
Firm Size and Profitability in the Cement Industry Taken Over by Foreign Investors: Evidence from Poland (2019-2024)

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Abstract:

Purpose: The study aims to determine whether firm size, measured by the logarithm of total assets, is a significant determinant of return on assets (ROA) in a highly concentrated and capital-intensive industry characterised by oligopolistic market conditions, in which all analysed enterprises are controlled by foreign capital groups.

Design/Methodology/Approach: The study applies a quantitative research approach based on balanced panel data analysis. The empirical analysis covers eight cement producers operating in Poland, all belonging to international capital groups, and is based on annual financial statements for the period 2019–2024. The relationship between firm size (SIZE) and profitability (ROA) was examined using pooled ordinary least squares, fixed-effects, and random-effects models.

Findings: The results indicate that firm size does not have a statistically significant impact on profitability measured by ROA in the cement industry in Poland.

Practical Implications: The findings suggest that managers of cement-producing enterprises should not rely solely on increasing firm size as a source of profitability improvement.

Originality/Value: The article contributes to the literature by providing empirical evidence on the relationship between firm size and profitability in a highly concentrated industrial sector characterised by oligopolistic competition and foreign ownership. Unlike studies based on diversified samples of manufacturing firms, this research examines a specific industry context in which all analysed companies operate as part of international capital groups.

Keywords: Firm size, profitability, cement industry, Foreign Direct Investment.

JEL codes: L11, L25, F23.

Paper type: Research article.

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1. Introduction

The cement market in Poland exhibits a number of characteristics typical of an oligopolistic market structure. First and foremost, the sector is characterised by a limited number of market participants, as cement production is carried out by eight companies operating a total of nine integrated cement plants. It should be noted that the cement industry in Poland was privatised as early as the 1990s with the involvement of foreign capital.

Foreign direct investors made substantial investments that enabled the modernisation of production facilities and helped maintain the industry's international competitiveness (Jasek and Bernat, 2024). In the case of the cement industry in Poland, Knickerbocker's (1973) theory of oligopolistic reaction provides the greatest explanatory power for the occurrence of foreign direct investment (FDI), as FDI inflows were largely driven by the strategic responses of the world's leading cement producers to the actions of their competitors. This concentration of cement supply in Poland implies that decisions made by individual producers can significantly affect the overall market situation.

The operation of cement plants is highly dependent on access to domestic limestone and marl deposits, which further restricts the entry of new firms into the market. High barriers to entry constitute another important factor supporting the persistence of the oligopolistic market structure. The construction of a modern cement plant requires substantial capital expenditure associated with land acquisition, securing access to raw material deposits, developing technological infrastructure, and complying with stringent environmental regulations.

Another characteristic feature of the market is the high energy intensity of the production process. Clinker production requires the firing of raw materials in kilns at temperatures exceeding 1,400°C, resulting in significant energy consumption. Consequently, energy costs represent one of the most important components of cement producers' operating costs and have a direct impact on their profitability.

Economies of scale achieved by the largest producers are also of considerable importance. The high fixed costs of production imply that profitability increases with sales volume, thereby promoting market concentration around the largest firms.

Furthermore, the limited number of producers enhances market transparency and facilitates the monitoring of competitors' actions, which is a typical feature of oligopolistic markets. The economic literature suggests that such conditions are conducive to relatively stable market shares and above-average corporate profitability (Łobos and Szewczyk, 2013; Rhoades, 1995). Research findings also indicate that market structure plays a significant role in shaping the performance of cement-producing firms (Rismayani *et al.*, 2017; Barjot, 2022; Sharma and Khurana, 2019).

The aim of this article is to analyse and evaluate the relationship between firm size and profitability in the cement industry in Poland over the period 2019-2024. The empirical analysis is based on panel data derived from the annual financial statements of eight cement producers operating in Poland.

2. Literature Review

The theory of firm profitability under oligopolistic market conditions was developed by Joe S. Bain within the framework of the Structure-Conduct-Performance (SCP) paradigm (Lelissa and Kuhil, 2018; Žáková Kroupová and Trnková, 2025). According to this approach, market structure, understood primarily in terms of the degree of firm concentration and the presence of entry barriers, determines the behaviour of economic agents, which in turn affects the economic outcomes achieved. Bain assumed that high market concentration reduces competitive pressure, enabling firms to maintain prices above marginal costs and generate above-average profits.

Consequently, the profitability of firms operating in oligopolistic markets should exceed that of firms operating in more competitive market environments. A key element of Bain's theory is the role of entry barriers, which limit the possibility of new competitors entering the market and allow incumbent firms to preserve their market power. The most important entry barriers include high capital requirements, economies of scale, access to raw materials, and technological advantages (DuPlessis and Gilbert, 2008).

In industries characterised by high concentration and substantial entry barriers, firms may maintain stable profit margins over an extended period. Bain also argued that a limited number of market participants facilitates coordinated behaviour, which does not necessarily take the form of formal cartel agreements but may nevertheless lead to a reduction in price competition. As a result, oligopolistic markets create conditions conducive to the generation of persistent economic rents.

The assumptions of Bain's theory are particularly applicable to the analysis of capital-intensive industries, such as the cement industry, where high costs associated with the construction of production facilities and significant economies of scale effectively restrict the entry of new firms (Sharma and Khurana, 2019). Under such conditions, market concentration may constitute an important factor influencing the level of firm profitability. Despite subsequent criticism, Bain's theory remains one of the most important approaches explaining the relationship between market structure and firms' financial performance (Bougette and Marty, 2026; Panhans, 2024).

According to the SCP paradigm, high concentration in oligopolistic markets contributes to higher profits due to the easier coordination of firms' actions. However, the Efficient Structure Hypothesis (ESH) suggests that high profitability

may result not only from collusive behaviour but also from the superior operational efficiency of large firms, which enables them to achieve dominant market positions.

The ESH assumes that firms with better management practices or more advanced production technologies incur lower operating costs. These efficient firms outperform competitors, allowing them to reduce prices, increase market shares, and achieve higher profits. From this perspective, increasing industry concentration (for example, the emergence of an oligopolistic structure) is a natural consequence of the success of the most efficient firms rather than a deliberate attempt to restrict competition.

Thus, efficiency determines market structure rather than the reverse (Barjot, 2022; Bikker and Haaf, 2002; Rismayani *et al.*, 2017; Sharma and Khurana, 2019; Tsang *et al.*, 2026).

The literature provides mixed evidence regarding the impact of firm size on profitability (Vijayakumar, 2011). Some studies indicate that firm size has a positive effect on profitability, suggesting that larger firms achieve higher returns due to economies of scale and stronger market positions (Łobos and Szewczyk, 2013; Stierwald, 2009). Other analyses confirm a significant positive relationship between firm size and profitability indicators such as return on assets (ROA).

At the same time, some studies demonstrate the opposite relationship, indicating that larger firms may exhibit lower profitability or efficiency (Dhawan, 2001). Possessing substantial market power in an oligopolistic environment may lead to the occurrence of the Quiet Life Hypothesis. Managers, rather than striving to maximise profits and control costs, may prefer a “quiet life” free from competitive pressure (Lelissa and Kuhil, 2018).

Firms with dominant market positions may afford inefficient organisational structures that would be eliminated under conditions of intense competition. A portion of firm resources may be allocated to activities aimed solely at maintaining acquired market power (e.g., lobbying) rather than improving productivity (Lelissa and Kuhil, 2018).

Based on the conducted literature review, the following research hypothesis was formulated: Firm size has a statistically significant impact on profitability in the cement industry in Poland.

3. Research Methodology

The study focuses on eight cement-producing enterprises operating on the market in Poland. The analysis was conducted using annual financial data covering the period 2019-2024. The selection of the cement sector is justified by its specific economic characteristics - it is a market characterised by a high degree of concentration,

significant entry barriers, and a capital-intensive and energy-intensive production process, which correspond to the features of an oligopolistic market structure. The cement industry plays an important role in the economy and remains strongly linked to developments in the construction sector and infrastructure investment.

The data used in the study were obtained from the annual financial statements of the analysed companies, in particular their income statements and balance sheets. Based on these data, return on assets (ROA) indicators were calculated. Empirical studies indicate that ROA appropriately reflects firms' long-term ability to survive and grow (Delmar *et al.*, 2013). The analysis was conducted both in a cross-sectional dimension (comparison of firms) and a time-series dimension (changes over the period 2019-2024), enabling an assessment of the level and stability of profitability in the cement sector in Poland.

To verify the relationship between firm size and achieved profitability, a model was applied in which the dependent variable was the ROA indicator, while the explanatory variable was firm size (SIZE) (Table 1) (Vieira *et al.*, 2019; Neves *et al.*, 2024; Serrasqueiro and MaçasNunes, 2008).

Table 1. *Measurement of variables*

Variables	Measurement
Dependent variable	$ROA = \frac{\text{Net Income}}{\text{Total Assets}}$
Independent variable	$SIZE = \ln(\text{Total Assets})$

Source: *Own study.*

The application of this model allows for answering the question of whether larger entities operating in a concentrated cement producer market achieve higher profitability than smaller firms, or whether smaller entities are able to generate higher profitability. The estimated model is specified as follows:

$$ROA_{it} = \alpha + \beta SIZE_{it} + u_i + \lambda_t + \varepsilon_{it} \quad (1)$$

where ROA_{it} denotes the return on assets of firm i in year t , α is the intercept, and $SIZE_{it}$ represents the size of firm i in year t . The parameter β measures the marginal effect of market share on ROA and constitutes the principal coefficient of interest. The term u_i captures unobserved firm-specific effects that are constant over time, such as managerial practices, organisational culture, or other time-invariant characteristics.

The term λ_t represents time-specific effects that are common to all firms, such as macroeconomic conditions or regulatory changes affecting the industry in a given year. Finally, ε_{it} is the idiosyncratic error term, reflecting random shocks and other unobserved factors that vary across both firms and time. The estimation of the model

and all related econometric procedures were performed using the GRETl software package.

4. Research Results and Discussion

The entry of foreign investors into Poland occurred primarily in the 1990s, during the privatisation of state-owned enterprises accompanying the country's transition to a market economy. One of the first major foreign investors was the German cement producer HeidelbergCement (currently Heidelberg Materials), which in 1993, through its subsidiary CBR Baltic B.V., acquired a stake in the privatised GóraŹdŹe Cement Plant near Opole.

Foreign capital entered Cementownia "ODRA" S.A. in 1993, when, as part of the government privatisation programme for the cement industry, the German company Miebach Projektgesellschaft GmbH acquired a controlling shareholding in the plant from the State Treasury. In the following years, Miebach Projektgesellschaft GmbH increased its equity involvement, eventually obtaining near-total ownership control of the company.

In 1994, foreign capital entered Cementownia Warta S.A. in Trębaczew, where 75% of shares were acquired by Polen Zement Beteiligungsgesellschaft, and the plant was subsequently integrated into the French Vicat Group. In 1995, the French Lafarge Group (currently part of the Swiss Holcim Group) commenced operations in Poland, acquiring, among others, the Małogoszcz Cement Plant and expanding its activities at the Kujawy facility.

Between 1995 and 1996, the Irish corporation CRH entered the Polish market through the acquisition of the OŹarów Cement Plant. In 1996, the German corporation Dyckerhoff AG acquired a 60% stake in the shares of the Nowiny Cement and Lime Works near Kielce, laying the foundations for the present-day operations of Dyckerhoff Polska. In subsequent years, Dyckerhoff was acquired by the Italian Buzzi Group, which, since 2008, has controlled cement production activities in Poland through Dyckerhoff Polska.

The French Vicat Group also expanded its presence in Poland through the acquisition of Górka Cement in Trzebinia, thereby complementing its portfolio with the production of specialised cements. In 2005, the Mexican corporation CEMEX entered the Polish market by acquiring cement production assets, including the Rudniki Cement Plant near Częstochowa and the Chełm Cement Plant. Following these acquisitions, the majority of large cement plants in Poland became incorporated into the structures of global cement corporations.

Within the analysed industry, enterprises operating on the market in Poland differ substantially in terms of their scale of activity (Table 2). The highest total asset values were recorded by GóraŹdŹe Cement and Holcim Polska, whereas

Cementownia Odra and Górka Cement represented the smallest entities in terms of operational scale. Significant disparities in firm size may affect the financial performance achieved by individual companies. Therefore, including the SIZE variable in the analysis of the relationship between firm size and profitability measured by ROA is justified.

Table 2. Total assets (mln PLN), 2019-2024.

	2019	2020	2021	2022	2023	2024
CEMEX Polska	1,150	1,179	1,221	1,531	1,544	1,621
GóraŹdŹe Cement	2,296	2,594	2,935	3,263	3,235	3,733
Cement OŹarów	1,313	1,385	1,488	1,751	1,750	2,327
Dyckerhoff Polska	509	555	569	627	709	824
Cementownia Warta	657	745	973	1,023	1,157	1,282
Cementownia Odra	165	161	160	205	248	263
Górka Cement	187	212	234	289	306	292
Holcim Polska	2,245	2,259	2,423	3,116	3,528	4,254

Source: Author's own compilation based on the annual financial statements (balance sheets) of the analysed companies.

During the analysed period, the cement sector in Poland maintained its ability to generate positive financial results (Table 3). In recent years, however, the profitability of the cement industry in Poland has been under considerable pressure. The key factors negatively affecting profitability include electricity prices in Poland (accounting for more than 35% of production costs), a sharp increase in the prices of CO₂ emission allowances within the EU Emissions Trading System (EU ETS), and imports of cheaper cement from Ukraine.

Table 3. ROA, 2019-2024.

	2019	2020	2021	2022	2023	2024	Mean
CEMEX Polska	0.9%	2.1%	4.1%	0.5%	8.4%	5.9%	3.6%
GóraŹdŹe Cement	15.5%	14.2%	13.8%	11.8%	14.4%	17.9%	14.6%
Cement OŹarów	11.0%	24.9%	25.1%	25.4%	27.0%	25.3%	23.1%
Dyckerhoff Polska	16.1%	18.6%	16.0%	13.9%	17.3%	15.3%	16.2%
Cementownia Warta	11.0%	12.1%	10.1%	11.2%	12.6%	16.0%	12.1%
Cementownia Odra	5.1%	3.8%	-1.6%	2.7%	12.7%	3.5%	4.4%
Górka Cement	15.2%	18.9%	18.2%	21.9%	0.6%	9.2%	14.0%
Holcim Polska	10.9%	12.2%	15.5%	13.7%	17.0%	12.2%	13.6%

Source: Author's calculations based on the annual financial statements (balance sheets) of the analysed companies.

The analysis of return on assets indicates significant differences among enterprises operating in the cement industry in Poland (Table 3). Based on the average ROA values, three groups of entities can be distinguished. Cement OŹarów achieved an average return on assets of 23.1% over the period 2019-2024, indicating a very high level of efficiency in utilising its assets.

The second group consists of enterprises with average ROA values ranging from 12.1% to 16.2%. These companies also demonstrate a relatively strong ability to generate profits from their assets, although their results remain noticeably below those of the market leader.

The third group comprises two enterprises achieving average returns on assets of only 3.6-4.4%, indicating considerably lower operational efficiency. Such pronounced differences between individual entities suggest that profitability levels in the industry may be determined not only by factors related to firm size but also by firm-specific conditions, including management efficiency, cost structure, the degree of production capacity utilisation, and competitive market position.

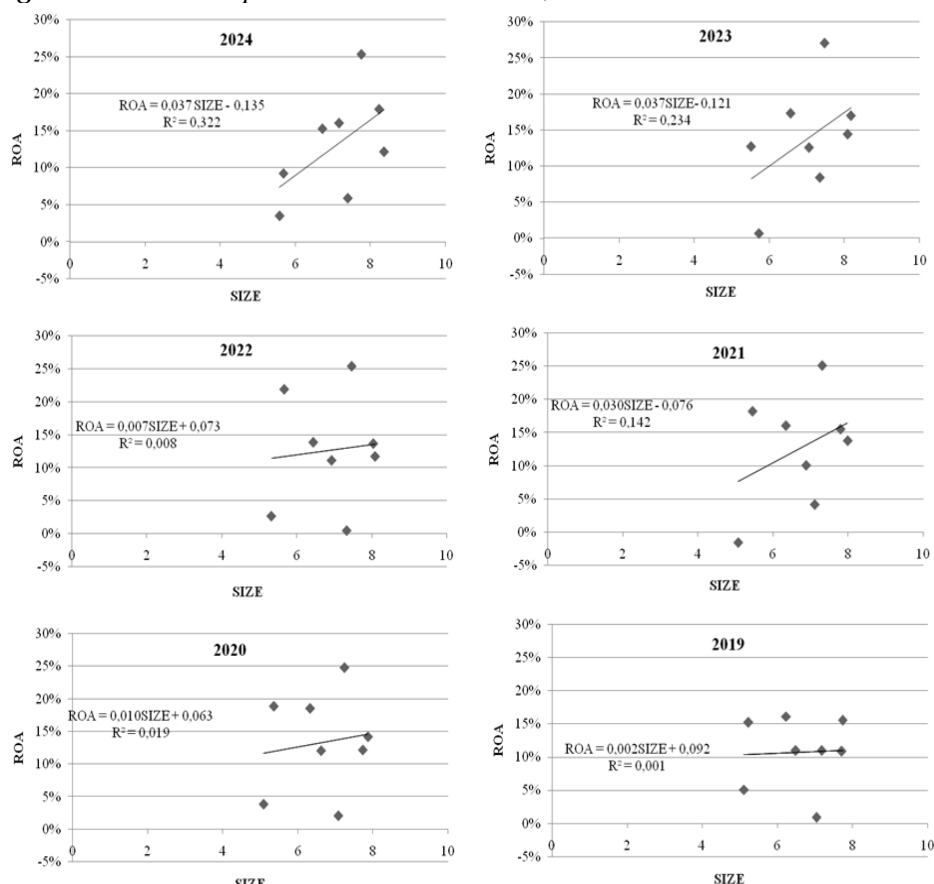
To provide an initial assessment of the relationship between firm size (SIZE) and return on assets (ROA), scatter plots were prepared for each year covered by the study, i.e., 2019-2024 (Figure 1). The distribution of observations in the plots enables a preliminary evaluation of the direction and strength of the relationship between the analysed variables. In subsequent years, the degree of concentration of observations around the hypothetical trend line can be observed, providing a basis for further formal verification of the research hypothesis using econometric models.

The analysis of scatter plots for the years 2019-2024 indicates that the relationship between firm size and return on assets was not uniform across all years. Despite certain differences in the distribution of observations, the overall pattern of the data suggests the existence of a positive relationship between the SIZE and ROA variables. In most of the analysed years, firms with a larger scale of operations achieved, on average, higher returns on assets than smaller entities. This relationship is consistent with the assumptions of economies of scale theory, according to which larger enterprises may achieve greater efficiency through more effective resource utilisation, stronger market positions, and easier access to financing.

These findings are also supported by a body of empirical research indicating a positive relationship between firm size and profitability. However, it should be noted that the dispersion of observations around the trend line is relatively high, suggesting a weak fit of linear models. This indicates that firm size alone does not fully explain the variation in return on assets within the analysed sample. Consequently, although the visual analysis suggests a positive effect of the SIZE variable on profitability, the strength of this relationship appears to be limited.

Based on the estimation of panel data models for 48 observations (8 cross-sectional units and 6 periods), using ROA as the dependent variable, an analysis was conducted using the pooled OLS model, the fixed-effects model, and the random-effects model (Table 4). The results of the pooled OLS model indicate that the SIZE variable has a positive and statistically significant effect on return on assets ($\beta=0.021$; $p=0.041$), suggesting that an increase in firm size (SIZE variable) contributes to an increase in the ROA ratio.

Figure 1. Relationship between SIZE and ROA, 2019-2024



Source: Author's calculations.

In the fixed-effects model, the coefficient of this variable remains positive ($\beta=0.034$), but loses statistical significance ($p = 0.294$). At the same time, the test for differences in intercepts revealed significant heterogeneity among the analysed entities ($F(7,39) = 11.690$; $p < 0.001$), suggesting the presence of unobserved individual effects.

In the random-effects model, the impact of the SIZE variable was also positive but statistically insignificant ($\beta = 0.025$; $p = 0.175$). The Breusch-Pagan test for the RE model rejected the null hypothesis of no individual effects ($\chi^2 = 44.8207$; $p < 0.001$), indicating the superiority of the random-effects model over the pooled OLS model.

At the same time, the Hausman test did not reveal statistically significant differences between the FE and RE estimators ($\chi^2 = 0.115$; $p = 0.734$), implying that there are no grounds for rejecting the assumption that individual effects are uncorrelated with the explanatory variables. This result supports the application of the random-effects model.

According to the procedure for selecting panel data models, the significant result of the Breusch-Pagan test and the insignificant result of the Hausman test indicate that the RE model is the most appropriate specification for the analysed data. Ultimately, the obtained results suggest that firm size does not constitute a statistically significant determinant of return on assets, despite the fact that this relationship was statistically significant in the simple pooled OLS model.

Table 4. *Estimation results of panel data models*

	Model 1 (Pooled OLS)		Model 2 (Fixed effects)		Model 3 (Random effects)	
	coefficient	p-value	coefficient	p-value	coefficient	p-value
const	-0.019	0.789	-0.104	0.634	-0.047	0.719
SIZE	0.021	0.041*	0.034	0.294	0.025	0.175

Note: * indicates significance at 5% level.

Source: Author's calculations.

The verification of the proposed research hypothesis does not allow for its confirmation. Although the coefficient of the variable representing firm size (SIZE) was positive in all estimated panel models, it was not statistically significant in models accounting for the specific characteristics of panel data (fixed effects and random effects).

Therefore, from the perspective of the model considered the most appropriate for the analysed data, it should be concluded that firm size does not have a statistically significant impact on return on assets in cement industry enterprises operating in Poland. Consequently, the research hypothesis assuming a significant impact of firm size on profitability was not confirmed. The lack of statistical significance in the fixed-effects and random-effects models may result from the limited number of observations, which reduces the statistical power of the estimations.

5. Conclusions

The cement sector in Poland represents an example of a market with a moderate degree of concentration, where the structure of supply, entry barriers, and the capital- and energy-intensive nature of production create conditions typical of an oligopoly.

The conducted study did not confirm the hypothesis assuming a statistically significant impact of firm size on return on assets in the cement industry in Poland. The obtained results indicate that the scale of operations alone, measured by the value of assets, is not a factor determining the efficiency of asset utilisation in the analysed sector.

These findings are consistent with a body of previous research emphasising the industry-specific nature of the relationship between firm size and profitability and indicating that, in many sectors, this relationship may be weak or statistically

insignificant. Consequently, it can be concluded that in the cement industry in Poland, the advantages resulting from a larger operational scale do not automatically translate into higher returns on assets, and sources of competitive advantage should be sought in other factors.

The lack of statistical significance may partly result from the limited number of observations and the specific characteristics of the analysed sector, which in Poland comprises a relatively small number of enterprises. Future research should consider the use of a larger number of potential explanatory variables and an extended observation period, which would increase the statistical power of the models and enable a more reliable assessment of the impact of the analysed factors on firm profitability.

It would also be justified to apply panel models incorporating a broader range of profitability determinants, allowing for a better identification of the complex relationships occurring in the cement sector and a more precise assessment of the importance of firm size for achieved financial performance.

References:

- Barjot, D. 2022. The European cement oligopoly: A French business perspective from 1880 to today. In: *A History of Business Cartels*, 149-168. Routledge.
- Bikker, J.A., Haaf, K. 2002. Competition, concentration and their relationship: An empirical analysis of the banking industry. *Journal of banking & finance*, 26(11), 2191-2214.
- Bougette, P., Marty, F. 2026. The SCP Paradigm Revisited: What Structuralism Really Contributed to US Antitrust (No. 2026-03). Groupe de REcherche en Droit, Economie, Gestion (GREDEG CNRS), Université Côte d'Azur, France.
- Delmar, F., McKelvie, A., Wennberg, K. 2013. Untangling the relationships among growth, profitability and survival in new firms. *Technovation*, 33(8-9), 276-291.
- Dhawan, R. 2001. Firm size and productivity differential: theory and evidence from a panel of US firms. *Journal of economic behavior & organization*, 44(3), 269-293.
- Du Plessis, S., Gilbert, E. 2008. The Structure-Conduct-Performance (SCP) paradigm and its application in South Africa: a review of the empirical evidence and the implications for competition policy. In: *Second Annual Competition Commission, Competition Tribunal and Mandela Institute Conference on Competition Law, Economics and Policy in South Africa* (Vol. 6).
- Jasek, S., Bernat, M. 2024. Impact of Foreign Direct Investment on Innovation in the Construction Materials Industry. *Scientific Papers of Silesian University of Technology. Organization and Management Series*, 204, 159-179. Available at: <https://managementpapers.polsl.pl/wp-content/uploads/2024/10/204-Jasek-Bernat.pdf>.
- Knickerbocker, F.T. 1973. Oligopolistic Reaction and Multinational Enterprise. *The International Executive*, 15(2), 7-9.
- Lelissa, T.B., Kuhil, A.M. 2018. The structure conduct performance model and competing hypothesis-A review of literature. *Structure*, 9(1), 76-89.

- Łobos, K., Szewczyk, M. 2013. Dystrybucja efektów koncentracji sektora piwowarskiego wśród dużych i małych przedsiębiorstw operujących na rynku polskim w latach 2004-2011. *Journal of Agribusiness and Rural Development*, 4(30), 149-159.
- Neves, M.E., Castanheira, P., Dias, A., Silva, R., Cancela, B. 2024. Determinants factors of the performance of metallurgical companies in Northern Portugal: new evidence using panel data. *EuroMed Journal of Business*, 19(3), 612-644.
- Rhoades, S.A. 1995. Market share inequality, the HHI, and other measures of the firm-composition of a market. *Review of industrial organization*, 10(6), 657-674.
- Rismayani, R., Pramudiana, Y., Firli, A., Manuel, B. 2017. Empirical study of Indonesian cement industry based on structure, conduct and performance paradigm. *International Journal of Economics, Commerce and Management*, 5(1), 105-127.
- Panhans, M.T. 2024. The rise, fall, and legacy of the structure-conduct-performance paradigm. *Journal of the History of Economic Thought*, 46(3), 337-357.
- Rismayani, R., Pramudiana, Y., Firli, A., Manuel, B. 2017. Empirical study of Indonesian cement industry based on structure, conduct and performance paradigm. *International Journal of Economics, Commerce and Management*, 5(1), 105-127.
- Serrasqueiro, Z.S., Maçãs Nunes, P. 2008. Performance and size: empirical evidence from Portuguese SMEs. *Small Business Economics*, 31(2), 195-217.
- Sharma, M.K., Khurana, A. 2019. An Analysis of Indian Cement Industry Using Structure Conduct Performance (SCP) and Efficient Structure (ES) Paradigms. *IUP Journal of Business Strategy*, 16(1), 76-87. Available at: <https://ssrn.com/abstract=3424525>.
- Stierwald, A. 2009. Determinants of firm profitability-the effect of productivity and its persistence. *Melbourne Institute of Applied Economic and Social Research*, 25.
- Tsang, C.H., Lee, Y.J., Tsay, W.J., Chang, J.J. 2026. A Country of Two Theories: Coexistence of Collusion and Efficiency Hypotheses. Available at: <https://dx.doi.org/10.2139/ssrn.6435921>.
- Vijayakumar, A. 2011. An empirical study of firm structure and profitability relationship: The case of Indian automobile firms. *International Journal of Research in Commerce and Management*, 1(2), 100-108.
- Vieira, E.S., Neves, M.E., Dias, A.G. 2019. Determinants of Portuguese firms' financial performance: panel data evidence. *International Journal of Productivity and Performance Management*, 68(7), 1323-1342.
- Žáková Kroupová, Z., Trnková, G. 2025. Profitability, Efficiency, and Market Structure in the Meat and Milk Processing Industry: Evidence from Central Europe. *International Journal of Financial Studies*, 13(1), 45. Available at: <https://doi.org/10.3390/ijfs13010045>.