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FINANCIAL PERFORMANCE AMONG TOP10 AUTOMOTIVE LEADERS IN THE EU: ESSENTIAL TECHNIQUES TO INVESTIGATE THE STRUCTURE OF MOMENTS WHILE USING THE GMM WITH DYNAMIC PANEL DATA

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Abstract: The automotive industry is widely considered to be crucial for the economy, as it reflects economic development in general. Despite interest in financial performance, few studies have considered paying attention to the ownership structure among stockholders. Hence, the study aims to find out how the degree of ownership concentration, measured through the independence indicator of the Bureau van Dijk, is reflected in the financial management of companies in the automotive industry among selected European countries. The generalized method of moments (GMM) technique is widely used while investigating panel data with a short estimating period, i.e. nine years annually in this case. However, this study reveals that, without deploying techniques, subsequently introduced a modified version of GMM estimators with panel data by providing an implementation using Stata statistical software. Otherwise, these particular econometric tools to analyze a dynamic panel can often give false significant estimates. Overall, liquidity seems to be significant in the case of firms with less concentrated ownership, whereas companies with a major owner are affected more by selected macroeconomic variables.

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1. Introduction

The company's investments require a return to be ensured as well as the ability to pay out profit shares. Even though the sale of products and services is widely considered to be key to the existence of almost all companies, a financially healthy unit must be able to perfectly control not only the commercial side of business activity. Although the task of financial management is to fulfill the primary goal of business, to maximize the value of the company, financial issues that represent a very important part of strategic decision-making should receive considerable attention as well. Without any doubt, profitability and liquidity are among the most commonly investigated financial indicators from the point of view of a company's efficient operation (Jensen, 1986; Williamson, 1988; Kim et al., 1998; Morellec, 2001; Bumbescu, 2020; Pordea et al., 2020). This study, therefore, focuses on the return on total invested capital and liquidity. These indicators are chosen to sufficiently cover the reasons for managing the financial structure of enterprises, i.e. not only the efficiency factor measured by return on assets but also the factor of maintaining the company's solvency measured by the liquidity acid test. Nevertheless, both of these parameters can be significantly influenced by the company's ownership structure (Gedajlovic and Shapiro, 2002; Yabei and Izumida, 2008; Prommin et al., 2016; Horobet et al., 2019; Laporšek et al., 2021). The existence of a proxy conflict between the company owners, management, and creditors is linked to information asymmetry (Stiglitz and Weiss, 1987).

This study aims to find out how the degree of ownership concentration, measured through the independence indicator of the Bureau van Dijk, is reflected in the financial management of companies in the automotive industry among selected European countries. TOP10 leaders within the EU automotive sector are chosen, particularly Belgium, Czech Republic, Germany, France, Hungary, Italy, Romania, Slovakia, Spain, and Sweden. The functional relationship between profitability and liquidity, particularly the return on assets (ROA) and acid test (LQ), will be investigated. Furthermore, this paper fills a gap in the analysis of the automotive industry in terms of ownership concentration. Earlier studies did not reflect much on the distribution of firms in terms of highly concentrated ownership (existence of a majority owner) and low concentrated ownership (no owner owns more than 50% of the shares). The influence of the ownership structure on the financial performance of the company is simply motivated by the idea that the less concentrated ownership

structure causes the more pronounced control of management, and hence the pressure on its functioning. Managerial conservatism is caused by managers' behavior to be less risky, as the fear of management fluctuation can be very high in this context. This naturally affects the pressure on profitability, which is the most important criterion of management ability from the owner's point of view. Franks and Harris (1989) operated with the idea of the opposite relationship, i.e. the more concentrated the ownership, the higher the level of profitability. However, the inclusion of liquidity among microeconomic factors is guided by the idea that a manager of a company with less concentrated ownership and high pressure on profitability may react by trying not to tie up funds in less profitable assets. According to the literature, the argument of this study is primarily the reduction of the agency problem (Maug, 2002; Palmiter, 2002). Respectively, studies can be found that refer to the fact that the more concentrated the ownership structure, the lower the liquidity of companies (Prommin et al., 2016). Companies with less concentrated ownership, even concerning the availability of resources in the European region, will inevitably use this financial flexibility and not direct funds into those liquid assets. This will be reflected in a low level of current liquidity. The object of interest is also the influence of the wider economic environment, i.e. how profitability at different levels of concentration of owners is influenced by the development of the economy. Although most studies focus on GDP, this study is original in measuring economic development exclusively by the rate of savings and the rate of consumption, both explored as a share of the gross domestic product. Domestic savings and consumption are used here unmistakably in meaning for the automotive industry. The automotive sector belongs to the most important sectors in Europe in terms of employment, share in the GDP of the EU, and volume of investments in research and development. The EU is one of the world's largest car producers. In terms of employment, according to Eurostat data, 11.3% of the population of the EU is employed in the automotive industry. The turnover share of the automotive industry in the EU is 7% of the gross domestic product. According to the European Automobile Manufacturers' Association (ACEA), 21% of all passenger cars are manufactured in Europe. Naturally, the largest volume of investment funds also flows into this particular industry. The importance of the automotive industry can also be perceived from the position of continuity with other sectors of the economy, which depend on the positive development of the automotive industry. According to OECD data, plastic production, metal production, and other engineering production within the production sector, wholesale and retail, and the service sector, can be mentioned in this context.

In 2017, a total of 302 automotive companies and companies engaged in the production of automobile accessories operated in Europe, of which 230 companies

are from the EU. The growth dynamics of the automotive industry in the EU amounted to 3.4% in 2017. The European leaders according to ACEA (2019) in terms of car production include Germany (31%), Spain (13.7%), France (11%), Great Britain (9.2%), and the Czech Republic (8.1%). Although Great Britain is in fourth place according to the volume of production, it is absent from the top 10 per capita and was replaced by Sweden in the list. According to WISO Diskurs data (2019), the automotive sector in Germany represents about one-fifth of the total industrial turnover and is also the most vital industrial sector in Germany. The German automotive industry is also one of the leaders in terms of investment in research and development, and its share is continuously growing. At the same time, however, it also belongs to the countries that had to face a downturn at the end of the monitored period, which ultimately led to very significant layoffs. Another fact related to Germany is that German companies produce much more abroad than in their own country, they are mainly linked to the United States of America or Slovakia, where they mainly produce SUVs. Spain is the second largest car producer in Europe. In Spain, the automotive industry generates almost a tenth of the gross domestic product. However, compared to Germany, the Spanish automotive industry recorded growth until 2019. At the same time, Spain is a significant exporter, as 85% of production is exported, which represents 19% of Spain's total export volume. Even in Spain, the importance of the automotive industry can be substantiated by the largest volume of investments in research and development. In addition, in Italy, the automotive industry is the main sector of the economy in terms of exports; more than 60% of production is exported. It accounts for more than 5% of total Italian exports. The automotive industry also ensured that the decline of the Italian economy was not too dramatic, e.g. the growth of the economy in 2017 was calculated at 1.6%, and the growth of the automotive industry in the same year was at the level of 4.3%.

It is clear from the above that the development in individual economies can be different and the influence of individual factors on the development of profitability in individual countries can be different. It is also necessary to realize that, at the end of the monitored period, the automotive industry was already strongly influenced by increasing the safety of cars and also under the pressure of the environmental activities of the EU. Due to the emphasis placed on the ecological operation of vehicles, the way cars are manufactured is also changing. Therefore, the traditional processing part is necessarily changing. This is also the reason why the automotive industry is the largest investor in research and development in the EU. It represents 28% of the total volume of the expenditure and €57.4 billion was invested annually. Most of the funds are directed to the field of e-mobility and digitization of production. Concerning profitability, this fact can also mean that there may be a decrease in profitability for automotive companies, as a high level of investment is

related to the increasing costs of these investments. Nevertheless, the costs incurred will bring positive effects only with a delay in time. Despite these facts, Europe still maintains a strong position in the export of automobiles, which, however, may drop significantly without investment, especially with the strengthening position of Asian automobile producers. In this context, another influenced indicator can be liquidity, which is drained by investments made. Another reason for choosing the automotive industry is the fact that, just as the automotive industry's position is significant in relation to the size of GDP in the monitored pre-pandemic period, the impact on the decline of the industry in the wake of the Covid-19 pandemic would have been equally significant. At the same time, it is necessary to realize that the combination of realized investments and Covid-19 does not give completely good conditions for the unequivocal results of the subsequent analysis in this field of business. This fact could be treated by an additional factor, which in this regard could be the growth of sales of electric cars. Subsequent comparative analysis can be very interesting in this regard precisely in the pre-pandemic period. Hereby, the results of this trial will have serious implications for future analyses of the period after the Covid-19 pandemic.
This paper is structured as follows; after this brief introduction, the literature review demonstrates the importance of the research in particular. Generalized methods of moment description, including essential techniques necessary to evaluate modeling according to the literature, are included in Section 3 which focuses on methodology and data used for further analysis. Discussion on the empirical results would be neither complex without these estimation results nor would it be accurate without technical comments of all post-estimation tests in Section 4. Finally, recommendations for future research are necessary within the conclusion.

2. Literature review

The choice of profitability indicators is the essence of the meaning of financial management. The central idea of the discussion is the influence of the setting of financing methods on the size of the generated profit and also on whether the company has a sufficient level of liquidity at the given level of reported profitability. To increase profitability, it is necessary to optimize the use of funding sources. To use foreign sources of financing, the company must have a sufficient level of liquidity. Otherwise, insufficient liquidity does not increase the cost of obtaining foreign sources. Here is where the basic goal conflict can be found. An increase in liquidity means that funds are invested in current assets that are generally not considered suitable assets for the appreciation of funds. This means that when the level of liquidity increases, there is usually a decrease or stagnation in profitability. (Růčková, 2015) In this respect, the availability of funds can therefore be limiting in terms of profitability, which is important for business owners. This leads to the

question of whether there will be a different relationship between profitability and liquidity at different levels of ownership concentration. When constructing the ROA indicator (EBIT/Assets) in total, this indicator will have its significance, especially concerning being freed from the influence of the taxation rate in individual countries. Furthermore, this indicator includes only the regular activity of the company, which means that extraordinary events are also not taken into account. The main factor in terms of efficiency is the growth of the economic result for the accounting period. However, it is reflected in both the numerator and the denominator, as it significantly affects the total amount of property or funding sources. The essence will primarily be how the economic result (or profit) will be dealt with. If the profit is paid to the owners through dividends, then the ROA will increase over time. If the profit is retained, then the ROA will stagnate or may even decrease depending on the other effects of the management of financing sources. Therefore, the question arises as to whether this effect will be more pronounced with a more concentrated or less concentrated ownership structure.

The consequence of the influence on profitability as a result of the concentration of ownership is not clearly described in the literature. The influence on the profitability of the total invested capital was investigated, for example, by Thomsen and Pedersen (2000), who dealt with the 435 largest companies in Europe. They found a positive effect of concentrated ownership on the growth of total profitability, but also on the growth of the market value of these companies. On the contrary, Laporšek et al. (2021) found that the effect of ownership in Slovenian-listed companies on company performance is not significant. Gedajlovic and Shapiro (2002) investigated the relationship between ROA and the concentration of ownership in Japanese companies. Their results showed that there is a negative effect, the more concentrated the ownership, the lower the profitability of Japanese companies as a whole. However, if they defined large companies, then the effect of concentrated ownership on profitability is positive. Using GLS random-effects regression, they evaluated the period from 2005 to 2017. In other studies, the focus is not on the concentration of ownership but on whether the owner is domestic or foreign. This fact was confirmed in Japanese processing companies traded on the stock exchange by Yabei and Izumida (2008). They state that concentrated ownership brings greater performance in the companies analyzed. For example, Parthiban et al. (2010) investigated the effect of domestic and foreign ownership on corporate profitability in 536 Japanese firms. The effect was significant and positive in both cases, so there was no difference between whether the company was owned by a domestic or foreign owner. The same results can also be found in Horobet et al. (2019) for the EU, and Rujiin and Sukirman (2020) in Indonesian manufacturing companies.

The purpose of focusing on liquidity in connection with profitability is the existence of a representative conflict between the managers and owners of the company. This results from the fact that the flow of capital is usually two-way, first from the capital provider to the business (assets consume the cash provided by the liabilities) and from the business back to the capital providers. To ensure two-way operation, there must be enough free cash flow. In the event of a negative free cash flow value, the assets consume all of the cash, potentially leading to management problems. (Sherman, 2015). the conflict between owners (shareholders) and managers in the area of dividend payments and agency conflict costs associated with free cash flow. The most important conflict between managers and owners in these cases is the situation in which the company generates a very significant free cash flow. In this case, it is a situation where the shareholders demand the payment of part of the company's resources, but the managers thereby lose an internal source of financing. Jensen (1986) explains this problem with two facts. The first fact is focused on the benefit of debt financing of the company and the reduction of agency costs of free cash flow. The second is focused on how the company can replace the payment of dividends, and thereby obtain a larger amount of free cash flow. To be able to pay out the result of the management, it is, therefore, necessary to have sufficient financial resources, which are reflected in the liquidity indicators. Among other covariates, Bumbescu (2020) employed general solvency while investigating financial performance. Apparently, liquidity is important from the point of view of the company's financial balance because only a sufficiently liquid company can meet its obligations. On the other hand, too high a level of liquidity is an unfavorable phenomenon for business owners, because funds are tied up in assets that do not work in favor of a significant appreciation of funds and thus "cut" from profitability. Liquidity is directly related to the use of foreign sources of financing, which, if readily available, reduce the need to hold excessive amounts of liquid assets. This combination (sufficient liquidity and sufficient availability of funding sources) is perceived as an aspect that makes it possible to better seize opportunities for unexpected investments or enables companies to better weather adverse business and economic conditions or, on the contrary, to sign more significantly to the reported profitability. In their studies, Williamson (1988) and Shleifer and Vishny (1992) argue that there is a positive relationship between a company's liquidity and the use of debt. On the contrary, Morellec (2001) claims that the relationship is constructed as negative. The positive relationship is explained by the idea that highly liquid assets are less effective from the point of view of financial distress costs, as their sale (except cash) is usually realized at a loss (we are talking mainly about receivables and inventories). However, a lower value of liquid assets increases the risk of not providing funds. If the manager wants to increase the value of the debt under

favorable conditions, it must be covered by a sufficient volume of liquid assets. Liquidity is also seen as an aspect that makes it possible to better seize opportunities for unexpected investments or enables companies to better weather adverse business and economic conditions. Morellec (2001) believes that the liquidity of assets (that is, the ability to include them in the sale of assets during liquidation) reduces the value of the firm, thus its debt capacity, and thus also the availability of funds. He also claims that the disproportionate liquidity of assets in a business leads to insufficient investment and problematic business development. In contrast, however, Kim et al. (1998) claim in their study that sufficient ex-ante liquidity takes care of the availability of funds in the future in the case of investments and thus the growth of investment profitability. Růčková (2015) claims that there is a positive link between liquidity and profitability in the manufacturing industry in Visegrad countries. At the same time, it is necessary to realize that several studies have pointed to the fact that it is not possible to find a significant effect of liquidity on corporate profitability. This is proven, for example, by Růčková (2015) in the Visegrad countries in the field of services. Similar results are presented by Majumdar (1997), Sur and Chakraborty (2011), and Pordea et al. (2020), respectively. If we also perceive liquidity in connection with the concentration of the ownership structure, we can state that, for example, Earle et al. (2005) state that for Hungarian companies traded on the stock exchange, as the concentration of the ownership structure increases, the need to hold excessively liquid assets decreases and the liquidity of the companies decreases. Prommin et al. (2016) in their study confirm the previous findings by stating that Thai companies with the growth of concentrated ownership reduce liquidity.

Another possible factor may be the influence of the wider environment, measured primarily by the growth rate of the gross domestic product since the performance of companies is largely influenced by the overall economic environment. The choice of the above-mentioned indicators is also based on already implemented studies (e.g. Nivorozhkin, 2005; Hernádi and Ormos, 2012; Crnigoj and Mramor, 2009; Růčková, 2015; Růčková and Heryán, 2015; Handriyani et al., 2018), which took into account the specifics of the European environment, especially the weaker availability of market data, as most such studies are conducted on American companies, e.g. Zuidberg (2017) conducted a study on 125 low-cost airline companies and found a negative link between GDP and profitability. Otherwise, the relationship between GDP growth rate and profitability is rather investigated at the level of the banking and insurance sector, e.g. Gaganis et al. (2013) performed an analysis on almost 400 insurance companies in 52 countries, Almeida and Divino (2015) further demonstrated a positive relationship between GDP and profitability. In the analysis of companies in the field of transport and warehousing in eight European countries,

Růčková and Škuláňová (2021) state that the growth of the gross domestic product has a positive effect on the growth of profitability in the mentioned field of business in the six countries analyzed, in two countries the growth of the gross domestic product in this field of the business domestic product harmed the efficiency of companies. The object of interest was the influence of macroeconomic indicators on company profitability, also in the study by Brezeanu et al. (2010). Five fields of business are monitored with a significant and positive effect of the gross domestic product on the profitability of businesses.

3. Methodology and empirical data

Annual data have been obtained from 2010 to 2018 for TOP10 EU countries within the automotive industry. Particularly, financial data have been obtained from the balance sheet and profit and loss statement of those companies belonging to the biggest producers in the EU, i.e., Belgium (BE), Czech Republic (CZ), Germany (DE), Spain (ES), France (FR), Hungary (HU), Italy (IT), Romania (RO), Sweden (SE) and Slovakia (SK). However, the year 2018 has been excluded due to the most missing data. Furthermore, companies that missed more than two years in the 2010-2017 estimation period or missed the first or the last year of it have also been excluded. To differentiate between ownership structures, the BvD independence indicator has been used among the sample used sample of 3,008 automotive companies. Table 1 describes in detail all the data used for the estimation.

Table 1 Description of data used to explore GMM instruments

Macroeconomic data the World Bank *	GDP	The sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for the depreciation of fabricated assets or depletion and degradation of natural resources. Data are in constant local currency.
	Consumption	Final consumption expenditure (formerly total consumption) is the sum of household final consumption expenditure (formerly private consumption) and general government final consumption expenditure (formerly general government consumption). Data are in constant local currency.
	Savings	Gross savings are calculated as gross national income less total consumption, plus net transfers.
Micro	EBIT	Earnings before interest and tax to explore the return on assets. All operating revenues minus all operating

		expenses (or gross profit minus other operating expenses).
	Total assets	Total assets of the company (fixed assets plus current assets)
	Cash	Detail of the Other current assets to explore Acid-test, i.e. only the amount of cash at the bank and in the hand of the Company.
	Debtors	Trade receivables to explore Acid-test (from clients and customers only).
	Current Liabilities	Current liabilities of the company to explore Acid-test (loans, creditors, and other current liabilities).

Source: Authors' view with citations from the World Bank online database (*) and Orbis (+)

The BvD independence indicator gives a piece of information about corporate governance among companies in TOP10 producers within the automotive industry in the EU. First, it has been created A category that includes these firms with shareholders having no more than 25% of ownership and ultimate voting rights, as well as firms with shareholders having no more than 50% but one shareholder with voting rights between 25.1% and 50%, for the independent automotive companies (A+B category within the BvD independence indicator). Second, on the contrary, category D includes these firms with a shareholder having a total or calculated ownership of 50.1% or higher, as well as those having a direct ownership of over 50% with branches and foreign companies, for the non-independent companies from the corporate governance view (C+D category within the BvD independence indicator).

The whole sample distribution is further described within the Appendix where it is apparent that even though, not normal, the distribution is symmetrical. Table 2 shows the number of observations and medians among dynamic panels and its comparison between automotive companies (group A, having less than 50% of shares at maximum for one stockholder) and the high-ownership structure (group D, having a majority owner with 51% and more). After the previously described data exclusion in the above paragraph has been employed the most affected case by the missing data is evident in HU and SE, low-ownership structured companies. The rest of the sample is considered representative enough to estimate the relationship even for this case. Whereas in most countries the median return on assets (ROA, explored as EBIT on total assets) of companies having a majority owner is surprisingly at a lower level, the exception is ES, FR, and RO. This might be primarily related to the fact that, with more concentrated ownership, it is easier to decide on reinvesting the profit, which is particularly related to the need to realize investments in research and development. This was mentioned above when describing the three largest countries

in terms of car production. It can be assumed that large concerns tend not to fall behind in research and development in the competition so as not to lose their position in the market. With less concentrated ownership, the manager will be responsible for a wider base of owners, and the pressure on the performance of the business and the uncertainty of his position will be greater. Both of these factors can be reflected to some extent in the result of the median ROA value.

Furthermore, the median of the liquidity acid test in Table 2 (LQ, explored as a sum of cash and debtors, both on current liabilities) is lower in such a group of firms in half of the countries. Liquidity shows smaller deviations than profitability in terms of the concentration of ownership. At the same time, it is clear that the median values for liquidity show values that oscillate close to the value 1, which is common in the literature as the lower limit of the recommended band. In this situation, the values of what can be paid are equal to what is required to be paid. Regardless of the concentration of ownership, the companies analyzed keep liquidity at the lower limit of the recommended band or even below it. This is understandable because under European conditions there is a developed financial market and the availability of free funds grows according to that. Larger values would indicate managerial conservatism, which would be detrimental to profitability. Excessive holding of liquid items usually appears to be inefficient. For less concentrated ownership, the liquidity value is the lowest for Hungarian companies. However, it is also the least represented item in terms of the number of observed subjects. In this context, the subsequent division of both groups according to the size of the companies will be interesting. However, the evidence does not suggest anything related to the lower power of financial management. From a macroeconomic point of view, the share of consumption in GDP (r-CNS) is greater than the share of savings of each country. In ES, FR, and IT, r-CNS is even close to 80%, in CZ, HU, and RO this ratio is below 70%, in contrast.

Table 2 Descriptive statistics

	Obs.		**ROA**		**LQ**		**r-CNS**	**r-SAV**
Country	*A*	*D*	*A*	*D*	*A*	*D*	*(%)*	*(%)*
BE	198	504	8.29	4.59	1.24	1.24	75.19	24.25
CZ	351	2 277	8.10	6.90	1.31	1.00	67.15	25.06
DE	423	1 458	7.01	6.98	1.08	1.24	72.66	27.08
ES	1 350	3 933	3.71	4.31	1.11	1.03	78.82	19.48
FR	648	4 032	3.25	3.71	1.09	1.03	77.68	21.32
HU	99	423	7.58	5.53	0.71	0.78	69.75	23.87
IT	2 475	4 842	3.80	3.78	0.93	0.96	79.73	18.52
RO	360	1 566	6.36	7.91	1.08	0.97	68.77	30.90

SE	90	891	6.42	5.84	0.84	0.93	72.28	27.41
SK	162	999	6.93	5.67	0.87	0.75	74.11	22.83

Note: Group A consists of automotive companies having low ownership concentration (less than 50% of shares at maximum for one stockholder), and Group D of those having high ownership concentration (a majority owner with 51% and more).
Source: Authors' calculations

The first obvious thing in Figure 1 is that the size of the companies is not possible to take into account if one wants to analyze TOP10 automotive leaders among the EU countries. Due to non-existing companies of a particular size, e.g. medium-sized in HU and SE within low ownership concentration, or medium-sized in SE within high ownership concentration, it is not distinguished between the size of companies in the sample. On the other hand, apparent differences in the ROA median can be caused not just by the ownership structure, but also, further, by the size of the companies. A very good example is, in contrast, a higher ROA median of very large companies in HU within the group of companies with a low ownership concentration or a higher CZ one within the group of companies with a high ownership concentration. However, the number of such companies matters according to their weight within a panel. Second, the data distribution varies, while the ROA median is a few times even on the core border of the box diagram. Methods as generalized least squares would therefore be ex-ante rejected to analyze such time series due to the problem of non-normality or even heteroskedasticity among residuals. Even the duration of the estimation period is too short to deploy these particular methods, that is, GLM, GLS, or panel GEE, for further analysis. Due to the above, this analysis does not consider the size of companies.

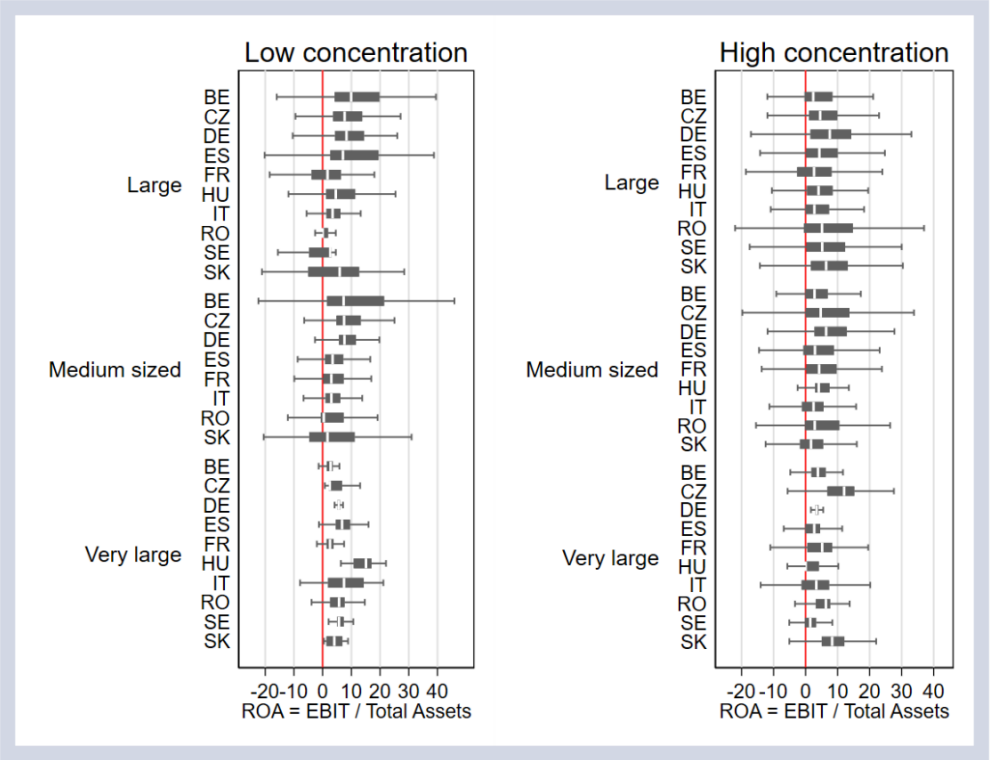

Figure 1 Distribution of dependent variable ROA
Source: Authors' self-processing

Last but not least is the economic development in our estimated countries. It follows that, for highly concentrated ownership, the dispersion of values is significantly greater than for companies with a low concentration of ownership. At the same time, between firm sizes and countries, it is clear that the median ROA is very similar for more concentrated firms. No apparent reason can be found in this analysis. Therefore, it is essential to perform a deeper analysis based on the most critical factors. Two factors have already been indicated above: the profitability of total assets and liquidity. In this particular business, the relationship with the economy should be determined in some way. Using GDP is common in the literature. However, distinguishing between the impact of savings and consumption, both measured on the GDP is unique. The reason for splitting the gross domestic product into consumption and savings is mainly the fact that the area of savings in particular brings positive effects to the automotive industry. On the one hand, the growth of savings signals the possibility of using savings for investments, which have been a

very important item in the automotive industry in recent years, especially for research and development of car safety and their ecological operation. On the other hand, growth in savings can signal future effects in terms of sales. The willingness of households to exchange an older car for a new one increases with the growth of the ability to finance from their resources. Nevertheless, it may also mean that the level of interest rates is such that it is worthwhile for households to save. This can theoretically reduce the availability of funds in the form of credit. However, with more concentrated ownership or with a holding arrangement of the management structure, the availability of funds often does not depend on the external environment but on the creation of internal financial resources and subsequent cash pooling. Nonetheless, this fact is not currently part of the research, but it provides a good prerequisite for the development of existing research.

To see a clear economic development, all variables in Figure 2 have been indexed on the value from 2010 which means 100% then. Especially the development of savings (SAV_index) could play a crucial role in supporting the profitability of those automotive companies among TOP10 countries. On the contrary, consumption (CNS_index) seems to be much more correlated with the GDP index. The most evident trend of the SAV_index tends to be in HU, CZ, and DE. However, ES or IT with the lowest economic growth in the middle of the estimation period has a similar trend. Nonetheless, this may be related to negative expectations for the future and an attempt to secure oneself in this regard. This could be a negative signal in terms of future sales if we do not count on the export of production, but both Spain and Italy are among the important exporters of cars. At the same time, the growth of savings can improve the availability of funds from the banking sector for the realization of investments in research and development for companies in the automotive industry.

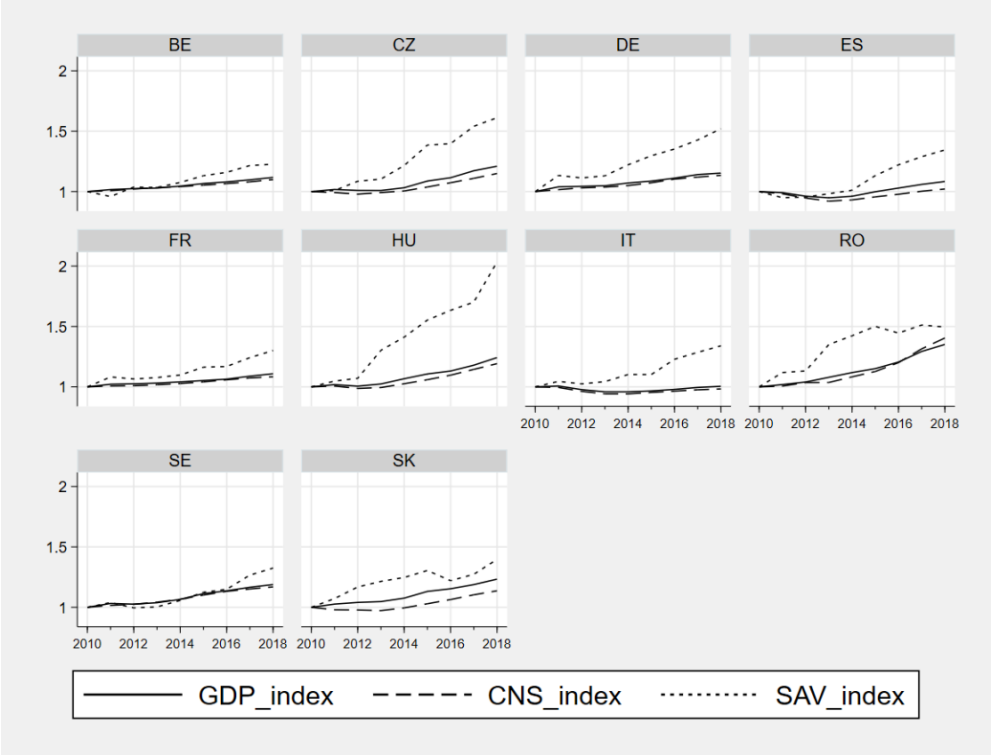

Figure 2 Macroeconomic development among selected countries (index 2010 = 100%)
Source: Authors' self-processing

The use of the generalized method of moments (GMM) while working with panel data is justified, especially when working with a dynamic panel when the observed period for estimating the regression coefficients is shorter (T≤10), but the cross-section of the panel includes a larger number of companies. Thanks to the generalization of the method of moments, the problem of heteroscedasticity of the residual component is also solved with the two-step corrected model. The method itself was originally constructed in their work by Andersen and Hsiao (1981) and subsequently by Hansen (1982). However, Arellano and Bond (1991) also contributed to its development and pointed out the problem of serial correlation across the idiosyncratic errors, which can be understood as a panel residual component. Arellano and Bover (1995) later modified the one-step corrected difference estimator, which differed from the previous version by rejecting homoscedasticity. In the following years, however, Blundell and Bond (1998)

focused on the error component of the models, focusing in particular on the possible distortion of the results due to systematic errors in the estimation of the studied effects of the two-stage estimation. They constructed a system GMM model that allows the inclusion of a much larger number of instrumental variables. The problem of error correction was solved finally by Windmeijer (2005), whose technical specification of the robust component of the model revealed not only several false significant results but also different signs of significant coefficients. A robust vector of errors has become essential to correctly estimate the two-stage coefficients of the dynamic panel GMM model. Without this Windmeijer correction, the GMM two-step standard errors are biased.

The system GMM estimator, as this technique is commonly referred to in the literature, with data arranged in panels, was thus constructed based on modifications of the two-step estimation using the techniques proposed by Arellano-Bover/Blundell-Bond with the contribution of Windmeijer. However, regardless of all the work, even such a two-step system GMM model has been criticized mainly for the following: (i) On the one hand, the testing of the exogeneity of the variables of the regression equation has not been fully solved, when the authors in the past tended to assume that the variables cannot be interpreted as strictly exogenous. These were subsequently introduced into the model as either predetermined variables or endogenous variables. However, endogeneity tests were finally developed by Kiviet (2022). (ii) When specifying an error vector robust to heteroskedasticity of Windmeijer corrections, it was not possible to test for oversizing of the estimate by variables using Sargan (1958) or the Hansen-J test (1982). This alternative was introduced by Sanderson and Windmeijer (2016). They also highlighted an issue that has been completely ignored for years, on the contrary, model under-identification, discussed in the past by Cragg and Donald (1993) or Kleibergen and Paap (2006). In addition, this issue comes to the forefront when, in the discussion, Windmeijer (2018) drew attention to the possible collision of the Sargan-Hansen and Kleibergen-Paap test results. Kripfganz (2019) subsequently introduced a modified version of GMM estimators with panel data and presented that at the Stata conference in London. Among others, these modified estimators employed many newly introduced diagnostic tests, including modifications of the Sargan and Hansen tests for use with the Windmeijer error-corrected two-step estimation. (iii) In the case of many studies, it is not even entirely clear how to test the lag setting of the instrumental variables, which do not enter the basic estimation equation but are related to the error component of the model with a robust error vector. Kripfganz and Swarz (2019) state that only if the homoscedastic residual component of the model is confirmed, the moments can be tested using the Hausman test. However, Andrews and Lu (2001) already present the MMSC test (model and moment selection criteria), which makes

it possible to compare models precisely in terms of their setting of the moments of the variables of the regression equation, including the moments of the instrumental variables.

A system GMM model with a dynamic panel including cross-sections with the missing data is generally described by the following equation (1):

$$y_{it} = \hat{a}_{j=1}^{p} \hat{I} \pm_j y_{i,t-j} + x_{it}\hat{I}_{\leftarrow 1} + w_{it}\hat{I}_{\leftarrow 2} + v_i + \_\mu_{it} \quad i = 1, \ldots, N \quad t = 1, \ldots, T_i \hat{A}, \quad (1)$$

where α_j indicates the total number of *p* parameters for the estimation of the explanatory variable ROA, x_{it} means $1\_— k_1$ vector of strictly exogenous variables and β_1 is $k_{1\_}— 1$ vector of parameters to be estimated, respectively w_{it} means $1\_— k_2$ vector of predetermined and endogenous variables and β_2 is $k_{2\_}— 1$ vector of parameters to be estimated, v_i represents panel effects that can be correlated with regressors, and $\_\mu_{it}$ is the residual component, i.e. the panel of idiosyncratic estimation errors, having a variance $\_É^2_{\_\mu}$.

4. Empirical results

Technically, all two-step system GMM models with dynamic panel data (Blundel and Bond, 1998) have been constructed with the robust idiosyncratic errors to heteroskedasticity (Windmeijer, 2005) using the xtdpdgmm STATA command introduced by Kripfganz (2019). However, in the past, it was not able to test such a model for overidentification by its parameters (Sargan-Hansen tests), nor its under-identification (Cragg-Donald and Kleibergen-Paap tests). Fortunately, recently developed techniques within the GMM applied all necessary tests. It is possible to see a few false significant cases among estimated results due to under- or overidentification of the collapsed models, i.e. ES and FR in the case of high-ownership concentration groups of companies, and BE or HU in the low-ownership concentration firms. Furthermore, even though the non-linear moments have been employed, the problem of insignificant first-order autocorrelation (Arellano-Bond test) has been still detected among a few outputs. Due to this particular issue, it has been able to exclude other false significant results such as CZ, HU, RO, and SK among high-ownership concentration groups of companies and CZ, FR, HU, SE, and SK in the case of low-ownership concentration companies.

A special case of different results of Cragg-Donald and Kleibergen-Paap tests has been detected in high-concentrated DE companies. While the Cragg-Donald robust continuous updating estimator (LM version) has indicated a problem of under-identification of the model (p-value = 0.2087), the Kleibergen-Paap robust limited

information maximum likelihood ratio (LM version) has not (p-value = 0.0000). This issue is discussed in Windmeijer (2018). Only in one case of low-concentrated BE has been detected a problem of multicollinearity been detected. Due to this issue, only 20 moments have been estimated with the collapsed model. According to the significant correlation between r-CNS and r-SAV, the endogeneity has been tested by Kiviet (2020, 2022) tests. However, due to the homoskedasticity assumption for such a test, it has been possible to test it only for these two particular variables. Nevertheless, assuming that savings are followed by consumption in the automotive industry, which has a further impact on profitability, r-CNS has been employed as the predetermined variable lagged by one year, whereas r-SAV has been employed as the endogenous lagged by two years. Furthermore, liquidity LQ has been employed as endogenous due to the acid test examination itself (as it depends on the level of cash, receivables as well as short-term liabilities). The rest of the models have been constructed in this way.

Empirically, only a few particular cases – as both IT cases or DE and ES just within low-concentrated ownership groups of companies – have finally concluded the robust results in good condition within Table 3 and Table 4. Differences remain in the case of liquidity LQ. Although low-concentrated IT has estimated a significant impact on liquidity and high-concentrated has not neither low-concentrated DE nor ES has estimated such an impact, on the contrary.

Table 3 H I G H ownership concentration estimates

Variable	*BE*	*CZ*	*DE*	*ES*	*FR*	*HU*	*IT*	*RO*	*SE*	*SK*
ROA										
L1.	0.9840	1.2142**	1.7217**	1.5656**	1.7029**	0.9554	1.5284**	1.1393	1.0697	1.0454
r-CNS	1.0568	1.4548	1.0670	0.9622	0.7797**	0.7416	0.9587*	1.1023	2.6820	3.6437**
r-SAV	1.0642	0.5657	0.9436	1.3735*	2.6426**	3.9663	1.4005**	1.0422	0.0680	0.0181**
LQ	1.0005	3.1540**	0.9474**	1.0047	1.0000	1.6476	0.9886	0.4639	989.0958	1.3158
AB(3)	0.0066	0.3011	0.0000	0.0002	0.0070	0.1980	0.0000	0.1234	0.0232	0.2074
	0.8135	0.2501	0.9786	0.6463	0.1853	0.1938	0.9921	0.4041	0.2507	0.1273
	0.2762	0.3309	0.3391	0.2460	0.2300	0.3421	0.6229	0.2576	0.2868	0.2115
Underid.	.	.	X	.	.	.	<.05	.	.	.
Overid.	>.05	X	>.05	X	X	X	>.05	X	X	X
m(l)	21	21	46	21	21	21	46	21	21	21
m(n)	1	1	.	1	1	1	.	1	1	1
Obs.	385	1720	1047	2970	2955	308	3702	1191	685	759
Firms	56	253	162	437	448	47	538	174	99	111

Note: Symbols * for p<.05, and ** for p<.01. The two-step system GMM estimation technique by Blundell and Bond (1998) with the robust bias-corrected variance–covariance matrix for standard errors, recommended by Windmeijer (2005), and the STATA *xtdpdgmm* command developed by Kripfganz (2019). Due to the high correlation between covariates and the rejection of their strict exogeneity, r-SAV and r-CNS treated as predetermined and LQ treated as endogenous, both with lagged levels as instruments. AB means the Arellano-Bond test for zero autocorrelation in first-differenced errors to test whether the moment conditions in the model are valid. According to

Windmeijer (2018), first, underidentification tested by the Cragg-Donald robust CUE-based (LM version) and the Kleibergen-Paap robust LIML-based (LM version), and then overidentification tested by the Sargan-Hansen test. The abbreviations m(l) and m(n) are used for the number of linear and nonlinear moments. Less than 30 m(l) are models with collapsed instruments due to orthogonality issues.

Source: Authors' calculations

Table 4 L O W ownership concentration estimates

Variable	*BE*	*CZ*	*DE*	*ES*	*FR*	*HU*	*IT*	*RO*	*SE*	*SK*
ROA L1.	1.7679**	1.2945	1.4732*	1.5754*	0.6152	1.0928	1.6045**	1.5247*	1.1450	1.0431
r-CNS	0.8846	1.0500	0.8490*	0.8959*	0.4453	1.2331	0.9360**	1.0914	0.9180	3.6826
r-SAV	1.7217	1.3405	1.7997**	1.7770*	20.3298	0.6429	1.5353**	0.9561	1.2618	0.0195
LQ	1.0111	0.1182**	1.2658	0.9833	1.0054	405.3363**	0.9962**	1.0842	0.8224	6.2134
AB(3)	0.0062	0.3329	0.0126	0.0075	X	0.1913	0.0000	0.0175	0.2073	0.1112
	0.4509	0.3083	0.2222	0.7766	0.0878	0.8651	0.3513	0.8554	0.3997	0.0357
	0.9091	0.0315	0.5959	0.3238	0.0001	0.3356	0.1041	0.7431	0.3917	0.9268
Underid.	X	.	.	<.05	.	.	<.05	.	.	.
Overid.	X	>.05	>.05	>.05	X	X	>.05	>.05	X	X
m(l)	20	21	21	21	21	21	46	21	21	21
m(n)	.	1	1	.	1	1	.	1	1	1
Obs.	154	261	294	1016	479	74	1898	271	69	121
Firms	22	39	46	150	72	11	275	40	10	18

Note: Symbols * for p<.05, and ** for p<.01. The two-step system GMM estimation technique by Blundell and Bond (1998) with the robust bias-corrected variance–covariance matrix for standard errors, recommended by Windmeijer (2005), and the STATA *xtdpdgmm* command developed by Kripfganz (2019). Due to the high correlation between covariates and the rejection of their strict exogeneity, r-SAV and r-CNS treated as predetermined and LQ treated as endogenous, both with lagged levels as instruments. AB means the Arellano-Bond test for zero autocorrelation in first-differenced errors to test whether the moment conditions in the model are valid. According to

Windmeijer (2018), first, underidentification tested by the Cragg-Donald robust CUE-based (LM version) and the Kleibergen-Paap robust LIML-based (LM version), and then overidentification tested by the Sargan-Hansen test. The abbreviations m(l) and m(n) are used for the number of linear and nonlinear moments. Less than 30 m(l) are models with collapsed instruments due to orthogonality issues.

Source: Authors' calculations

From the development of individual accounting elements in Figure 3 entering the construction of the indicators used, it is evident that higher fluctuations can be observed in the area of total assets (TA) in highly concentrated ownership, which tended to grow, especially between 2014 and 2015. However, fluctuations can be perceived as positive, as they are a signal of growth in investments in long-term assets. This can be argued based on the development of cash and cash equivalents (CC) and debtors' receivables (DE), where we do not see this fluctuation. Investments mean the stability of the given sector, but at the same time, a slower-growing EBIT (EB) means a slowdown or a decrease in ROA (the denominator grows more intensively). Hence, it can be assumed that the profitability of the previous periods can affect the profitability in the following periods, which has been proven by the GMM estimation included in Table 3 and Table 4. The side of used capital (CP) can be viewed through a similar lens. Current liabilities (CL) did not experience a similar fluctuation, so it can be deduced that there was an increase in long-term capital. Here, either the effect of the growth of retained earnings (however, this does not indicate EBIT) or the increase of long-term external capital can be noted.

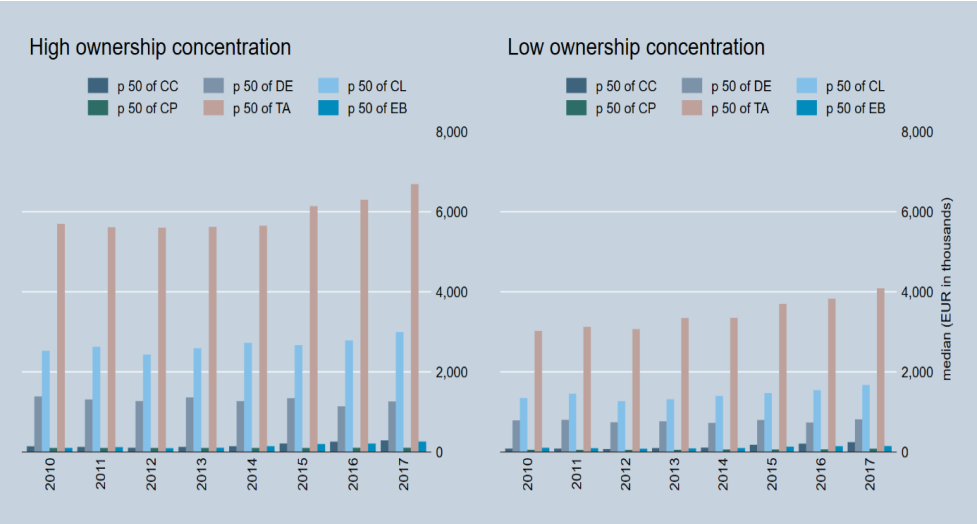

Figure 3 Development of medians among particular financial variables in Italy
Source: Authors' self-processing

In this context, the growth of savings, which is more intense between 2014 and 2015 than in previous years, can play a significant role. The availability of funds can encourage investments and the growth of profitability in the following periods.

Although Italy is one of the countries where the density of motor vehicles per inhabitant is one of the highest, it is also one of the countries where the intensity of vehicle fleet change is the lowest. Between 2015 and 2017, only 1.7% of the fleet was replaced. However, the Italian automotive industry exports 65% of its production (data from 2017), so it is not dependent on the domestic market. In the case of concentrated ownership, the Fiat company is most involved in this, which also records financial investments in long-term assets, because in the monitored period the merger of Fiat and Chrysler took place, and the company thus became the eighth largest manufacturer in the world (Jílek, 2018). The GMM estimates included in Table 3 and Table 4 suggest that previous growth in profitability induces growth in profitability in subsequent periods. Its value is not very high, but its positive influence is indisputable. A similar positive effect can be seen in the effect of savings. The size of the coefficient is approximately the same, so we can state that the growth of savings (and thus the volume of free funds on the Italian market) and the growth of profitability in previous periods have a positive effect on the development of profitability in companies with highly concentrated ownership. On the contrary, liquidity did not have a statistically significant effect. It cannot be claimed that it would influence the level of profitability. This fact is interesting precisely in the context of the growth of savings and possible availability. Liquidity in less concentrated ownership was shown to be significant. Thus, all factors were significant for less concentrated ownership. Although it is possible to observe a more significant effect, just as with concentrated ownership, the profitability of the previous period and savings. However, the same positive effect with a slightly lower coefficient is observed for consumption and liquidity. Hence, the higher liquidity supports the higher profitability. Although the theory claims that funds stored in liquid assets harm the growth of profitability, there are also studies in the literature that present a proven positive effect of liquidity on profitability (Morellec, 2001; Earle et al., 2005). This statement is mainly related to the reduction of the costs of the financial crisis and the better availability of funds from the banking sector. Again, it is possible to focus primarily on the high volume of investments realized in research and development in the automotive industry. The coefficient of influence of savings is slightly higher than that of consumption. As already mentioned above, the relatively low coefficient may be related to the impact of invested funds. The delay in the impact of research and development will be more than a year, but without realized investments, the market potential of companies would be lost due to the dynamics of the development of the automotive industry.

In addition to the results of Italian car companies, the results in Germany and Spain can also be commented on. However, only the lagged profitability, consumption, and savings values were significant in these countries. The median profitability in

Germany was significantly influenced by the slow growth of EBIT (in addition to the decrease recorded in the last year) and, conversely, by the significant growth of total assets. From the structure of assets, it can be seen that behind the increase in total assets are fixed assets, which again signals investments that may have caused costs that affected the size of EBIT. However, at the same time, these investments may not yet be worth the returns, and their effect will occur with delay. The situation is slightly different in Spain, where the development of profitability in companies with a low concentration of ownership shows a steady increase. The increase was most pronounced between 2014 and 2015, during which both total assets and EBIT grew. In the following years, the increase in profitability was due to the growth of EBIT and the uneven development of total assets, which first decreased and increased in the last period. At the end of the period, Spanish car companies began to cooperate very intensively with German car companies on the research and development of electromobility, which could be reflected in the results of the last period because, in the last year, we still observed an increase in profitability. Although the profitability median is already minimal in 2017.

Table 5 Results compared to the related literature

Ownership	*Our results*	*Similar studies*		*Studies without significant results*
		The same results	**Different results**	
HIGH concentrated ownership structure	Positive impact	Morck (1988) Demsetz and Villalonga (2001) Kapapoulos and Lazaretou (2017) Hanafi et al. (2018)	Aluchna and Kaminski (2017) Balsmeier and Czarnitzki (2017) Ersoy and Koy (2012) Horobet et al. (2019)	Demsetz and Lehn (1985)
LOW concentrated ownership structure	Positive impact	Morck (1988) Balsmeier and Czarnitzki (2017)	Horobet et al. (2019)	

Source: Authors' self-processing

As we can see in Table 5, a similar study can be found in Horobet et al. (2019). However, they examined companies in the manufacturing sector traded on public capital markets. In their study, they use two accounting ratios, ROE and ROA, in contrast to this study where the focus is on ROA. The common indicator examined

is ROA. Horobet et al. (2019) arrived at different results, which means that for both concentrated and non-concentrated ownership structures, they concluded that it negatively affected the performance of firms as measured by ROA. One of the earliest studies in which ownership structure was considered in two categories, highly and not-highly concentrated, Morck et al. (1988) was conducted on US companies, the results showed a positive relationship but the data was non-robust. Robust data were used by Demsetz and Villalonga (2001) who confirmed a positive effect between concentrated ownership structure and firm performance for Australian companies. Positive relationships between ownership structure and profitability were also found in the study of Hanafi et al. (2018) in developing countries between 1997 and 2008, or Kapopoulas and Lazaretou (2017) in 175 Greek companies. Balsmeier and Czarnitzki (2017), when examining ownership concentration and profitability in Central and Eastern Europe, concluded that the effect of ownership on performance can be characterized as an inverse u-shape relationship, that is, a positive effect can be observed at lower ownership concentration, which turns into a negative effect at concentration above 50%. Different results from the results of this study can also be found in Aluchna and Kaminski (2017), who, however, focused their attention on the largest publicly traded companies in Central Europe and examined ownership structure from the perspective of shareholder type. The same results can be observed for Turkish companies in the study by Ersoy and Koy (2012).

5. Conclusions

The study aimed to find out how the degree of ownership concentration, measured through the independence indicator of the Bureau van Dijk, is reflected in the financial management of companies in the automotive industry among selected European countries. This analysis carried out using the GMM method showed that it is possible to work with the results for both ownership variants only for automotive companies in Italy. The fact that both forms of ownership can be traced to the positive influence of selected factors on the development of profitability in the given field of business is not without interest. The only difference is that, with less concentrated ownership, liquidity also plays a significant role. For concentrated ownership, a positive effect on profitability was demonstrated for lagged profitability, consumption, and savings rates. A more detailed analysis of the items indicated that the total assets of the companies were growing, which means that investments were taking place, which may be related to the increase in the savings rate. Therefore, in the case of concentrated ownership, further analysis could be directed to the area of investment in science and research, which is usually referred to as an essential part of the current functioning of automotive companies in analyses

at the republic level. This argument will also be very important in the context of the current development of fuel prices and the crisis regarding the impact of COVID-19. For less concentrated ownership, in addition to the positive effect of delayed profitability, the consumption rate, and the savings rate, a positive effect of liquidity was also recorded. On the one hand, this can be surprising since liquidity here is backed by money, cash equivalents, and receivables. However, looking at the median values, it is clear that liquidity is kept below the commonly recommended value of 1.00, so the potential for possible growth without jeopardizing profitability. In addition, the compliance of both microeconomic quantities gives a very good prerequisite for raising funds under better conditions. This fact opens up possibilities from the point of view of analyzing the influence of interest rates on the financial policy of companies. The search for an answer to the question of whether decreasing interest rates will automatically mean an increase in the demand for free funds is already part of many analyses at the level of financial institutions, but the analysis from the corporate point of view, especially in European countries, is not covered much. Overall, the results of this study suggested that the impact of the ownership structure is not as clear as the theory claims. Although the results of this paper cannot be generalized, they provide the tools for a new way to investigate corporate financial data using GMM with dynamic panel data, as suggested by Kripfganz (2019).

The results of this paper support the idea of Thonet and Poensgen (1979) investigating German manufacturing companies, where less concentrated ownership with management outside the framework of ownership caused a greater rate of profitability growth. It is also necessary to realize that within the automotive industry, there can also be mutual ownership between companies that manufacture cars and companies that manufacture parts for the production of automobiles. Furthermore, according to the OECD (1995), interconnected ownership structures are common in Italy. This can lead to both positive and negative interactions following the return on assets. Already Mayer (1996) states that, especially in manufacturing companies, the effectiveness of activities is largely dependent on the mutual interaction of many participating entities, i.e. both suppliers and customers. If there is an ownership nexus, then activities are much less demanding. On the other hand, significant interdependence can hinder restructuring in the case of inefficiency, which was shown, for example, by the OECD (1999) in the example of the crisis in Korean companies.

The present study has only examined one business industry in the EU. Hence, results would be different for a different business industry as well as amongst the U.S. or Asian economies. Some limitations should be considered. First, even though the profit was measured on total assets, it was not distinguished between the size of

companies, i.e. very large, large, or medium-sized enterprises. Second, although ownership concentration has been distinguished, cross-company relations have not been investigated. Finally, the automotive industry was not taken into account as part of international trade. Nevertheless, the results of this paper are encouraging and should be validated with a larger sample size. The approach from this paper could also be applied to different business industries. However, future studies should perhaps concentrate on the management of earnings and the agency theory. Research into solving this particular issue is already in progress.

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Appendix Sample distribution in detail

	LOW concentrated structure (A)					HIGH concentrated structure (D)				
	Mean	*Median*	*S.D.*	*Skew.*	*Kurtosis*	*Mean*	*Median*	*S.D.*	*Skew.*	*Kurtosis*
BE										
ROA	10.60	8.29	14.26	0.98	5.27	6.02	4.59	12.40	0.45	7.35
LQ	1.87	1.24	1.69	1.54	4.28	2.10	1.24	2.01	1.30	3.29
CNS	75.32	75.19	0.52	0.33	1.73	75.32	75.19	0.52	0.33	1.73
SAV	24.43	24.25	1.18	-0.23	2.15	24.43	24.25	1.17	-0.23	2.15
CZ										
ROA	9.34	8.10	12.12	0.58	5.70	8.24	6.90	12.50	0.45	5.27
LQ	1.66	1.31	1.13	0.44	1.67	1.28	1.00	0.93	1.05	3.11
CNS	67.05	67.15	1.12	0.41	2.34	67.05	67.15	1.12	0.41	2.34
SAV	24.84	25.06	2.66	-0.12	1.48	24.84	25.06	2.65	-0.12	1.48
DE										
ROA	7.09	7.01	9.00	-1.37	8.66	7.22	6.98	11.90	-0.20	4.33
LQ	1.85	1.08	1.67	1.35	3.73	2.00	1.24	1.84	1.15	2.97
CNS	72.65	72.66	0.48	0.57	2.52	72.65	72.66	0.48	0.57	2.52
SAV	27.32	27.08	2.28	0.19	1.98	27.32	27.08	2.28	0.19	1.98
ES										
ROA	4.39	3.71	9.17	-0.20	6.84	5.31	4.31	10.75	-0.19	5.42
LQ	1.37	1.11	0.90	0.83	2.65	1.28	1.03	0.90	0.97	2.94
CNS	78.78	78.82	1.55	0.25	1.74	78.78	78.82	1.55	0.25	1.74
SAV	20.21	19.48	1.85	0.23	1.49	20.21	19.48	1.85	0.23	1.49
FR										
ROA	2.78	3.25	10.66	-0.60	5.92	2.39	3.71	12.69	-1.27	6.29
LQ	1.23	1.09	0.61	0.44	2.15	1.16	1.03	0.61	0.59	2.45
CNS	77.77	77.68	0.47	0.40	3.06	77.77	77.68	0.47	0.40	3.06
SAV	21.74	21.32	1.04	0.37	2.17	21.74	21.32	1.04	0.37	2.17
HU										
ROA	5.78	7.58	13.39	-1.36	5.85	5.22	5.53	10.74	-1.00	6.49
LQ	0.83	0.71	0.53	0.83	2.81	0.94	0.78	0.54	0.82	2.65
CNS	69.93	69.75	0.98	0.66	2.34	69.93	69.75	0.97	0.66	2.34
SAV	23.29	23.87	3.75	-0.05	1.83	23.29	23.87	3.74	-0.05	1.83
IT										
ROA	5.20	3.80	8.05	0.76	6.59	4.73	3.78	8.74	0.20	5.23
LQ	1.13	0.93	0.64	0.70	2.32	1.10	0.96	0.61	0.77	2.63
CNS	79.76	79.73	0.48	1.32	4.26	79.76	79.73	0.48	1.32	4.26
SAV	18.67	18.52	1.83	0.34	1.70	18.67	18.52	1.83	0.34	1.70
RO										
ROA	11.95	6.36	17.75	1.03	5.35	10.80	7.91	18.53	0.67	7.49
LQ	1.44	1.08	1.08	1.01	2.75	1.32	0.97	1.04	1.11	3.14
CNS	88.57	88.77	2.03	0.48	2.61	88.57	88.77	2.03	0.48	2.61
SAV	40.77	40.90	3.31	-0.12	1.91	40.77	40.90	3.31	-0.12	1.91
SE										
ROA	4.27	6.42	9.84	-1.69	6.76	6.11	5.84	13.00	0.01	4.63
LQ	0.94	0.84	0.44	0.73	3.10	1.01	0.93	0.48	0.46	2.19
CNS	72.10	72.28	0.53	-0.16	1.47	72.10	72.28	0.53	-0.16	1.47
SAV	27.69	27.41	1.30	1.03	2.74	27.69	27.41	1.29	1.03	2.74
SK										
ROA	6.47	6.93	13.95	-2.17	19.17	5.22	5.67	19.07	-2.63	17.60
LQ	1.02	0.87	0.69	0.67	2.29	0.90	0.75	0.65	0.86	2.74
CNS	74.75	74.11	2.02	1.57	4.54	74.75	74.11	2.02	1.57	4.54
SAV	22.37	22.83	1.12	-0.45	1.81	22.37	22.83	1.12	-0.45	1.81

Source: Authors' self-processing