DIRECCIÓN Y ORGANIZACIÓN

Comparative analysis of business profitability in Ukraine and Poland

Análisis comparativo de la rentabilidad empresarial en Ucrania y Polonia

Mykhailo Luchko[1] ⓘ**, Stanislaw Szmitka**[2] ⓘ**, Nataliia Dziubanovska**[3] ⓘ**, Iryna Vovk**[4] ⓘ

Abstract
This paper investigates the entrepreneurial activity in two countries (Poland and Ukraine) in terms of profitability. The research objectives are achieved through scientific inquiry and comparative data analysis on business profitability. The article aims to determine the relationship between profitable business operations and the variables affecting them. Also, identifying the most significant and influential variables from the set for each country and comparing national results. The authors conducted an intellectual multivariate adaptive regression analysis of business activities. Profitability is the dependent variable. The relationships are investigated for such inputs as the number of enterprises, number of employees, labor costs, country population, immigration, emigration, and capital investment. Analysis results and the matrix of model coefficients are obtained using the STATISTICA software, in particular the Data Mining/MAR Splines Analysis. The resulting equation of multivariate regression and splines regression panels indicates that enterprises can achieve optimal profitability under different conditions in the two countries, i.e., maximum values of different variables. The theoretical developments of this paper can be practically implemented, making it a valuable resource.

Keywords Probability, data, Minning/MAR Splines Analysis, intellectual data analysis, modeling, regression, spline.

Resumen
Este artículo investiga la actividad empresarial en dos países (Polonia y Ucrania) en términos de rentabilidad. Los objetivos de la investigación se alcanzan mediante la indagación científica y el análisis comparativo de datos sobre la rentabilidad empresarial. El artículo pretende determinar la relación entre las operaciones empresariales rentables y las variables que las afectan. Asimismo, identificar las variables más significativas e influyentes del conjunto para cada país y comparar los resultados nacionales. Los autores realizaron un análisis de regresión adaptativa multivariante intelectual de las actividades empresariales. La rentabilidad es la variable dependiente. Las relaciones se investigan para variables como el número de empresas, el número de empleados, los costes laborales, la población del país, la inmigración, la emigración y la inversión de capital. Los resultados del análisis y la matriz de coeficientes del modelo se obtienen utilizando el programa STATISTICA, en particular el análisis Data Mining/MAR Splines. La ecuación resultante de los paneles de regresión multivariante y de regresión splines indica que las empresas pueden alcanzar una rentabilidad óptima en condiciones diferentes en los dos países, es decir, valores máximos de las distintas variables. Los desarrollos teóricos de este trabajo pueden aplicarse en la práctica, lo que lo convierte en un recurso valioso.

Palabras clave Probabilidad, datos, análisis de splines Minning/MAR, análisis de datos intelectuales, modelización, regresión, spline.

[1] Department of Accounting and Control in Public Administration, West Ukrainian National University, 11 Lvivska str., Ternopil, 46009, Ukraine. Email: m_luchko@ukr.net

[2] Department of Economics, Faculty of Humanitarian, Social Sciences and Technology, Olsztyn University, Jagiellonska 59, Olsztyn, 10283 Poland. Email: stanislaw.szmitka@osw.edu.pl

[3] Department of Applied Mathematics, West Ukrainian National University, 11 Lvivska str., Ternopil, 46009, Ukraine. Email: n.dziubanovska@wunu.edu.ua

[4] Department of Innovation and Services Management, Ternopil Ivan Puluj National Technical University, 56 Ruska str., Ternopil, 46001, Ukraine. Email: vovk.ira.2010@gmail.com

1. Introduction

In modern economic conditions, the most pressing problem countries face is increasing the efficiency of all production sectors, as extensive growth factors of social production are becoming increasingly limited. At the same time, market conditions are strengthening the role and importance of improving labor relations and economic operations to ensure efficient, competitive production capable of providing for state food security. Countries should increase exports of certain products and food, increasing their contribution to their economies. Therefore, improving the economic efficiency of production and its dependence on the individual indicators that reflect the different conditions and aspects of enterprise operation is an urgent problem.

An important indicator of countries with market economies is their profitability. Given this, it should be noted that other macroeconomic indicators influence this generalized indicator. This impact is not always positive and constant over time. In our opinion, this complex problem can be solved using economic and mathematical modeling and statistical methods. One such method, which allows us to determine the factors and dependencies and assess the degree of their impact, is multivariate regression analysis. Therefore, we use multivariate adaptive regression analysis in our study. The famous American statistician Jerome Harold Friedman proposed this method of flexible regression modeling of multidimensional data arrays for the first time. His work Multivariate Adaptive Regression Splines (1991) described the procedure for solving regression and classification problems wherein the relationship between sets of dependent and independent variables needed to be assessed. This procedure is motivated by a recursive approach to regression and offers more power and flexibility to model the interdependencies between sets of variables.

Generally speaking, many authors have already addressed the research topic. We will not name any forgotten scholars; the question of economic profitability has always been at the forefront of research for many scientists. That is why, perhaps, the analysis of this issue in the economic literature deserves a whole article, not just one. But we do not aim to maximize the breadth of our literature review of these issues in modern research, rather, we will focus on only those publications which correlate with the general purpose of our study.

For example, Geamănu (2011) pointed out that economic efficiency is a term used to assess the outcomes of economic performance in comparison with the efforts involved therein. Economic efficiency is the main qualitative factor of economic growth, as it provides absolute growth of outputs with the same amount of effort. Economic efficiency includes profitability as a general indicator of efficiency.

Clark et al. (2011) conducted a macroeconomic study to determine how much investment growth influences economic growth. The authors found that the external effect of technology transfer is a major factor in long-term economic growth. However, the effect of investment growth exacerbates income inequality, even though raising capital contributes to increasing the country's welfare. They noted that investment is positively correlated with the external effect of technology transfer. This problem was previously addressed by Haddad and Harrison (1993), who conducted a study of the impact of investment inflows on the efficiency of firms in the manufacturing sector by studying the variance of productivity and increase in productivity through competition.

Luchko (2017) investigated the impact of several factors on the country's economy to increase its competitiveness and profitability. The author noted the problematic nature of Ukraine's economy as an "economy of war" aimed at solving its territorial problems. Despite the difficult conditions, it is necessary to assess the potential for recovery and systematically plot the way out of the crisis.

Steinerowska-Streb (2012) aimed to explore the characteristics of small and medium-sized enterprises that contribute to reductions in profits during a decline in economic activity. The research was conducted on the example of Polish enterprises. Empirical evidence revealed that the type of manager, market range, and organizational and legal form determine the likelihood of achieving greater profitability despite the declining economic activity. Researchers Dang Ngoc Hung et al. (2019) studied the impact of growth in firm size, capital structure, and profitability on enterprise value. According to the regression results by generalized least squares analysis and analysis of structural paths, the variables of size and profitability are positively correlated with the value of the enterprise. At the same time, the capital structure is a factor that negatively affects the value of the enterprise and, thus, its profitability.

Mazanec (2022) studied how working capital management influences profitability as an important pillar of corporate finance. He found that profitability could be significantly improved through efficient working capital management, cash management, inventory management, and receivables management. This approach is aimed at the sustainable growth of companies under international competition. The author identified statistically significant working capital management variables describing liquidity and performance. He developed models for small and medium enterprises using several criteria of linear regression, described the total sample, determined emissions, multicollinearity in comparison with other models describing the return on assets. This proved that value added explains the impact of working capital management on the profitability of small and medium enterprises.

Anh Huu Nguyen et al. (2020a) investigated the impact of working capital management on firm profitability based on statistical approaches, namely least squares, and a fixed effects model, to solve econometric problems and to improve the accuracy of regression coefficients. Empirical results showed the significant negative impact of working capital management on profitability, which is measured by the conversion cycle of cash and three components, including receivables turnover in days, inventory turnover in days, and payables turnover in days. They significantly affect a firm's profitability as measured by return on assets. The authors proved that firms could increase profitability by maintaining optimized working capital management. Thus, this article gave managers new insight into improving business performance and profitability with working capital management.

Farah Margaretha and Nina Supartika (2016) aimed to study the factors influencing the profitability of activities, namely the size and age of the enterprise, growth, lag in profitability, and productivity. The results of this study showed that size, growth, lag in profitability and productivity, and industry affiliation significantly affect profitability.

Vyhovska (2020) conducted a study to identify the relationship between the profitability of enterprises, their solvency, and business activity to ensure optimal management decisions based on a formalized forecast model, taking into account the scale and type of economic activity.

Vosloban (2012) explored the concept of productivity management, which must be put into practice when it comes to the company's most important resource - the employee. The author found that the results of the employee's work affect the enterprise's profitability directly or indirectly.

Chung Jo Ey and Rashad Yazdanifard (2014) noted that employees had become one of the company's most important assets, which affects profitability. This article discusses the factors that affect employee satisfaction and their impact on the profitability and sustainability of enterprises in the long run.

The study by Mesut Doğan (2013) aimed to establish the impact of enterprise size on its profitability. The author used several methods of regression and correlation empirical analysis. Its results indicate a positive relationship between the size and profitability of the firm. The control variables were found to have a negative relationship, and the liquidity level – had a positive impact.

John R. Becker-Blease (2010) investigated the relationship between firm size and profitability and found that it depends on the industry. But, regardless of the size, profitability is negatively correlated with the number of employees in the company.

Daniel S. Hamermesh (2021) studied the impact of labor costs on the profitability of enterprises and the economy as a whole. He pointed out that higher labor costs (higher wage rates and employee benefits) improve the position of employees, but they can reduce company profits and the number of jobs. Overtime pay, wage subsidies, minimum wages, and payroll tax affect the cost of labor and, therefore, the economy and its profitability.

Babiak et al. (2019) investigated how the minimum wage raise would affect profitability. They focused on panel data from firms in Poland, where wage growth remained stable at an average of about 4 percent between 2003 and 2007 but accelerated to 20 percent in 2008. The authors found that the increase in the minimum wage had a positive effect on average wages and a negative influence on the profitability of enterprises. Increased labor costs due to higher minimum wages directly reduce profits without adjustment of labor demand. The validity of these empirical predictions is proved by the authors in a simple theoretical model of maximizing profitability.

Choi et al. (2013) analyzed macroeconomic indicators in general and in terms of labor productivity, gross profit, and wages; they developed a quantitative model that predicts the enterprise's profitability. Kouser (2012) aimed to describe the relationship between firm size, growth, and profitability of non-financial companies. The study suggested that profitability has a strong positive link to the growth of enterprise size, but size has a less significant and negative impact on profitability.

Agiomirgianaki et al. (2006) explored key financial determinants of firm profitability and employment growth. Their analysis included stepwise regression models. The authors used independent variables like size, age, location, and exports, as well as a number of financial ratios that describe the structure of assets, capital structure, debt dependence, employee productivity, and management efficiency. The study's results showed that the size, age, exports, debt structure, investment in fixed assets, and return on assets and sales significantly contribute to the firm's growth. Econometric results also showed that profitability is influenced by firm size, age, exports, sales growth, debt on fixed assets, investment growth, and effective asset management.

The article by Alshehhi et al. (2018) presents an analysis of the existing research on the impact of corporate activities on the sustainability of the company's financial results and profitability.

Additionally, Dustmann et al. (2007) indicated that estimating the total net profit or loss for the economy from immigration is a difficult task both from a theoretical and empirical point of view. Nguyen et al. (2020b) found a moderate impact of education and migration on the relationship between local government and profitability. Researcher Assem Ehamd (2022) studied the impact of labor migration on the business environment of individual countries and identified the impact of international labor migration on company operations.

Orrenius et al. (2020) determined that immigration, like any positive shock to labor supply, should increase return

on capital and stimulate business investment. The study results showed that immigration increases the rate of business growth, stimulating business survival and increasing employment, which positively affects the macroeconomic indicators.

Singh and Bagga (2019) studied the impact of capital structure on firm profitability. Descriptive statistics, correlation, and regression of multiple panel data were used to analyze the data. Four regression models were used to study the relationship between capital structure and profitability. The authors proved that capital structure has a significant positive impact on the profitability of the firm.

Anton et al. (2021) investigated the relationship between working capital and profitability. The lack of empirical data for developing countries and the importance of working capital efficiency motivated the research into the relationship between working capital and financial performance and between working capital and firm profitability. The authors concluded that working capital has a positive effect on profitability.

Adiputra and Hermawan (2018) used regression analysis to prove that managers cannot change the level of profitability by adopting any working capital policy, i.e., there is no relationship between working capital policy and profitability. In addition, profitability is directly related to inventory retention days and accounts payable days but is inversely related to receivables days.

Paun et al. (2021) examined the dimension of public intervention and the quality of public administration in general management. They found that they have a clear impact on profitability and economic sustainability and the ability of economies to recover after business cycles have run their course.

Luchko (2017) raised the issue of innovation in terms of achieving economic and social impact. He discovered that innovation is one of the main catalysts for economic efficiency and affects profitability. At the same time, they must

have a social effect. The paper presented a three-factor linear dependence equation.

This is not an exhaustive list of responses to the challenges that determine the individual indicators influencing profitability, but it emphasizes the chosen topic's importance and relevance. The analysis of the literature and our conclusions allowed us to determine the purpose of the article – establishing the factors affecting enterprise profitability and choosing the crucial factors that have the greatest impact on each country.

We conducted an intellectual multivariate adaptive regression analysis to achieve the article's goal. We proposed several hypotheses in pursuit of our endeavor, assumptions that we will test for a possible solution to the problem. First, we set the dependent variable as the profitability of enterprises and assessed its dependence on such factors as the number of enterprises, number of employees, labor costs, population, immigration, emigration, and capital investment. We also identified the most significant values of enterprise profitability, achieved at the maximum value of individual variables, and determined whether they differ in the two countries.

2. Models and methods

In methodological terms, we will try to outline the paper and set out our views on the problems in a certain sequence. First, we establish the preconditions for writing and the parameters of our view of a certain problem as general starting points for our arguments. Next, at the research stage, we present our judgments by the article's purpose and the tasks we must solve to prove or refute our hypotheses. In the final phase, we offer a possible model for solving tasks and problems and test the developed theoretical and methodological grounds for assessing our opinions and judgments on this range of issues.

The chosen objectives and the need to solve scientific issues were the reasons behind the division of stages.

Figure 1. Profitability of Ukrainian Enterprises.
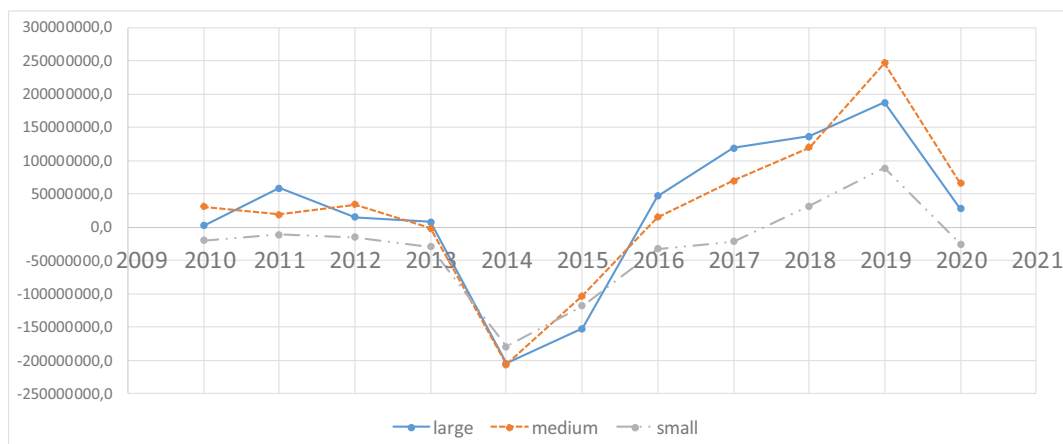
Namely, the need to test and prove the study's hypotheses and develop a model for solving them called for different approaches inherent to the stage. Thus, in the first stage, we used such traditional scientific methods as literature review and analysis, direct observation, and documentary methods. In the second stage, we employed surveys and interviews. The obtained information and knowledge were processed using comparison methods (sample analysis, retrospective analysis). The collected quantitative and qualitative empirical data were processed using statistical calculation, significance tests, and correlation between estimates.

In general, we used the systematic approach as one of the main methods, as well as methods of economic and mathematical modeling, regression dependencies, analogies, retrospective analysis, and the classical method of hypothesis testing. We conducted practical testing of theoretical developments using Statistica software and the MARSPline module – a Data Mining Results technology component. The advantage of using multivariate adaptive regression analysis lies in its simplicity and high efficiency in solving problems with large data sets. The main results of the study, on which further conclusions are based, are substantiation, development, and testing of multivariate adaptive regression analysis to determine the impact of factors (number of enterprises, number of employees, labor costs, population, immigration, emigration population, capital investment) on enterprise profitability. Data from Poland and Ukraine were used for comparative analysis. In our opinion, the practical value of theoretical results lies in their connection with the production.

Statistical data for Ukraine and Poland is used in the paper.

3. Results

First, we will determine under what conditions Ukrainian enterprises achieve profits and choose the factors that affect them.

As the literature review on the topic has shown, a number of factors, including population and migration processes, are reflected in the volume of products sold by enterprises. Therefore, it is logical to analyze how the demographic situation in the country, as well as the situation in the labor market and capital investment, affect the profitability of the business.

In previous studies, we have already used MAR Splines models (Luchko et al., 2020). We can show that this multivariate adaptive regression analysis technique can be used to assess the business's profitability. To compare the modeling results, we estimate the profitability of enterprises in Ukraine and Poland, pre-dividing all enterprises in the country into small, medium, and large.

First, we will perform a multivariate adaptive regression analysis for Ukraine's businesses. The dependent variable is Y – the profitability of Ukrainian enterprises, billion UAH. The dependence of this indicator is estimated for such factors as: X_1 – number of enterprises; X_2 – number of employees, thousand people; X_3 – labor costs, UAH billion; X_4 – population, thousand people; X_5 – population immigration, thousand people; X_6 – emigration; X_7 – capital investment, UAH billion.

The data of the State Statistics Service of Ukraine for 2010–2020 was used for the analysis (excluding the temporarily occupied territory of the Autonomous Republic of Crimea, the city of Sevastopol, and temporarily occupied territories in Donetsk and Luhansk regions) (SSC OF UKRAINE (n.a.)). Fig. 1 illustrates the profitability trends of Ukrainian enterprises from 2010 to 2020. The graph shows significant fluctuations in profitability over the decade. There is a notable decline in profitability from 2010 to 2014, followed by a sharp increase in 2015. After 2015, profitability experiences some volatility but generally maintains a higher level compared to the early 2010s. The graph provides a visual representation of the changing economic landscape for Ukrainian businesses during this period, reflecting various factors such as economic reforms, geopolitical events, and market conditions that have influenced enterprise profitability in the country.

We obtain the analysis results (Table 1) and the matrix of model coefficients (Table 2) using the *Data Mining / MAR Splines Analysis* module of the *STATISTICA 10* software.

We also calculate the multivariate regression equation:

$$Y = -186343996 + 95 \cdot max(0; X_4 - 41858172) + 671 \cdot max(0; X_1 - 383) + + 2347321 \cdot max(0; X_3 - 107,62) - 4088279 \cdot max(0; 107,62 - X_3) + 197319 \, max(0; 2091,498 - X_2) - 330 \cdot max(0; X_5 - 256808)$$

Table 1. Results of MAR Splines Analysis (Ukraine).

Model specifications	Model Summary
	Value
Independents	7
Dependents	1
Number of terms	7
Number of basis functions	6
Order of interactions	1
Penalty	2,00000
Threshold	0,00050
GCV error	3961756
Prune	Yes

Table 2. Profitability of Ukrainian Enterprises. Matrix of the model coefficients (Ukraine).

Coefficients, knots and basis functions	Model coefficients (Spreadsheet1)							
	NOTE: Highlighted cells indicate basis functions of type max(0. independent-knot), otherwise max(0. knot-independent)							
	Coefficients Y	Knots X1	Knots X2	Knots X3	Knots X4	Knots X5	Knots X6	Knots X7
Intercept	-186343996							
Term.1	95				41858172			
Term.2	671	383,0000						
Term.3	2347321			107,6202				
Term.4	4088279			107,6202				
Term.5	197319		2091,498					
Term.6	-330					256808,0		

Figure 2. 3D Surface plot.
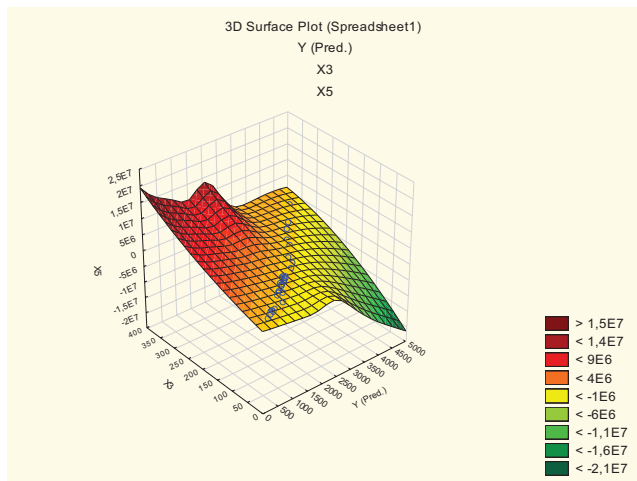
Table 3. Results of MAR Splines Analysis (Poland).

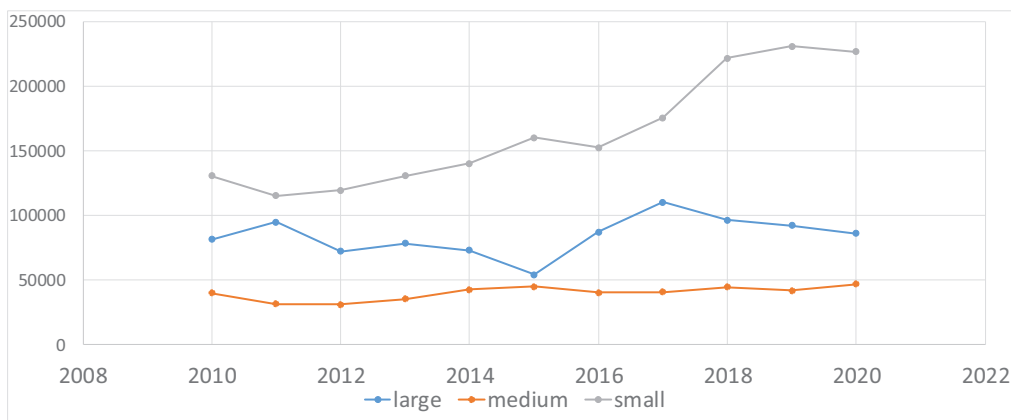| Model specifications	Model Summary
	Value
Independents	7
Dependents	1
Number of terms	5
Number of basis functions	4
Order of interactions	1
Penalty	2,00000
Threshold	0,00050
GCV error	1858051
Prune	Yes

Figure 3. Profitability of Polish Enterprises.

Table 4. Matrix of model coefficients (Poland).

Coefficients, knots and basis functions	Model coefficients (Spreadsheet1)							
	NOTE: Highlighted cells indicate basis functions of type max(0, independent-knot), otherwise max(0, knot-independent)							
	Coefficients Y	Knots X1	Knots X2	Knots X3	Knots X4	Knots X5	Knots X6	Knots X7
Intercept	70328,29							
Term.1	0,04		1576002					
Term.2	-23,59			4015,000				
Term.3	-34,76			4015,000				
Term.4	-353,62						180,5940	

The study confirms that the most significant values of enterprise profitability are achieved at the maximum value of variables X_1, X_2, X_3, X_4, and X_5. Spline regression surfaces also confirm this. For example, consider the interaction between profitability and labor costs in enterprises and immigration (Fig. 2).

Next, we will make the same assessment of Polish businesses using statistical data * (Eurostat, n.a.).

Changes in the profitability of Polish enterprises over the years are presented in a graph format (Fig. 3).

We obtain the results of the analysis (Table 3) and the matrix of model coefficients (Table 4) using the *Data Mining / MAR Splines Analysis* module of the *STATISTICA 10* software.

We also calculate the multivariate regression equation:

$$Y = 70328,29 + 4015 \cdot max(0; X_2 - 1576002) - 23,59 \cdot max(0; X_3 - 4015) - + - 34,76 \cdot max(0; 4015 - X_3) - 353,62 \cdot max(0; X_6 - 180,594).$$

The study confirms that Poland's most significant values of enterprise profitability are achieved at the maximum value of variables X_2, X_3, and X_6. This significantly distinguishes the entrepreneurial activity of Poland from Ukraine, where the most significant values of profitability are achieved at the maximum value of variables X_1, X_2, X_3, X_4, and X_5.

4. Conclusions

Thus, based on statistics of large, medium, and small enterprises in Ukraine and Poland, we have set the profitability of enterprises as the dependent variable and assessed its dependence on factors such as the number of enterprises, number of employees, labor costs, population, immigration, emigration, and capital investment. Using the Data Mining / MAR Splines Analysis method of the STATISTICA software, we have obtained the analysis results, the matrix of model coefficients, and the multivariate regression equa-

tion; subsequently, we have formed spline regression panels. We have established that individual variables differ in the two countries at the maximum value of which enterprise profitability reaches the most significant values. The study has shown that the most significant values of enterprise profitability in Ukraine are achieved at the maximum value of such variables as X_1 – number of enterprises, X_2 – number of employees, X_3 – labor costs, X_4 – population, X_5 – immigration. In Poland, the most significant values of enterprise profitability are achieved at the maximum value of such variables as X_2 – the number of employees, X_3 – labor costs, and X_6 – emigration.

This study has also made it possible to identify new research directions that should be investigated further because of their theoretical and practical relevance. These include, first of all, the use of intellectual analysis, artificial intelligence, and neural networks in conditions of uncertainty.

Another possible direction for further research on this issue is consideration of the future value of money in these calculations and the impact of inflation from depreciation. In our opinion, this requires additional substantiation and changes in some components of the calculations.

References

ADIPUTRA, I. G., & HERMAWAN, A. (2018). The Impact of Capital Structure Determinant on Investment Opportunity: Evidences from Manufacturing Companies in ASEAN Countries. In *Proceedings of the 7th International Conference on Entrepreneurship and Business Management (ICEBM Untar 2018)*, pp. 105-112. https://doi.org/10.5220/0008488901050112

AGIOMIRGIANAKIS, G., VOULGARIS, F., & PAPADOGONAS, T. (2006). «Financial factors affecting profitability and employment growth: the case of Greek manufacturing». *International Journal of Financial Services Management*, *1*(2), 232-242. https://doi.org/10.1504/IJFSM.2006.009628

ALSHEHHI, A., NOBANEE, H., & KHARE, N. (2018). «The impact of sustainability practices on corporate financial performance: Literature trends and future research potential». *Sustainability*, *10*(2), 494. https://doi.org/10.3390/su10020494

ANTON, S. G., AFLOAREI NUCU, A. E. (2021). «The Impact of Working Capital Management on Firm Profitability: Empirical Evidence from the Polish Listed Firms». *Journal of Risk and Financial Management 14*(9). https://doi.org/10.3390/jrfm14010009

BABIAK, M., CHORNA, O., & PERTOLD-GEBICKA, B. (2019). *Minimum wage increase and firm profitability: Evidence from Poland* (No. 14/2019). IES Working Paper. https://www.econstor.eu/bitstream/10419/203233/1/1667730924.pdf

BECKER-BLEASE, J. R., KAEN, F. R., ETEBARI, A., & BAUMANN, H. (2010). «Employees, firm size and profitability of US manufacturing industries». *Investment Management and Financial Innovations*, 7(2). Retrieved from https://core.ac.uk/download/pdf/215534922.pdf

CHOI, K., HAQUE, M., LEE, H. W., CHO, Y. K., & KWAK, Y. H. (2013). «Macroeconomic labour productivity and its impact on firm's profitability». *Journal of the Operational Research Society*, *64*(8), 1258-1268. https://doi.org/10.1057/jors.2012.157

CLARK, D., HIGHFILL, J., de OLIVEIRA CAMPINO, J. & REHMAN, S. (2011). «FDI, Technology Spillovers, Growth, and Income Inequality: A Selective Survey». *Global Economy Journal, 11*(2). https://doi.org/10.2202/1524-5861.1773

DANG, H. N., VU, V. T. T., NGO, X. T., & HOANG, H. T. V. (2019). «Study the impact of growth, firm size, capital structure, and profitability on enterprise value: Evidence of enterprises in Vietnam». *Journal of Corporate Accounting & Finance*, *30*(1), 144-160. https://doi.org/10.1002/jcaf.22371

DOĞAN, M. (2013). «Does firm size affect the firm profitability? Evidence from Turkey». *Research Journal of Finance and Accounting*, *4*(4), 53-59. Retrieved from https://core.ac.uk/download/pdf/234629457.pdf

DUSTMANN, C., FRATTINI, T., & GLITZ, A. (2007). «The impact of migration: a review of the economic evidence». *Centre for Research and Analysis of Migration (CReAM), Department of Economics, University College London, and EPolicy LTD, November*, 1-113. Retrieved from https://gov.wales/sites/default/files/statistics-and-research/2018-12/080506migrationeconomicevidenceen.pdf

EHAMD, A. (2022). «The Impact of international labor migration on business activities». *International Journal of Business and Management, 17*(2), 28-44. https://doi.org/10.5539/ijbm.v17n2p28

EUROSTAT. (n.a.). Retrieved from http://www.ec.europa.eu/

EY, C. J., & YAZDANIFARD, R. (2014). «The impact of employee's satisfaction on company's well-being and sustainability of the company in the long run». *Journal of Research in Marketing*, *3*(1), 239-242. https://doi.org/10.13140/2.1.1703.9043

FRIEDMAN, J. H. (1991). «Multivariate adaptive regression splines». *The annals of statistics*, *19*(1), 1-67. https://doi.org/10.1214/aos/1176347963

GEAMĂNU, M. (2011). «Economic efficiency and profitability». *Studia Universitatis Vasile Goldiş, Arad-Seria Ştiinţe Economice*, *21*(2), 116-119. Retrieved from https://www.researchgate.net/profile/Marinela-Geamanu/publication/265814327_ECONOMIC_EFFICIENCY_AND_PROFITABILITY/links/5706431008ae0f37fee19a21/ECONOMIC-EFFICIENCY-AND-PROFITABILITY.pdf

HADDAD, M., & HARRISON, A. (1993). «Are there positive spillovers from direct foreign investment?: Evidence from panel data for Morocco». *Journal of development economics*, *42*(1), 51-74. https://doi.org/10.1111/kykl.12223

HAMERMESH, D. S. (2021). «Do labor costs affect companies' demand for labor?». *IZA World of Labor*. https://doi.org/10.15185/izawol.3

KOUSER, R., BANO, T., Azeem, M., & UL HASSAN, M. (2012). «Inter-relationship between profitability, growth and size: A case of non-financial companies from Pakistan». *Pakistan Journal of Commerce and Social Sciences (PJCSS)*, *6*(2), 405-419. Retrieved from https://www.researchgate.net/publication/330075755

LUCHKO M. (2017). «Economy of Ukraine: The analysis of the innovative way of the development». *Economics, Management and Sustainability, 2*(2), 95-103. https://doi.org/10.14254/jems.2017.2-2.10

LUCHKO, M., HOLINACH, L., SHCHYRBA, I., & MUZHEVYCH, N. (2020). «Innovative Technologies and Social Responsibility of Business: Analysis of Possibilities». *TEM Journal*, *9*(2), 680-687. https://doi.org/10.18421/TEM92-34

MARGARETHA, F., & SUPARTIKA, N. (2016). «Factors affecting profitability of small medium enterprises (SMEs) firm listed in Indonesia Stock Exchange». *Journal of Economics, Business and Management*, *4*(2), 132-137. https://doi.org/10.7763/JOEBM.2016.V4.379

MAZANEC, J. (2022). «The Impact of Working Capital Management on Corporate Performance in Small–Medium Enterprises in the Visegrad Group». *Mathematics*, *10*(6), 951. https://doi.org/10.3390/math10060951.

NGUYEN, A. H., PHAM, H. T., & NGUYEN, H. T. (2020a). «Impact of working capital management on firm's profitability: Empirical evidence from Vietnam». *The Journal of Asian Finance, Economics and Business*, *7*(3), 115-125. https://doi.org/10.13106/jafeb.2020.vol7.no3.115

NGUYEN, B., & CANH, N. P. (2020b). «The Effects of Regional Governance, Education, and In-Migration on Business Performance». *Kyklos*, *73*(2), 291-319.

ORRENIUS, P. M., ZAVODNY, M., & ABRAHAM, A. (2020). *The Effect of Immigration on Business Dynamics and Employment* (No. 13014). Institute of Labor Economics (IZA). https://doi.org/10.24149/wp2004

PAUN, C., MUSETESCU, R., ISAIC, R., MANEA, G. C., & Shayb, H. (2021). «Economic resilience and the state: A global panel analysis». *Economics, Management and Sustainability*, *6*(2), 34-45. https://doi.org/10.14254/jems.2021.6-2.3

SINGH, N. P., & BAGGA, M. (2019). «The effect of capital structure on profitability: An empirical panel data study». *Jindal Journal of Business Research*, *8*(1), 65-77. https://doi.org/10.1177/2278682118823312.

SSC OF UKRAINE. (n.a.). The State Statistics Service of Ukraine [Державна служба статистики України: офіційний сайт]. Retrieved from http://www.ukrstat.gov.ua

STEINEROWSKA-STREB, I. (2012). «The determinants of enterprise profi tability during reduced economic activity». *Journal of Business Economics and Management*, *13*(4), 745-762. https://doi.org/10.3846/16111699.2011.64586

VOSLOBAN, R. I. (2012). «The Influence of the Employee's Performance on the company's growth-a managerial perspective». *Procedia Economics and Finance*, *3*, 660-665. https://doi.org/10.1016/S2212-5671(12)00211-0

VYHOVSKA, N. G., POLCHANOV, A. Y., OSTAPCHUK, T. P., & DOVGALIUK, V. V. (2020). «The impact of solvency and business activity on profitability of mining companies in Ukraine». *Natsional'nyi Hirnychyi Universytet. Naukovyi Visnyk*, (4), 164-170. https://doi.org/10.33271/nvngu/20204/164