

SIZE AND FIRM PERFORMANCE IN EXTRACTIVE INDUSTRIES: LESSONS FOR ENTREPRENEURS

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Abstract

Despite the attempts of an impressive number of theories to identify and clarify the determinants of business performance and of the many studies that considered various variables that may impact performance, the issue of corporate performance remains a boundless topic that draws attention of practitioners and researchers. Entering this debate, our paper investigates the impact of firm size on the performance of EU extractive firms by examining a sample of 66 EU headquartered firms from the mining and quarrying industry, a valuable industry to industrial, social, and technological progress. Using three size-based samples of EU mining and quarrying companies (small, medium and large companies), our research has two main objectives: to determine possible differences in the general performance of EU mining and quarrying companies depending on their size and to analyze probable dissimilarities in the relationship between firm size and performance between EU mining and quarrying companies. In order to evaluate the performance of EU mining and quarrying companies, we use two aggregate performance ratios: Return on assets (ROA) and Return on equity (ROE). Besides these two measures of performance we delve into the differences in performance between firms of different size using other relevant indicators. This study uses data collected for the period between 2010 and 2016 from the Orbis Bureau van Dijk database. As far as we are aware, this is one of the first studies to tackle differences in the performance of mining and quarrying firms with different countries-of-origin in the EU from the point of view of size and corporate performance. Our results show that firm size represents a significant factor explaining the differences in performance among firms in the extractive industry in the EU.

Keywords: firm size, corporate performance, mining and quarrying industry, European Union

1. INTRODUCTION

Extractive industries represent a noteworthy wealth-generating endeavour for developing countries around the world. The most important economic effects of extractive industries are demonstrated on the macroeconomic performance of countries, governments revenues, direct employment levels, and in the economic externalities and spillover effects on other sectors of the world economy [1].

According to Eurostat, the mining and quarrying industry incorporates the activities which are particularly defined by NACE (Rev. 2) codes 05 (Mining of coal and lignite), 06 (Extraction of crude petroleum and natural gas), 07 (Mining of metal ores), 08 (Other mining and quarrying), and 09 (Mining support service activities). Otherwise stated, the activities related to this industry include the extraction of fossil fuels such as coal (code 05), crude oil and natural gas (code 06), ferrous and non-ferrous metal ores (code 07), construction materials (for instance, stone and sand) and other industrial materials, namely salt, phosphates and gemstones (code 08) and additionally, they comprise mining support service activities (code 09). In the EU, this sector had more than 17,500 companies in 2017, which employed around 413,300 people (see Table 1), corresponding to 0.3% of all persons employed in the non-financial business economy. They generated EUR 40.0 billion of value added or 0.6% of the non-financial business economy total [2]. Figure 1 shows a brief statistics of EU mining and quarrying firms in 2017 and we notice that most of them are small, regardless of country. But, if we take into consideration the number of persons employed, it seems that this sector is dominated by large firms, which employed 250 or more persons (see Table 1).

	Number of enterprises	Number of persons employed	Value added	Apparent labour productivity
	(thousands)		(EUR million)	(EUR thousand per head)
All enterprises	17.5	413.3	40 000.0	·
All SMEs	17.3	162.8	14 161.9	87.0
Micro	13.5	33.4	1 761.6	52.7
Small	3.2	65.8	4 894.2	74.4
Medium-sized	0.6	63.6	7 506.1	118.0
Large	0.2	250.4	25 838.1	103.2

Table 1. Key size class indicators for mining and quarrying companies (EU-27, 2017)

Source: Eurostat. Available at: <https://ec.europa.eu/eurostat/statistics-explained/index.php/Mining_and_quarrying_statistics_-_NACE_Rev._2#Size_class_analysis>

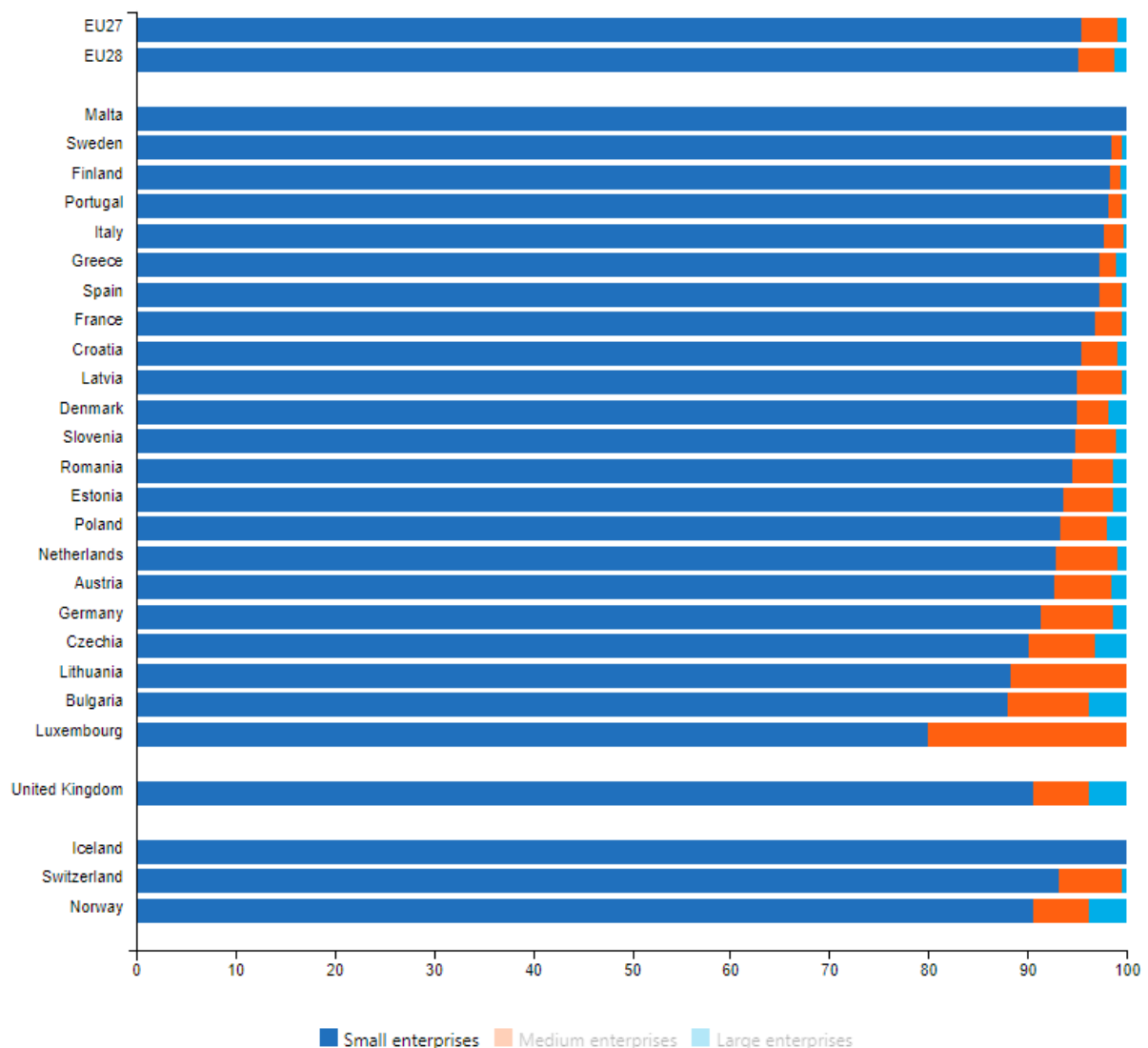


Fig. 1. Number of mining and quarrying companies by size class in 2017
(as % of total number of companies)

Source: Eurostat. Available at: <https://ec.europa.eu/eurostat/statistics-explained/index.php/Mining_and_quarrying_statistics_-_NACE_Rev._2#Size_class_analysis>

This study examines the impact of firm size on the performance of extractive firms by analyzing EU headquartered firms from the mining and quarrying industry, a valuable industry to industrial, social, and technological progress in the EU. Our objectives are twofold: to identify possible differences in the general performance of EU mining and quarrying companies depending on their size and to analyze probable dissimilarities in the relationship between firm size and performance between EU mining and quarrying companies.

The performance of the company can be estimated on the basis of various indicators, such as: rates of return, profit margins, turnover and profit, etc. It is worth mentioning that any economic decision starts from the financial position of the company and aims to achieve a certain level of performance. The empirical literature on companies' performance is predominantly concentrated at the microeconomic level, in a firm-specific characteristics framework. Discussions regarding the role of firm size in explaining performance have been continuous in areas of business organization and industrial economics. Some early studies [3, 4] highlighted the importance of scale economies and other efficiencies in large companies. At the same time, the "structure-conduct-performance" paradigm points out the importance of market concentration and conduct in justifying profitability. For example, the advantages of larger companies derive from their market power and better access to capital markets [5]. Furthermore, a study assigns variations in profitability to group strategic behavior in different industries [6]. It is important to mention that with a few exceptions, there is substantial evidence in early empirical studies on a positive link between firm size and profitability. Nevertheless, as a research study indicates, numerous studies ignore the potential impact of other factors, as for example market structure, entry barriers or company strategies [7]. More recent research discovered more particularities which confirm a link between firm size and profitability [8]. The authors detect evidence in US retailing industries that both small and large companies can successfully capture niche markets, while medium-sized companies seem 'stuck in the middle', meaning they are less competitive than their counterparts. Moreover, a strong positive correlation between these two variables was found as well in other studies [9 - 11]. On the other hand, some other recent studies indicate no relationship or a negative relationship between firm size and profitability [12 - 14].

Even if many recent studies have provided additional evidence regarding the determinants of company performance, their findings are complicated to generalize due to the fact that they are based on data of large companies, and/or include a single year or industry. For example, a study analyses the impact of firm size on the performance of selected firms in the building industry in Nigeria from 2004 to 2017 [15]. The author finds that total sales and age of firm since incorporation induce a positive effect on ROA. Another example of study [16] examines the determinants of ROE for two Polish companies listed on the Warsaw Stock Exchange from the mining and metallurgical sector. The author investigates the determinants of ROE for the original version and five-factor version of the DuPont formula and finds that using various financial and operational strategies companies can influence ROE. In the case of Polish companies, the most significant factor influencing the decrease of ROE proved to be operating profit margin. Moreover, another study [17] investigates the determinants of firm performance and, most notably, the role of firm size in profitability. Using a dynamic panel data model, the author examines more than 7,000 US publicly-held companies over the period 1987–2006 and finds that profit rates are positively correlated with firm size in a non-linear manner, holding an array of firm- and industry-specific characteristics constant. Furthermore, in a study that examines the main drivers of return to investors in CEE countries with the help of DuPont model [18], the authors use as indicators efficiency, profitability, leverage and aggregate performance indicators between 2012 and 2016 to show that low returns to investors were driven by the efficiency of using assets, but not by profitability.

This paper is structured as follows. The following section describes the data and the methods used. The next section outlines the most relevant results. Then, in the following section our findings are discussed and the last section concludes and indicates directions for future research.

2. MATERIALS AND METHODS

We use a sample of 66 EU headquartered companies from the mining and quarrying industry (EU28, including United Kingdom), selected based on data availability on all indicators for at least four years from 2010 to 2016. These are presented in Table 2, together with their turnover in 2016 and their average turnover for the investigated period, considering that turnover represents the strongest benchmark of financial performance of the companies. We considered as small companies those that had their average turnover below 25% of the median of average turnover of all 66 companies. Companies with average turnover between 25% and 500% of the median of average turnover of all companies were considered as medium-sized and the rest were considered large in our analysis. We use annual data collected from the Orbis Bureau van Dijk database.

Large companies				Medium-sized companies				Small companies			
Name	Country	Turnover in 2016	Mean turnover	Name	Country	Turnover in 2016	Mean turnover	Name	Country	Turnover in 2016	Mean turnover
ROYAL DUTCH SHELL PLC	GB	221,602.407	304,537.354	IMERYS SA	FR	4,165.200	3,792.000	EXILLON ENERGY PLC	GB	120.455	171.247
GLENCORE PLC	GB	164,911.368	155,310.293	PETROL, SLOVENSKA ENERGETSKA DRUZBA, D.D.	SI	3,856.703	3,637.473	TETHYS OIL AB	SE	82.630	73.126
TOTAL S.A.	FR	121,359.504	154,621.849	TECNICAS REUNIDAS, SA	ES	4,792.610	3,287.449	MISEN ENERGY AB	SE	68.372	63.141
ENI S.P.A.	IT	55,762.000	95,195.000	SBM OFFSHORE N.V.	NL	2,155.21	2,851.821	AMERISUR RESOURCES PLC	GB	44.753	63.063
REPSOL S.A.	ES	34,689.000	50,014.714	NOBLE CORPORATION PLC	GB	2,183.916	2,552.494	ANGLO ASIAN MINING PLC	GB	75.120	61.209
BHP BILLITON PLC	GB	27,843.631	46,316.586	TULLOW OIL PLC	GB	1,204.725	1,542.146	ATLANTIC PETROLEUM P/F	DK	1.375	46.184
RIO TINTO PLC	GB	32,047.257	38,152.328	ROWAN COMPANIES PLC	GB	1,748.601	1,357.353	GEODRILL LIMITED	GB	69.585	43.933
OMV AKTIENGESELLSCHAFT	AT	19,260.000	31,448.552	POLYMETAL INTERNATIONAL PLC	GB	1,501.756	1,225.395	UNIVERSAL COAL PLC	GB	65.271	41.630
GALP ENERGIA, S.G.P.S., S.A.	PT	13,240.592	16,536.156	FERREXPO PLC	GB	935.704	1,076.903	CENTRAL ASIA METALS PLC	GB	63.283	40.687
MOL MAGYAR OLAJ-ES GAZIPARI RT.	HU	11,476.911	15,674.952	PREMIER OIL PLC	GB	932.929	945.927	DALDRUP & SOHNE AKTIENGESELLSCHAFT	DE	31.137	40.339
ESSO SA	FR	11,146.900	14,529.543	GRUPA AZOTY ZAKLADY AZOTOWE PULAWY S.A.	PL	759.887	853.108	BISICHI MINING PUBLIC LIMITED COMPANY	GB	26.627	36.387
AURUBIS AG	DE	9,474.706	11,591.623	LUNDIN PETROLEUM AB	SE	1,100.370	812.695	DRILLCON AB	SE	26.976	35.319
N.V. UMICORE S.A.	BE	10,443.541	10,893.928	CORE LABORATORIES N.V.	NL	564.217	715.498	IKTINOS HELLAS SA MARBLE INDUSTRY	GR	35.701	30.659
HELLENIC PETROLEUM SA	GR	6,679.923	8,769.841	ENQUEST PLC	GB	757.161	709.346	RAYSEARCH LABORATORIES AB	SE	55.637	28.691
PETROFAC LIMITED	GB	7,468.934	5,136.356	LUBELSKI WEGIEL BOGDANKA S.A.	PL	405.472	404.764	IMPAX ASSET MANAGEMENT GROUP PLC	GB	24.465	23.552
KGHM POLSKA MIEDZ SA	PL	4,348.301	5,081.359	ZIMPLATS HOLDINGS LIMITED	GB	424.949	377.461	ANGLO PACIFIC GROUP PLC	GB	22.997	21.752
OMV PETROM S.A.	RO	3,581.688	4,757.980	CENTAMIN PLC	GB	652.108	360.680	INDUS GAS LIMITED	GB	36.548	21.165
JOHN WOOD GROUP P.L.C.	GB	3,909.118	4,490.112	PETRO WELT TECHNOLOGIES AG	AT	304.379	330.176	OIL AND GAS EXPLORATION AND PRODUCTION AD	BG	20.145	20.055
BOLIDEN AB	SE	4,220.483	4,241.382	BREEDON GROUP PLC	GB	530.649	291.161	STERLING ENERGY PLC	GB	4.568	12.352
SUBSEA 7 S.A.	LU	3,383.646	4,115.153	SUDWESTDEUTSCHE SALZWERKE AG	DE	239.038	279.051	DEUTSCHE ROHSTOFF AG	DE	9.170	10.006
ANTOFAGASTA PLC	GB	3,439.428	4,076.337	SOCO INTERNATIONAL PLC	GB	146.665	263.194	FORAJ SONDE SA VIDELE	RO	9.391	9.041
								GETECH GROUP PLC	GB	8.337	8.050
								EMPYREAN ENERGY PLC	GB	0.001	5.931
								DOLKAM SUJA A.S.	SK	2.562	2.557

Table 2. Selected mining and quarrying companies, 2010-2016 (in EUR millions)

Source: Orbis Bureau van Dijk database.

In order to evaluate the performance of these 66 companies, we use two aggregate performance ratios: Return on assets (ROA) and Return on equity (ROE). Besides these two measures, we also use other relevant indicators for other areas of corporate performance: liquidity (company's ability to pay its short-term liabilities as they become due) - Quick ratio (QR); efficiency (the productivity of firm's assets) - Total Asset Turnover (TAT); leverage (the degree of company's indebtedness) - Financial leverage multiplier (FLM); profitability - Net profit margin (NPM); and market value - Price-to-earnings ratio (PER), Percentage change in market capitalization (MK). For each variable we use annual data from 2010 to 2016 and we calculate the mean of all years.

An integrated model used in order to indicate the performance of a firm is well known as the DuPont model [19]. The first ratio that measures the aggregated of a business is ROA, which can be calculated as:

$$ROA = \frac{\text{Net Profit}}{\text{Total Assets}} = \frac{\text{Net Profit}}{\text{Total Sales}} * \frac{\text{Total Sales}}{\text{Total Assets}} = NPM * TAT \quad (1)$$

NPM, which is the first component of ROA, has the role of providing information regarding the profitability of the company and the control it has upon costs.

The second component, TAT, offers an insight of how efficient are the firm's assets in generating turnover. ROA decomposition's objective is to evidence the impact of profitability, and efficiency on the return generated by the company's assets. Therefore, this financial indicator can be divided in many combinations of asset turnover and profit margin, so called "ROA lines", where each line reveals the combinations of the two components, with high turnover along with low profit margin [20].

The second component of the DuPont model, ROE, is decomposed in profit margin multiplied by asset turnover multiplied by financial leverage:

$$ROE = \frac{\text{Net Profit}}{\text{Total Equity}} = \frac{\text{Net Profit}}{\text{Total Assets}} * \frac{\text{Total assets}}{\text{Equity}} = ROA * FLM \quad (2)$$

As in the case of ROA, ROE's decomposition indicates that the return available to company's shareholders is influenced by the return generated by company's assets in use – which, in turn, depends on profitability and efficiency – and company's leverage. The decomposition also shows that companies can shrewdly and incorrectly increase return to shareholders by using more debt in the capital structure.

A descriptive analysis of the variables has been carried out in Table 3 for each category of companies. For the estimation of the results we used Tibco Statistica 13.3. Overall, the values are small, with only a few exceptions, which means that they are closer to the mean, on average. From this point of view, the series of data are concentrated.

Considering the large and medium-size companies, the means of all indicators are statistically significant. On the other hand, for the small companies, the mean of Mean MK and Mean NPM does not present statistical significance. For all types of companies, the value of the means of all indicators are very close to the medians, which means that our data are rather symmetrically distributed about the mean. Regarding the standard deviation of large companies, the values are quite small (except Mean PER) and this indicates that data points tend to be close to the means of the data sets. Considering medium-size and small companies, the values of standard deviations for all indicators indicate a significant spread out over of values across companies.

Type of companies	Descriptive statistics	Mean ROE	Mean ROA	Mean QR	Mean TAT	Mean PER	Mean MK	Mean FLM	Mean NPM
Large companies	Mean	8.809	4.423	1.486	1.236	20.368	0.070	2.381	5.126
	Median	9.577	4.074	1.319	0.987	15.699	0.037	2.221	3.945
	Std.Dev.	7.169	3.241	0.585	0.928	14.792	0.097	0.821	4.589
	Min.	-5.202	0.119	0.862	0.408	6.799	-0.065	1.614	-0.143
	Max.	24.569	12.516	3.668	4.027	69.655	0.316	5.028	14.346
Medium-sized companies	Mean	11.646	5.698	2.286	0.663	29.652	0.148	2.598	8.517
	Median	10.142	4.658	1.865	0.475	19.182	0.109	2.321	7.879
	Std.Dev.	21.607	6.195	1.628	0.529	27.494	0.256	1.430	14.389
	Min.	-13.995	-1.918	0.912	0.183	6.418	-0.185	0.971	-20.702
	Max.	93.241	26.050	7.788	2.415	114.893	0.998	7.174	39.058
Small companies	Mean	5.164	5.273	4.356	0.472	23.927	0.753	1.752	-21.926
	Median	6.760	4.897	2.868	0.387	19.047	0.151	1.440	7.947
	Std.Dev.	11.062	6.515	4.580	0.340	21.287	2.521	0.863	77.811
	Min.	-31.302	-7.735	0.433	0.048	1.913	-0.243	1.094	-287.987
	Max.	28.147	23.406	22.370	1.349	87.953	12.451	5.266	36.567

Table 3. Descriptive statistics of variables

Note: Bolded values denote statistical significance at 5% level. Std. Dev. – Standard Deviation, Min. – Minimum, Max. – Maximum, SE = Standard Error of Mean.

Source: Authors' work in Statistica.

3. RESULTS

Figures 2 and 3 show the boxplots of Mean ROA and ROE grouped by firms' size, as well as the boxplots of means for other three indicators: QR, TAT, FLM. ROE is more variable than ROA across companies for each size-based group, with the highest difference in the case of average (M) companies. Mean ROE distribution for average companies also indicates the presence of more outliers and extremes (3) compared to ROA (only one extreme). On the other hand, QR presents the highest variability for small companies, followed by average and then large companies. TAT is more variable in the large companies group, while average companies are more dispersed than small and large ones in terms of financial leverage.

The presence of statistically significant differences between two groups (L-M, M-S and L-S) for our indicators was verified using t-tests, a type of inferential statistics designed to compare means of same variable between two groups. Table 4 presents the results of the t-tests. Statistically significant means between the three groups of companies are the following: (i) QR – for large against average (smaller QR for large companies), and for large against small (smaller QR for large companies); (ii) TAT – for large against average (higher TAT for large companies), and for large against small (higher TAT for large companies); FLM – for average against small (higher FLM for average companies), and for large against small (higher FLM for large companies).

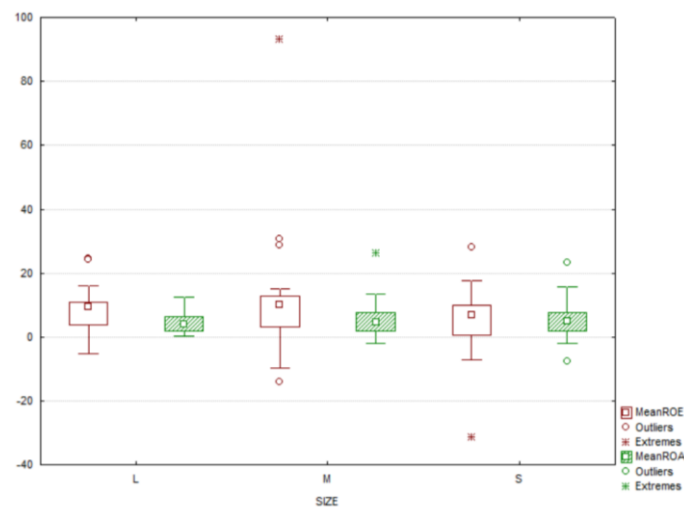


Fig. 2. Boxplots of Mean ROE and Mean ROA grouped by firm size

Source: Authors' work in Statistica.

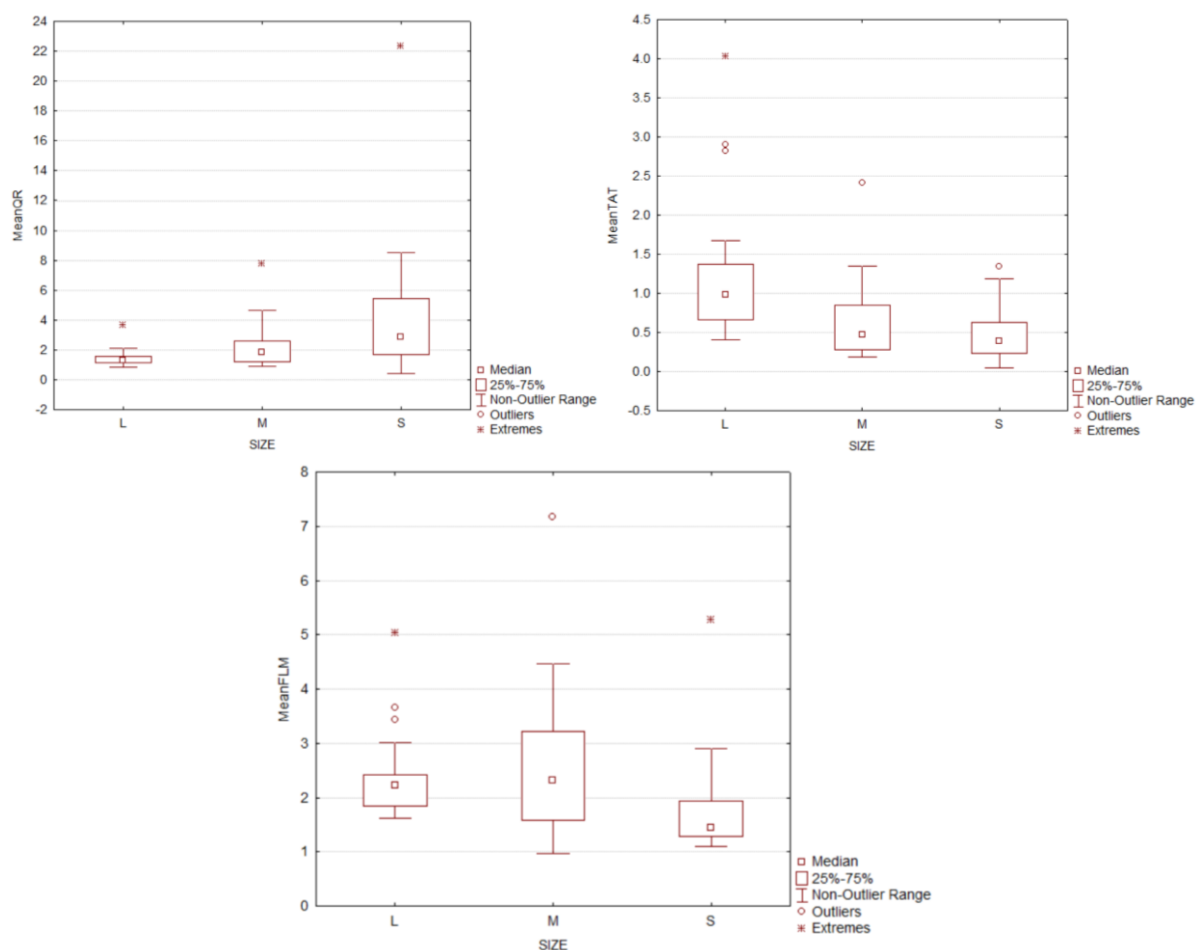


Fig. 3. Boxplots of Mean QR, Mean TAT and Mean FLM grouped by firm size

Source: Authors' work in Statistica.

Group 1: L; Group 2: M					
Variable	Mean L	Mean M	T-statistic	df	p
Mean ROE	8.809	11.646	-0.571	40	0.571
Mean ROA	4.423	5.698	-0.836	40	0.408
Mean QR	1.486	2.286	-2.121	40	0.040
Mean TAT	1.236	0.663	2.461	40	0.018
Mean PER	20.368	29.652	-1.363	40	0.181
Mean MK	0.070	0.148	-1.315	40	0.196
Mean FLM	2.381	2.598	-0.602	40	0.550
Mean NPM	5.126	8.517	-1.029	40	0.310
Group 1: M; Group 2: S					
Variable	Mean M	Mean S	T-statistic	df	p
Mean ROE	11.646	5.164	1.291	43	0.204
Mean ROA	5.698	5.273	0.223	43	0.824
Mean QR	2.286	4.356	-1.963	43	0.056
Mean TAT	0.663	0.472	1.460	43	0.152
Mean PER	29.652	23.927	0.786	43	0.436
Mean MK	0.148	0.753	-1.093	43	0.281
Mean FLM	2.598	1.752	2.438	43	0.019
Mean NPM	8.517	-21.926	1.764	43	0.085
Group 1: L; Group 2: S					
Variable	Mean L	Mean S	T-statistic	df	p
Mean ROE	8.809	5.164	1.290	43	0.204
Mean ROA	4.423	5.273	-0.542	43	0.591
Mean QR	1.486	4.356	-2.848	43	0.007
Mean TAT	1.236	0.472	3.764	43	0.001
Mean PER	20.368	23.927	-0.642	43	0.524
Mean MK	0.070	0.753	-1.239	43	0.222
Mean FLM	2.381	1.752	2.496	43	0.016
Mean NPM	5.126	-21.926	1.588	43	0.120

Table 4. Results of t-tests for independent samples grouped by firm size

Note: Bolded values denote statistical significance at 5% level. L – large companies, M – average companies, S – small companies, df – degrees of freedom, p – Probability value.

Source: Authors' work in Statistica.

We use scatter plots and linear trend lines in order to study the relationship between two variables. The scatterplot shows the simplest link between variables, without necessarily indicating causation. On the other hand, we interpret the placement of companies on these graphs as a sign of their flexibility regarding the use of one and/or both areas of performance captured by the respective indicators to improve ROA and/or ROE. Figure 4 presents the relationship between efficiency (TAT) and profit margin (NPM), as well as between ROA and FLM for all companies in the sample, regardless of their size. We observe that TAT and NPM are somehow positively related, although most NPM seem “agglomerated” on the right of the graph – this is due to the presence of outliers with very small values of NPM. Also, some companies record means of TAT above 2, which is an outlier value for this industry as well. Contrarily, ROA and FLM are negatively correlated, which indicates that FLM rather acts as a balance for ROA when reflected into companies’ ROE.

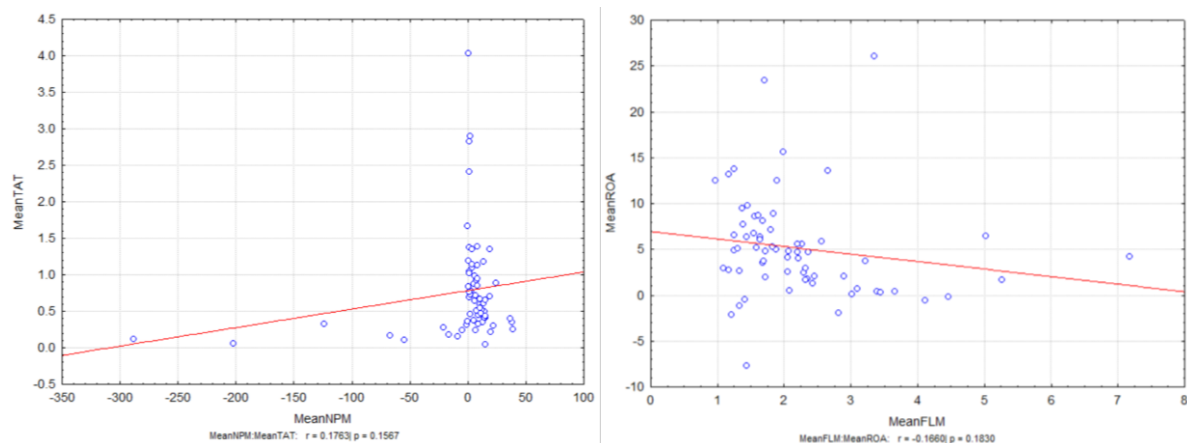


Fig. 4. Scatter plots of Mean TAT against Mean NPM (left) and Mean ROA against Mean FLM (right)

Source: Authors’ work in Statistica.

Besides the overall view on the relationship between companies’ areas of performance, our main objective is to observe whether this link is influenced by companies’ size. Figure 5 shows clearly that size matters for the TAT-NPM relationship. Thus, there is a clear-cut negative relationship for large companies (-0.562), but a smoother one for average companies (-0.022), and a positive one for small companies (0.426). Table 5 displays the correlations between Mean TAT and Mean NPM. In the case of large companies, it seems that their flexibility in terms of improving ROA is mostly based on efficiency and much less on profitability, which means that increasing ROA requires, for large companies, capital budgeting strategies directed towards balancing long-term versus short-term assets and increasing turnover. On the other hand, average companies and mostly smaller companies show more flexibility in terms of profitability, as TAT values for them seem to not exceed 2.5 (for average companies) and 1.5 (for smaller companies).

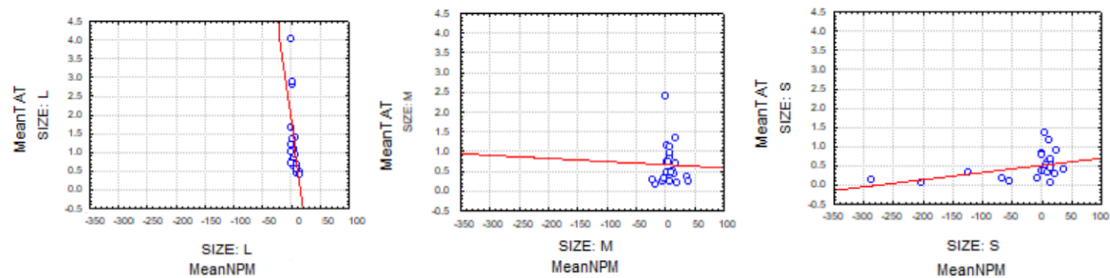


Fig. 5. Scatter plot of Mean TAT against Mean NPM, categorized by firm size and firm size

Source: Authors' work in Statistica.

		Mean TAT	Mean NPM
All companies	Mean TAT	1.000	0.176
	Mean NPM	0.176	1.000
Large companies	Mean TAT	1.000	-0.562
	Mean NPM	-0.562	1.000
Medium-sized companies	Mean TAT	1.000	-0.022
	Mean NPM	-0.022	1.000
Small companies	Mean TAT	1.000	0.426
	Mean NPM	0.426	1.000

Table 5. Correlations between Mean TAT and Mean NPM

Note: Bolded values denote statistical significance at 5% level.

Source: Authors' work in Statistica.

Contrarily to the differences observed in the relationship between TAT and NPM between size-based groups of companies, Figure 6 indicates a negative relationship between ROA and FLM for all types of companies, although with different intensities. The strongest negative correlation is found for large companies (-0.385) and the weakest for small companies (-0.091). This information is available as well in Table 6. Another interesting observation is that large companies operate in a more flexible FLM environment compared to ROA, while smaller companies seem to enjoy the lowest flexibility in terms of FLM. This may be explained by the reluctance of smaller companies to use debt in their capital structure, given their fears of entering bankruptcy.

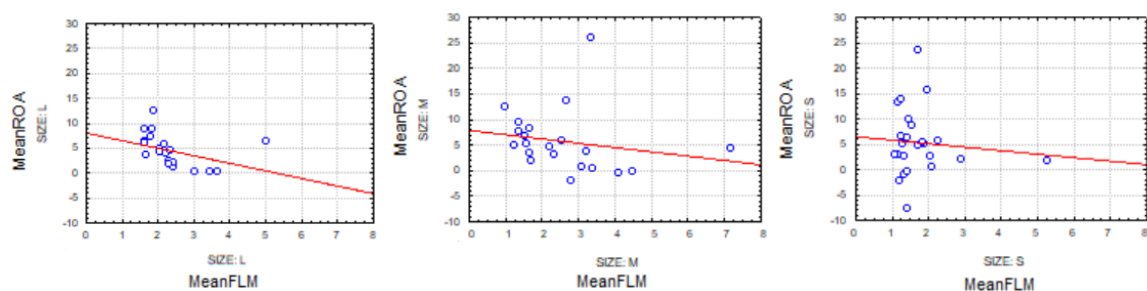


Fig. 6. Scatter plot of Mean ROA against Mean FLM, categorized by firm size and firm size

Source: Authors' work in Statistica.

		Mean ROA	Mean FLM
All groups	Mean ROA	1.000	-0.166
	Mean FLM	-0.166	1.000
Large companies	Mean ROA	1.000	-0.385
	Mean FLM	-0.385	1.000
Medium-sized companies	Mean ROA	1.000	-0.194
	Mean FLM	-0.194	1.000
Small companies	Mean ROA	1.000	-0.091
	Mean FLM	-0.091	1.000

Table 6. Correlations between Mean ROA and Mean FLM

Source: Authors' work in Statistica.

4. DISCUSSION

This study provides some thought-provoking lessons for entrepreneurs in the extractive industry regarding the determinants of business performance. The entrepreneurs of startups or small companies generally tend to scale up the firm by hiring more employees, seeking international sales and so on. They should take into consideration the relationship between firm size and firm performance.

Our results reveal that size matters for the TAT-NPM relationship. Considering the case of large companies, it turns out that their flexibility in terms of improving ROA is mostly based on efficiency and much less on profitability, thus increasing ROA requires, for this type of companies, capital budgeting strategies directed towards balancing long-term versus short-term assets and increasing turnover. At the same time, medium-sized companies and smaller companies display more flexibility in terms of profitability. Moreover, taking into account the relationship between ROA and FLM, we notice that small companies seem to enjoy the lowest flexibility in terms of FLM, while large companies operate in a more flexible FLM environment compared to ROA.

In this paper our findings illustrate that firm size represents a significant factor explaining the differences in performance among firms. Our results are consistent with previous findings [8 – 11, 15, 17] and contradict the results provided in other studies [12 – 14].

5. CONCLUSIONS

Our study examines the impact of firm size on the performance of EU extractive firms by investigating a sample of 66 EU headquartered firms from the mining and quarrying industry. To the best of our knowledge, this is one of the first studies that address the differences in the performance of mining and quarrying companies with different countries-of-origin in the EU from the point of view of size and corporate performance. Our findings suggest that firm size represents a considerable factor explaining the differences in performance among companies in the extractive industry in the EU.

Indeed, this analysis has limits and one of them is the relatively small number of extractive firms in our sample. Including more firms in the sample would offer better insights into the relationship between firm size and size performance. In this context, we believe that an interesting possible future direction of research would be to extend the sample to international level and include firms from all over the world. As well, the influence of the firm size on the firm performance could be empirically analyzed in terms of other sectors.

ACKNOWLEDGMENTS

This work was cofinanced from the European Social Fund through Operational Programme Human Capital 2014-2020, project number POCU/380/6/13/125015 “Development of entrepreneurial skills for doctoral students and postdoctoral researchers in the field of economic sciences”.

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