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Determinants of profitability of firms in the retail sector: The case of Croatia

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Abstract

Profitability is often defined as an ultimate criterion of a firm's competitiveness. A firm is considered competitive if it can outperform its rivals and make profits in the long run. The ability of firms to make profits is commonly associated with a number of firm-specific, industrial and location-specific characteristics. The need to understand these factors and forces is particularly pronounced in the context of the current economic downturn. To explore the impact of firm size, market share, market orientation, agglomeration externalities, industrial concentration and foreign direct investment (FDI) on the profitability of firms, a GMM dynamic panel methodology is applied to the large sample of firms from the Croatian retail sector in the period between 2003 and 2010, taken from Amadeus database. The choice of dynamic panel methodology enables us to distinguish between the short and the long run effects of these factors and forces on profitability, as well as to take into account the potential sources of unobserved heterogeneity and endogeneity.

Keywords: profitability, competitiveness, retail sector, dynamic panel analysis

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1. Introduction

Economists often state that the principal objective of firm behaviour is to outperform their rivals in competitive battle. This ability to compete is being measured by indicators reflecting the competitive performance of firms, and those related to their competitive potential. The former group encompasses the results of firms in interaction with their rivals, while the latter includes the activities of firms, their characteristics and features of their environment. However, it is taken as stylised fact that the ultimate criterion of a firm's competitiveness is its profitability (Buckley et al., 1988). This is particularly true for the long run prospects of firms, as in the long run firms can survive only if they remain profitable.

Traditional economic theory considered the existence of above-average profits only as a short run phenomenon which diminishes under pressure of competitive forces. However, a sizeable body of knowledge points to the persistence of profits over time. For example, industrial organisation literature explains the relative ranking of firms within their industries in terms of their profitability with industrial characteristics such as concentration, economies of scale and entry and exit barriers

(Goddard et al., 2005).¹ In endogenous growth models, knowledge and technology enable firms to differentiate themselves from their rivals either by offering products at lower costs or better quality and thus achieve above-average returns (Aghion and Howitt, 1992; Grossman and Helpman, 1994). Similarly, resource-based view associates the competitive advantage of firms with distinctiveness of their human, physical and organisational capital resources (Barney, 1991). Finally, agglomeration literature attaches great importance to the location-specific determinants of profitability such as inter-firm knowledge and technology spillovers, cooperation with professional and scientific institutions as well as access to greater demand in large urban areas (Krugman, 1993).

Empirical research on the determinants of profitability has reported that efficiency, the ability to exploit economies of scale or to exercise market power all lead to high rates of profit (Benacek et al., 1997; Slade, 2004). In addition, measures of financial performance such as gearing or liquidity have been identified as important drivers of profitability (Goddard et al., 2005). Selling and Stickney (1989) report that profitability increases with the technological intensity of industry, entry barriers or the ability to pursue product differentiation strategy. Finally, much of the existing literature suggests that profitability tends to be persistent over time (Cubbin and Geroski, 1990).

Over recent decades the retail sector in Croatia has gone through significant changes. The expansion of small shops in the first half of 1990s was followed by the inflow of foreign direct investment in the 2000s. The penetration of large foreign retailers has increased competitive pressure, brought new managerial practices and provided the impulse for the restructuring of domestic enterprises (Anic and Nusinovic, 2003). These changes have resulted in the concentration of retail sector in Croatia (Segetlija, 2005; Karic and Kristek, 2009). In addition, the inflow of foreign rivals as well as small size of domestic market has motivated numerous firms to search for their business opportunities outside domestic borders. According to Anic and Nusinovic (2003), stronger intensity of competition exerted a downward pressure on the profitability of firms in this sector. However, most of existing studies are descriptive in nature and, to the best of our knowledge, there has been no attempt to quantify the impact of individual factors and forces on the profitability of firms in the Croatian retail sector.

This paper intends to fill the above mentioned gap in the literature. In order to explore the determinants of profitability of firms in the Croatian retail sector, a dynamic panel system GMM estimation technique is applied to Amadeus database of firms between 2003 and 2010. The selected methodology enables us to take into account the persistence of profitability, potential endogeneity of individual covariates, as well as the distinction between short and long run impact of individual variables on the ability of firms to make profits. Next section of the paper brings stylised facts about the Croatian retail sector, while model and methodology are discussed in Section 3. This is followed by the discussion of findings in Section 4. Finally, Section 5 concludes.

2. Stylised facts about the retail sector in Croatia

The analysis in this paper is based on the data coming from *Amadeus* database provided by Bureau van Dyke. This database contains annual information from financial reports such as balance sheet and profit loss accounts, financial ratios, as well as some general information about enterprises such as location or type of industry. For the purpose of the paper, the data for about 3700 firms collected over the period 2003-2010 have been accessed. The number of firms varies between 2922 in 2003 and 4754 in 2010 which means that panel is unbalanced.

¹ This approach is also known as Structure-Conduct-Performance (SCP) paradigm.

Findings from the previous literature suggest that over the past decades the Croatian retail sector underwent major structural change which manifested itself in stronger development of non-food retailers at the expense of food retail stores (Anic and Nusinovic, 2003). Figure 1 presents the distribution of sales revenues across NACE 3 digit industries within the retail sector.² From there it is evident that the greatest share of sales is being generated in retail sale in non specialised stores. This sector is being followed by retail sale of other goods in specialised store and household equipment. The sales generated in other industries had negligible share in total retail sector sales.

Figure 1: Distribution of sales in Croatian retail sector 2003-2010



Source: Authors' calculations

Table 1 brings stylised facts about the structure of sample and the performance of analysed companies. As it can be seen from there, the sample includes mostly small and medium sized firms with average firm size, measured by the number of employees ranging between 17 and 22. Furthermore, the market share of the analysed firms expressed as the ratio between their own sales revenues and sales revenues of the entire retail sector is relatively low, below 1%, and does not exhibit variations across time. Turning to the most important issue, the profitability of firms, a downward trend can be observed. More importantly, in the last two analysed years the average profitability takes negative values. Such finding may be associated with the recent economic downturn. However, it is also consistent with the findings from earlier literature. To this end, it has been suggested that the intensity of competition in combination with stagnating or increasing costs exerted pressure on the prices and profits of firms in Croatian retailing (Anic and Nusinovic, 2003).

Table 1: Changes in Croatian retail sector 2003-2010

	Number of firms	Firm size (employees)	Profitability (ROA)	Market share (%)	FDI (mil EUR)	Concentration (HHI)
2003	2922	17	0.48	0.02	70	0.15
2004	3339	18	0.26	0.02	122	0.16
2005	3547	22	0.16	0.02	119	0.16
2006	3677	19	0.13	0.02	86	0.15
2007	3935	22	0.12	0.02	108	0.13
2008	3756	22	0.15	0.02	151	0.13
2009	4266	19	-0.32	0.02	155	0.15
2010	4754	18	-0.47	0.02	69	0.15

Source: Authors' calculations and Croatian National Bank

The existing studies identify the inflow of foreign direct investment (FDI) as the factor that brought new technology, knowledge and managerial practices which enhanced the restructuring of enterprises

² Sales revenues are expressed as the share of total sales in the retail sector.

in Croatian retailing (Anic and Nusinovic, 2003; Dunkovic, 2004). The information on foreign direct investment in the Croatian retail sector expressed in millions of EUR demonstrates that FDI in retailing was positive in all analysed years.³ Finally, the concentration of industry, measured by Herfindahl-Hirschmann (HHI) index, was growing until 2005 and has been stable since. The magnitude of coefficient is characteristic for moderately concentrated industry.

4. Model specification and methodology

The empirical analysis of determinants of profitability in Croatian retail sector is based on the model which relates the ability of firms to make profits with the number of firm and industry specific characteristics, as well as with its past realisations. This model takes the following form:

$$Prof_{it} = \alpha_0 + \alpha_1 Prof_{it-1} + \alpha_2 size_{it} + \alpha_3 share_{it} + \alpha_4 exp_{it} + fdi_{it} + hhi_{it} + \alpha_5 locef_{it} + \alpha_6 loc_{it} + u_i + v_{it}$$

where u_i stands for time-invariant elements of error term and v_{it} for usual idiosyncratic errors. In the above equation the dependent variable, the profitability of firm i in year t , is measured by the return on assets (ROA) defined as earnings before interest and taxes (EBIT) divided by total assets. The inclusion of lagged dependent variable on the right hand side of equation is intended to control for the persistence of profits. On the one hand, competitive forces or quiet life behaviour may exert a downward pressure on profit performance of firms over time. However, on the other hand, by pursuing the strategy of differentiation in the presence of market imperfections, firms can enjoy long periods of the above average profitability.

The inclusion of *size*, the natural logarithm of the number of employees, allows for the relationship between economies of scale and scope and profitability. The presence of these economies can enable firms to achieve higher profits. However, larger size can be associated with stronger diversification, which would lead to diseconomies of scale and scope and negatively impact profitability. The model also includes the natural logarithm of the market *share* of a firm, defined as its sales as proportion of the total industry sales whereby industry is defined at NACE rev.2 4-digit level. On the one hand, higher market share should enable firms to achieve higher profits. On the other hand, the ability of firms to seize the market of their rivals will depend on their restructuring efforts in terms of both product innovations and improvements in efficiency (Goddard et al., 2005). These improvements have to be financed, particularly in the case of small firms, with own profits, which means that the two are in mutually reinforcing relationship, an issue to which we shall return later. Market orientation of firms can affect their profitability in two ways. First, by expanding beyond borders of domestic market, firms get in touch with knowledge and technology that can be used to improve their relative performance. Second, the participation on larger market means larger demand which may have a positive impact on profitability. To control for market orientation, the model includes categorical variable *exp* which takes the value of one if firm is an exporter.

In addition to these firm-specific characteristics, the model also includes two industry level variables. The concentration of industry, measured by the natural logarithm of Herfindahl-Hirschmann index (*hhi*), is intended to control for the relationship between anti-competitive strategies such as barriers to entry, as suggested in SCP approach. Hence, a positive coefficient can be expected for this variable. The model also includes the natural logarithm of FDI intensity (*fdi*) defined as foreign direct investment in retailing industry divided by the total foreign direct investment in Croatia in each year. As asserted earlier, while FDI acted as an impulse for restructuring of domestic retailers, foreign

³ The information on FDI was taken from Croatian National Bank (HNB).

competition also exerted a negative pressure on the profitability of the entire sector, for which reason a negative sign can be expected on this variable.

Final two variables entering the model control for the relationship between agglomeration externalities and profitability. The location of firms in large urban areas can be associated with the access to higher demand and the ability to achieve internal economies of scale more easily, which should have a positive impact on profitability. For this reason, the model includes categorical variable *loc* taking the value of one if a firm is located in one of the five largest urban areas in Croatia.⁴ It is also recognised in the literature that stronger concentration of firms within the same industry on one location leads to within-industry economies, such as knowledge and R&D spillovers from other firms, professional and scientific institutions, as well as ease of access to specialised inputs and skilled labour (Krugman, 1993). The variable *locef* defined as the natural logarithm of a number of firms in a given region coming from the same NACE 4-digit industry divided by the total number of retailers in that region in one year, controls for these localisation economies. Table 2 brings the description of variables.

Table 2: Description of variables

Dependent variable	
<i>Prof</i>	Profitability of firm <i>i</i> – return on assets (EBIT/Total assets)
Independent variables	
<i>size</i>	Size of firm <i>i</i> – Number of employees
<i>share</i>	Market share – Sales of firm <i>i</i> divided by total sales of its 4-digit industry
<i>exp</i>	Dummy for market orientation - 1 if firm <i>i</i> is an exporter
<i>hhi</i>	Market concentration – Herfindahl-Hirschmann index at 4-digit industry level
<i>fdi</i>	FDI intensity – Amount of FDI in retail sector divided by total FDI in economy
<i>loc</i>	Dummy for location – 1 if firm <i>i</i> is located in a large urban area
<i>locef</i>	Localisation economies – Number of firms from the firm's 4-digit industry in an administrative region to the total number of firms in the region

The above discussion reveals several stylised facts about the model which need to be taken into account when choosing appropriate methodology. The longitudinal nature of dataset suggests that a suitable estimator should be looked for in the family of panel estimators. Furthermore, the persistence of profitability suggests that required estimator should be capable of handling the relationship between the current level of dependent variable and its past realisations, i.e. for the fact that any time-invariant source of cross-sectional variation will be correlated with profitability in all periods. It has also been mentioned that profitability and market share are in mutually reinforcing relationship suggesting that the common set of unobserved factors could be correlated with both of them giving rise to potential endogeneity. Finally, the full impact of individual factors and forces on the profitability of firms is likely to be realised in the long run, which suggests that the estimation technique should make distinction between short and long run.

The methodology capable of handling all of the above mentioned issues is dynamic panel system GMM estimator (Arellano and Bover, 1995; Blundell and Bond, 1998). This method overcomes the problem of correlation between explanatory variables and time-invariant elements of error term by using lagged levels and lagged differences of potentially endogenous variables as instruments. Another advantage of dynamic panel technique is its ability to distinguish between the short and the long run impact of right-hand side variables on dependent variable. However, this estimator is found to be sensitive to the number of instruments used in the analysis and to the sources of cross-sectional

⁴ These include Zagreb, Split, Rijeka, Osijek and Zadar.

dependence such as universal time shocks. With respect to the former problem, it is taken as a rule-of-thumb that the optimal number of instruments should not exceed the number of cross-sectional groups, while the latter problem is commonly controlled with inclusion of annual time dummies (Roodman, 2009). Dynamic estimators can be estimated with one-step and two-step procedures of which the latter is found to be robust to patterns of heteroscedasticity and cross-sectional correlation. However, standard errors obtained this way are found to be downward biased for which reason the estimation applies Windmeijer's (2005) corrections for robust standard errors.

5. Discussion of findings

The results of estimation for variables of interest are presented below in Table 3. For expositional convenience, this table does not refer to annual time dummies which are included in the estimation.⁵

Table 3: Results of estimation

	Short run	Long run
Lagged dependent variable	0.17(0.030)**	-
<i>size</i>	-0.10(0.02)**	-0.13(0.02)**
<i>share</i>	0.16(0.00)***	0.19(0.00)***
<i>exp</i>	0.01(0.70)	0.01(0.70)
<i>hhi</i>	0.08(0.00)***	0.10(0.00)***
<i>fdi</i>	-0.30(0.00)***	-0.36(0.00)***
<i>loc</i>	-0.02(0.22)	-0.03(0.24)
<i>locef</i>	0.23(0.00)***	0.29(0.00)***
<i>constant term</i>	1.29(0.16)	-
MODEL DIAGNOSTICS		
Number of observations	30196	
Number of groups	6845	
Wald test	174.10	
Prob>chi2	0.000	
Hansen J Statistic	10.70	
Prob> chi2	0.297	
Arellano-Bond m1 test for AR(1)	-3.83	
Prob>chi2	0.000	
Arellano-Bond m2 test for AR(2)	-0.05	
Prob>chi2	0.962	
Instrument count	24	

Source: Authors' calculations

Note: *, ** and *** denote statistical significance at 1%, 5% and 10% level respectively

The examination of relevant model diagnostics provides support to the model. Accordingly, Hansen test for validity of overidentifying restrictions cannot be rejected suggesting that these restrictions are valid. Furthermore, m1/m2 test suggests that there is autocorrelation of the first but no autocorrelation

⁵ The model was estimated using statistical software Stata 11 with lagged dependent variable treated as predetermined and market share as potentially endogenous. These variables are instrumented by their own lags and differences, while other variables enter instrumentation matrix on their own. Detailed printout of estimation can be provided upon request.

of the second order providing further support to the choice of instruments. Finally, the number of instruments used is relatively low compared to the number of cross-sectional groups.⁶

The coefficient on lagged dependent variable is statistically significant and positive. This means that the profitability of firms in the Croatian retail sector has been developing over time. The coefficient on firm size is negative and statistically significant. In the context of earlier discussion in Section 4, this finding can be interpreted as evidence of diseconomies of scale and orientation of Croatian retailers on differentiation strategy. The estimated parameter on market share is statistically significant and positive, suggesting that the ability of firms to seize the market of their rivals leads to higher profits. However, the variable measuring the impact of exporting on profitability is not statistically significant.

Both industrial variables are highly statistically significant. The estimated parameter for concentration has a positive sign. Such finding can be understood in the context of propositions from SCP literature that stronger concentration provides opportunity to exercise anti-competitive strategies, which in turn leads to higher profits. The coefficient on foreign direct investment is also highly significant, but with a negative sign. Several studies mentioned earlier in this paper have found that the inflow of foreign competition exercised a downward pressure on the profits of firms in Croatian retailing, as domestic producers responded with the adjustment of prices. Findings of this paper should be understood in the same context.

The variable controlling for location in large urban areas has no statistical significance. This implies that agglomeration externalities, such as access to larger demand or better infrastructure, do not have impact on the profitability of analysed firms. However, the coefficient on localisation economies is highly significant and positive. As mentioned in the previous section, these economies refer to knowledge and technology spillovers, as well as the transfer of skills within industries which are otherwise costly and difficult to obtain. Bearing in mind findings from Table 1 about low average size of firms in the sample, as well as those from earlier literature suggesting that Croatian retailers mainly compete in terms of prices, it is likely that localisation economies enable firms to reduce their costs and thus achieve higher profits. Finally, all explanatory variables retain their significance in the long run. As it can be seen from Table 3 the magnitude of coefficients is about 1.2 times higher than in the short run. This suggests that the full impact of right-hand side variables manifests itself through increases in long run profitability which is often defined as an ultimate criterion of a firm's competitiveness.

6. Conclusion

There is a widespread consensus among economists that profitability presents one of the most important firm objectives. For many firms, particularly small and medium sized ones, profits are the principal source of finance which can be invested in restructuring and improvements of competitiveness. While traditional economic theory explained the existence of above-average profits only as a short-run phenomenon, recent research in this field points to the persistence of profitability which can be attributed to a number of firm and industry-specific characteristics. Building on these foundations, this paper examined the determinants of profitability among firms in Croatian retailing sector. The existing body of knowledge has pointed to sizeable structural changes that took place in

⁶ For expositional convenience Table 3 presents only the most important diagnostics. However, additional tests have been also imposed on the model, including difference-in-Sargan test for levels equation and for lagged dependent variable in order to check whether steady-state assumption is satisfied and whether the model suffers from cross-sectional dependence after inclusion of time dummies. Finally, the magnitude of coefficient on lagged dependent variable has been compared with those obtained using fixed effects panel estimator and OLS techniques as it has been suggested that true dynamic estimator should lie within the range of coefficients obtained with latter two techniques (Roodman, 2009). All tests provide support to our model. Detailed printouts of these diagnostics are available upon request.

this sector during two decades of transition but there has been no attempt to quantify the impact of these changes on profitability of firms. To this end, dynamic panel system technique has been applied to a large database covering behaviour of Croatian retailers over much of the recent decade.

The results of investigation, in general, confirm the theses presented in earlier literature. In this context, the persistence of profitability over time is confirmed, while rising industrial concentration and the ability of firms to seize the market share of their rivals have a positive impact on profitability. Furthermore, the inflow of FDI and the increase in the size of firms negatively influence their ability to make profits. The latter two findings are particularly important as they can be associated with intensifying price competition, identified as a feature of this sector in the previous literature, as well as with the diversification strategy of Croatian retailers, which generally leads to diseconomies of scale and scope. Finally, the results of the investigation point to the importance of agglomeration externalities, such as within-industry economies. This finding suggests that firms in this sector rely on the transfer of knowledge, skill and technology as cost-sharing strategies in their attempts to survive the pressure of price competition.

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