DETERMINANTS OF FIRM PROFITABILITY IN CROATIA'S MANUFACTURING SECTOR

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Abstract: *This paper investigates determinants of the profitability of industrial firms in Croatia, using data for large, medium and small companies for the period 2003-2014. This paper provides a broad theoretical review of the determinants of profitability analysed in economic literature with special remarks on firm level determinants, and explanation of most used variables such as size of firm, revenues, growth rate of revenues, sales, profit in previous years, ownership, productivity level, financial leverage, cost of inputs, indebtedness. Results from the panel ordinary least squares model for Croatia's manufacturing sector reveal a positive and statistical significant relationship between profitability, total factor productivity, and concentration measured through Herfindahl-Hirschman index. On the other hand, indebtedness and liquidity show a negative relationship with the firm profitability of Croatia's manufacturing sector.*

Keywords: *Profitability, Determinants, Manufacturing Industry*

JEL Classification: D22, L10

1. Introduction

Manufacturing industry represents a significant base for the long-term economic growth and development of each nation's economy, especially when it comes to a small country which has to focus on foreign markets during its process of development. A strong industrial base, export-oriented, competitive in the international market, represents an economic objective of both developed and less developed countries. It is evident that the countries, which are in the process of its economic development, exceed from being industrial countries into being service countries, that is, after a certain degree of achieved economic development, industrial sector is being replaced by the service sector. Accordingly, and in the EU, there has been a reduction in the share of manufacturing industry in the gross domestic product, which, in the economic literature, is known as the process of de-industrialization.[1]

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1   De-industrialization began in the mid-60s in the US and copied to Europe, and its manifestations are reflected in reduced number of employees in the manufacturing industry as a result of increased productivity and decrease in demand towards this segment of the economy.

Reduction in the share of the manufacturing industry in total national production, regarding the number of employees, was affected by the changes in demand, increased productivity and dynamics in trade.

The share of the manufacturing industry varies from country to country, ranging from 5.2% in value added GDP (Luxembourg, the year of 2013) to 22.2% (Germany, in 2013). Following the trend line in the manufacturing industry since 1970 to this date the shares have continuously declined in the European countries. In France, the share fell from 22.3% (1970) to 11.3% (2013), while significantly smaller decrease was recorded in Germany, from 27.8% (1970) to 22, 2% (2013). The country which recorded the largest decline in the share of value added in GDP is Luxembourg, where the share dropped from 41.5% (1970) to 5.2% (2013) (www.unctad.org).

If the process of de-industrialization is to be observed from the of micro-entity aspect, then it may be due to the slower growth of those companies in relation to companies of the service sector. The cause for the slower growth lies both on the supply and the demand side. The company, like any other living organism has its path, from starting point to death, during which some companies grow faster, some slower, and some stagnate. Length of the company's existence on the market is also individual and depends on the degree of adaptability to the environment. Companies that produce products with higher demand, achieve faster growth rates, and with the proper cost management they preserve better financial results, which then allow them a higher investment rate and investment in the production process technology. This simple explanation of profitability circle and company's existence on the market, can be viewed from the Firm`s Theory aspect. The level of profitability depends on the ultimate goal of a business entity.

Firm`s Theory, observed through prism of neoclassical school of economics, focuses on the production aspect, specifically on transformation of inputs into outputs, for which a level of technology and market environment, in which entities work, are important in terms of pricing and volume of production, and the market plays an important role on the output side in the design of consumer behaviour. The neoclassical theory company is based on market analysis models of perfect and imperfect competition, and within these other market structure on the analysis of oligopoly and monopoly, and monopolistic competition. The neoclassical theory company believes that the company is also the entrepreneur who is at the same time unified function of owner and manager, and whose main goal is to maximize profit, or to achieve maximum possible difference between total revenue and total costs. An entrepreneur makes the decision on how many inputs to be employed in order to achieve the planned level of production, taking into consideration the price of inputs and output prices on the market. Hence, in the basis of neoclassical theory, property and institution have no influence on the company's goal, as well as on the amount of knowledge, technology and cost-effectiveness (as summarized set of production capabilities). For each level of output, the entrepreneur determines that quantity of input that will minimize the expenses, but only output, through which the maximum profit is achieved, is considered to be the balanced level of production, which presents the rational behaviour of entrepreneurs.

Generally, by reducing the agriculture share, country carries out a higher level of national income and fewer people are employed in that sector, while the employment in the industry increases and so its share in value added, which gives way to the service sector after a certain stage. This process is associated with the reallocation of resources from less to more effective productions which implies structural changes.

All mentioned provides importance of profitability determinants for firm` performance and on the other hand, undoubted influence on the economy in the whole. Manufacturing industry in Croatia is the important contributor to the Croatian economic growth, especially in the past. It is arguable that the impact of determinants of profitability, throughout the world, is not similar on the firm` financial performance in every country that gives different influence on all stakeholders. Such reason gives motivation for this research which include quantitative data of all manufacturing companies in Croatia for over 11 years, from 2003 until 2014. All data gathered from FINA database. According to that, the aim of this research is to determine which microeconomic factors influence on the profitability of firm`s in Croatian manufacturing industry.

The paper is organized as follows. Section 2 presents review of microeconomic determinants of firm profitability what includes theoretical background and related literature with discuss on main characteristics and relations. Section 3 gives extensive overview of methodology, used models and explanation of research results of determinants of profitability. At the end, Section 5 concludes the article and gives main points of research with recommendations for further researches.

2. Review of Microeconomic Determinants of Firm Profitability

The connections between the profitability determinants and profitability of companies are well represented in previous researches. Most common question is what drives firm profitability unrelated to the firms' essence. According to that, models of firm profitability can be classified into two major groups, structure-conduct performance (SCP) and firm effect models (Škuflić, Mlinarić and Družić, forthcoming). There has been a huge volume of literature to date that has sought to identify the determinants of firm profitability. Here are some of them. Gringer and McMKiernan (1991) focused on the determinants of profitability and showed that market share, capital intensity, growth of sales, working capital and decentralization play a significant role in explaining firm profitability. Brush et al. (1999) find that company and industry affect business profitability, but company has the larger influence. In addition to the size of the firms, and investment, some of the other determinants have also affected profitability, such as lagged profitability, a significant determinant of current profit margins, and that industry concentration is positively related to firm profits margins. Further, profit margins are found to be pro cyclical in concentrated industries but counter cyclical in less concentrated industries (McDonald, 1999). Similar, Feeny (2000) found a strong connection of a positive association between capital intensity, size and profitability. In addition, Nunes, Serrasquerio and Sequeria (2009) found a positive relationship between size, growth and profitability. Moreover, they concluded that higher liquidity will not decrease profitability. On the other hand, lower level of debt and lower level of fixed assets are more profitable. Depending on the research, firm-level or industry-specific effects are found to be the dominant factor on firm profitability. According to the all mentioned next Table briefly shows microeconomic determinants and their indicators of firm` profitability.

Table 1: Microeconomic determinants of firm profitability

Determinants	Indicators
1. Lagged profitability	- net profit from previous year
2. Firm` size	- total assets; number of employees
3. Firm growth in industry	- growth rate in operating income from the sale of company/growth rate in operating income of the industry
4. Age	- years of firm existence
3. Ownership	- share of state ownership - share of foreign ownership
4. Cost management	- cost of production - share of material costs in total costs - growth rate of material costs - share of labor costs in total costs - growth rate of labor costs - cost of I&R - cost of advertising
4. Leverage ratio; capital structure	- financial leverage - leverage ratio - net debt/EBITDA - self-financing coefficient - net debt ratio - share of loans in equity - EBIT/interest coverage ratio
5. Working Capital Productivity; Multifactorial Productivity	- operating income/working hours - operating income/capital
6. Tax burden	- paid taxes/total costs
7. Export oriented firm	- amount of export
8. Import dependence	- share of import in total sales
9. Human capital	- number of high educated employees
10. Quotation on the stock exchange and EPS	- dividends per share - annual growth (decline) rate of market price shares
11. Current ratio	
12. Regional affiliation (location)	

Table 1 shows microeconomic determinants of firm` profitability with their indicators what is in continuation thoroughly explained with all significant literature and authors.

CONCENTRATION

Generally, in theory of industrial organization it is well known that concentration indicators are good approximation for market power, with positive correlation. There are a lot of researches about positive correlation, one of them is shown in „Oligopoly Theory" of Stigler (1964). It is demonstrated positive correlation between profit maximization and relative firm size. Saving (1970) also showed same but in correlation

between firm` shares and Lerner index. Same results are shown also in Encaoua and Jacquernin (1980). According to that, most used approximation of concentration are Herfindahl-Hirschman index and concentration index, with positive correlation, what is in accordance with SCP paradigm (see: Bain, 1951; Demsetz, 1973; Peltzman, 1977). Most important concentration indicators, are briefly described below.

Concentration index represents sum of market shares of *k* number of firm`s.

$$CR_k = S_1 + S_2 + S_3 + \cdots + S_k$$ where are S_1 to S_k market shares of one firm.

This indicator shows share of total revenues or sales of firm in total revenues or sales of an industry. It is possible to calculate market shares of 4, 8, 20 or even 50 largest firms in the industry. The most common concentration ratios are the and the . Next Table shows classification of market structures for concentration ratio .

Table 2: Classification of market structures for concentration ratio

	Market structure
0 =	Perfect competition
40 > > 0	Monopolistic competition
60 > => 40	Weak oligopoly
=> 60	Extremely oligopoly
=> 90	Monopoly

Herfindahl-Hirschman index is defined as the sum of the squares of the market shares of the firms within the industry, with equation

$$HHI = S_1^2 + S_2^2 + S_3^2 + S_4^2 + \cdots + S_n^2$$

where is S_i market share of firm.

The Herfindahl index provides a more complete picture of industry concentration than does the concentration ratio. Here are advantages of HHI:

a) HHI gives distribution of markeet shares of four (or eight) firms and compozition of market not just for larger firms.
b) HHI also gives more weight to larger firms, respectively it recognizes interction between larger concurents.

Table 3: HHI classification of market structures

HHI	Imperfectly competitive market structure
HHI < 1000	Monopolistic competition
HHI < 1800 > 1000	Monopolistic competition or oligopoly
HHI > 1800	Oligopoly or monopoly

SIZE

In theoretical and empirical economic literature, within the framework of current researches, issues of correlation of company's size and profitability are indispensable. A variety of researches, as the main evidence of importance of company's size arguments, that the average cost of operating a small business is higher than the average cost of operating large enterprises (Agiomirgianakis et al., 2013) so it is necessary to observe the relationship between the two variables. Large enterprises have higher levels of

profitability when compared to small ones, primarily due to economy of scale. On the other hand, small enterprises are often new players on the market, so they take over market shares and profits of large companies (Papadogonas, 2007). According to above mentioned, and considering the majority of studies that show the significance of company's size to its level of profitability (see Dwyer et al., 2010), we can generally state and assume a positive correlation. According to RBV theory, the positive correlation between company's size and profitability, is a result of the more accessible access to capital and of suitability for utilization of the economy of scale's principles, which ultimately leads to higher profitability. Furthermore, other studies also confirm the hypothesis of positive correlation: Gschwandtner (2005), Nunes et al. (2009), Fukao (2006), Asimakopoulos et al. (2009), Stierwald (2010). The most common choice for company's size variable comes down to property size, number of employees and total sales, of which one of the most frequently used according to (Hirschey, 2008) is total sales.

LAGGED PROFITABILITY

Getting back to prior period assets, is mentioned in literature as an indispensable determinant because the lagged profitability is related to profitability of the next period. Positive correlation is expected, which has been confirmed in the works of Bothwell et al. (1984) and Fenny and Rogers (1999).

AGE

In the framework of the resource based view theory, RBV (see Jovanovic, 1982; Wernerfelt, 1984), where specific determinants of business enterprise have the greatest significance, it is assumed that the older the company is it can potentially acquire more resources (Autio, 2005), and the older the company is, it possesses higher amounts of information and more experience, enjoys a better reputation and it is enabled to have wider and better access to financing. However, there are a multitude of studies which confirmed the negative relationship of age and profitability, where as an important argument, the lag of older companies to market changes and innovations have been highlighted (Glancey, 1998). According to studies determinant of age can have a positive and a negative impact on profitability.

INDEBTEDNESS

Generally, indebtedness does not have to have only negative impact on profitability. Namely, if the borrowed funds are invested in products / services which bring an additional income, with the average profit values, indebtedness will in the long term have a positive impact on profitability. Thus, theoretical studies provide complex and intertwined answers on the impact of debt on profitability.

The impact of debt on profitability can be divided according to three basic relations (Kebewar, 2012):

   a) Signal theory which assumes a positive impact of debt on profitability;
   b) The theory of agency costs: b1.) The correlation is positive if the capital's agency costs are between the owners and manager, b2.) The correlation is negative if the agency costs of debt are between owners and lenders;
   c) The tax aspect - correlation is unpredictable, complex and depends on the tax evaluation of interests, income tax and tax valuation.

Such dual points of view are confirmed by the results of empirical researches, where the negative impact has been proved by Majumdar and Chhibber (1999), Eriotis et al. (2002), and Ngobo Capiez (2004), Goddard et al. (2005), Rao et al. (2007), and Tian Zeitun (2007) and Nunes et al. (2009). On the other hand, a positive impact has been proved by Baum et al. (2006, 2007), Berger and Bonaccorsi (2006), Margaritis and Psillaki (2007).

The high rate of invested capital refund reflects the real state of the market, namely its imbalance. The degree of profitability is one of the most important indicators of market power. Studies, that tried to prove the connection between capital refund, industry concentration and also entry barriers, have been carried out. Weiss (1974) determined the link between profits, concentration and entry barriers. Salinger (1984) demonstrated that the MES in concentrated industries is linked with capital refunds, while this link was not found with other entry barriers variables such as the level of advertising (Carlton and Perloff, pp. 260-261).

The capital structure, according to Bos and Fethersonu (1993), affects the profitability and the companies' risk. There are several debt ratios used in studies within the capital structure. Muhammad (2003) concludes in his paper, that a certain level of indebtedness is desirable, but an excessive level leads to financial turmoil. It uses indicators such as the ratio of total indebtedness in relation to properties, total capital debt and long-term debt in relation to capital. Ventoura (2002) proves that the ratio of debt and capital has a negative effect on profitability. Finally, literature on the effect of capital structure and profitability states that there are certain circumstances in which the ratio is positive and also negative.

FIRM GROWTH IN INDUSTRY

According to Greiner (1972) growth of the company in relation to the profitability can have a positive and a negative effect. In case of a negative ratio, the cause is found in violation of interpersonal relationships within the company due to the increased growth of demands for increasing formal relations in order to achieve the necessary efficiency, which in the short term represents a challenge for the achievement of the desired level of profitability. The positive effect is explained by the increased motivation of employees that, given the growth in the future, they will achieve set goals and thus affect profitability. There are few studies which would undoubtedly lead to a defined impact of the company's growth on the profitability, for example Roper's (1999) and Gschwandtner's (2005) study, whose results studied a statistically insignificant relationship between growth and profitability of the company. However, a positive relationship can be considered more natural as evidenced in the work of Serrasqueiro (2009).

OWNERSHIP STRUCTURE

High quality and comprehensive display for the significance of the ownership structure to the company's management was given in the work of Berle and Means (1932), which demonstrate the advantages and disadvantages of public ownership. Since then, there are many studies that speak in favor of one or the other ownership structure, but there are also studies that have shown no effect (positive or negative) of property to profitability as in Demsetz and Lehn (1985), Himmelberg et al. (1999), Demsetz and Villalonga (2001), Holderness and Sheehan (1988) and Denis and Denis (1994). Shirley

and Walsh (2000) explain the differences in company management, depending on the type of ownership. Finally, it is not possible to unambiguously determine the impact, because there are examples and studies for both types although it is expected that the companies in private ownership are more efficient and therefore more profitable.

IMPORT DEPENDENCE

According to Peltonen et al. (2008) import can have two different effects on profitability. First of all, it can influence in the way that it increases competitiveness on the market and consequently reduces profitability. It can also affect the competitiveness of companies which will ultimately increase profitability. By using the dynamic panel model Peltonen et al. (2008) demonstrated a negative and significant relationship between imports of goods and profitability. Such attitude is confirmed by the works of Sauner-Leroy (2003) and Boulhol (2005). Hansson (1992) determines a different result with respect to geographic region (country) in which the company operates.

In summary, studies researching the determinants of profitability have identified several factors in many countries. However, they do not clearly indicate which factors are the most significant in relation to the firm profitability, although different factors have been identified as determinants of profitability in different countries by using the different methods of study. This is an area this research intends to explore.

3. Methodology, model and research results

The analyzed period covers the years 2003-2014, for which the data were available. However, for our sample of companies relevant data are not abundant. All data gathered from Croatian database FINA. The FINA database contains tax return information on an annual basis. Each year all of entities in Croatia return data on their income, expenses, and other financial activities.

The results have to be evaluated with the fact that some entities in sample may be used for tax planning purposes rather than for reporting the financial activities of a particular line of business. The use of tax entities for accounting purposes will affect the results of an investigation of the determinants of entity profitability using economic variables. This has influenced our choice of explanatory variables, as discussed above, but also a method of estimation. We have applied the panel data analysis method, using the unbalanced sample to obtain the estimated coefficients.

It is well known that determinants are product of specific characteristics of industry and at the end economy, namely different variable has different impact and relation with profitability with other intensity (Škuflić, Mlinarić and Družić, forthcoming). This research employed the most important factors that influence firms profitability and that are commonly utilized through the previous researches. The variables and their used measurements are presented in Table 1. The dependent variable is profitability as measured by net profit before tax. As independent variables consider (1) indebtedness (Debt/EBITDA); (2) concentration (Herfindahl-Hirschman index); (3) liquidity (Current ratio); (4) productivity (Total factor productivity); (5) indebtedness (Indebtedness factor).

Table 4: Variables and measurement

Dependent variable	Measurement	Symbol
Profitability	Net profit before tax	
Independent variables		
Indebtedness	Debt/EBITDA	ldug_EBITDA
Concentration	Herfindahl-Hirschman index	lhhi2
Liquidity	Current ratio	lkoefteklik
Productivity	Total factor productivity	LTFP
Indebtedness	Indebtedness factor	lfak_zad

Further, while current studies do indicate that panel data analysis is more suitable than other methods of study in determining the profitability of manufacturing companies (Pratheepan, 2014). Therefore this study also hopes to explore the relative importance of determinant of profitability by using the panel data analysis.

Panel data (also known as longitudinal or cross sectional time-series data) is a dataset in which the behavior of entities are observed across time. Panel data allows you to control for variables you cannot observe or measure like cultural factors or difference in business practices across companies; or variables that change over time but not across entities. This is, it accounts for individual heterogeneity. With panel data you can include variables at different levels of analysis suitable for multilevel or hierarchical modeling. Some drawbacks are data collection issues, non-response in the case of micro panels or cross-country dependency in the case of macro panels.

Usage of fixed-effects (FE) is appropriate in analyzing the impact of variables that vary over time. FE explore the relationship between predictor and outcome variables within an entity. Each entity has its own individual characteristics that may or may not influence the predictor variables. When using FE we assume that something within the individual may impact or bias the predictor or outcome variables and we need to control for this. This is the rationale behind the assumption of the correlation between entity's error term and predictor variables. FE remove the effect of those time-invariant characteristics so we can assess the net effect of the predictors on the outcome variable. Another important assumption of the FE model is that those time-invariant characteristics are unique to the individual and should not be correlated with other individual characteristics. Each entity is different therefore the entity's error term and the constant (which captures individual characteristics) should not be correlated with the others. If the error terms are correlated, then FE is no suitable since inferences may not be correct and you need to model that relationship (probably using random-effects), this is the main rationale for the Hausman test. (Torres-Reyna, 2007)

The equation for the fixed effects model becomes: $Y_{it} = \beta_1 X_{it} + \alpha_i + u_{it}$

Where α_i (i=1....n) is the unknown intercept for each entity (n entity-specific intercepts). Y_{it} is the dependent variable (DV) where i = entity and t = time. X_{it} represents one independent variable (IV), β_1 is the coefficient for that IV and u_{it} is the error term.

For the sample of our research, the fixed effects method is more appropriate than the random effects. This assumption was also formally tested. Breusch-Pagan Lagrange multiplier test is based on verification and selection an appropriate model between Ordinary Least Squares (OLS) or random model. The null hypothesis is when is the variance between the entities (in this case firms) zero, i.e., what implies that there is no panel effects, what allows us to conclude that the usual OLS is suitable method. However, the test result suggest rejection of the null hypothesis with on all levels of reliability, what implies that random model is more appropriate. Further, Hausman test helps us in making decision about better model between fixed and random. Main point is about whether the errors are correlated with regression. The null hypothesis presupposes that they are not, what goes in favour of random model, but if results are opposite, more appropriate is fixed model. The result of Hausman's test indicates rejection of the null hypothesis at all levels of significance, and fixed effects is better model than random effects. Nevertheless, we have concluded that the fixed effects method should be applied in this case. The results of the estimation are presented in the following table:

Table 5: Results of Breusch & Pagan and Hausman tests

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Breusch and Pagan Lagrangian multiplier test for random effects

    lPrfPRO[ID,t] = Xb + u[ID] + e[ID,t]

    Estimated results:
                            Var       sd = sqrt(Var)

            lPrfPRO      4.771073        2.184279
                  e       .7250876        .8515208
                  u       1.14926        1.072036

    Test:   Var(u) = 0
                            chibar2(01) = 63918.40
                        Prob > chibar2 =    0.0000
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                ---- Coefficients ----
                  (b)          (B)            (b-B)      sqrt(diag(V_b-V_B))
                 fixed        random        Difference          S.E.

ldug_EBITDA    -.1819732    -.1885957        .0066225         .0041334
   lfak_zad    -.6143266    -.583628        -.0306986         .0033769
 lkoefteklik   -.2401719    -.2354695       -.0047024         .0037796
       LTFP     .0075825     .0086374       -.0010549         .0002127
      lHHI2     .3131585     .35242          -.0392615         .0034747

                b = consistent under Ho and Ha; obtained from xtreg
            B = inconsistent under Ha, efficient under Ho; obtained from xtreg

    Test:  Ho:  difference in coefficients not systematic

            chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                    =      235.38
            Prob>chi2 =     0.0000
```

The results of panel Ordinary Least Square (OLS), random effects, between effects and fixed affects are reported in Table 6. The basic equation for our model is as follows:

$$Profitability = const + \alpha ldug\ EBITDA + \beta lfak\ zad + \gamma lkoefteklik + \eta LTFP + \mu lHHI2 + u$$

Table 6: Results of panel data analysis method

VARIABLES	(1) OLS	(2) Random	(3) Between	(4) Fixed
ldug_EBITDA	***-0.306	***-0.189	***-0.364	***-0.182
	(0.0151)	(0.0122)	(0.0381)	(0.0128)
lfak_zad	***-0.455	***-0.584	***-0.356	***-0.614
	(0.0132)	(0.0105)	(0.0338)	(0.0111)
lkoefteklik	***-0.199	***-0.235	***-0.231	***-0.240
	(0.00688)	(0.00690)	(0.0145)	(0.00787)
LTFP	***0.0109	***0.00864	0.00499	***0.00758
	(0.00229)	(0.00156)	(0.0128)	(0.00158)
lHHI2	***0.383	***0.352	***0.362	***0.313
	(0.00149)	(0.00241)	(0.00307)	(0.00423)
Constant	***15.15	***15.05	***14.96	***14.85
	(0.0142)	(0.0204)	(0.0343)	(0.0256)
Observations	63,496	63,496	63,496	63,496
R-squared	0.625		0.620	0.462
Number of ID		12,888	12,888	12,888

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The Table above shows dependent variable with profitability which is represent with net profit before tax and five independent variables. All variables are significant on 1%. Concerning statistical significance, estimated parameters and Breusch & Pagan and Hausman tests we have used fixed effects panel models. There is a positive and significant relationship between concentration which is represent with Herfindahl-Hirschman index and productivity with measurement in total factor productivity with dependent variable (profitability). Contrarily, there is negative and also strong significant relationship between indebtedness which is represent with ratio of debt and EBITDA, liquidity with current ratio and indebtedness factor and profitability. Further more, final and concrete conclusion about relation between profitability and selected microeconomic determinants in Croatian manufacturing industry are given in below.

If we change indebtedness by one percent, we would expect profitability to change by -0,182%, in average. If we change Herfindahl-Hirschman index by one percent, we would expect profitability to change by 0,313%, in average. If we change current ratio by one percent, we would expect profitability to change by -0,24%, in average. If we change indebtedness factor by one percent, we would expect profitability to change by -0,614%, in average. If we change total factor productivity by one percent, we would expect profitability to change by 0.00758%, in average.

The results showed evidence of a strong positive significant relationship between profitability and Herfindahl-Hirschman index and total factor productivity. The strongest negative correlation with profitability has indebtedness factor, followed by current ratio and indebtedness.

4. Concluding remarks

Particularities of manufacturing industry, in general sense, considering the changes in macroeconomic and microeconomic indicators with their relation puts determinants of firm profitability for high level of importance for firm`s profitability in Croatia. The main contribution of this paper is the identification of the determinants affecting profitability of manufacturing firms in Croatia. A static panel model method is utilized on a sample of all manufacturing firms with business in Croatia covering the period between 2003 and 2014.

Parameter coefficients show that market concentration (Herfindahl-Hirschman index) and total factor productivity had a significant and positive impact on the profitability for the manufacturing industry in Croatia during the study period. The results also showed a significant but negative relationship between indebtedness, current ratio and indebtedness factor. This results implies that concentration and indebtedness factor are determinants with larger influence on profitability and next researches have to absorb that facts. Further, provided results are in line with previous studies in the same area but for future researches we should pay attention to some notes from this research. First of all, there are restrictions about selection of the determinants (different number of determinants give different results), picked econometric tools and usage of different variation of panel (dynamic) models. Inclusive, it is common knowledge that the profitability determinants of manufacturing firms are very important according to the economic development of any country, especially to countries adopting an export what includes oriented industrialization policy within an open economic environment, according to that, more researches in this area are necessary.

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