, the following hypothesis was put forward:

H2: There is a significant and negative influence of the days sales outstanding on the profitability of the enterprises from the manufacturing industry.

It is expected that the slower collection of receivables from customers will affect the decrease in the profitability of the enterprise.

2.4. Days payable outstanding and the profitability of manufacturing enterprises

Days payable outstanding show the average time from receipt of a supplier's invoice to settlement of the debt in days. Mathuva (2015), Goncalvez, Gaio and Robles (2018), Amponsah-Kwatiah and Asiamah (2020), Hogerle et al. (2020), Hossain (2020), Kafeel Ali et al. (2020), Kayani, De Silva and Gan (2020), Pham, Nguyen and Nguyen (2020), Golas (2020) and Alvarez, Sensini and Vazquez (2021) found a positive correlation between the days payable outstanding on the profitability of manufacturing enterprises, while Perković (2012), Uremadu, Egbide and Enyi (2012), Seyoum, Tesfay, and Kassahun (2016), Iqbal et al. (2017), Fernandez-Lopez, Rodeiro-Pazos, and Rey-Ares (2020), Prša (2020), Arnaldi et al. (2021), Fejzullahu and Govori (2021) and Kušter (2022) found a negative correlation between the days payable outstanding and profitability. Some authors failed to find any significant correlation between the days payable outstanding and the profitability of the enterprise (Hameer, Ramakrishnan and Gillani 2021).

Due to the different results obtained in previous studies on the influence of the days payable outstanding on the profitability of manufacturing enterprises, the following hypothesis was put forward:

H3: There is a significant and positive influence of the days payable outstanding on the profitability of enterprises from the manufacturing industry.

It is expected that a longer period of time for payment of liabilities to suppliers will affect the profitability of the enterprise.

Two control variables were also applied in the research. The first control variable is sales growth, where the control variable is business income according to Kayani, de Silva and Gan (2020), Pham, Nguyen, and Nguyen (2020), Prša (2020), Fejzullahu and Govori (2021). In the research, they found a positive correlation between the growth of the company's sales and the level of profitability, and the research in this paper wanted to verify this on a sample of Croatian manufacturing enterprises, so the following hypothesis was put forward:

H4: There is a significant and positive influence of the growth of company sales on the level of profitability of enterprises from the manufacturing industry.

It is expected that the increase in sales will affect the increase in the level of profitability of the enterprise.

The second control variable is GDP, where the percentage of GDP growth in the current year compared to the previous year is used for the GDP variable, which is expressed as a decimal number. The deterioration of macroeconomic conditions in the country can affect the level of profitability of the enterprise, so GDP was taken as the control variable according to Garcia-Teruel and Martinez-Solano (2007), Enqvist, Graham and Nikkinen (2014), Mathuva (2015), Soukhakian and Khodakarami (2019), Prša (2020).

Deterioration of macroeconomic conditions affects the collection of receivables in enterprises. Then enterprises have a reduced ability to generate money from their operations, and banks reduce the offer of loans to enterprises, which results in an increase in days sales outstanding. Accordingly, it can be concluded that the changes in the economic conditions in the country affect profitability. In their research, Enqvist, Graham, and Nikkinen (2014) showed that the relationship between customer receivables and the level of the profitability of the enterprises is different during economic crises and economic growth and also that during economic crises working capital management is of great importance. Garcia-Teruel and Martinez-Solano (2007) find a positive correlation between trade receivables and economic growth, but the economic impact of this variable is limited. Soukhakian and Khodakarami (2019) found in their research that GDP is positively correlated to the return on assets indicator (ROA), while Prša (2020) found that it is not statistically significant. Based on the statements above the fifth hypothesis was defined, which states that:

H5: There is a significant influence of GDP on the level of profitability of enterprises from the processing industry.

A significant influence of GDP on the level of profitability of the enterprise is expected.

3. Research

3.1. Methodology

Research on the impact of working capital management on the profitability of manufacturing enterprises began with descriptive statistics, followed by a correlation between the variables in the model, namely ROA profitability indicators, independent variables: inventories, receivables and liabilities, as well as control variables: business income and GDP. Finally, a panel regression model was used to examine the influence of receivables, inventories, payables, sales and GDP growth on the profitability of manufacturing enterprises in the Republic of Croatia. The manufacturing sector, along with trade, is the most important sector in the Republic of Croatia, where 25% of all employees are employed and which participates in the total acquired added value with 25.9%.

The analyzed companies are classified in area C - Manufacturing activity according to the National Classification of Activities, which is harmonized with European standards, respectively, it corresponds to the NACE Rev.2 classification.

3.1.1. Sample description

The subject of the research are Croatian manufacturing enterprises which, according to the Croatian Accounting Act (Official Gazette 2016), are defined as large companies, respectively, those that exceed two of the following three conditions: total assets of HRK 150 million, total revenue of HRK 300 million and the average number of employees during the business year year is 250. For the purposes of this paper, a research was conducted on a sample of all large companies in Croatia that operated in the period from 2018 to 2021 (124 companies) and that create 51.5% of the added value of the manufacturing industry and employ 40% of the manufacturing industry's employees. The data was collected from the Register of Annual Financial Statements from the Internet pages of the Financial Agency, to which entrepreneurs submit their annual financial statements.

3.1.2. Data and variables

In research on the influence of working capital on profitability of the enterprise, profitability is measured as a dependent variable through the return on assets indicator (ROA), which is defined as the ratio of operating profit or EBIT (Earnings Before Interest and Taxes) to total assets. Days sales outstanding period is an independent variable and is defined as the average time it takes for receivables to be converted into cash. The second independent variable is days inventory outstanding, which represents the average time it takes to convert materials into finished goods and then to sell those goods. The next independent variable is days payable outstanding which shows the average time between the purchase of materials and labor and the payment of cash for them. The control variables are business income and GDP. The business income variable is a monetary variable that has been converted into its natural logarithm, thus normalizing the distribution (Ford 2018).

The dependent, independent and control variables used in the model are described in Table 1.

3.2. Results of empirical analysis and discussions

3.2.1. Descriptive analysis

The analysis began with descriptive statistics showing for all variables their arithmetic mean, standard deviation, their minimum and maximum values, interquartile ranges, as well as the total number of observations. The research included 124 large enterprises from the manufacturing industry over four years.

The results of the descriptive statistics are shown in Table 2.

Table 1. Variables with full name, abbreviations and explanation

	Variable	Abbreviation	Explanation
Dependent variable	Return on assets	ROA	the ratio of the difference between business income and business expenses (EBIT) to average total assets expressed as a decimal number
Independent variables	Days sales outstanding	DSO	the ratio of the number of days in a year to the receivables turnover
	Days inventory outstanding	DIO	the ratio of the number of days in a year to inventory turnover
	Days payables outstanding	DPO	the ratio of the number of days in a year to the turnover of payables
Control variables	Business income	BI	logarithm of business income
	Gross domestic product	GDP	the percentage of GDP growth in the current year compared to the previous year, expressed as a decimal number

Source: Made by the authors

Table 2. Descriptive statistics

Statistic	N*	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
ROA	496	0.1	0.1	-0.5	0.02	0.1	0.7
DSO	496	40.0	34.7	0.001	14.8	58.1	229.5
DIO	496	69.4	60.6	0.01	29.0	90.4	415.3
DPO	496	41.1	45.4	0.04	22.1	51.4	572.6
BI	496	$708 \cdot 10^6$	$1833 \cdot 10^6$	$67 \cdot 10^6$	$246 \cdot 10^6$	$653 \cdot 10^6$	$22 \cdot 10^9$
lnBI**	496	19.8	0.8	18.0	19.3	20.3	23.8
Rast GDP	496	2.1	6.6	-8.1	-8.1	3.5	10.2

Source: Made by the authors

*124 enterprises were observed over 4 years. That amounts to 496.

**Only BI is logarithmized, because it is the only variable expressed in absolute numbers. The other variables are relative numbers and are therefore not logarithmized.

The results of descriptive statistics show that the average profitability indicator of return on assets ROA is 0.10 and that there is a large deviation from the average indicator of return on assets ROA among large enterprises from the manufacturing industry in Croatia. The average business income of large companies in Croatia is HRK 708 million (about EUR 94.5 million), with a very large deviation from the average.

The collection of receivables of large enterprises from the manufacturing industry takes an average of 40 days, with 25% of large companies collecting their receivables in less than 15 days. The average days inventory outstanding are about 70 days, while in 25% of enterprises it is shorter than 29 days, in 25% it is longer than 90 days, and in some enterprises it is even about 400 days. In large enterprises, the average days payables outstanding are 41 days, which is almost equal to the days sales outstanding. There is a large discrepancy between enterprises in the days payables outstanding, ranging from 1 to about 570 days. The average growth of GDP in the period from 2018 to 2021 is 2.1%.

3.2.2. Correlation analysis

The paper examined the correlation between the variables in the model and the results are shown in Table 3.

Correlation analysis showed that there is no statistically significant correlation between profitability indicator of return on assets (ROA) and days sales outstanding. Kafeel Ali et al. (2020) and Prša (2020) found a weak negative correlation between profitability indicator and the days sales outstanding, while Kušter (2022) and Hossain (2020) found a negative and statistically significant correlation between profitability and receivables. As expected, the research found a statistically significant negative, but weak correlation between the indicator of return on assets (ROA) and the days inventory outstanding ($r = -0.12$, $p < 0.05$). The result is in accordance with the results obtained by Kušter (2022) and Prša (2020). Seyoum, Tesfay and Kassahun (2016) and Golas (2020) also found a significant and negative correlation between profitability and the days inventory outstanding.

A statistically significant negative weak correlation between return on assets (ROA) indicator and days payables outstanding was determined ($r = -0.24$, $p < 0.01$). The results are in accordance with the results obtained by Seyoum, Tesfay, and Kassahun (2016), Kušter (2022), Prša (2020). The results of the research in this paper on the correlation between the return on assets (ROA) indicator and the days payables outstanding are not expected. It would be expected that the longer the enterprise extends the time of payment of liabilities to suppliers, the more opportunities it has to increase working capital, which affects the profitability of the enterprise. The results obtained in the research show that a longer period of payment of liabilities to suppliers affects the decrease in profitability. This leads to the conclusion that enterprises did not take advantage of the possibility of delaying the payment of their liabilities to improve their sales because they were most likely in financial difficulties and were late in paying their liabilities, which created additional costs for them such as default interest.

A statistically significant, medium-strong positive correlation between the independent variables of the days inventory outstanding and the days payables outstanding was determined ($r = 0.28$, $p < 0.01$).

Correlation analysis showed a statistically significant weak positive correlation between the return on assets (ROA) indicator and the logarithm of business income ($r = 0.15$, $p < 0.01$), which is in accordance with the results obtained by Iqubal et al. (2017) and Golas (2020). The business income variable, measured by

Table 3. Correlation matrix

	ROA	DSO	DIO	DPO	lnBI
ROA					
DSO	0.00				
DIO	-0.12**	-0.03			
DPO	-0.24***	0.05	0.28***		
lnBI	0.15***	-0.11*	-0.25***	-0.19***	
GDP growth	0.00	-0.03	-0.05	-0.02	0.92***

*p< 0.1, **p< 0.05, ***p< 0.01

Source: Made by the authors

the natural logarithm, is statistically significantly correlated to all variables. While this correlation is positive with the return on assets (ROA) indicator, there is a negative, albeit weak, correlation with the independent variables days sales outstanding, days inventory outstanding and days payables outstanding. The expected results show a negative correlation between the return on assets (ROA) indicator and the days sales outstanding and the correlation between the return on assets (ROA) indicator and the days inventory outstanding.

A statistically significant strong positive correlation between the logarithm of business income and GDP growth was determined.

3.2.3. Multiple regression

For data analysis, a multiple regression model was used, namely a panel regression model with random effects, since the Hausman test for a panel regression model with fixed effects did not give significant results ($p<0.05$). The Hausman test in the panel regression model with random effects gave the result shown in Table 4.

Table 4. Hausman test of the panel regression model with random effects

Chi-sq	P-value	Method
1.991	0.574	Hausman Test

Source: Made by the authors

A panel regression model with random effects can be represented by the expression:

$$ROA_{it} = \mu + \beta_1 \cdot DNP_{it} + \beta_2 \cdot DVZ_{it} + \beta_3 \cdot DPOD_{it} + \beta_4 \cdot PP_{it} + \beta_5 \cdot BDP_t; \quad i = 1, \ldots N, t = 1, \ldots T$$

Table 5 shows the results of regression with random effects in three models.

The overall model fit as measured by R^2 is extremely low and close to 0.05 in all three cases. In other words, the model does not seem to explain a large proportion of the variance in the dependent variable. Furthermore, the results suggest that two of the three independent variables (days sales outstanding and days inventory outstanding) are not statistically

Table 5. Panel regression with random effects

	Dependent variable:		
	ROA		
	(1)	(2)	(3)
DSO	-0.00001 (0.0001)	0.00003 (0.0001)	0.00002 (0.0001)
DIO	-0.0001 (0.0001)	-0.00001 (0.0001)	-0.00001 (0.0001)
DPO	-0.0003*** (0.0001)	-0.0003*** (0.0001)	-0.0003*** (0.0001)
lnBI		0.026*** (0.008)	0.027*** (0.008)
GDP			-0.0003 (0.0004)
Constant	0.083*** (0.010)	-0.446*** (0.153)	-0.459*** (0.154)
N	496	496	496
R^2	0.030	0.052	0.053
Adjusted R^2	0.024	0.044	0.043
F statistic	15.503***	27.270***	27.695***

*p< 0.1, **p< 0.05, ***p< 0.01

Source: Made by the authors

significant in any of the three models shown in Table 5. Olaoye and Okunade (2020) reached the same results on a sample of manufacturing enterprises listed on the stock exchange in Nigeria, while Prša (2020) found in her research that the effect of receivables on profitability is not statistically significant.

However, the variable days payables outstanding is highly statistically significant with an unchanged correlation coefficient of -0.0003 and statistical significance $p< 0.01$. The result shows that extending the term of payment to suppliers by 1 day results in a decrease in the return on assets (ROA) indicator by 0.0003%. The results are consistent with the results obtained by Kušter (2022).

The introduction of the natural logarithm of business income in models 2 and 3 does not contribute to a major change in the overall result. The logarithm of business income is a statistically significant variable ($p< 0.01$) in both models (2 and 3). The results show that each increase in business income by, for example, 5% results in an increase in ROA by 0.0013%. The results of the natural logarithm of business income (0.026 and 0.027) were recalculated according to Ford (2018). Kayani, de Silva and Gan (2020), Pham, Nguyen and Nguyen (2020), Prša (2020); Fejzullahu and Govori (2021) also determined a positive correlation between the growth of company sales and the level of profitability in their research.

With the introduction of the GDP variable the model remains almost unchanged. GDP has no influence on the return on assets (ROA) indicator because the coefficient is not statistically significant, which is in accordance with the research conducted by Prša (2020).

4. Conclusion

Effective working capital management implies ensuring the successful business activity without endangering its liquidity, where it is important to maintain an optimal balance between the determinants of working capital: the days sales outstanding, the days inventory outstanding and the days payables outstanding. The working capital management method, on the one hand, affects the liquidity and security of the business activity, and on the other hand, the profitability and the business risk (Shin and Soenen 1998). Various studies have analyzed the relationship between working capital management and profitability of enterprises of different sizes in different economies. Different results were obtained because they are influenced by the market in which companies operate and different substitute indicators are used to measure profitability, as well as different methodologies such as linear regression and multiple regression.

For the purposes of this paper, research was conducted on a sample of all large enterprises in the Republic of Croatia that operated in the period from 2018 to 2021 (124 enterprises). The collected data were analyzed using descriptive statistics, correlation analysis and multiple regression analysis - a panel regression model with random effects. The panel data analysis examined the impact of receivables, inventories, payables, sales growth and GDP growth on the profitability of Croatian manufacturing enterprises.

According to the research results, the model determined a statistically significant and negative influence of the variable days payables outstanding on the level of profitability of the enterprise, while the correlation method of the mentioned variables established the existence of a statistically significant weak negative correlation between the indicators of return on assets (ROA) and days payables outstanding.

The results obtained from the research show a significant positive impact of the sales growth on the level of profitability, as well as a significant weak positive correlation between the indicators of return on assets (ROA) and sales. The obtained results imply that the variables days sales outstanding, days inventory outstanding and GDP growth are not statistically significant.

This research has shown that enterprises in the manufacturing sector can increase their profitability by paying their obligations to suppliers on agreed terms by using the amounts of rebates they receive from the supplier for short-term investments in, for example, the production of more products. Payment in the agreed term will not create additional costs such as default interest. Enterprises can also increase their profitability by increasing sales.

The conducted research expanded the knowledge about working capital management, where the research results provide a scientific contribution to economic sciences in a theoretical and applied sense. It expands the knowledge of previous analyzes on the topic of working capital management and profitability of enterprises in general, and particularly from the manufacturing industry, published in the SEE European Journal of Economics and Business. The scientific contribution of the research is already reflected in the review of previous research on working capital management in one of the most important sectors of the economy, and the research conducted in this paper determined that the days inventory outstanding, the days sales outstanding, the days payables outstanding, sales growth and GDP growth all affect the profitability of manufacturing companies. The

research results will be useful to policy makers and business management when making decisions on improving the financial performance of enterprises.

This paper initiates further research that could cover a larger number of sectors, research on enterprises from other countries and combined qualitative and quantitative research.

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