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Determinants of SME profitability in the service sector: An empirical investigation from Poland

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ABSTRACT

Objective: The article aims to verify profitability and its determinants in SME service firms.

Research Design & Methods: We conducted a critical literature review and analysed empirical data based on a linear mixed model. The research sample comprises 1851 SMEs representing the service sector.

Findings: An analysis of the determinants of SME profitability in the service sector indicates the significance of such factors as belonging to a given industry, debt levels, asset structure, company size, and financial liquidity.

Implications & Recommendations: The financial success of SMEs in the service sector results mainly from belonging to a specific industry. The profitability of a business activity is determined by a given sector's internal competition, entry and exit barriers, technological advancement, and the structure of the market and business environment. Moreover, the profitability of SME service companies also depends on their size. On the other hand, such variables as indebtedness, asset structure, and financial liquidity negatively impact profitability.

Contribution & Value Added: An analysis of SME profitability in the service sector is the first such undertaking in Eastern Europe. It is also true of the verification of profitability determinants in the service sector. The article also empirically verifies the profitability of different activities in the service sector.

Article type: research article

Keywords: Profitability; financial result; SME; service sector; Poland

JEL codes: M40, L8, G32

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INTRODUCTION

Profitability is a significant determinant of a company's long-term operations and its market success. It provides information on the effectiveness of a company's business activities and its ability to achieve specific financial results in a given period, taking into account a company's volume of sales, assets, and equity. An unprofitable entity cannot conduct long-term operations if it does not have access to external sources of capital. Moreover, a company's profitability impacts corporate value, business risk, the cost of capital, and other key financial categories. However, it cannot be the only criterion for financial decisions, particularly in longer periods.

Corporate profitability is an issue undertaken in a number of research studies, especially those which analyse large companies listed on stock exchanges. Scholars give much less attention to the SMEs' profitability. We can attribute it to the limited accessibility of high-quality data as compared with financial statements provided by listed companies. An analysis of SME profitability can be all the more interesting because such entities significantly contribute to economic growth and job creation. The identification and good understanding of profitability determinants can help managers develop effective profitability management strategies. We attempted to empirically verify the factors which determine the profitability of SMEs representing the service sector in Poland. We

identified the following profitability determinants: a company's age and size, development potential, asset structure, financial liquidity, indebtedness, industry, and risk.

Undoubtedly, SMEs are very important for most European economies. In most EU countries, SMEs account for well over 60% of GDP and employ by far the largest number of employees in the economy. Moreover, they create the largest number of new jobs in national economies (Kędzior & Kędzior, 2020). The subject of this study is SMEs from the service sector. They are the largest group SMEs group in Poland comprising 52% of all SMEs. In comparison, SMEs from the commercial sector account for 22.4%, and 10.1% of SMEs operate in the manufacturing sector. Larger SMEs usually conduct industrial activities (over 50%), while smaller SMEs usually operate in services (31.5%) and trade sector (13.6%). Moreover, SMEs from the service sector often determine the success of national economies, introduce numerous innovations, and do not require significant capital outlays. The most developed economies in the world are characterized by a high level of development of the service sector belonging to SMEs. The modern economy is based to the greatest extent on knowledge and services (Węgrzyn, 2010). Success factors in this sector are very important to numerous internal and external stakeholders. The main objective of this study was to empirically verify microeconomic profitability determinants for SMEs representing the Polish service sector. An analysis of SME profitability in this sector can contribute to extending our knowledge in this field. Research studies rarely undertake the profitability of such entities. Until now, no Polish researchers have presented empirical verifications. Regarding foreign literature, Gharaibeh and Khaled (2020) explored the profitability of the service sector. They analysed the profitability of Jordan's listed service companies. Other examples of research studies in this area include, *e.g.* Adams and Buckle (2003), who focused on the profitability of insurance companies; Goddard *et al.* (2005), who verified the profitability of European hospitality enterprises; Nunes *et al.* (2009), who analysed the profitability of the Portuguese service sector; and Qian and Li (2003), who analysed hi-tech SMEs. Thus far, the profitability of the service sector, and particularly belonging to SMEs, has not received much attention as a research area.

In the article, we analysed profitability determinants using a linear mixed model which took into account time- and space-related correlations between observations. The structure of the article is as follows: (1) introduction, (2) literature review, (3) research methodology, (4) results and discussion, (5) conclusions.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

In the literature, there is a wide variety of factors affecting SMEs' profitability. Gharaibeh and Khaled (2020), who analysed the profitability of 46 Jordanian service companies listed on the Stock Exchange, distinguished the following factors: company size, tangibility, development opportunities, business risk, and share of debt in the total capital. In turn, Adams and Buckle (2003), who include an analysis of the profitability of insurance companies in Central America, verified the following factors empirically: company size, risk, debt, liquidity, type of business, and scope of business. Goddard *et al.* (2005) analysed the profitability of the hotel industry of European enterprises, specifying the following profitability factors: profitability in previous periods, debt, and liquidity. Whereas Nunes *et al.* (2009) studied the profitability of the service industry in Portugal. In our opinion, the most important profitability factors are growth potential, debt, liquidity, size, and tangibility. In the high-tech industry belonging to SMEs, the most important factors were: company size, debt, risk, past financial performance, innovation, market knowledge, product type, and international activity (Qian & Li, 2003).

One of the major determinants is company size. Larger SMEs, including service firms, are frequently engaged in diversified economic activities. As a rule, larger entities have easier access to modern technologies and have a cost advantage, benefitting from economies of scale (Orser *et al.,* 2000). Larger SMEs in the service sector have access to lower-cost sources of financing as a result of their stable market position and greater resilience to risk (Petersen & Rajan, 1994). Service companies are frequently characterised by flexible management structures, enabling them to gain a competitive advantage. Larger service SMEs achieve higher productivity levels and have more

specialised and better-qualified employees (Prusak, 2019; Yang & Chen, 2009). They achieve better results and are more profitable than small entities (Anastassopoulos, 2004).

Most research studies point to a positive correlation between the size of service SMEs and their profitability. Nunes *et al.* (2009, pp. 693-707), Pantea *et al.* (2014), Margaretha and Supartika (2016), and Gharaibeh and Khaled (2020) confirm this correlation. Meanwhile, Goddard *et al.* (2005) and Pi and Timme (1993) found negative correlations. Agency theory can explain the correlation between a bigger size and lower profitability. Conflicts between managers and owners can result in less strict control over a company's management. Moreover, larger companies tend to offer higher compensation to managers and maintain employment stability, providing incentives to achieve better financial results (Nunes *et al.*, 2009). However, we assume that lower bankruptcy risk, lower cost of capital, and economies of scale are more important than agency costs. Pursuant to the above considerations, we hypothesised:

H1: Company size positively impacts its profitability.

Age affects small and medium-sized service enterprises. The impact of this variable on corporate effectiveness is not explicit. Scholars believe that profitability increases over the course of time. Older entities are more productive, have a greater potential for generating profit and record lower debt levels, which contributes to higher profitability (Coad *et al.*, 2013). Moreover, thanks to their experience and market reputation, more mature firms are more effective in transforming higher sales volumes into profit (Pervan *et al.*, 2019). This is consistent with the assumptions of the bankruptcy theory. Smaller companies incur higher costs of bankruptcy, which reduces their financial results. On the other hand, there is empirical evidence which indicates that age negatively affects SMEs' productivity. Older companies are characterised by decreased volumes of sales as well as lower productivity and profitability (Yazdanfar, 2013). Salman and Yazdanfar (2012), Coad *et al.* (2013), and Pervan *et al.* (2019) confirmed negative correlations between age and profitability. In our opinion, experience in the industry, reputation on the market, and greater efficiency are more important than the flexibility and speed of operation of young enterprises.

H2: Company age positively impacts its profitability.

A significant SME profitability determinant is belonging to a given industry. Industry determines the level of risk, the type of assets, debt structure, and margin levels (Myers, 1984). Companies representing a given industry are similar in terms of operational and financial risk (Hovakimian *et al.*, 2001). Differences in profitability levels between entities representing the same industry result mainly from their development pace, market share, the use of production potential, labour productivity, and capital intensity (Ponikvar & Tajnikar, 2011). Service SMEs are characterised by higher margins and higher productivity along with lower labour costs. Reductions in compensation levels are a problematic option which can result in the loss of qualified staff. Moreover, SMEs' competitiveness is determined by the quality of services and after-sales service. The achievement of higher profitability depends on SME's competitiveness, access to modern technologies, and investment potential (Jabłońska-Porzuczek *et al.*, 2018). Higher profitability is also affected by the maturity of a given industry. Furthermore, SMEs representing mature sectors dominated by large companies cannot achieve higher margins because they are less competitive (Coad, 2007). The above considerations led us to the following hypothesis:

H3: Belonging to a specific industry is strongly correlated with the profitability of service SMEs.

The literature offers examples of research studies which confirm the impact of a company's development potential on its profitability. Scholars believe that a company's development is the indicator of its success (Gharaibeh *et al.*, 2020). An economic entity with good development prospects has usually a good market reputation and easier access to external financing sources (Bhayani, 2010). Generally, a company's growth potential translates to satisfactory financial results in the future, and, consequently, increased profitability (Nunes *et al.*, 2009). Greiner (1972) believes that better development prospects can also lead to decreased profitability. The development of services SMEs can negatively impact informal interpersonal relations between employees. Large-scale activities require more formalised working relationships for which many small businesses are not prepared. Better financial results and higher profitability often depend on executives' ability to motivate employees to

maintain profitability levels in expanding companies. Nunes *et al.* (2009) and Gharaibeh and Khaled (2020) confirmed positive correlations between a company's development potential and profitability. On the other hand, Goddard *et al.* (2005) found negative correlations. The positive impact of growth opportunities on profitability appears to outweigh the potential negative impact. It is difficult to assume high development opportunities if it is not accompanied by a high level of profitability.

The above led us to the following hypothesis:

H4: A company's development positively impacts the profitability of service SMEs.

Financial liquidity significantly impacts profitability. Scholars define it as an economic entity's ability to meet its short-term obligations (Czekaj & Dresler, 2008). However, excess liquidity decreases profitability, because financial assets are not reinvested but retained in liquid assets (Bhayani, 2010). Fama and Jensen (1983) claim that firms with higher liquidity can face manager-owner agency problems. As a rule, managers have a greater knowledge about investment opportunities than company owners. The managers who make investment decisions are more inclined to choose projects which strengthen their own position and prestige rather than those which contribute to increased profitability. Liquidity ratios are frequently treated as the measures of risk. The lack of liquidity can decrease the ability to meet obligations in due time and to conduct long-term operations on the market (Pervan, 2017). Nunes *et al.* (2009), Goddard *et al.* (2005), Bhayani (2010), and Srbinoska (2018) confirmed a positive correlation between SME financial liquidity and profitability. This is consistent with the assumptions of signalling theory. The literature also presents cases of a negative correlation between financial liquidity and profitability (*e.g.* Eljelly, 2004). With regard to service SMEs, we may assume that profitability decreases when financial liquidity is higher. Therefore, we hypothesised:

H5: Financial liquidity is negatively correlated with the profitability of SME service providers.

Companies finance investment projects in different ways. They can rely on retained earnings, issue shares, or take out short- and long-term loans. According to information asymmetry theory, managers have more information about companies than their owners, so reliance on the issue of shares as a source of financing investment projects, especially in smaller businesses, can be viewed as a negative market signal indicating the overestimation of shares. Financing based on the issue of shares is not always successful, and it can negatively impact profitability. On the other hand, financing based on long-term loans points to a company's ability to pay off its debt. Long-term credit is a more reliable indicator of profitability than the issue of shares aimed to finance an investment project (Myers, 1984). Adams (1996) believes that there should be a positive correlation between a company's debt and profitability. Indebtedness can eliminate the threat of ineffective management. The repayment of debt reduces free cash flows, enforcing more effective management of resources (Gharaibeh, 2020). World literature presents several research studies which confirm a negative correlation between SME profitability and debt levels (*e.g.* Michaelas *et al.*, 1999; Sogorb-Mira, 2005; Lopez-Gracia & Sogorb-Mira, 2008; Olokoyo, 2013; Nunes *et al.*, 2009). For the purpose of this study, we put forward the following hypothesis in connection with the correlation between profitability and debt:

H6: Indebtedness negatively impacts the profitability of service SMEs.

Asset structure is one of SME profitability determinants. Most studies presented in the literature on the subject point to a negative correlation between asset structure and profitability. Enterprises with a large amount of liquid assets have a greater ability to implement long-term investment projects (Deloof, 2003). Noteworthy, service SMEs do not invest substantially in fixed assets to conduct successful operating activities. Therefore, a larger share of fixed assets can have an adverse effect on profitability (Nucci, 2005). On the other hand, investment in tangible fixed assets can contribute to a long-term increase in profitability. Nunes *et al.* (2009) explored the cases of service companies and found a negative impact of asset structure on profitability. Chinaemerem and Anthony (2012) confirmed this finding. In our opinion, only companies can conduct investment activities, which as a result guarantees a high level of profitability, it leads to the following hypothesis:

H7: Asset structure negatively impacts the profitability of service SMEs.

Risk greatly affects the level of profitability. Economic entities engaged in more risky undertakings record more variable cash flows (Fama & Jensen, 1984), which can hinder access to bank credit (Kędzior, 2016). Certain types of services carry higher risk, *e.g.* the high-tech sector (Qian & Li, 2003). In this case, managers should adopt strict management standards and have more freedom in responding to market changes in order to mitigate risk and maximise return on investment (Adams & Buckle, 2003). In high-risk sectors, all breakthrough technological changes and the resulting obsolescence of products lead to greater market fluctuations which, combined with high-risk levels, can lead to business failures (Qian & Li, 2003). Getahun (2016) found a positive impact of risk on profitability. Adams and Buckle (2003) obtained a similar result. Qian and Li (2003) found negative correlations. In our opinion, more risky companies have limited operational, investment, and financial capabilities, which in turn leads to lower profitability.

H8: Risk negatively impacts the profitability of service SMEs.

RESEARCH METHODOLOGY

This work is based on the financial data of 1851 economic entities in the period from 2016 to 2019. We collected the empirical data from EMIS (Emerging Markets International Statistics).[1] EMIS Intelligence Region is a service with data on enterprises and sectors of the economy, as well as press and agency articles, reports, statements, stock quotes, and macroeconomic data. We collected all the necessary data to calculate the dependent and independent variables from the EMIS Intelligence Region. The analysed companies represented the service sector, they employ not more than 250 people, and their balance sheet total is up to EUR 43m (as recommended by European Commission 2003/361/WE of 20 May 2003). The analysis excluded micro-businesses, *i.e.* entities with less than 10 employees and total revenue below EUR 2m. Based on the Polish Classification of Economic Activities (PKD) of 2007, we identified 12 types of services within the SME sector.

Table 1 presents the number and share (%) of entities by industry.

Table 1. The number of service SMEs by industry

Industry according to PKD	Number of SMEs	Share
Water supply and waste	176	9.5%
Professional activities	266	14.4%
Real estate services	504	27.2%
Culture and entertainment	98	5.3%
Education	55	3.0%
Finance and insurance	119	6.4%
Information and communication	199	10.8%
Health care	54	2.9%
Other activities	28	1.5%
Transport	200	10.8%
Leasing	95	5.1%
Accommodation and gastronomy	57	3.1%
Total	**1851**	**100.0%**

Source: own elaboration.

We examined the impact of particular factors on profitability using ROA. We defined the adopted ratio in the following way:

$$ROA = \frac{net\ profit}{total\ assets} \quad (1)$$

We adopted the following definitions of independent variables for the purpose of this study:

- age = natural logarithm of a company's age,

[1] Data collected from EMIS on 3 September 2020.

- company size = natural logarithm of total assets,
- growth potential = revenue dynamics (%),
- financial liquidity ratio = current assets / short-term liabilities,
- indebtedness = total liabilities/total assets,
- asset structure = fixed assets /total assets,
- risk = changeability of operational risk (%).

The most common types of measures in the literature are the rate of return on equity (ROE), the return on assets (ROA), and the return on sales (ROS). Most often, the authors use one of them, rarely introducing more than one measure of profitability. Each of the above measures is correct, minor differences may concern their detailed definition. Below, we provide the literature review.

In the literature, scholars usually use ROA to determine profitability, described as net (gross) profit to total assets or ROE expressed as the ratio of net (gross) profit to equity capital and ROS determined as net (gross) profit divided by sales revenue. Sometimes, scholars replace net profit with operating profit (Gharaibeh & Khaled, 2012). Mehari and Aemiro (2013), Nunes *et al.* (2009) and Salman and Yazdanfar (2012) adopted ROA calculated as operating profit to assets. Ivković and Cero (2021) also used the ROA to analyse profitability. Some authors use several indicators simultaneously in various combinations. Chinaemer and Anthony (2012) used ROA and ROE to determine profitability. In turn, Qian and Li (2003) used ROE, ROA, and ROS. In the literature, apart from the above-mentioned measures of profitability, scholars use the following indicators: the return on capital employed (ROCE) (Yapa Abeywardhana, 2015), earnings per share (EPS) (Goh & Ryan, 2008), return on assets measured by operating profit over total assets (ROTA) (Padachi, 2006). Some authors use Tobin's Q market financial ratio as a measure of profitability. Because SMEs are rarely present on capital markets, the use of this measure for this group of enterprises seems to be unjustified.

An initial analysis comprised the calculation of the arithmetic mean, median, standard deviation, quartiles, and minimum and maximum values for variable Y. In the next step, we analysed the significance of differences for dependent variables in particular years using a mixed model. Then, we examined the dynamics of SME profitability in the service sector in 2016-2019 by industry. A comparison of industries for ROA was based on a Kruskal–Wallis test. In the case of statistically significant differences, we applied a post hoc analysis using Dunn's test, which aimed to identify statistically significant differences between groups. We verified correlations between variables using the Pearson correlation coefficient.

We based on a linear mixed model which took into account time- and space-related correlations between observations. We presented the results as the parameter values of a regression model with a 95% confidence interval. The analysis assumed the significance level of 0.05. We regarded all p-values below 0.05 as statistically significant. To test our hypotheses, we used the following model:

$$ROA_{i,t} = age_{i,t} + company\ size_{i,t} + growth\ potential_{i,t} + financial\ liquidity\ ratio_{i,t} + indebtedness_{i,t} + asset\ structure_{i,t} + risk_{i,t} \quad (2)$$

RESULTS AND DISCUSSION

We founded initial analysis of SME profitability on mean values, standard deviation, medians, quartiles, and minimum and maximum values for ROA (Table 2). The obtained results indicate a positive value of the profitability of service SMEs. Importantly, we noticed a high value of standard deviation, which implies a significant difference in profitability in the analysed group of firms.

We founded industry-based analysis of the profitability of service SMEs on such values as arithmetic mean, and medians, and quartiles for Y (Table 3). We assigned the following codes to the identified industries: water supply and waste – A, professional activities – B, real estate services – C, culture and entertainment – D, education – E, finance and insurance – F, information and communication – G, health care – H, other activities – I, transport – J, leasing – K, accommodation and gastronomy – L.

The obtained results point to the highest mean value of return on assets in transport activities, in which the arithmetic mean was 0.07, and the median – 0.05. This high level of profitability can result from a low value of fixed assets. Transport companies often rely on an operating lease, or outsource

Table 3. Profitability of service SMEs by industry, based on arithmetic mean, standard deviation, median, and quartiles

Parameter		Industry												p
		Water supply and waste – A (N=643)	Professional activities – B (N=969)	Real estate services – C (N=1785)	Culture and entertainment – D (N=359)	Education – E (N=203)	Finance and insurance – F (N=441)	Information and communication – G (N=734)	Health care – H (N=192)	Other activities – I (N=101)	Transport – J (N=723)	Lease services – K (N=333)	Accommodation and gastronomy – L (N=205)	
ROA	mean±SD	0.03±0,06	0.06±0,2	0.02±0.09	-0.02±0,23	0.01±0.04	0.06±0.48	0.05±0.38	0.02±0.18	0.03±0.19	0.07±0.12	0.05±0.15	0.05±0,14	p<0,001*
	median	0.02	0.03	0.01	0	0.01	0.02	0.05	0.01	0.02	0.05	0.03	0.03	
	quartiles	0-0.04	0-0.1	0-0.03	-0.01-0.01	0-0.03	0-0.13	0.01-0.13	-0.02-0.04	0-0.1	0.01-0.1	0-0.08	-0.01-0.07	K,B,F>A,C,E,H,D L,I,A>C,E,H,D E,H>D C>E,D J,G>K,L,B,F,I,A,C,E,H,D

Water supply and waste – A; Professional activities – B; Real estate services – C; Culture and entertainment – D; Education – E; Finance and insurance – F; Information and communication – G; Health care – H; Other activities – I; Transport – J; Lease services – K; Accommodation and gastronomy – L; p – Kruskal Wallis test + posthoc analysis (Dunn's test); * statistical significance (p<0.05)
Source: own elaboration.

Table 4. Analysis of statistical significance of differences for Y in particular years

Parameter		Year					Mixed model					
		2016	2017	2018	2019		2017 vs 2016	2018 vs 2016	2019 vs 2016	2018 vs 2017	2019 vs 2017	2019 vs 2018
ROA	mean±SD	0.0339 ±0.3363	0.0435 ±0.1409	0.0346 ±0.1848	0.0408 ±0.1407	Differences in mean values	0.0096	0.0007	0.0072	-0.0094	-0.0022	0.0067
	median	0.018	0.0184	0.0173	0.0173	95%CI	(-0.0064; 0.0255)	(-0.0158; 0.0171)	(-0.0086; 0.0231)	(-0.0178; -0.001)	(-0.0086; 0.0043)	(-0.0011; 0.0145)
	quartiles	0.0009-0.0688	0.0013-0.0654	0.0011-0.0682	0.0011-0.0651	P	p=0.24	p=0.937	p=0.37	p=0.029 *	p=0.514	p=0.091

Note: *statistically significant correlation (p<0.05).
Source: own elaboration.

Table 2. Analysis of dependent and independent variables: arithmetic means, standard deviation, median-service SMEs in Poland

Parameter	Mean	SD	Median	Min	Max
Profitability	0.04	0.22	0.02	8.5	1.52
Indebtedness	0.48	0.41	0.44	-0.28	11.50
Company's age	2.32	0.67	2.48	0.69	4.57
Company size	10.04	1.00	9.99	0.00	14.91
Growth potential	36.45	435.97	0.49	-439.81	14807.75
Capital intensity	0.61	0.33	0.71	0.00	2.93
Financial liquidity	5.95	31.23	1.54	-3.57	703.47
Risk	-11.43	325.64	-5.73	-5866.67	3984.49

Source: own elaboration.

certain activities to the owners of the means of transport. High ROA ratios are also recorded in finance and insurance as well as in professional activities – 0.06. Such activities do not require the possession of high-value fixed assets, so tangible assets can represent a lower value. Return on assets at the level of 0.05 is achieved by lease-related activities as well as information and communication services. The lowest negative values regarded the culture and entertainment sector.

The presented analysis confirmed statistically significant differences between industries. The profitability of the particular sectors is greatly affected by capital intensity, business risk, and entry barriers.

Table 4 presents the analysis of the significance of differences for variable Y (ROA). We verified the significance of differences for Y using a mixed model. Values $p<0.05$ were statistically significant between the years 2017 and 2018. In 2018, the mean value of ROA was lower than in 2017.

Table 5 presents the Pearson correlation coefficients. We found the strongest negative correlation between profitability and indebtedness. In the first place, service SMEs rely on their generated profit to finance investment projects instead of external sources of funding. Cassara and Holmesb (2003) share this view. It may result from the lack of collateral in the form of fixed assets, which increases the loan costs.

Moreover, we recorded a negative correlation between profitability and capital intensity and asset structure. As a rule, service SMEs have lower-value fixed assets, which translates to higher returns on assets. A higher level of liquid assets can increase the ability to implement long-term investment projects.

Empirical evidence confirms the positive impact of a company's size on the profitability of service SMEs. Larger companies are more competitive, benefit from economies of scale, and, consequently, have easier access to less expensive funding than smaller SMEs (Gharaibeh & Khaled, 2020). They are also regarded to be more stable and less exposed to risk, which contributes to their higher profitability.

The obtained results suggest that SMEs representing the service sector show positive correlations between profitability and financial liquidity. Such entities have a greater ability to adapt to market changes and a larger development potential. They do not have to rely on long-term debt, but can resort to interest-free trade credit, granted to reliable business partners who meet their financial obligations in due time. Variables such as a company's age, growth potential, and risk are not significantly correlated with variable Y.

We examined the factors influencing the profitability of service SMEs are examined using a linear mixed model Table 6). We present the results with a 95% confidence interval. We assumed the level of statistical significance for $p<0.05$. We conducted the empirical analysis for a rate of return on assets (ROA). The significant factors influencing variable Y included indebtedness, company size, asset structure, financial liquidity, and industry. Larger service SMEs were characterized by higher values of ROA, lower risk levels, better financial results thanks to economies of scale, greater productivity, and more qualified staff. Moreover, they conduct more diversified activities. Thus, we positively verified hypothesis (H1) about the impact of size. Coad *et al.* (2013) and Pervan *et al.* (2019) obtained similar results in the SME sector.

Industry is the most significant factor affecting the profitability of service SMEs. Thus, we positively verified the hypothesis (H3) on the impact of a given industry on SME profitability. The achieved profitability level was strongly associated with SME operating activities. Belonging to a specific sector determines a company's entry conditions and growth opportunities, access to new technologies, or industry risk. Ponikvar and Tajnikar (2011) also observed the impact of the industry on the profitability of SMEs.

Table 5. Pearson correlation coefficients between independent variables and rates of return on assets

Independent variables	ROA
Company's age	r=0, p=0.997
Company size	r=0.035, p=0.004*
Growth potential	r=-0.012, p=0.347
Financial liquidity	r=0.034, p=0.005*
Indebtedness	r=-0.273, p<0.001*
Capital intensity	r=-0.132, p<0.001*
Risk	r=0.003, p=0.811

Note: r – the Pearson correlation coefficient; *statistically significant correlation (p<0.05).
Source: own elaboration.

Regression analysis verified the negative impact of financial liquidity on a company's profitability (H5). The SMEs with higher financial liquidity are less profitable. When businesses do not reinvest generated profits, their profitability decreases. High financial liquidity may discourage managers from making risky but potentially profitable decisions. Excessive liquidity can reduce the profitability of SMEs (Bhayani, 2010).

Another significant profitability determinant in service SMEs is the debt level. Regression analysis confirmed a negative impact of this variable on ROA. Therefore, we confirmed the adopted research hypothesis (H6). The analyzed companies were less inclined to use external financing and preferred to choose their own funds.

Service SMEs with a lower value of fixed assets achieve higher profitability levels. Liquid financial assets increase the profitability of the analyzed group of firms. A negative association between asset structure and profitability confirmed the hypothesis (H7). Among other researchers, Srbinoska (2018) verified positive relationships.

Table 6. Linear mixed model for the profitability of service SMEs

Feature	Parameter	95%CI		p
Company size	0.01373264	0.0067659	0.02069937	<0.001*
Age	0.00510993	-0.00536492	0.01558477	0.339
Industry	0.75150682	0.52807893	0.97493472	<0.001*
Growth potential (%]	-0.00000004	-0.0000001	0.00000002	0.229
Financial liquidity	-0.0000641	-0.00012178	-0.00000641	0.029 *
Indebtedness	-0.10658882	-0.12263213	-0.09054552	<0.001 *
Asset structure	-0.09294025	-0.11428263	-0.07159787	<0.001 *
Risk (%]	0.00000001	-0.00000015	0.00000016	0.937

Note: *statistically significant association (p<0.05).
Source: own elaboration.

The most significant factor influencing the profitability of service SMEs is industry, followed by indebtedness, asset structure, company size, and financial liquidity. The impact of the company's age (H2), growth opportunities (H4), and risk (8) on profitability turned out to be statistically insignificant.

CONCLUSIONS

We attempted to identify the profitability determinants of service SMEs. The empirical verification confirmed a positive effect of company size on profitability. The obtained results indicate that agency problems between managers and owners have a slight impact on SME operations. Larger service SMEs have better financial results and higher profitability. In this context, industry plays an important role. The profitability of a given activity depends on a sector's internal competition, entry barriers, technological advancement, market structure, and a business environment.

We found that indebtedness, asset structure, and financial liquidity negatively impact profitability. Excessively indebted enterprises record lower profitability levels. Moreover, SMEs prefer to rely on their own resources instead of resorting to debt. Excessively high values of fixed assets decrease the profitability of trading SMEs, while high capital intensity leads to lowered financial results. Noteworthy, maintaining high financial liquidity and the lack of reinvestment of free funds can decrease SME's profitability and hinder potentially profitable investment projects.

The results of this study can be useful for SME owners and executives, private and public institutions as well as researchers. The issue undertaken in this work provides insights into the factors which influence corporate profitability. Company managers should give special attention to those factors which contribute to achieving financial targets, mainly through increased profitability – a basis for evaluating SME performance by investors, counterparties and banks. Moreover, profitability ratios are the main criteria for assessing managers' performance and effective tools for supervising their activities. The obtained results can also be helpful for various government institutions and agencies, because they identify key success factors in a sector of crucial economic significance – SME service companies.

The presented empirical study had its limitations. Firstly, the examined population of companies had to be limited due to the low quality of SME financial reporting. Thus, we excluded many entities from the analyses. Secondly, we believe that research should also comprise companies from other countries and investigate the factors which, as yet, scholars have not verified in the literature on the subject. However, analyses of new variables can face the previously mentioned problem of a limited number and low quality of financial and non-financial disclosures in the SME sector. Future research studies should consider an empirical verification of non-financial factors which have an increasing impact on economic entities' profitability. Moreover, it would be interesting to extend research samples by including SMEs from other countries and listed and unlisted SMEs.

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