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RESEARCH ON THE ROLE OF INVESTMENTS IN ENSURING SUSTAINABLE DEVELOPMENT OF MACHINERY ENTERPRISES IN EUROPEAN UNION COUNTRIES

Relevance. Enhancing the development of the machinery manufacturing sector significantly contributes to realizing sustainable economic development goals, thereby fostering sustainable growth opportunities across various scales, ranging from local to global. The active advancement of the machine-building sector, which serves as the foundation for sustainable societal progress, demands careful consideration of key factors for the effective operation of machinery manufacturing enterprises with investments being one of the foremost. This highlights the imperative for comprehensive research into the tangible impact of investments in securing the sustainable growth of machine-building businesses.

Objective. The paper targets the conduct of analytical research on investment practices and approaches adopted by machine-building enterprises in European Union countries to specify the key investment factors for their sustainable development.

Methods. The research is based on both general scientific and specialized methods of economic theory, including methods of theoretical synthesis and comparative analysis. Throughout the research, statistical data from the European Union regarding the operation and performance of machinery manufacturing enterprises were utilized and processed using analysis methods, including comparison,

grouping, calculation of averages, and absolute growth. Furthermore, a rating methodology was implemented to identify European Union member states exhibiting the most favorable indicators about the status and dynamics of the machine-building industry.

Results. A comprehensive analysis of contemporary scholarly advancements regarding the examination of the role of investments and effective methodologies for their implementation within the machine manufacturing industry was conducted. A grouping of 22 European Union member states was undertaken based on the criteria of the number of machine-building enterprises and indicators of its absolute growth over a ten-year temporal span. The 22 EU member states are grouped by the parameters of the number of machine-building enterprises and their absolute growth over a ten-year period. The average revenue and gross income per enterprise in the selected countries of the European Union's machinery sector were studied, and based on the results, a ranking was conducted. Utilizing the established ranking of the top selected countries, a comprehensive analysis of key investment indicators was conducted, focusing on parameters that include investments in tangible assets, machinery and equipment, as well as human resources. An overview of investment practices by machinery manufacturing enterprises was undertaken, resulting in the identification of their respective strengths and weaknesses.

Keywords: mechanical engineering, machinery manufacturing enterprises, investments, development, European Union, best practices, comparative analysis

JEL classification: ***F21, L64, O10, F29***

Актуальність. Ефективний розвиток машинобудівної промисловості відіграє одну з визначальний ролей у досягненні цілей сталого економічного розвитку, створюючи можливості для сталого зростання на всіх рівнях – від місцевого до глобального. Активний розвиток машинобудування, формуючи базові передумови для стійкого суспільного розвитку, вимагає детальної уваги до ключових чинників успішного функціонування машинобудівних підприємств, провідним із яких є інвестиції, що актуалізує потребу поглибленого дослідження реальної ролі інвестицій у забезпеченні стійкого розвитку підприємств машинобудування.

Мета. Аналітичне дослідження практик і підходів у здійсненні інвестицій машинобудівними підприємствами країн Європейського Союзу в цілях конкретизації ключових інвестиційних чинників їх стійкого розвитку.

Методи. Методологічну основу дослідження склали загальнонаукові та спеціальні методи економічної теорії, в числі яких методи теоретичного узагальнення та порівняльного аналізу. В процесі дослідження було використано статистичні матеріали Європейського Союзу щодо питань функціонування та результатів діяльності машинобудівних підприємств і опрацьовано їх з використанням методів статистичного аналізу: порівняння, групування, розрахунку середніх величин та абсолютного приросту. Крім того, було застосовано рейтинговий метод при відборі країн ЄС з найкращими показниками стану і динаміки машинобудівної промисловості.

Результати. Здійснено аналіз сучасних наукових напрацювань у питаннях вивчення ролі інвестицій та шляхів їх ефективного застосування у машинобудівній промисловості. Проведено групування 22 країн-членів ЄС за параметрами чисельності машинобудівних підприємств та показників її абсолютного приросту за десятирічний період. Досліджено середні обсяги виручки та валового прибутку в розрахунку на одне підприємство машинобудівного сектору обраних країн ЄС та за його результатами проведено рейтингування. На основі побудованого рейтингу для відібраних топ-10 країн досліджено основні показники інвестування за параметрами вкладень в матеріальні активи, машини та обладнання і в персонал. Здійснено огляд практик інвестування машинобудівними підприємствами з визначенням їх сильних і слабких сторін.

Ключові слова: машинобудування, машинобудівні підприємства, інвестиції, розвиток, Європейський Союз, найкращі практики, порівняльний аналіз

JEL classification: ***F21, L64, O10, F29***

Relevance. Mechanical engineering is pivotal in the United Nation's Sustainable Development Program until 2030 [1], approved by the United Nations in 2015. This role is underscored by its "critical contribution to fulfilling basic human needs, enhancing our quality of life, and fostering opportunities for sustainable growth

across local, national, regional, and global dimensions" [2, p.89].

The dynamic growth of the machinery industry, alongside advancements in science and technology, creates the fundamental conditions for sustainable social development. This requires a keen focus on the critical success factors for machinery business, where investments stand as "the foremost driver of profitability for economic entities, ensuring both their quantitative expansion and qualitative enhancement" [3]. Domestic scholars are placing significant emphasis on issues related to attracting substantial capital investments and the effective administration of investment assets within the machinery manufacturing sector [4]. This underscores the imperative for conducting thorough academic investigations into the genuine significance of investments in safeguarding the sustainable development of machinery manufacturing enterprises.

Analysis of recent research and publications. The study of both theoretical and practical aspects concerning efficient investments within the machinery manufacturing sector continues to be a ubiquitous and enduring theme in the academic discourse, albeit often encompassed by various research paradigms and trajectories. Thus, some scholars substantiate the concept of returns from technological talent and investments in artificial intelligence [5], analytically demonstrating the relationship between investing in the application of artificial intelligence in production processes and indicators of accelerated company growth. Others focus on the issue of investment project control in the machinery manufacturing sector [6], emphasizing the need for establishing clear control algorithms for investments in new projects and developments. Alternatively, they address the application of modern information technologies in the context of investment analysis for projects in the manufacturing sector, aiming for systematic, phased control of their cost and performance [9].

Ukrainian academic discourse demonstrates a comprehensive array of research endeavors about investments within the machinery manufacturing sector. Certain scholars [7, p. 89] concentrate their research efforts on assessing the investment prospects of enterprises within the machinery manufacturing sector. Their investigations culminate in affirming the industry's appeal for investment and underscore the imperative of directing investment capital toward its advancement. Other researchers [8] insist on the necessity of constructing a framework aimed at ensuring the efficiency of investment endeavors, based on the evaluation of investment effectiveness within domestic machinery manufacturing enterprises.

The third group derives their conclusions from a comparative analysis of statistical data concerning the performance indicators of Ukrainian machinery manufacturing enterprises and certain European Union countries. Their findings emphasize a notably substantial disparity in investment levels in fixed assets among domestic economic entities. Consequently, their assessment highlights the imperative for the widespread implementation of the Industry 4.0 technological framework within the machinery manufacturing sector. However, conducting a comparative analysis of Ukraine's indicators with those of more developed nations would undoubtedly unveil a noticeable disparity. Nevertheless, it is noteworthy that the presented study is deficient in analytical justification for the consistent growth of the machinery manufacturing sector in any particular country, including an examination of the role played by investment contributions.

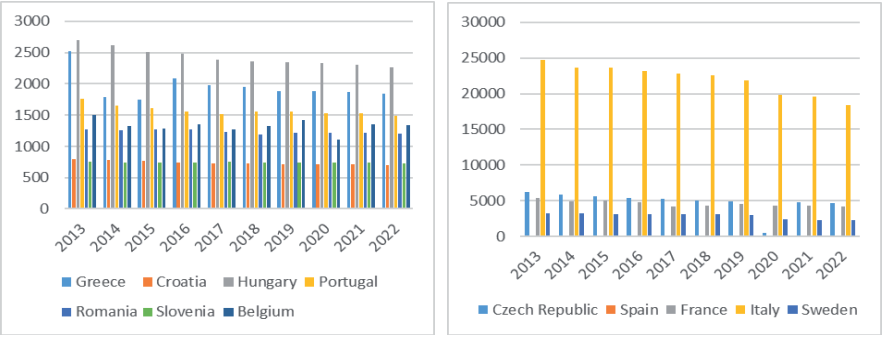
Considering that the current situation in our country is exceptionally complex, and a significant portion of previous research has largely lost its relevance, there arises a need for new developments oriented towards the formulation of theoretical constructs and practical approaches to ensure the rapid post-war recovery of the machinery manufacturing sector, at least in territories that were not within the active combat zone. Within this context, it is considered necessary to examine the development of machinery manufacturing enterprises in European Union countries with a focus on investment expenditures. This examination aims to determine the most effective strategies and approaches, particularly taking into account significant Euro integration prospects for our state.

Formulation of the article's task. The purpose of this study is an analytical examination

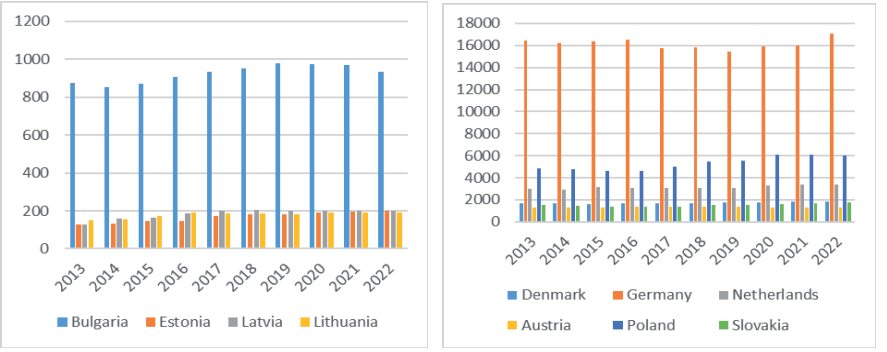
of practices and approaches implemented by machinery manufacturing enterprises in European Union countries to specify the key investment factors contributing to their sustainable development.

Research Methodology. The methodological framework of this study is comprised of general scientific and specialized methods derived from the field of economic theory. Specifically, it involves methods of theoretical synthesis and comparative analysis to comprehensively examine the research topic under investigation. In the course of the research, statistical data sourced from the European Union concerning the operation and performance of machinery manufacturing enterprises were utilized and processed. These data were subjected to rigorous analysis through statistical methods, including comparative analysis, data grouping, average calculations, and absolute growth assessments. Furthermore, a ranking methodology was utilized to identify European Union countries exhibiting the most favorable indicators of the machinery manufacturing industry's condition and dynamics. The study encompassed the analysis of machinery manufacturing enterprises in 22 European Union member countries.

The presentation of the primary research findings with the full justification of the obtained scientific results. To conduct the research, 22 member states of the European Union were selected, with the key criterion for selection centered on the availability of the necessary statistical datasets for the specified period from 2013 to 2022. The analysis of the number of machinery manufacturing enterprises in the selected countries allowed for their categorization based on the indicators of the engineering sector's scale and trends of its change (Fig. 1).



a) group of EU countries with stable tendencies to decrease the number of machine-building enterprises



b) group of EU countries with increasing trends in the number of machine-building enterprises

Fig. 1. Dynamics of the number of machine-building enterprises in the EU countries in 2011–2020*

* calculated and constructed by the authors based on Eurostat data [10]

Thus, four groups of countries were identified:

− Two main groups: countries with positive and negative growth in the number of engineering enterprises during the studied decade-long period;

− And two additional groups of countries within each of the previously identified categories, distinguished by the criteria of the number of enterprises.

First of all, the provided data makes it possible to conclude that among the 22 analyzed countries of the European Union, nearly half exhibited a positive trend in the number of mechanical engineering enterprises over the preceding decade. In this particular scenario, the declining trends are pronounced when considering the group of countries with a reduction in the number of the analyzed indicators. However, the positive dynamics are undulating. Furthermore, it is worth noting that the positive dynamics in the number of mechanical engineering enterprises were observed among the majority of countries with a total count not exceeding 1,000 units, while in countries with a significant number of entities in the mechanical engineering industry, contrasting trends are evenly prevalent.

Another pivotal observation is that the countries characterized by a relatively small number of mechanical engineering enterprises experienced the most substantial growth during the study period. In Estonia, for instance, it totals 56.3% compared to 2013, in Latvia it comprises 55.4%, in Lithuania it is 26 %. However, the situation is entirely different in the leading countries in terms of the number of representatives in the mechanical engineering sector. In Italy, which is an undisputed leader in the number of mechanical engineering enterprises, their reduction over 10 years amounted to 25.4%, while in Germany, although there was an increase recorded, it was only at the level of 3.8%.

Therefore, even within a single economic space and with predominantly unified macroeconomic factors, the mechanical engineering industry in each country operates according to its trends, which require more detailed study, especially in comparison with performance indicators. Consequently, the next stage of the given research involved analyzing the average revenue indicators of mechanical engineering enterprises in each of the countries on a per-company basis, with a graphical representation corresponding to the previously identified four groups of countries (Fig. 2).

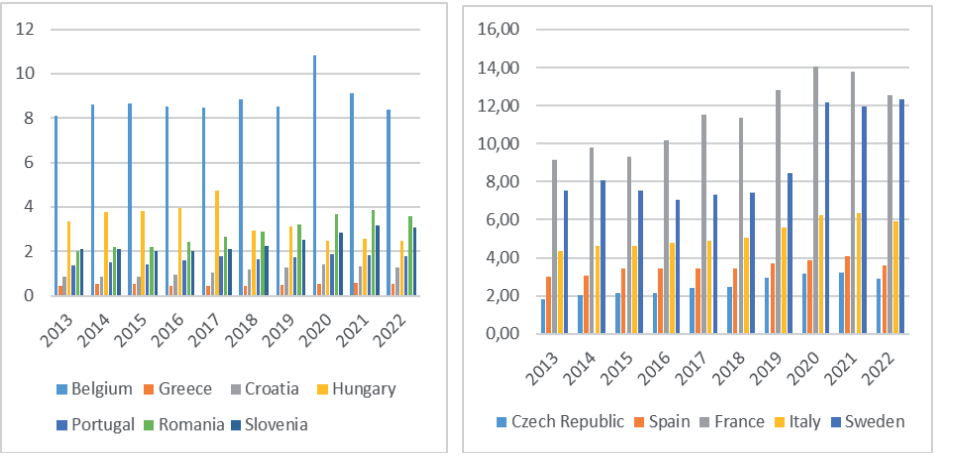
Analyzing the obtained results, first and foremost, it is crucial to highlight that

among all the countries selected for the study, only Hungary exhibited a decrease in revenue from sales of products in the mechanical engineering sector per enterprise. This observation is significant, especially considering that this country belongs to the group with consistent trends in reducing the number of mechanical engineering enterprises.

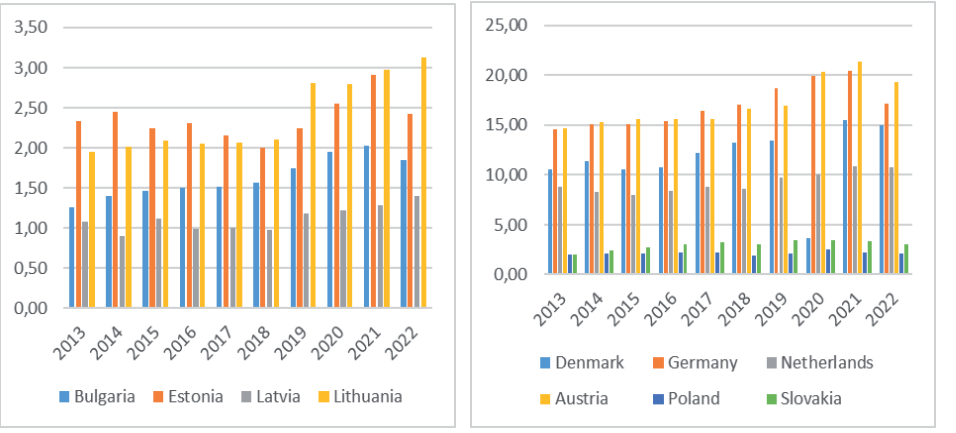
Based on the average calculated indicators, the most profitable activities, in terms of revenue, are the operations of mechanical engineering enterprises in Austria (€19.32 million per year), Germany (€17.17 million per year), Denmark (€14.96 million per year), France (€12.53 million per year), and Sweden (€12.35 million per year). However, when it comes to the growth in revenue within the mechanical engineering sector over the ten years, the absolute leaders are the mechanical engineering enterprises of Romania with a rate of 78.7% growth rate, Sweden (63.76%), Lithuania (60.55 %), the Czech Republic (57.58 %), and Croatia (52.84%). In this context, it is the Lithuanian mechanical engineering sector from the above list that can be considered the leader in terms of development indicators in the period under study because it demonstrates consistent trends of growth in both the number of enterprises and their revenues.

Subsequently, let us present the results of the assessment of the average profitability indicator (based on gross profit) per mechanical engineering enterprise (Fig. 3).

The results obtained primarily underscore the presence of several countries where the examined indicators experienced negative growth in 2022 compared to their value in 2013. Certainly, the average growth



a) group of EU countries with stable tendencies to decrease the number of machine-building enterprises



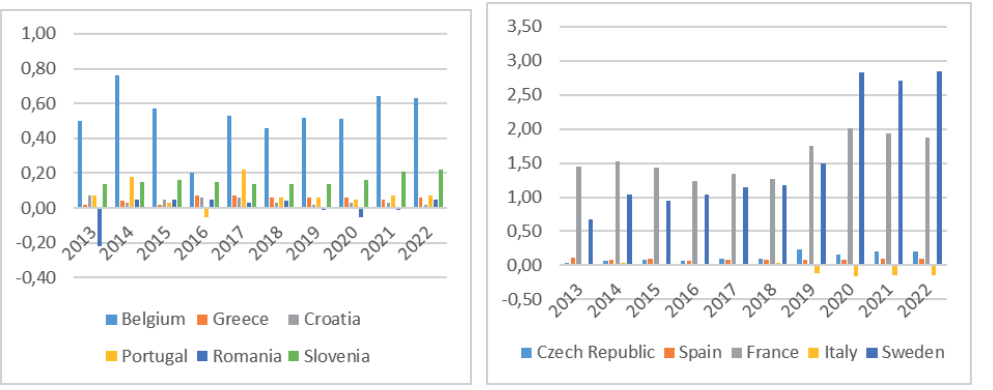
b) group of EU countries with increasing trends in the number of machine-building enterprises

Fig. 2. Dynamics of the average indicator of sales revenue per enterprise in EU countries in 2011–2020*

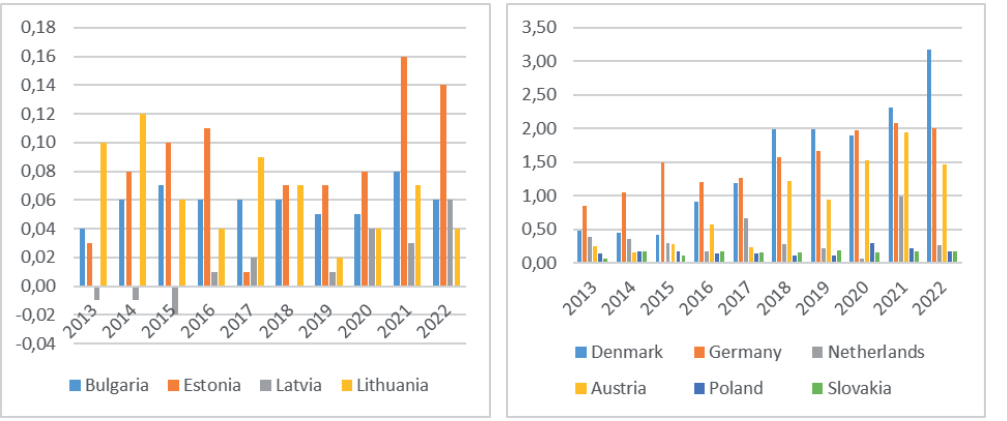
** calculated and constructed by the authors based on Eurostat data [10]*

profit per mechanical enterprise in Italy decreased by a factor of 13, whereas in the case of Romania, this reduction amounted to a factor of 1.3. Furthermore, there was also a decline in the gross profit indicator of enterprises in Hungary (by 74 %), Croatia (by 73 %), the Netherlands (by 34 %), and Spain (by 20.2 %). Moreover, in the cases of Romania and Italy, it is noteworthy that the average calculated gross profit indicators per enterprise exhibited negative values. This phenomenon suggests a deliberate effort by manufacturers to market their products with the least minimal markups.

Another interesting fact is the similarity in the dynamics of gross profit per enterprise among the countries in the three researched groups. Both groups of countries with stable tendencies towards a decrease in the number of machinery manufacturing enterprises



a) group of EU countries with stable tendencies to decrease the number of machine-building enterprises



b) group of EU countries with increasing trends in the number of machine-building enterprises

Fig. 3. Dynamics of the average indicator of gross profit per machine-building enterprise in EU countries in 2011–2020*

** calculated and constructed by the authors based on Eurostat data [10]*

and the group of EU countries, where the total number of machinery manufacturing enterprises does not exceed 1000 units but tends towards an increase in their numbers were observed throughout the analyzed period. These trends were characterized by a noticeable decline in this indicator in 2016-2019 (with some differences). Another rather interesting fact is a certain similarity in the dynamics of gross profit per enterprise among the countries divided into three groups - two groups of countries with stable trends of decline in the number of machine-building enterprises and a group of EU countries in which the total number of machine-building enterprises does not exceed 1000 units, but there are trends towards an increase in their number, namely, characterized by a noticeable decrease in this indicator in 2016-2018 (with certain differences) during the analyzed period. In contrast, in Denmark, Austria, and Germany, the dynamics of the

average gross profit per enterprise showed a predominantly steady upward trend.

In 2022, Denmark had the highest gross profit in the machinery manufacturing industry, averaging 3.18 million euros per enterprise. Sweden occupies the second position with an average gross profit of 2.85 million euros per enterprise. Meanwhile, the German machinery manufacturing sector is the third in the list with a figure of 2 million euros per enterprise.

In general, summarizing the data obtained, it can be noted that there are no fundamental differences between the situation within the machinery manufacturing sector of individual countries from various selected groups. Therefore, a ranking of the chosen countries was constructed for further research purposes based on the analyzed indicators (Table 1).

The application of rating analysis in this case involved determining the ranking position of each of the countries by each of the six examined indicators. Subsequently, all the obtained rankings were summed up and each country was assigned a position in the ranking based on the total scores: the lower the score, the higher the position in the ranking.

Therefore, the application of the rating method made it possible to select the top 10 European Union countries with the best values for the examined indicators of their machinery manufacturing industry, including Denmark, Germany, Austria, Sweden, Czech Republic, France, Slovakia, the Netherlands, Poland, and Belgium. The calculation of key indicators of investment in development was specifically conducted for the selected countries, and the results are presented in Table 2.

Table 1

Rating of the studied EU countries by individual indicators of the state of development and dynamics of their machine-building industry*

Country	Place in the rating for each indicator							The final place in the rating
	1	2	3	4	5	6	7	
Belgium	14	4	7	21	6	15	67	9
Bulgaria	17	8	18	6	17	12	78	14
Czech Republic	5	19	14	4	9	4	55	4
Denmark	11	7	3	9	1	1	32	1
Germany	2	9	2	18	3	9	43	2
Estonia	21	1	16	20	13	5	76	12
Greece	10	21	22	15	16	8	92	16
Spain	4	11	9	17	14	17	72	11
France	6	18	4	10	4	14	56	5
Croatia	19	15	20	5	21	20	100	18
Italy	1	20	8	11	22	22	84	15
Latvia	21	2	20	14	18	2	77	13
Lithuania	22	3	11	3	20	19	78	14
Hungary	8	17	15	22	10	21	93	17
Netherlands	7	5	6	16	7	18	59	7
Austria	15	10	1	12	5	3	46	3
Poland	3	4	17	19	10	13	66	8
Portugal	13	16	19	13	15	16	92	16
Romania	16	13	10	1	19	10	69	10
Slovenia	18	12	12	8	8	11	69	10
Slovakia	12	6	13	7	12	7	57	6
Sweden	9	22	5	2	2	6	46	3
1 – number of enterprises; 2 – increase in the number of enterprises for 10 years; 3 – revenue from the sale of products per 1 enterprise; 4 – increase in sales revenue in 10 years; 5 – gross profit per 1 enterprise; 6 – increase in gross profit per enterprise over 10 years; 7 is the sum of indicators from 1 to 6								

* calculated and constructed by the authors based on Eurostat data [10]

Table 2

The main indicators of investment by machine-building enterprises in the development of activities in individual EU countries in 2011–2020*

Country	Year									
	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
The average volume of investments in tangible assets by one enterprise. million euros										
Denmark	0.56	0.38	0.30	0.31	0.28	0.32	0.32	0.31	0.38	0.47
Germany	0.36	0.40	0.39	0.39	0.45	0.47	0.49	0.59	0.64	0.45
Austria	0.37	0.40	0.38	0.36	0.35	0.35	0.41	0.61	0.63	0.57
Sweden	0.14	0.15	0.16	0.13	0.13	0.14	0.15	0.24	0.27	0.27
Czech Republic	0.09	0.10	0.11	0.13	0.13	0.12	0.13	0.15	0.16	0.11
France	0.29	0.28	0.24	0.26	0.28	0.27	0.40	0.45	0.42	0.39
Slovakia	0.16	0.15	0.13	0.18	0.21	0.18	0.19	0.18	0.20	0.18
Netherlands	0.31	0.25	0.20	0.19	0.29	0.23	0.19	0.26	0.32	0.23
Poland	0.09	0.09	0.10	0.12	0.11	0.09	0.10	0.13	0.12	0.10
Belgium	0.21	0.21	0.18	0.40	0.24	0.17	0.19	0.27	0.22	0.27
The average volume of investments in machinery and equipment by one enterprise. million euros										
Denmark	0.48	0.26	0.21	0.22	0.20	0.24	0.26	0.24	0.27	0.34
Germany	0.31	0.33	0.32	0.34	0.38	0.39	0.41	0.46	0.50	0.34
Austria	0.26	0.28	0.28	0.25	0.26	0.26	0.30	0.37	0.39	0.37
Sweden	0.12	0.13	0.14	0.12	0.12	0.12	0.12	0.19	0.23	0.19
Czech Republic	0.07	0.07	0.08	0.09	0.10	0.09	0.10	0.11	0.12	0.08
France	missing data									
Slovakia	0.13	0.12	0.09	0.13	0.15	0.13	0.13	0.13	0.16	0.13
Netherlands	0.20	0.18	0.13	0.14	0.07	0.17	0.14	0.17	0.19	0.16
Poland	0.06	0.07	0.07	0.08	0.08	0.06	0.07	0.09	0.09	0.07
Belgium	0.18	0.17	0.13	0.32	0.21	0.14	0.16	0.22	0.18	0.22
The average volume of investment in personnel by one enterprise. million euros										
Denmark	2.02	2.05	1.95	2.01	2.15	2.23	2.34	2.58	2.67	2.56
Germany	3.54	3.74	3.87	4.01	4.40	4.43	4.78	5.27	5.63	4.87
Austria	3.17	3.43	3.64	3.64	3.68	3.87	3.89	4.63	4.83	4.73
Sweden	1.47	1.51	1.53	1.44	1.47	1.50	1.58	2.17	2.20	2.31
Czech Republic	0.31	0.34	0.36	0.37	0.40	0.44	0.51	0.58	0.61	0.58
France	1.83	2.01	2.00	2.08	2.45	2.41	2.74	3.10	3.06	2.94
Slovakia	0.36	0.41	0.46	0.51	0.53	0.52	0.58	0.61	0.60	0.56
Netherlands	1.48	1.55	1.48	1.59	1.66	1.68	1.75	1.71	1.84	1.94
Poland	0.33	0.35	0.34	0.36	0.36	0.33	0.35	0.42	0.40	0.38
Belgium	1.39	1.50	1.55	1.55	1.47	1.38	1.35	1.82	1.47	1.41

* calculated and constructed by the authors based on Eurostat data [10]

The results demonstrate, firstly, that among the top three countries in terms of machinery manufacturing development and according to the ranking presented, there are consistently similar annual levels of investment in tangible assets and machinery and equipment. Furthermore, some individual enterprises exhibit very high levels of investment in human resources.

The highest average calculated levels of investment in human resources, which encompass expenses for their maintenance and development, were observed during the studied period in the machinery manufacturing enterprises of Germany (4.87 million euros per enterprise on average each year) and Austria (4.73 million euros). In this regard, each company in Austria and

Germany invests approximately 0,3 million euros per year in machinery and equipment.

It could be argued that investments in such directions are the key to the successful development of the machinery industry. However, as evidenced by the previous analysis, certain issues with the revenue growth indicator for the machinery industry's product sales are observed in Germany, for example. On the other hand, in Denmark, which holds the top position in the development and dynamics of the machinery industry, the number of investments per employee in a single enterprise is significantly lower than in Austria, Germany, or even France, despite amounting to 2.6 million euros in 2020.

Concerning the mechanical engineering sector in France, according to the ranking analysis, its main problems lie in growth rates, which are rather low compared to other EU countries, although the country's mechanical engineering companies are among the top 6 in terms of revenue and gross profit. In this case, as per the calculation conducted, an average French mechanical engineering company dedicates approximately 0.4 million euros each year towards investments in tangible assets and about 3 million euros towards investments in human resources. Lacking comprehensive statistical data, precise calculations of French companies' machinery and equipment are unattainable making it challenging to draw conclusive insights. However, it can be observed that the French investment model employed by mechanical engineering companies is characterized by high profitability and a steady pattern of growth.

Within Swedish mechanical engineering enterprises, there is a notable pattern of comparatively lower annual investment volumes, both in human resources (averaging 2.31 million euros per company in 2020) and in machinery and equipment (0.19 million euros). However, the ranking presented demonstrates that they hold the third position with the main issue being a declining trend in the number of enterprises in the industry. In other words, by looking at the indicators of the mechanical engineering industries in France and Sweden, it becomes evident that mechanical engineering enterprises can effectively operate and thrive, even with notably reduced levels of investment.

Completely different approaches are observed in the mechanical engineering enterprises of the Czech Republic, Poland, and Slovakia. To illustrate, in Poland, the mechanical engineering companies exhibit the lowest levels of investment among all the surveyed countries, with each enterprise allocating an average of only 0.38 million euros annually for their human resources and a mere 0.07 million euros for machinery and equipment. And this already poses significant challenges for the country's mechanical engineering industry both in terms of revenue amounts and dynamics. In contrast, within the Czech Republic, while investment levels in tangible assets and machinery and equipment closely resemble those in Polish enterprises, there is a notable disparity with significantly higher investments in human resources. Furthermore, the overall development indexes of mechanical engineering enterprises in the Czech Republic showcase a significantly more favorable situation. Therefore, the primary challenges faced by the Czech mechanical engineering industry are a significant reduction in the number of economic entities and relatively low revenue per enterprise.

Overall, the analysis of the top 10 EU countries in terms of performance in the mechanical engineering industry made it possible to identify the presence of various investment approaches, each with its drawbacks. Nevertheless, it is worth emphasizing that the key factors for success are investments in human resources and core production assets.

The findings derived from this investigation and the future research prospects within this domain. Based on the conducted research, it is evident that investments hold a pivotal role within the mechanical engineering sector. However, it is crucial to note that excessive growth in investment does not correlate with sustainable development. Consequently, this underscores the imperative for more

comprehensive research within this domain, aiming to delineate the optimal investment limits for mechanical engineering enterprises. Such delineation is critical for facilitating their progressive growth, enhanced revenue generation, and maintaining high levels of profitability. Simultaneously, the examination of investment activities within mechanical engineering enterprises in specific European Union countries and its findings led to the conclusion that human resources, in particular, stand as one of their most vital resources requiring ongoing investment in development.

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RESEARCH ON THE ROLE OF INVESTMENTS IN ENSURING SUSTAINABLE DEVELOPMENT OF MACHINERY ENTERPRISES IN EUROPEAN UNION COUNTRIES

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Relevance. Enhancing the development of the machinery manufacturing sector significantly contributes to realizing sustainable economic development goals, thereby fostering sustainable growth opportunities across various scales, ranging from local to global. The active advancement of the

machine-building sector, which serves as the foundation for sustainable societal progress, demands careful consideration of key factors for the effective operation of machinery manufacturing enterprises with investments being one of the foremost. This highlights the imperative for comprehensive research into the tangible impact of investments in securing the sustainable growth of machine-building businesses.

Objective. The paper targets the conduct of analytical research on investment practices and approaches adopted by machine-building enterprises in European Union countries to specify the key investment factors for their sustainable development.

Methods. The research is based on both general scientific and specialized methods of economic theory, including methods of theoretical synthesis and comparative analysis. Throughout the research, statistical data from the European Union regarding the operation and performance of machinery manufacturing enterprises were utilized and processed using analysis methods, including comparison, grouping, calculation of averages, and absolute growth. Furthermore, a rating methodology was implemented to identify European Union member states exhibiting the most favorable indicators about the status and dynamics of the machine-building industry.

Results. A comprehensive analysis of contemporary scholarly advancements regarding the examination of the role of investments and effective methodologies for their implementation within the machine manufacturing industry was conducted. A grouping of 22 European Union member states was undertaken based on the criteria of the number of machine-building enterprises and indicators of its absolute growth over a ten-year temporal span. The 22 EU member states are grouped by the parameters of the number of machine-building enterprises and their absolute growth over a ten-year period. The average revenue and gross income per enterprise in the selected countries of the European Union's machinery sector were studied, and based on the results, a ranking was conducted. Utilizing the established ranking of the top selected countries, a comprehensive analysis of key investment indicators was conducted, focusing on parameters that include investments in tangible assets, machinery and equipment, as well as human resources. An overview of investment practices by machinery manufacturing enterprises was undertaken, resulting in the identification of their respective strengths and weaknesses.

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