The Dynamics of Enterprises in Romania from the Perspective of their Performance during 2015-2022

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Abstract: Romanian economy has faced significant changes, reflected in the structure and dynamics of enterprises, during last years. This study analyzes the dynamics of enterprises in Romania, from the perspective of the number of employees and turnover, during 2015-2022. This research highlights the differences of the typology of enterprises, the dynamics of their numerical variation, as well as the results of the challenges and opportunities, associated with adaptation to the economic and technological changes, going to the dynamics of the number of employees and turnover, and using statistical data. The conclusions offer the perspective on future transformations and recommendations for the stimulation of innovation and the sustainable growth of the competitiveness of Romanian enterprises in the current global context. This analysis contributes to the understanding of economic dynamics and to the formulation of strategies for the consolidation and development of the private sector of Romania in the coming years.

Keywords: enterprises; average number of employees; turnover

JEL Classification: M21

1. Introduction

This paper aims to capture the evolution of the tipolgy of enterprises in Romania during the reference period, analyzing the dynamics the number of employees and the turnover obtained for each enterprise category. The time horizon in which the indicators are analyzed, as well as their modeling component, provides a perspective on the trend that these indicators could follow in the future. At the same time, the results of the statistical processing of the indicators could provide support for the business environment which, in an economic context marked by multiple challenges and uncertainties, it would have solutions to anticipate potential imbalances in the market.

The level of connection of the Romanian business environment to the global economy can be easily noticed by analyzing the indicators of this paper. Thus, the pandemic crisis, uncertainties at the global level, in the context of the energy crisis and the war in Ukraine, inflation, real estate speculation, dependence on the capital of foreign banks, but also the international economic growth can be easily seen in the fluctuations of the indicators analyzed for Romanian companies. Although the domestic business environment is rather unstable, Romanian enterprises have demonstrated that they have a

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high level of resilience to economic vicissitudes and thus, they have permanently found operating resources.

2. Analytical Techniques

This study used both descriptive and econometric data analysis methods.

Descriptive statistics is important in providing insight into the distribution of the data, as well as, explaining some important statistical measures prior to the econometric analysis.

Descriptive statistics were used in the study to present, synthesize and interpret the main characteristics of the analyzed data. All these provide the tools to investigate, understand, and communicate information from a simplistic and structured perspective. This serves as a foundation for further analysis and for anticipating or minimizing potential market imbalances.

The econometric analysis was carried out with the R studio program in order to research, explore and interpret the results.

The correlation method and the time series method were used to examine, quantify and evaluate the relationship between the variables in the analyzed data, more precisely, the number of enterprises, their typology, the number of employees or the turnover during the period of reference in order to highlight the dependence of the indicators. This is a statistical concept based on mathematical and methodological principles, that allow the analysis and interpretation of associations between variables, thus facilitating the understanding and explanation of phenomena and behaviors noticed in the context of the data under analysis.

3. Analysis of Indicators

3.1. Analysis of the Type of Enterprises

The number of current enterprises at the national level, at the end of 2022 indicates a continuity of growth of this indicator, reaching the value of 672.021 entities at the end of the year. Its increase, by 2,78% compared to the number of enterprises in the previous year, being however below the increase recorded in the year 2021, compared to 2020, when the increase was 4,73%. The higher increase in the number of enterprises in 2021, compared to the previous year is the result of a soar generated by the post-pandemic economic recovery. As for the more sensitive growth recorded in 2022 – it has its explanation in the context of the three major economic problems generated by the pandemic crisis: the budget deficit, the deficit of current account and inflation.

The increase in the number of enterprises does not significantly change their types, and thus, their division being summarized as follows:

- micro-enterprises: the number of employees below 10 and the turnover below 2 million euros;

- small enterprises: number of employees from 10 to 50 and turnover below 10 million euros;

- medium enterprises: number of employees from 50 to 250 and turnover below 50 million euros;

- large enterprises: number of employees over 250 and turnover over 50 million euros.

It was noticed that at the end of 2022, a percentage of 99,74% from the enterprises are SMEs, and the remaining 0,26% are large enterprises, with similar values obtained for the year 2021, but also for the previous years. The number of large companies is still reduced in Romania, as in the member countries of the European Union, and they constantly represent between 96 and 99% of all businesses. The small differences that appear between countries are generated by the internal climate, by the characteristics of the local entrepreneurial environment, but also by the appetite of society as a whole, towards the exploitation of the entrepreneurial spirit.

What differs more is the share that each of the three typologies has in the SME structure, and this share is influenced by the financial potential of the entrepreneurs, the support of the authorities, legislation and the general business climate in each country.

As for the data analyzed on Romania, in 2022, it can be seen that there was a significant increase in the number of large enterprises, by 2,82%, micro-enterprises also registered an increase of 3,22%, still an increase, but very small also registers medium enterprises, only 0,97%, and the number of small enterprises decreased by 2,33%, the differences representing the variation compared to the previous year. The biggest variation is registered at the level of the number of micro-enterprises, which represent 91,45% in the total number of enterprises and which registered an increase in absolute values of 19.165 entities in 2022.
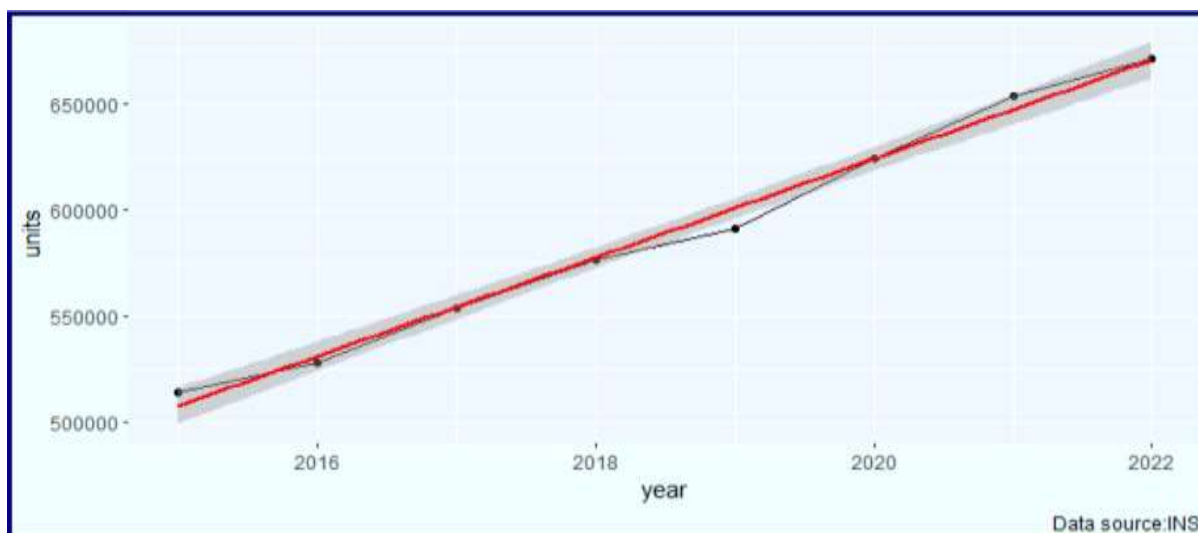
Figure 1. Evolution of the Total Number of Enterprises during 2015-2022
Source: author processing based on INS data

Coefficients:
Estimate   Std. Error   t value Pr(>|t|)
(Intercept) 484.172.5   4.293.5   112.77 3.28e-11 ***
time   23.354.9   850.2   27.47 1.54e-07 ***
Signif. codes: 0 '***'   0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 5510 on 6 degrees of freedom
Multiple R-squared: 0.9921,   Adjusted R-squared: 0.9908
F-statistic: 754.5 on 1 and 6 DF, p-value: 1.539e-07

As it can be seen from Figure 1, there is an upward trend in the number of companies that have linearly grown in the stage of 2015-2022. The blue line inside the graph represents the evolution of the total number of enterprises, and the red line represents the statistical adjusting line. This monotonous linear growth trend is also statistically validated by the correlation coefficient between the total

number of enterprises and the time variable which for the mentioned data was 0,99, that demonstrates an intensity of correlation that is directly and a very strong one.

The dependence between the variables has a form like that:

units = 484.172,5 + 23.354,9 * time

It is noticed that both coefficients are statistically significant. It can also be concluded that from one year to another the total number of enterprises increased by 23.355,9 on average.
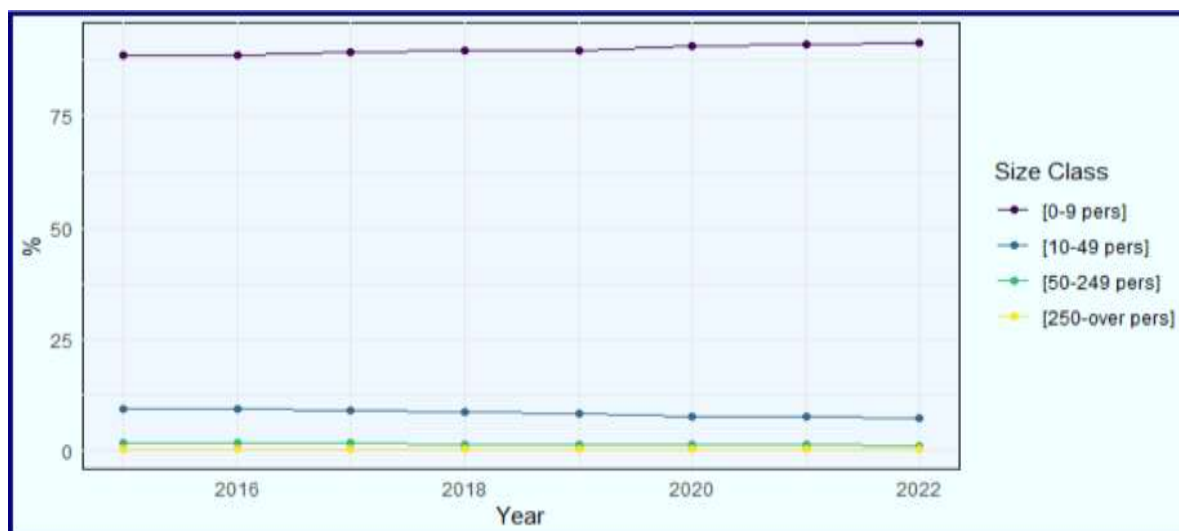
Figure 2. Percentage Evolution of the Structure of Enterprises during 2015-2022
Source: author processing based on INS data

Figure 2 shows the percentage evolution of enterprises according to their structure in the time horizon under analysis. As can be seen, the largest share in the total number of companies is represented by micro-enterprises, followed in descending order by small and medium-sized enterprises, and the smallest share is represented by large enterprises. Such a small percentage of large enterprises provides valuable information about the structure and dynamics of the economic sector. By collecting, calculating and interpreting relevant data, policy makers, analysts and stakeholders can gain a clearer perspective on the distribution of economic power, competitiveness and opportunities in the business environment.

3.2. Analysis of the Average Number of Employees

In a simple logic, the increase in the number of enterprises correlates with an increase in the number of employees. In this study, the evolution of the number of employees was analyzed compared to the number of enterprises, and it was found that at the level of 2022, with a 2,78% increase in the total number of enterprises, the increase in the average number of employees was only 1,08 %.

As for the level of the structure of enterprises, it is found that large enterprises have the largest share of the increase in the number of employees, of 2,34%, followed by micro-enterprises with 1,71% and medium-sized enterprises with 1,02%, and small enterprises registered a decrease of 1,5%, compared to the previous year, when this category of enterprises had an increase of 2,12%, so as this being in the second place of the increase – as for the number of employees, in the structure of enterprises, so they

being ranked after micro-enterprises. The variations of this indicator are directly related to the tax legislation and the entrepreneurial climate.

Tax legislation has a defining role in the dynamics of business structures at the level of a country. Analyzing the existing data from the year 2022, compared to those from the year 2021, at the level of micro-enterprises, there it can be noticed that the number of new employment contracts was 17.604, according to the available data from the National Institute of Statistics. But following the data from the preceding subsection, it becomes evident that the average number of newly hired employees within micro-enterprises was lower than the number of new micro-enterprises established, implying that companies were formed without having a single employee.
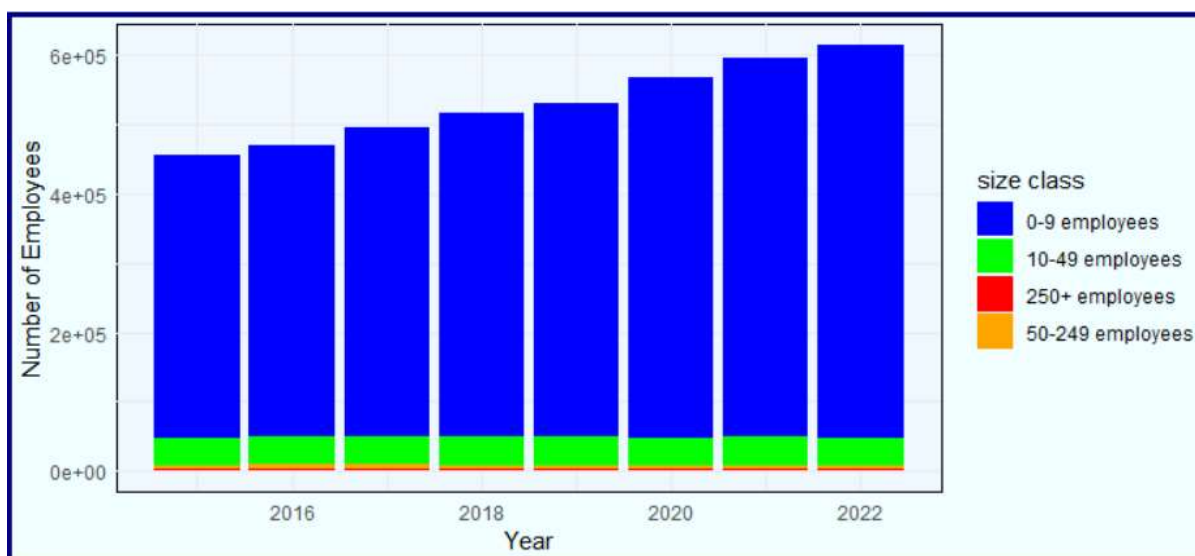

Figure 3. Evolution of the Number of Employees According to the Type of Enterprises during 2015-2022
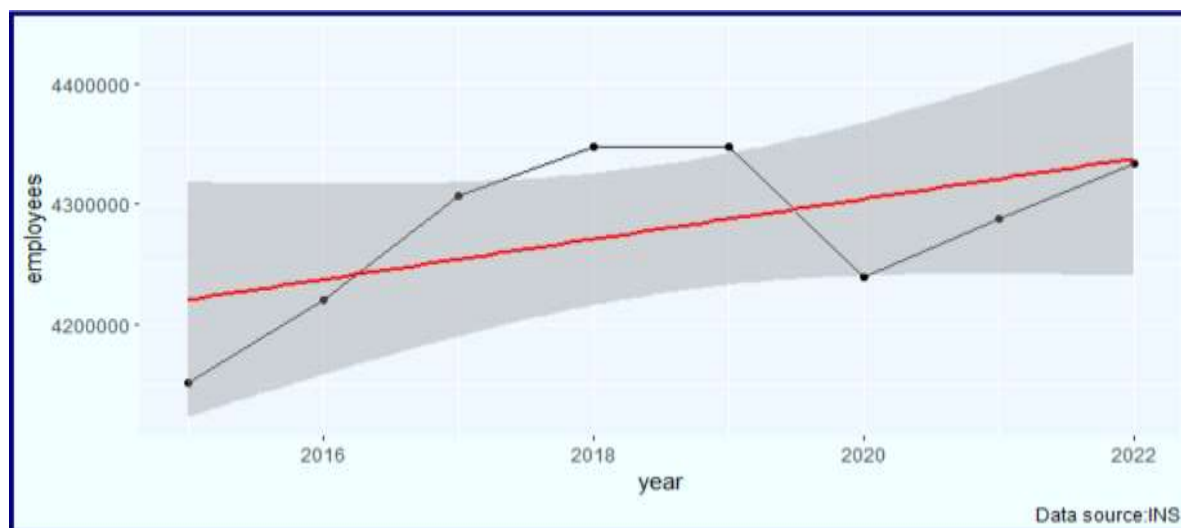*Source: author processing based on INS data*

Figure 4. Evolution of the Average Number of Employees during 2015-2022
Source: author processing based on INS data

Dependent variable:
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employees
(1)   (2)

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------------------------------------------------------------
      Constant       4,203,462.000***   4,094,240.000***
                     (48,441.580)      (74,565.260)
         time         16,827.810         82,360.880*
                      (9,592.862)       (38,016.500)
      I(time2)                          -7,281.452
                                        (4,123.469)
------------------------------------------------------------
                    Observations       8              8
   R2               0.339          0.593
   Adjusted R2      0.229          0.430
Residual Std. Error 62,168.850 (df = 6) 53,446.260 (df = 5)
F Statistic      3.077 (df = 1; 6)   3.641 (df = 2; 5)
============================================================
Note:                *p<0.1; **p<0.05; ***p<0.01
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Figure 4 - as well as the statistical analysis, shows an increasing trend in the average number of employees over the entire analyzed period, but with a significant decrease in 2019, a decrease caused by the COVID 19 pandemic. The minimum level of employees was reached in 2020, after which their number has began to increase again. The blue line in chart number 4 represents the actual evolution of the indicator, and the red line represents the linear adjustment. This can be seen both from the graphic representation, and also from the statistical processing, that the dependence of the two variables is not linear, having an undefined trend.

The evolution of the average number of employees represents an essential barometer for the dynamics of the labor market and the business environment -generally speaking. The analysis of this indicator provides a perspective on the adaptation of enterprises and human resources to the new realities, in the context of the rapid socio-economic and technological changes.

The beginning of the analyzed stage shows a linear evolution, and a constant upward trend in the number of employees, thus reflecting post-crisis economic stability. During the 2018-2019 years the number of workers stagnates, and years 2019-2020 were marked by a significant turning point. The COVID 19 pandemic has had a devastating impact on the labor market, causing significant reductions in the average number of employees in many sectors. Lockdowns, travel restrictions and economic uncertainty have contributed to a steep decline and a climate of uncertainty both for employees and the employers.

Despite of these challenges, the years 2021 and 2022 brought signs of recovery and as it can be seen in Figure 4, the trend of the average number of employees is again an upward one. The rapid implementation of technology in innovative ways in most fields has helped many businesses succeed in reinventing and adapting. This was reflected by a rebound in the average number of employees and reemployment initiatives in revitalized sectors.

As a conclusion, the evolution of the average number of employees during the analyzed stage reflected the complexity and dynamics of the labor market. This indicator underlines the resilience, adaptability and innovative spirit of the Romanian business environment, from stability to dramatic changes and then to recovery.
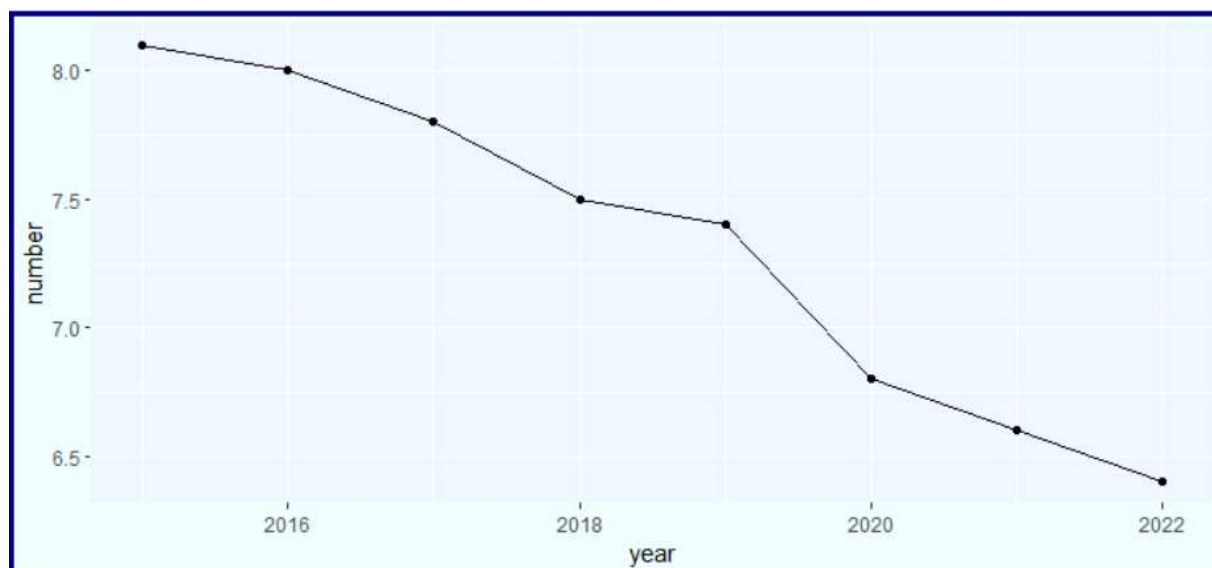
Figure 5. Evolution of the Average Number of Employees Per Enterprise during 2015-2022
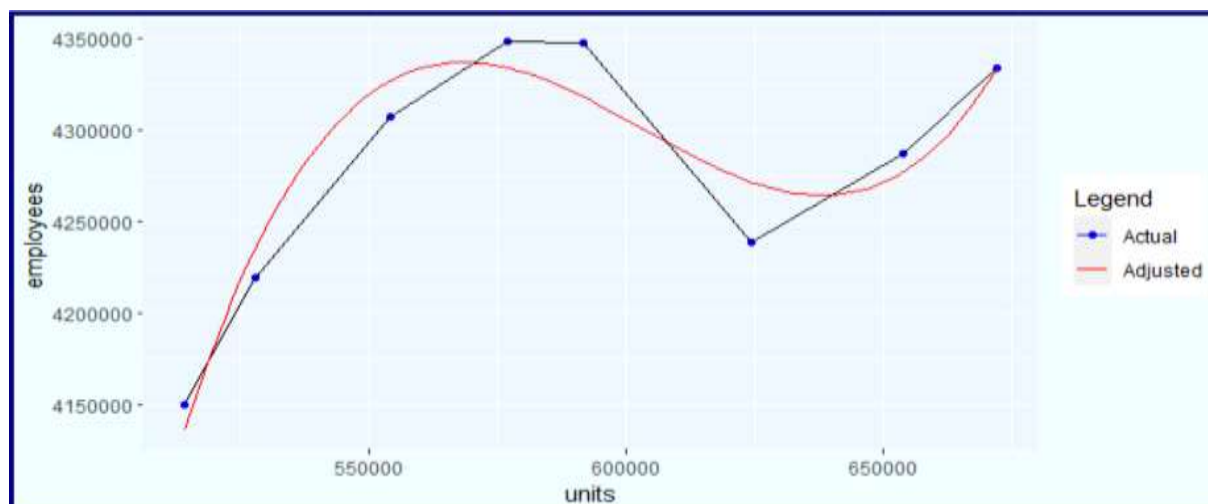*Source: author processing based on INS data*

On the Figure 5, it can be seen that the average number of employees per company follows a constant downward trend throughout the analyzed period. The explanations of this result represent a significant economic theme, highlighting the deep and dynamic transformations that organizations can go through in the context of a business environment, in a permanent technological progress that represents one of the most influential factors in reducing the number of employees. The implementation of automation, artificial intelligence and other disruptive technologies led to the optimization of processes and the elimination of the need for a large number of employees of certain tasks.

Another major motivation that has led to a reduction in the number of employees per enterprise is globalization and competition. So, in a globalized landscape, businesses face heightened competition. To remain competitive, they must streamline their operations, which may include reducing their workforce.

Economic crises, market fluctuations or changes in consumer demand can also cause businesses to reevaluate team structure and size.

The downward evolution of the number of employees per enterprise in the reference period reflects the complexity and dynamics of the contemporary business environment. In the face of challenges and opportunities, businesses must navigate with caution, vision and responsibility.

Figure 6. Evolution of the Average Number of Employees According to the Total Number of Enterprises
Source: author processing based on INS data

Coefficients:
Estimate   Std. Error t value   Pr(>|t|)
(Intercept) -8.872e+07   2.201e+07 -4.031   0.0157 *
units   4.658e+02   1.125e+02   4.141   0.0144 *
I(units^2) -7.750e-04   1.909e-04 -4.060   0.0153 *
I(units^3)   4.283e-10   1.075e-10   3.985   0.0163 *

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 27780 on 4 degrees of freedom
Multiple R-squared: 0.912,   Adjusted R-squared: 0.846
F-statistic: 13.82 on 3 and 4 DF, p-value: 0.01409

The evolution of the average number of employees according to the total number of enterprises, during 2015-2022, has the course of a polynomial function of the third degree which, as can be seen, both from the graph and from the statistical processing, it is significant and it has the following form:

$-8.872e^{+07} + 4.658e^{+02} * (-7.750e^{-04}) * units^2 + 4.283e^{-10} * units^3$

As it can be seen from Figure 6, the downward course of the total number of employees attracted an oscillating evolution of the average number of employees. The dependence between the number of enterprises and the average number of employees is very high, so the value of the correlation coefficient being 0,912.

The oscillatory evolution is due to the COVID 19 pandemic, which reduced the number of employees during 2019-2020.

As it can be seen from Figure 6, the dynamics of the average number of employees is not perfectly symmetrical with that of the number of enterprises. Thus, a constant upward evolution of the number of companies does not correspond to the same increase in the number of employees. The explanation could be either because of the increase in the average number of employees – that does not follow the same growth rate as the number of enterprises, or the dynamics of the average number of employees is regressive, despite the fact that the total number of enterprises has increased. As the statistical processing shows, the dependence between the number of enterprises and the average number of employees is very high –as the value of the correlation coefficient being 0,912, that means the connection between the two variables is direct and very close.

3.3. Turnover Analysis

The analysis of the turnover calculated cumulatively at the total number of enterprises indicates a constant increase over the analyzed stage, 2015-2022, as per in absolute and relative terms - so it could also be seen in graphs number 7 and 8. These would indicate a cumulative effect of the automation of activities or of work efficiency, and ultimately a result of the health of the business environment. The exception to this constant growth of this indicator is the year 2020, when the turnover value decreased by 0,57%, the reason being related to the pandemic crisis and its effects. The most frequently mentioned impacts on business functions were at the level of sales activity, associated with the decrease in demand, followed by human resource issues due to the unavailability of employees, but also supply issues caused in particular by delayed imports.
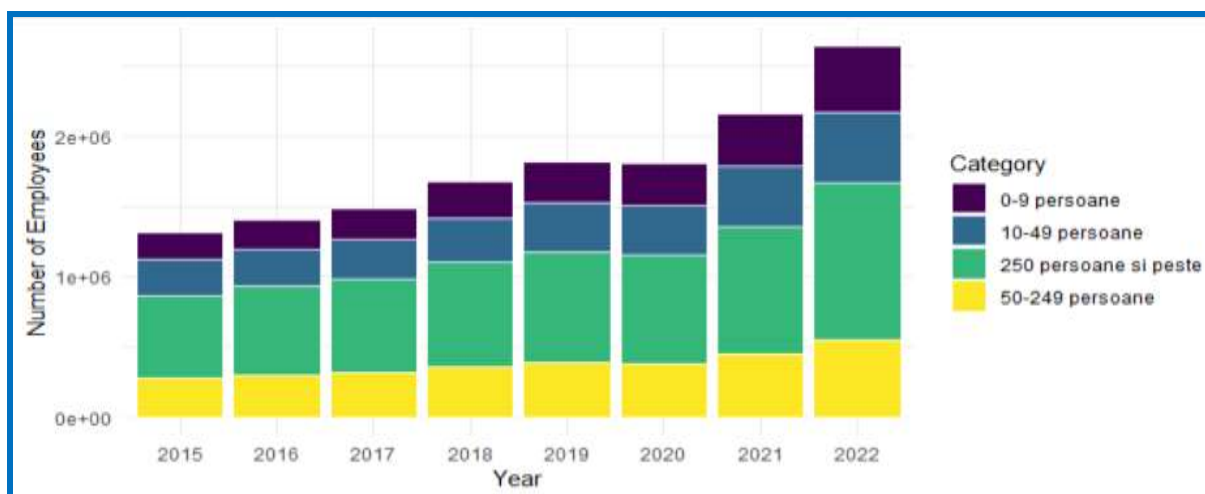

Figure 7. Evolution of Turnover According to the Type of Enterprises during 2015-2022
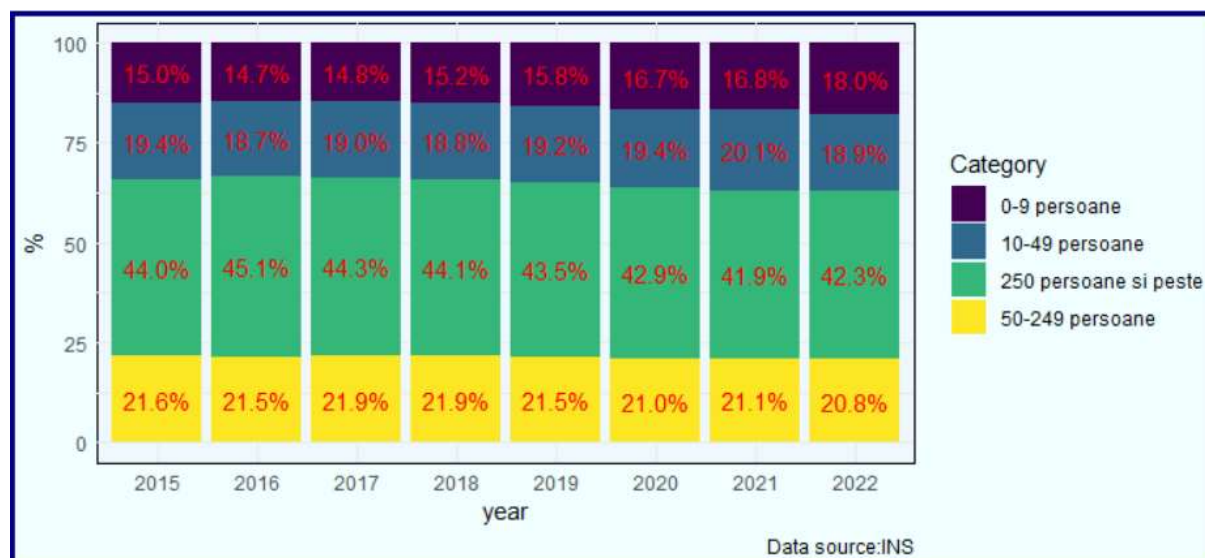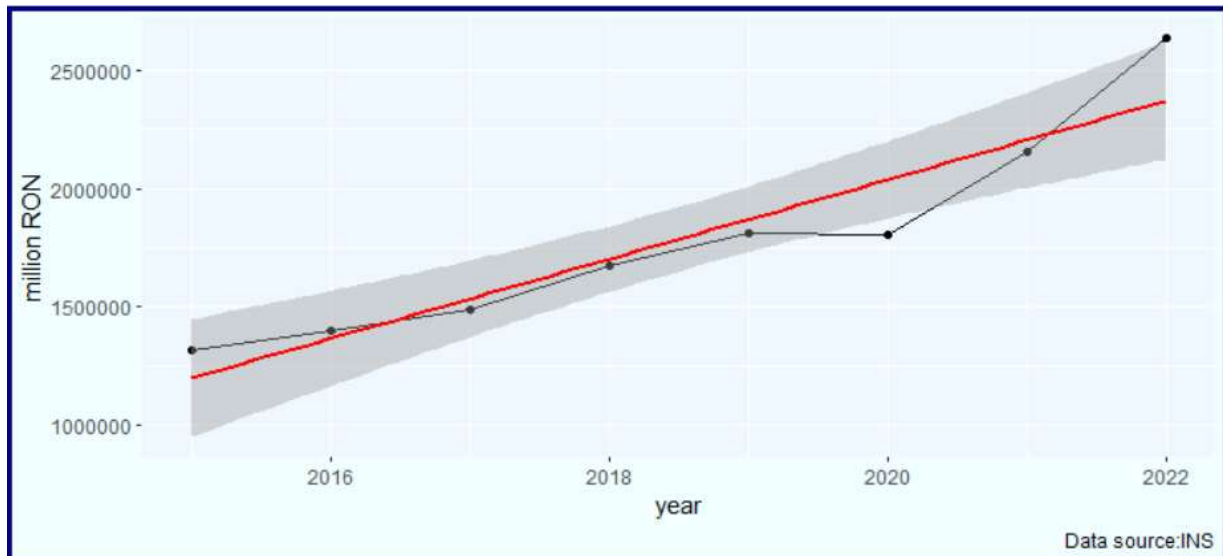*Source: author processing based on INS data*

Figure 8. Percentage Evolution of Turnover of Each Type Enterprise According to the Total Number of Enterprises during 2015-2022
Source: author processing based on INS data

Figure 9. Evolution of the Turnover of All Enterprises during 2015-2022
Source: author processing based on INS data

Coefficients:

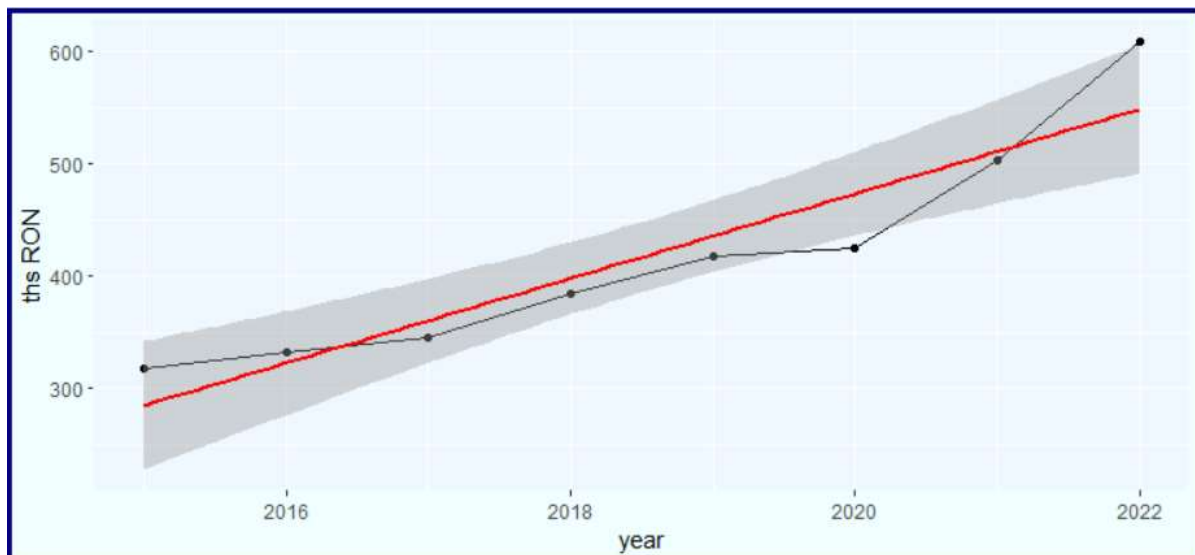|	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	1.031.372	122.770	8.401	0.000155	***
time	167.753	24.312	6.900	0.000458	***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 157600 on 6 degrees of freedom
Multiple R-squared: 0.8881,   Adjusted R-squared: 0.8694
F-statistic: 47.61 on 1 and 6 DF, p-value: 0.0004578.

The turnover increased annually, as it can be seen from both the graphic and statistical processing.

Figure 10. Evolution of the Total Turnover According to the Total Number of Enterprises during 2015-2022
Source: author processing based on INS data

Coefficients:

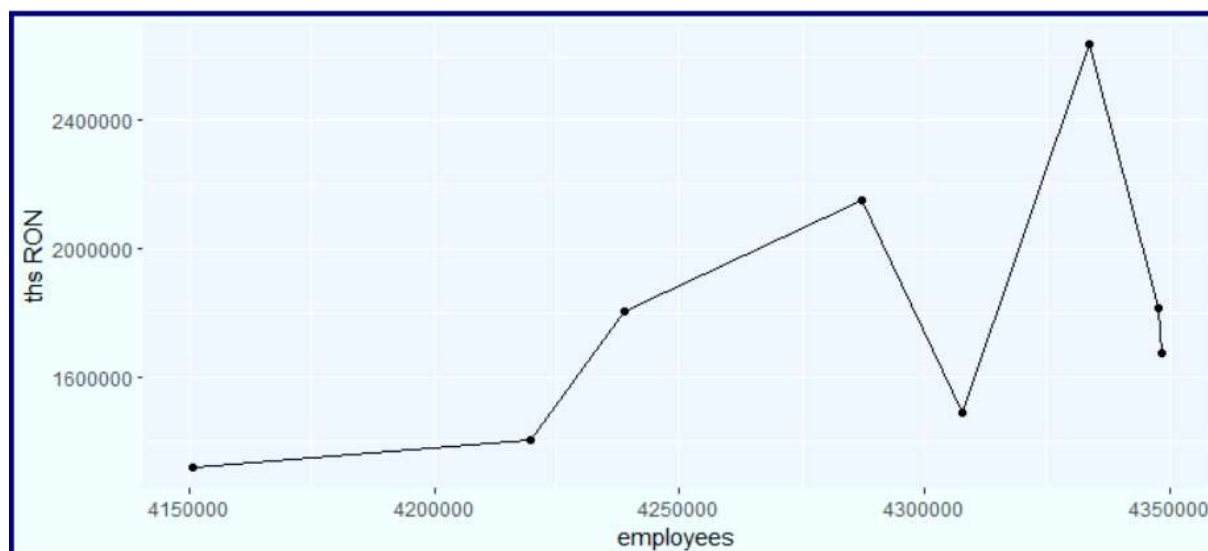|	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	247.31	28.18	8.777	0.000121	***
time	37.65	5.58	6.748	0.000516	***

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Residual standard error: 36.16 on 6 degrees of freedom
Multiple R-squared: 0.8836,   Adjusted R-squared: 0.8642
F-statistic: 45.53 on 1 and 6 DF, p-value: 0.0005164

Figure 11. Evolution of Total Turnover According to the Average Number of Employees
Source: author processing based on INS data

The analysis of the evolution of turnover according to the average number of employees represents a great relevance in the analysis of the companies' performance, this being an essential indicator for the evaluation of efficiency, growth and organizational adaptation.

The size and success of a company was often directly related to its number of employees in the past. But nowadays, the economic, technological and organizational evolution has transformed this paradigm, emphasizing efficiency, adaptability and innovation.

The evolution of turnover according to the number of employees reflects the profound transformations and complexity of the contemporary market. Optimizing resources, promoting innovation and prioritizing social equity are essential to building prosperous, sustainable and forward-looking organisations. By deeply understanding the dynamics, trends and associated implications, business leaders and decision-makers can shape strategies and practices that support economic growth, sustainable development and collective well-being in an ever-evolving and transforming world.

4. Conclusions

The analysis carried out on Romanian companies during the reference stage shows that the performance of the companies is not linear, following various directions, and depending on the typology of the companies. The data collected and analyzed indicate a number of trends and patterns that reflect the dynamics and complexity of the labor market and the business environment as a whole.

First of all, the analyzed data show that the differentiation of companies according to the typology attracts strategic decisions adapted to each category of enterprise. Thus, it follows that enterprises with high turnover operating with a relatively small number of employees involve increased efficiency, automation or specialization in sectors with high added value. These entities demonstrate the ability to generate substantial revenue with limited human resources, which may indicate significant investment in technology, innovation and process optimization.

By contrast, there are companies with more modest turnovers which employ a significant number of people. These organizations may operate in labor-intensive sectors with lower profit margins or in early stages of development, where organizational expansion and growth is a priority in their business strategy. This pattern may be characteristic of labor-intensive sectors such as manufacturing, construction or low-value-added services.

In addition, the analysis revealed the importance of enterprise size in interpreting the relationship between the number of employees and turnover. Large companies with diversified operations may have different structures and models comparing to small and medium-sized enterprises with specialized or niche market activities. This aspect underlines the need for a segmented and contextual analysis to understand and interpret the dynamics and specificities of different sectors and industries.

To conclude, the analysis carried out on these indicators within Romanian enterprises highlights the complexity and diversity of the Romanian business environment. Variability in employment patterns, operational efficiency, growth strategies and adaptability to market conditions reflect the interactions between economic, social, technological and institutional factors that influence the activity and performance of companies. To navigate and thrive in this dynamic and competitive environment, Romanian companies must adopt flexible, innovative and adaptable approaches, recognizing the opportunities, challenges and trends shaping the country's economic and business landscape.

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