

WORK PERFORMANCE IN THE PUBLIC SECTOR IN ROMANIA: AN ANALYSIS OF STATISTICAL DATA

Carmen Nadia CIOCOIU^{a*}, *Corina MARINESCU*^b, *Cezar SIMION*^c,
Mihai CIOC^d, *Claudiu CICEA*^e

^{a, b, c, d, e} *Bucharest University of Economic Studies, Romania*

ABSTRACT

The aim of this research is to analyze statistical data related to work performance in order to design a macroeconomic overview on this theme, which in particular is more often approached at a microeconomic level. Gaining a macroeconomic perspective on work performance actually needs a relevant and more reliant set of indicators, from international data bases on labour. The main indicator used in contouring work performance is labour productivity. This indicator has an per hour basis or an per person basis method of describing productivity level of employees. This paper refers only at public sector data, using statistical classification of economic activities, included in this field. The evolution of labour productivity is also described for the EU-27 level. Three hypothesis are tested as related to work performance and factors influencing it in the public sector. A correlation analysis is developed using such type of indicators. Among main findings, the following are to be highlighted: labour productivity developments in the EU have shown a general upward trend; productivity increases have been more pronounced on an hours-worked basis than on a per person basis; although productivity growth rates are high, Romania is in the lower echelon of the EU average, in terms of labour productivity; the correlation between the performance management system and labour performance is positive and strong for the public system in Romania.

KEYWORDS: *labour cost, productivity, public sector, Romania*

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1. INTRODUCTION

Organizational performance plays an important role both economically and socially or environmentally. As for the way of defining it, at the level of organizations we can distinguish between an employee performance, an economic performance resulting from its activity, but also a performance in the field in which it coexists with other organizations and which ensures it a certain place in the market. Thus, performance automatically refers to a measured result that is greater than intended, which implies having a previously set target. For organizations in the private sector this seems to be much easier to achieve than for those in the public sector. There is a perception that performance in public sector organizations is poorer than in the private sector, both in terms of efficiency and quality of service. Those who can provide both are actually the employees, so it becomes extremely important to measure their performance. In response to this need, the concept of performance management system has emerged. It is able to provide an image of the extent to which employees contribute to achieving the objectives of the organizations they belong to and to guide

* Corresponding author. E-mail address: nadia.ciocoiu@man.ase.ro

managers in getting employees to have this contribution. It has first materialized in the private sector and slowly migrated to the public sector in the movement called New Public Management. At the organizational level, the link between the performance management system and work performance is undeniable, with an impact on its overall performance. However, can these two concepts be translated to the macroeconomic level? Would they have meaning, and if so, for whom? What relevance would such a link between the two have for the public or private sector? These are questions that we will try to answer by carrying out a research study. However, this present research paper will only address a part of them. Thus, its objective is to highlight the link between employee performance and the performance management system, from a macroeconomic perspective, in the public field. The first step to present such relies in presenting a preliminary statistical analysis of work performance related indicators.

2. LITERATURE REVIEW

Performance is one of the most common words used in organizations, regardless of the activity field. On the one hand, it is important for employees to receive feedback on the performance they have achieved/recorded in a certain period in order to calibrate their future actions. On the other hand, companies are interested in measuring the work performance of their employees. This method represents a good basis in the development of an individual career plan, which leads to the expansion of management within companies.

Campbell (1990) defined performance as "that something that people do and that is reflected in the actions that people take". Furthermore, "Performance is not the consequence(s) or result(s) of an action; it is the action itself" (Campbell, 1990). According to Campbell (1993), performance can be translated into those actions or behaviors relevant to the goals assumed by the organization and which can be measured in terms of the effectiveness of each person. In other words, through performance management at the level of an organization, it is possible to observe and determine the level of contribution of each individual, being able to reflect the productivity of work in relation to the tasks set by the company.

One important thing when talking about job performance is the connection between it and the skills that companies are looking for. In the scientific literature, there are numerous studies that emphasize the fact that one of the most important factors that determine employers to select employees, including graduates, is represented by the skills possessed by the candidates. Candidates' previous experience plays an important role in their selection, but the matching of individual competencies with the goals of the organization is a starting point in achieving the desired performance (Hodges & Burchell, 2003). Goleman (1996) argues that emotional intelligence is as important as the intelligence quotient (IQ) for achieving success academically, professionally, socially, therefore in all interpersonal aspects of an individual's life.

If, in addition to emotional intelligence, manifested through the ability to adapt, self-discipline, motivation, candidates also possess other skills such as team spirit, innovation and creativity, analytical skills or problem-solving orientation, then all these things are a guarantee for achieving success at work (Thomas et al., 2022) and implicitly achieving work performance. By finding candidates who can create a better work environment or improve work performance, companies secure their future and competitive advantage that will allow them to develop organically.

In other words, work performance depends not only on the individual skills of each person, but also on the conditions and resources made available by the employer. Zhang et al. (2020), Kaarlela-Tuomaala et al. (2009), Lou & Ou (2020), respectively Martellotta et al. (2011) highlighted the fact that the quality of the acoustic environment in the office area becomes a critical factor influencing the work performance of people working in the office. Background noise such as noise from air conditioning equipment and the sound of nearby conversations can distract employees and even decrease work performance (Meng et al., 2021). In this situation, it is important that the assessment

of work performance takes into account, on the one hand, the individual abilities of the people, and on the other hand, the environment in which a certain task was carried out, respectively the working conditions represented by external factors and internal that could have influenced overall performance.

As for the ways of assessing work performance, at a microeconomic level, they are clear and refer to, as we presented above, specific aspects of the employee's work performance, respectively the characteristics of each employee (experience, competences, individual skills, etc.). At the macroeconomic level, however, performance evaluation involves finding indicators capable of exposing aspects of performance at the national level, indicators that can ensure its comparability between various states of the world. Thus, one of the most frequently used indicators for capturing the level of work performance is work productivity. According to several researches, labor productivity differs greatly depending on the activity sector for which it is quantified. Thus, Barany and Siegel (2021) carry out an analysis that highlights that these sectoral differences in labor productivity growth are largely due to sectoral differences in the growth rate of the technologies used. Other authors demonstrate that, for example, in the energy sector, in Romania, labor productivity increased as a result of the restructuring carried out during the energy reform, which began in 1990 (Dudian & Gherman, 2013). Another analysis for the construction sector tries to differentiate the concept of productivity from that of performance and that of profitability, bringing sufficient arguments to differentiate them, but also to bring them together, in the sense that performance can include the others two, according to the authors' understanding (Pekuri, Haapasalo & Herrala, 2011).

Performance Management is a weighty concept in the area of human resources processes in terms of implications it has in all organizational life's dimensions. According to the HR Academy (2022), Performance Management constitutes a set of human resources processes that can lead to the improvement of the performance recorded by employees, the processes involving different ways of working, but being characterized by convergence. Based on a performance management system, it is possible to perform a set of essential functions at the organizational level, among which:

- Individual evaluation of employees performance, of team's performance, of the organizational structures (departments) and of the entire company as a whole;
- Differentiating between effort and result. It is important that the result is obtained by consuming a small number of resources. Prolonged effort can be a guarantee of a good result, but it must not become an end in itself;
- Recognition of individual merits and contributions, with a direct effect on the reward system to ensure internal equity;
- Identifying personal and professional development opportunities for employees.

Campbell (1990) also formulated a series of determinants of work performance:

- Declarative knowledge – is described by knowing the requirements of a given task, that is, the individual is familiar with a series of facts, ideas, principles regarding the given situation. In other words, the individual masters the theoretical aspects that can help him in carrying out the task and achieving performance;
- Procedural knowledge and skills – are described by the individual's ability to know how to perform a certain task;
- Motivation – the choice of the individual to expend a certain effort, respectively to persist in expending that level of effort that allows the achievement of the expected results in the proposed term.

The practice of performance management is a systematic way of communicating with employees what they are expected to do and which are the parameters of performance and productivity (Marsor, 2011). The notion of performance management is considered to be predominantly found in the private sector, where organizations focus on profit maximization and have a high potential to

generate revenue (Gichuki, 2014). It is also appreciated that performance management systems started as simple methods of income justification and performance appraisal was used to decide whether an employee's salary or earnings is justified or not (Maina, 2015).

Public sector organizations differ from their private sector counterparts in various aspects such as: they have little potential to generate income, there is no focus on profit maximization; most of the time there is no bottom line against which performance can be measured; most public sector organizations still generate most of their revenue from the state and are dependent on multiple stakeholders. Although, for these reasons, it has often been considered impossible to measure performance in the public sector (Boland and Fowler, 2000), recently, studies have nevertheless turned to this sector: Qu & Cai (2011), Jaroš, Melichar & Švadlenka (2014), Hajnal & Satronova (2021), Hitka et al. (2021), Chiang & Birtch (2007). They used regression analysis or the survey technique to study various aspects regarding the performance, respectively the productivity of the labor force in various sectors of activity.

Moreover, researchers in the field (Kozłowski & Klein, 2000; Den Hartog, Boselie & Paauwe, 2004) believe that the micro level emphasizes the existence and importance of variations in individual behavior and characteristics. Thus, the focus is on the individual level, but there is a risk of paying insufficient attention to contextual factors that limit the effect of individual differences. In contrast, the macro perspective emphasizes the collective level, and uniformity/regularity in social behavior is assumed to transcend differences between individual social actors. Given a set of demographic and situational constraints, people are assumed to behave similarly. A risk of this view is to ignore relevant individual variations that may influence the collective.

The major difference between productivity measurement and performance measurement is that the former tries to account for input expenditure. If done accurately, this is preferable, as achieving substantial gains in performance may be undesirable if gains occur only as a result of excessive increases in input expenditure. However, in cases where the production function is complex and quality is difficult to capture, a focus on single productivity metrics can hide important trends underlying various components of an organization's operations. In addition, the use of productivity metrics in benchmarking and monitoring exercises may encourage excessive cost reduction at the expense of service quality, especially when there is a time lag between input expenditures and their measurable effects on services (World Bank, 2021).

Measuring both productivity and performance separately—by tracking and reporting each component of the productivity calculation—allows for a better understanding of the drivers of public sector productivity and can minimize potentially harmful counterincentives. The nature of public sector work—where there are often competing objectives unrelated to broad productivity—complicates efforts to define and measure it. In general, definitions and measurements of public sector productivity typically look at efficiency (the ratio of inputs to outputs) and effectiveness (the achievement and quality of outputs) (Atkinson, 2005; Lau, Lonti & Schultz, 2017; Forum, 2014).

Public sector efficiency refers to the inputs required for a given number of outputs produced with those inputs (resources). This concept is easier to apply to public sector activities that most closely mirror the private sector (e.g. data centers, financial management) and often focuses on issues such as cost savings and public management reforms such as decentralization (Forum, 2004). Public sector efficiency has been a major reason for institutional reforms in OECD countries, despite a lack of empirical evidence of their impact.

Effectiveness includes hard-to-measure objectives such as quality, equity and accessibility of services and reflects the view that outputs may not be considered equal to inputs (Forum, 2014). Incorporating effectiveness into measuring public sector productivity can provide a more robust view of productivity in sectors where outcomes include intangible outcomes. For example, health, education and defense for which outcomes may include increased welfare and safety. There is a public management literature focused on how quality can be improved given existing resources (Atkinson, 2005).

3. METHODOLOGY

As can be seen from the literature review, many previous studies have focused on organizational level analysis and extremely few have attempted to quantify the performance management – work performance relationship at a macroeconomic level. Moreover, an orientation of the analysis at the microeconomic level most often involved questionnaire-based analyses, while an orientation of the analysis at the macroeconomic level would also imply a change in methodology (analysis of statistical data, correlation analysis, regression analysis). Moreover, analyses developed on the public sector were not a point of interest for researchers. Thus, the present research tries to offer a new perspective on how the link between performance management and work performance can be rendered, involving specific methods for carrying out a macro-economic analysis, in the public sector. Therefore, in the following we will outline the research methodology, outlining the research steps:

(1) Establishing the main research objective.

The objective of the research will highlight what is desired to be achieved through the proposed scientific approach. In the present case, it will be a correlational one, as it will aim to explain the relationship between the performance management system and work performance, in general, but also in the public system in Romania, measured by various macroeconomic indicators.

(2) The review of scientific literature.

This step is carried out with the aim of creating a conceptual framework regarding the notions of performance management and work performance, but also to highlight specific aspects of previous research in the field, respectively aspects that have not been addressed so far or elements on which was not emphasized in the research.

(3) Collecting data.

In order to select the indicators that will serve as ways to quantify both the results of using performance management systems and work performance, we will use databases that include time series specific to the public sector workforce. We will mainly use the databases: Eurostat, INS (National Institute of Statistics), and REVISAL (General Register of Employees' Records).

Macroeconomic indicators of productivity are present in numerous databases and international studies, even if in some cases they are not collected separately for the public and private sectors.

For the analysis of the data from the national statistics (INS), it was necessary to clarify the categories of activities according to Classification of Activities in the National Economy that will be considered in the research. Based on previous studies (Voinea & Albu, 2011), budgetary employees can be found in the branches: 84. Public administration and defense; social insurance from the public system; 85. Education; 87. Combined medical care and social assistance services, with accommodation; 88. Social assistance activities, without accommodation; 91. Activities of libraries, archives, museums and other cultural activities.

Within the INS-Tempo database, the data are grouped by activities of the national economy in four categories as follows: Public administration and defense; social insurance from the public system; Education; Health and social assistance; Performing, cultural and recreational activities.

(4) Preliminary data analysis

This refers to the synthesis of the collected information, in a graphical representation (diagrams, histograms, etc.), followed by their preliminary interpretation.

(5) Setting the hypotheses to be tested.

These relate to the assumptions of the analysis itself regarding the relationship between performance management and work performance. Thus, the following will be tested:

H1: Repeated increases in the minimum wage generate reductions or slowdowns in jobs number growth in low-skilled occupations, mainly in unskilled workers;

H2: Increases in the minimum wage stimulate the development of jobs in industries that use labor with a medium or high level of qualification;

H3: The impact of minimum wage increases on the economy is different at the level of counties in Romania.

(6) Correlation analysis

This type of analysis will highlight the dependency between the elements of interest (in this case performance management and work performance). We will appreciate the type of correlation (positive or negative) that appears between the respective categories of numerical data and how strong this correlation is (by using the correlation coefficient).

4. PRELIMINARY ANALYSIS OF MACROECONOMIC INDICATORS ON LABOUR PRODUCTIVITY

4.1. Romania – Employment and the employee number

In Romania, based on INS data for the period 2008-2021, the following information on the employed population can be extracted:

- the employed population in the 4 listed categories as a proportion of the total employed population is between 13.08% (minimum value for 2014) and 16.41% (maximum value for 2021). This evolution correlates with that of the employed population over the period 2008-2021, as shown in Figure 4.1.
- the population employed in activities from the 4 listed categories with form of public ownership, oscillates between 11.13% in 2014 (minimum value) and 13.77% in 2021 (maximum value) of the total employed population at national level.

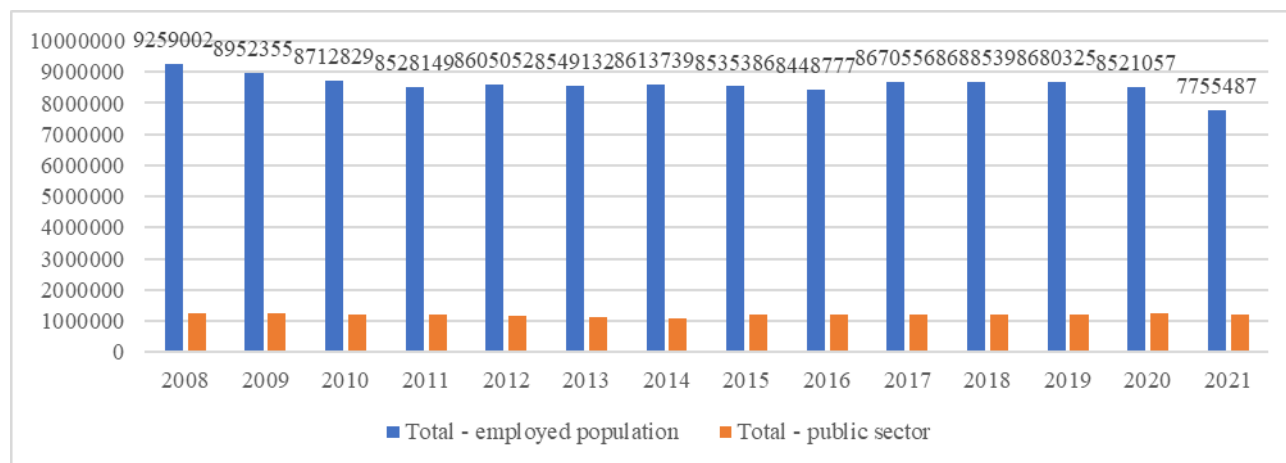


Figure 4.1. Evolution of the total employed population and the public sector in the 2008-2021 period

Source: authors based on the INS-Tempo data series

The average number of employees in the public sector, based on data for the period 2018-2020, is presented as follows (figure 4.2):

- employees from the 4 listed categories have a share between 19.76% (minimum value related to 2008) and 23.06% (maximum value related to 2010).
- If only employees in the 4 categories are taken into account, but in publicly owned organisations, the shares range from 17.73% in 2019 (minimum value) to 21.7% in 2010 (maximum value).

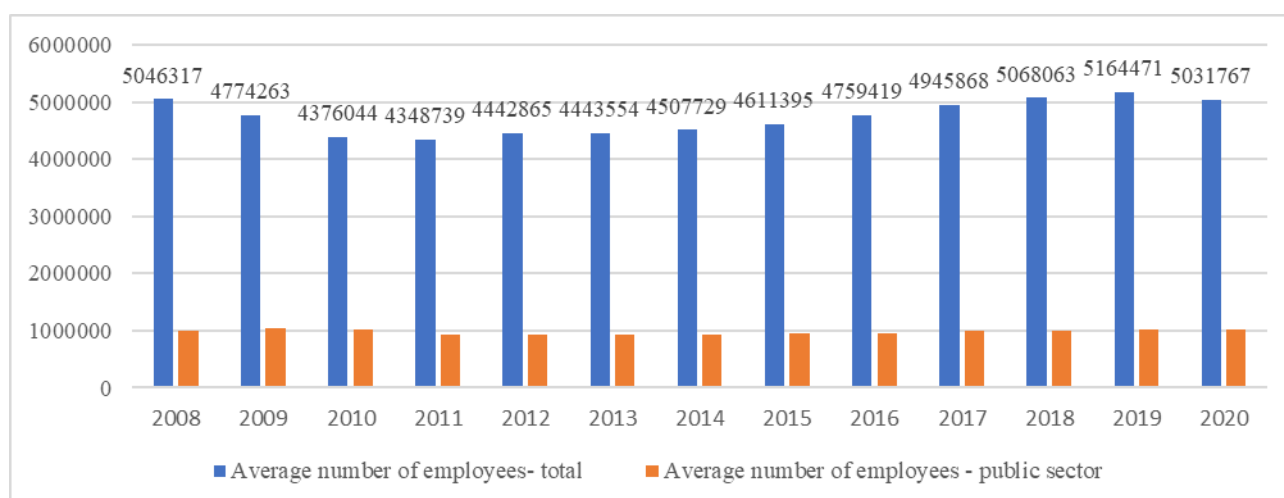


Figure 4.2. Evolution of the average number of employees by total and public sector in the 2008-2020 period

Source: authors based on the INS-Tempo data series

The large differences between the employed population and the number of employees generate distortions in the calculation of labour productivity in Romania. Thus, unlike most other EU (European Union) member countries, the share of employees in the total employed population remains relatively low in Romania, even if it has experienced a significant increase in the last decade (from 50.22% in 2010 to 64.88% in 2020), remaining far from countries like Denmark or Hungary, where this share is over 90%.

4.2. Romania - Labour productivity, per employed person, by activity of the national economy (NACE)

According to the NIS (National Institute of Statistics), the employed population comprises all persons – both employees and self-employed – engaged in production activities that fall within the limits of national accounts production. Labour productivity per employed person is calculated as a ratio between the gross value added and employment.

Figure 4.3 shows that labour productivity in the public sector is close to the evolution of total productivity over the period 2008-2021. The highest values are in Information and Communication and the lowest in Agriculture. It should be noted that Real estate transactions topic has been excluded from the graph due to the particularly high values compared to the other categories. In 2019-2020, labour productivity in the public sector is higher than the total labor productivity.

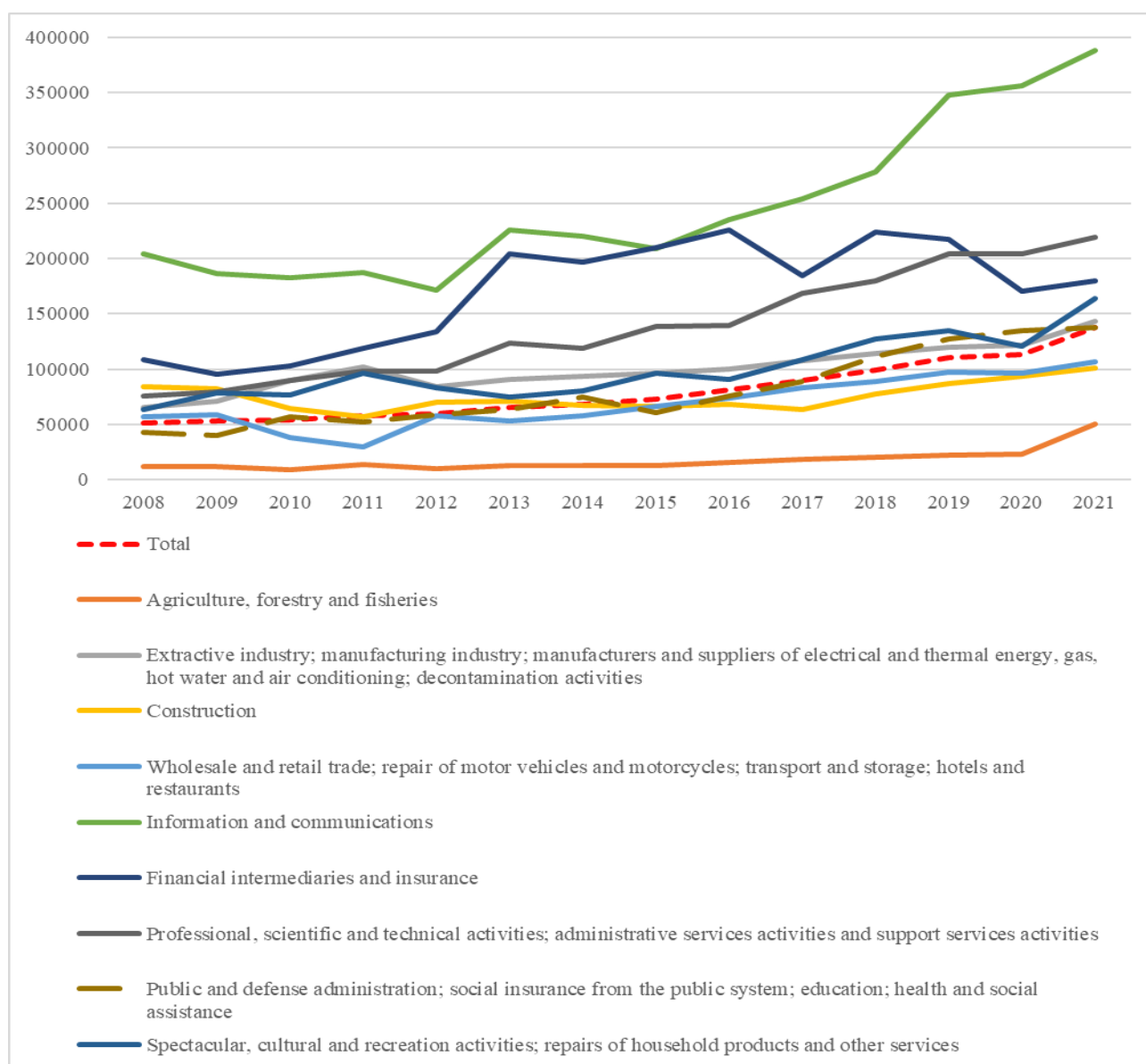


Figure 4.3. Evolution of the labour productivity, per employed person, by activity of the national economy (RON/person)

Source: authors based on the INS-Tempo data series

Eurostat data on nominal labour productivity per employed person (expressed as a percentage of EU-27 in 2020, current prices) show an increasing trend for Romania, reaching 84.3% of the EU-27 value in 2021. However, Romania ranks among the last positions, ahead of Bulgaria, and in recent years also Greece, Portugal and Slovakia.

4.3. Romania – Labour productivity per hour worked, by activity of the national economy

In terms of labour productivity per hour worked, expressed in RON/hour, the situation is similar to that of productivity per employed person. The highest value in public administration and defence, social insurance in the public system, education, health and social assistance is recorded in 2021 at 74.6 lei/hour, close to the total of 75.1 lei/hour; with this value the public system ranks 7th out of the 10 groups of activities of the national economy analysed (Figure 4.4).

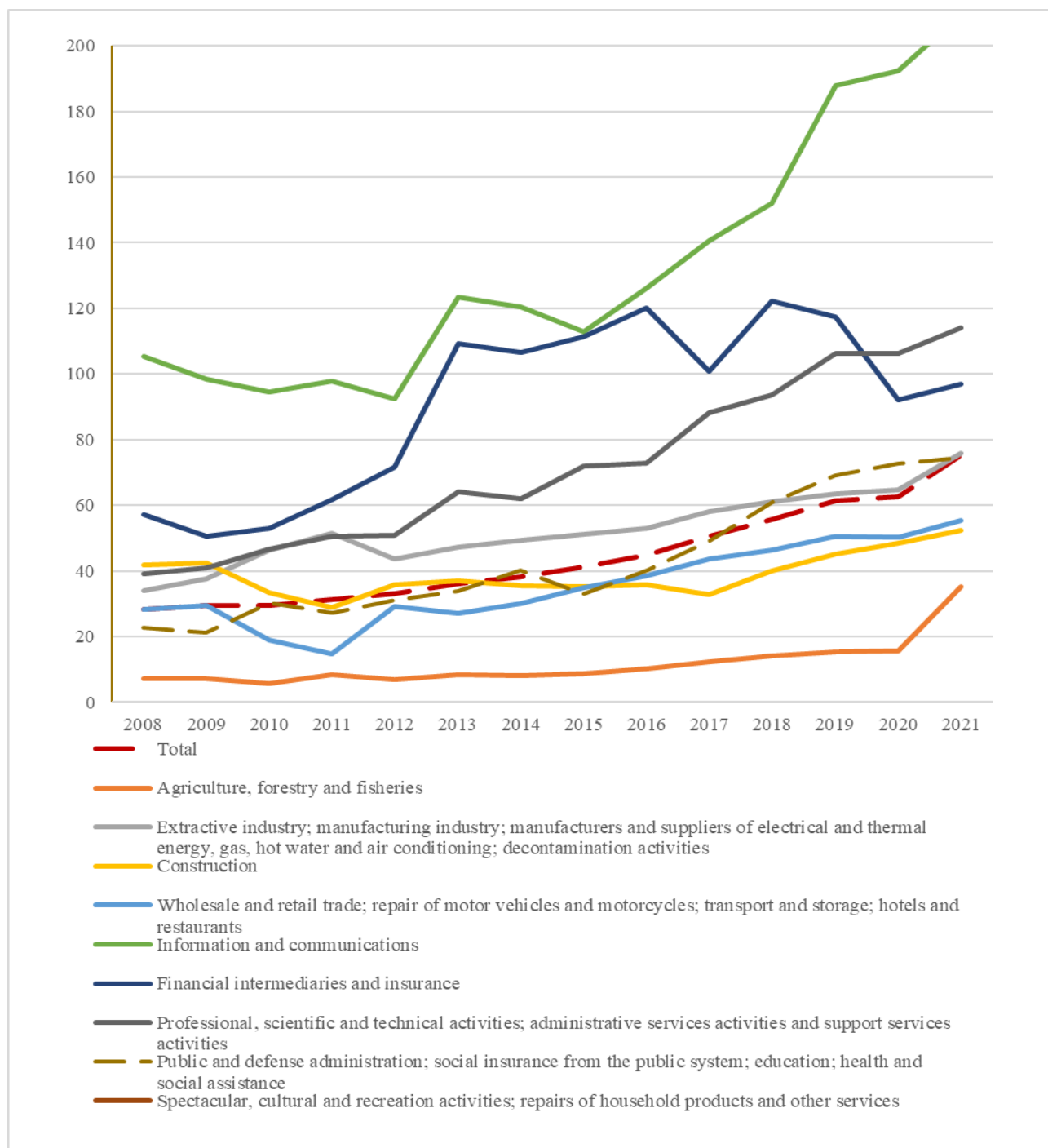


Figure 4.4. Evolution of the labour productivity per hour worked, by activity of the national economy (RON/hour)

Source: authors based on the INS-Tempo data series

The data presented in Figures 4.2 and 4.3 illustrate the important differences between productivity per employed person and productivity per hour worked. Figure 4.5 shows the growing gap between the two productivity metrics, especially in the predominantly public sectors.

Eurostat data on nominal labour productivity per hour worked (expressed as a percentage of EU-27 in 2020, current prices) show an increasing trend for Romania, reaching 73.3% of the EU-27 value in 2021. Here again, Romania is in the lower echelon of the EU average, ahead of Bulgaria, but also countries such as Greece, Estonia, Portugal and Poland.

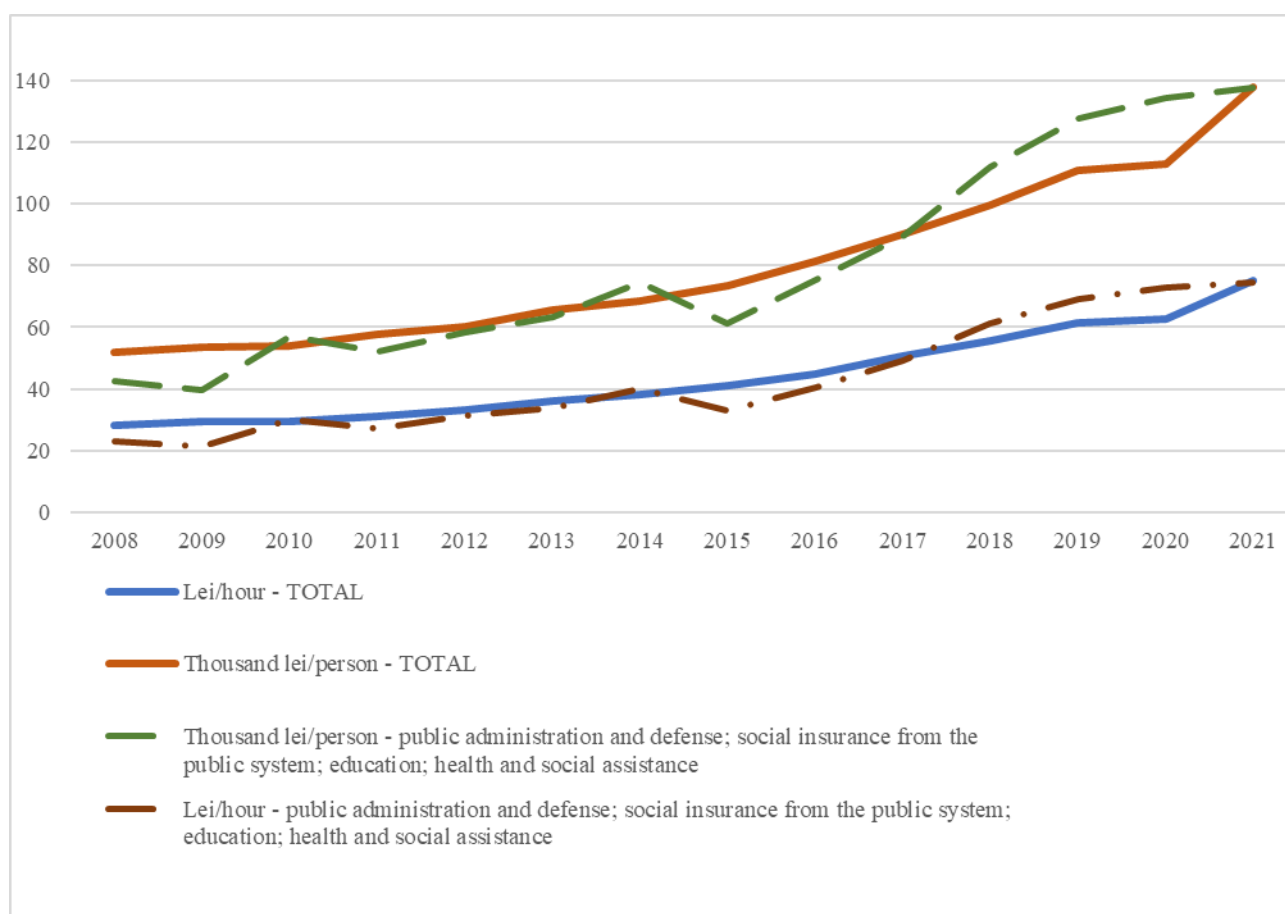


Figure 4.5. Comparative evolution of productivity per employed person and per hour worked, in total and in the public sector

Source: authors based on the INS-Tempo data series

According to studies (Guga, 2020) the ratio between the two indicators decreased during the period of accelerated economic growth in the 2000s, reflecting the increase in the average number of hours worked by each employed person. During the crisis period (2008-2009), when working hours contracted faster than employment, a sharp increase followed, and since 2012 there has been a significant increase due more to the proliferation of part-time employment, a trend that seems to have stopped in the second part of the period 2010-2020, when the problem of cheap labour shortages reappeared (in this situation it is assumed that more and more workers were able to choose a full-time schedule). Such developments are therefore reflected in productivity developments. It is always thought that productivity per hour worked is the more appropriate indicator for the real situation, but it is not uncommon to talk more about productivity per employed person, either for lack of information or because it is more advantageous to convey certain messages. When productivity per hour worked is growing faster than productivity per employed person, it is more useful to talk about the latter rather than the former if the aim is to limit possible wage claims.

4.4. Evolution of the labour productivity in the European Union

Looking at labour productivity developments in the EU, based on real GDP per person employed and per hour worked (together with GDP per capita), labour productivity has shown a general upward trend since 2007, according to both indicators. Productivity increases have been more pronounced on an hours worked basis than on a per person basis, as hours worked per person have followed a long-term downward trend.

Compared to the year of accession, Romania is far ahead of the EU Member States from the former socialist bloc, both in terms of labour productivity growth and GDP per capita, according to data published by Eurostat. According to Pană (2019) an important factor was that, unlike Bulgaria and the Baltic countries, which chose to practice a fixed exchange rate against the single currency, Romania followed the practice of Central Europe, where Poland, the Czech Republic and Hungary had a floating exchange rate regime.

In 2021 compared to 2020, real labour productivity per employed person increased at EU-27 level, while real productivity per hour worked increased, but much less (0.4%) (Figure 4.6).

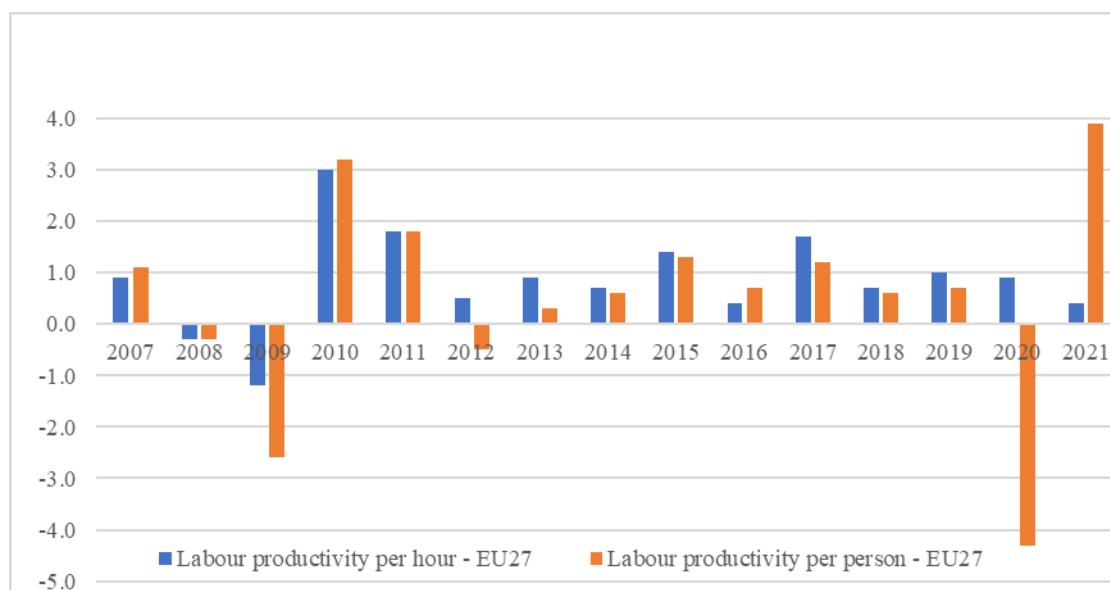


Figure 4.6. Average annual growth rate of productivity per employed person and per hour worked for EU 27 (percentage change as compared to the previous period)

Source: authors based on Eurostat database,

https://ec.europa.eu/eurostat/databrowser/view/NAMA_10_LP_ULC__custom_3369320/default/table

4.5. Unit labour cost in the European Union

Relevant aspects for the analysis of macroeconomic performance in terms of productivity are also provided by the unit labour cost indicators: nominal unit cost and real unit cost. Both are calculated as the ratio of labour cost to labour productivity, where labour cost is equated. Nominal unit cost is the ratio of labour cost without adjustment for price changes to productivity adjusted for price changes, while real unit cost takes into account both adjusted variables; nominal unit cost is generally the most widely used variant (Guga, 2020).

An increase in unit labour cost indicates a loss of competitiveness and vice versa. Of course, an increase in unit labour cost effectively means a faster increase in compensation of employees than in productivity. Unit labour cost is usually reported in the form of an index, which makes it possible to calculate growth rates and observe changes over time, but does not allow a comparison of absolute levels.

The evolution of the annual labour cost for LCI (compensation of employees plus taxes minus subsidies) in Romania in euro has been steadily increasing over the last 10 years from 4.2 in 2012 to 8.5 euro in 2021. An analysis in lei versus euro shows a discrepancy that emerges from the evolution of the exchange rate. The appreciation of the leu between 2005 and 2007, for example, led to a stronger increase in the nominal unit cost calculated in euro than in lei, while between 2017 and 2019 the devaluation of the leu led to a weaker increase in the unit cost in euro than in lei. In theory, the devaluation of the leu at least partially mitigates the increase in wage costs.

As regards Romania's position in relation to other EU countries, in 2021, Eurostat data show that it holds the penultimate position with an average annual cost of 8.5 euro/hour, followed only by Bulgaria, and well below the EU-27 average of 29.1 euro/hour. The top ranking is led by Denmark, followed by Luxembourg, Belgium, Sweden and the Netherlands, countries known for their high wage levels and high competitiveness.

An interesting development is shown in Figure 4.7 which highlight how the average labour cost (compensation of employees plus taxes minus subsidies) has changed in the sectors: public administration and defence; compulsory social security; education; human health and social work; arts, entertainment and recreation. Thus, it can be seen that in Romania, with the exception of 2010 when the salaries of the 1.2 million budget employees were reduced by 25% (as a result of the economic crisis), each year has brought varied increases placing Romania above the level of EU-27 increases. High growth rates after 2017 also apply in Bulgaria, Latvia and Lithuania.

The average hourly labour cost in the public sector in Romania increased much faster than in the EU, which recorded an annual growth rate of between 1 and 4% over the whole period analysed. Thus, the highest value at EU level was in 2020, by 3.9% compared to 2019. In 2021 the increase was only 1.9% compared to the previous year.

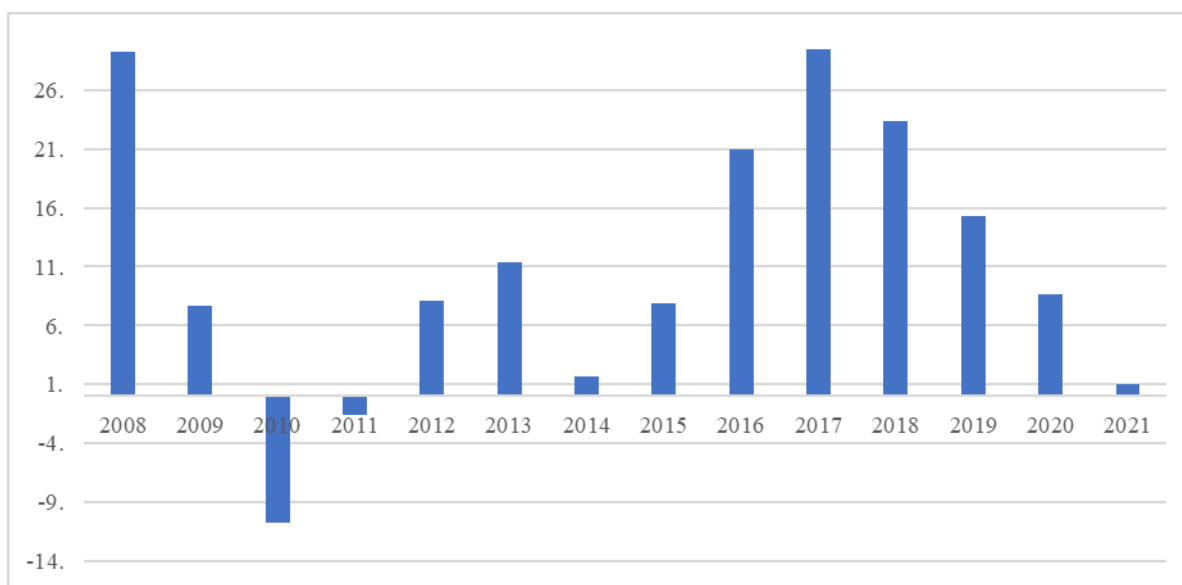


Figure 4.7. Annual percentage changes in labour costs (compensation of employees plus taxes minus subsidies) in the public sector in Romania

Source: authors based on Eurostat database,

https://ec.europa.eu/eurostat/databrowser/view/LC_LCI_R2_A__custom_3403755/default/table?lang=en

The evolution is somewhat similar if we look at the percentage increases in fixed monthly wages (salaries) and hourly wages, the only exception being 2018 when the increase was almost double compared to the previous indicator. One possible explanation is the very high wage increases in the public sector following the application from 1 January 2018 of *Law 153/2017 on the salaries of staff paid from public funds*.

5. ANALYSIS OF THE CORRELATION BETWEEN THE PERFORMANCE MANAGEMENT SYSTEM AND LABOUR PERFORMANCE

This sub-chapter presents the researchers' results on the statistical analysis of correlations between performance management system and labour performance. The analyses carried out focused primarily, at the Romanian level, on the relationships between the difference between income and

wages (which is an expression of the performance management system) and labour productivity (as a synthetic expression of labour performance). In order to have elements of comparability of the relationship between the performance management system and labour performance, an analysis of the correlation between real labour productivity per employed person and nominal unit labour cost (based on persons and hours) in European countries (including Romania) was carried out.

As we considered that the analysis of the reward-productivity relationship is not sufficient to capture the complexity of performance management systems and labour performance, we also investigated the relationship between the evolution of the gross minimum wage and the evolution of the number of contracts in this wage area (analysis carried out at the level of COR groups, training levels).

A significant element of the performance management system is the difference between income (which includes variable elements related to performance management) and salary (which is fixed income). Labour performance is expressed through labour productivity. The correlation matrix including these elements is shown in Table 4.1.

Table 4.1. Correlation matrix

	Difference (income-gross salary) on total	Labour productivity on total	Difference (income - gross salary) public property and public administration defence
Difference (income-gross salary) on total	-	0.986	-
Labour productivity on total	0.986	-	0.984
Difference (income - gross salary) public property and public administration defence	-	0.984	-

Source: own calculation based on NIS database from 2013-2020 period

It can be seen that for all forms of ownership (public and private) as well as for public ownership there is a very close relationship between the income-gross wage gap and labour productivity.

To determine the relationship between performance management systems and job performance it is important to study the *relationship between successive increases in the minimum wage and the number of full-time contracts*. The values of the correlation coefficient in this respect are shown in Table 4.2.

It is observed that the relationship between the gross minimum wage in Romania and the number of full-time employment contracts in the area of the minimum wage (minimum wage + 10%) is stronger for unskilled workers (correlation coefficient 0.83) than for skilled and equivalent workers (correlation coefficient 0.70), but also for skilled workers in agriculture, forestry and fishing. The increase in the minimum wage leads to an increase in the number of employment contracts in the minimum wage zone at a faster rate for unskilled workers as this category of workers is more exposed to undeclared work. The increase in the minimum wage stimulates an increase in the number of newly created jobs for administrative and managerial/senior civil servants for two reasons: the increased attractiveness of wage increases in the public sector and the lack of educational requirements for managerial positions (especially in small and medium-sized enterprises).

Table 4.2. Correlations between the gross minimum wage in Romania and the number of full-time employment contracts in the minimum wage zone (minimum wage + 10%) – by COR groups

No.	COR major group	Pearson correlation coefficient
1.	Members of the legislature, the executive, senior government officials, managers and senior civil servants	0.93
2.	Specialists in various fields of activity	0.93
3.	Technicians and other technical specialists	0.96
4.	Administrative officials	0.93
5.	Service workers	0.90
6.	Skilled agricultural, forestry and fishery workers	0.37
7.	Skilled and related workers	0.70
8.	Plant and machine operators; machine and equipment assemblers	0.85
9.	Unskilled workers	0.83

Source: own processing of data from the National Employee Register – REVISAL for 2016-2019 period

Contrary to the situation for skilled workers, repeated increases in the minimum wage lead to reductions or slowdowns in job growth in low-skilled occupations, mainly unskilled workers.

From the perspective of the work performance measurement system we also consider the relationship between *the gross minimum wage in Romania and the number of full-time employment contracts in the minimum wage area for different levels of education to be relevant*. The evolution of the number of individual contracts but also of the gross minimum wage in the period 2016 -2019 is shown in Figure 4.8.

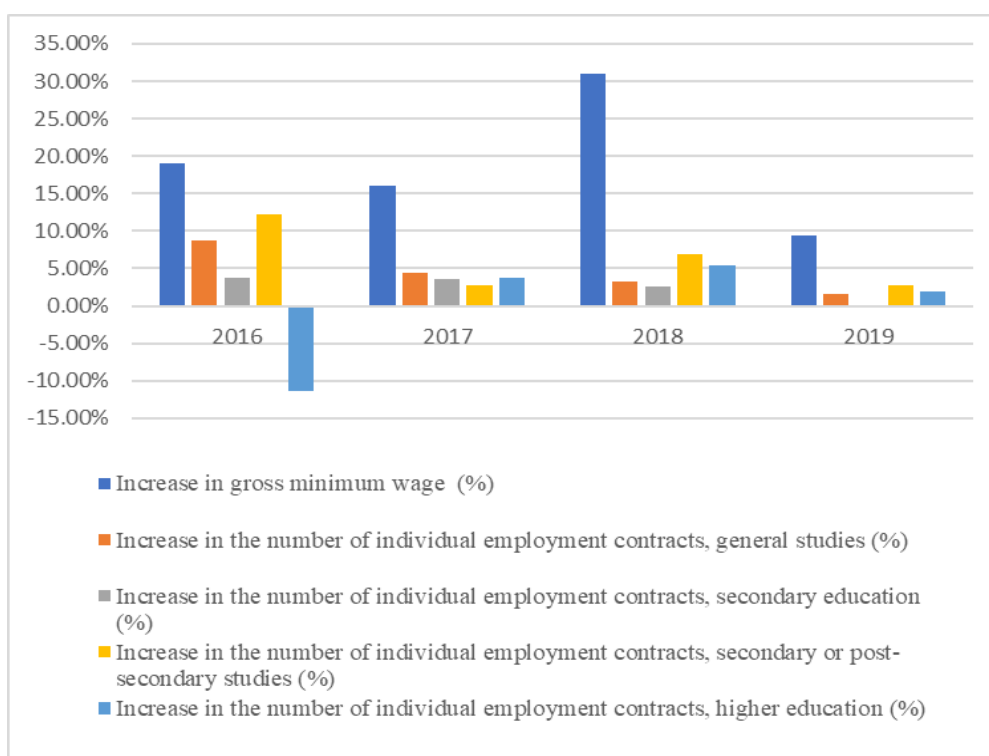


Figure 4.8. Evolution in the gross minimum wage and the number of individual employment contract by educational level

Source: own processing of data from the National Employee Register – REVISAL for 2016-2019 period

As can be seen from Figure 4.8, the evolution of the minimum wage followed an upward trend with sharp increases in its level in 2016, 2017 and 2018, when there were significant wage increases, especially in the public sector. The number of individual employment contracts for different levels of training also experienced an upward trend over the period considered, but not at the same rate as for the minimum wage. An exception is the reduction in the number of individual employment contracts for employees with secondary education in 2016. The rate of increase in individual employment contracts for employees with higher education was higher than that of employees with secondary or lower education, which indicates the reorientation of labour demand towards employees with higher education, but also the fact that there is a tendency to pay newcomers with higher education at the minimum wage level.

The relationship between the gross minimum wage in Romania and the number of full-time employment contracts in the minimum wage area does not seem to be influenced by the level of education. For all levels of education according to the Romanian Classification of Occupations, the relationship between the gross minimum wage in Romania and the number of full-time employment contracts in the minimum wage area is positive and strong. The values of the correlation coefficient between the gross minimum wage in Romania and the number of full-time employment contracts in the area of the minimum wage (minimum wage + 10%) by training level according to the classification in the COR are shown in table 4.3.

Table 4.3. Correlations between the gross minimum wage in Romania and the number of full-time employment contracts in the area of the minimum wage (minimum wage + 10%) - by education level according to COR classification

No.	Training levels according to the COR framework	Pearson correlation coefficient
1.	General studies	0.99
2.	Secondary education	0.97
3.	Secondary or post-secondary education	0.94
4.	Higher education	1.00

Source: own processing of data from the National Employee Register - REVISAL for 2016-2019 period

Since we considered that national data on the relationship between the gross minimum wage in Romania and the number of full-time employment contracts in the area of the minimum wage (minimum wage + 10%) were not sufficient for an exhaustive analysis, we also investigated the intensity of this relationship at county level.

From the point of view of the intensity of the link between the gross minimum wage in Romania and the number of full-time employment contracts in the minimum wage area (minimum wage + 10%), Romania's counties fall into three main groups:

- *The group of counties where the link between the gross minimum wage in Romania and the number of full-time employment contracts in the minimum wage area (minimum wage + 10%) is positive and strong.* This group includes most of Romania's counties (with very high correlation coefficient values for *Alba, Bistrița-Năsăud, Botoșani, Dâmbovița, Giurgiu, Gorj, Hunedoara, Iași, Ilfov, Sălaj, Suceava, Timiș, Vâlcea* counties).
- *The group of counties in which the relationship between the gross minimum wage in Romania and the number of full-time employment contracts in the area of the minimum wage (minimum wage + 10%) is positive and relatively strong: Braila, Caras-Severin, Calarasi.*
- *The group of counties where the relationship between the gross minimum wage in Romania and the number of full-time employment contracts in the minimum wage area (minimum wage + 10%) is positive but very weak.* Counties such as *Covasna* and *Teleorman* belong to this group.

It is noted that the majority of Romanian counties fall into the category of those in which the link between the gross minimum wage in Romania and the number of full-time employment contracts in the minimum wage area (minimum wage + 10%) is positive and strong. *Therefore, the increase in the minimum wage generates an increase in the share of employees working at the minimum wage in most Romanian counties (since employers only partially adjust contracts in the area of the minimum wage on economy, for the difference being preferred the option of bonuses).*

6. CONCLUSIONS

The aim of the research was the statistical analysis of the main indicators on the evolution of work performance in the public sector in Romania and the European Union.

- Performance measurement at the macroeconomic level, whether in the public or private sector, is measured by labour productivity indicators: labour productivity per hour worked or employed person, labour productivity cost expressed in various forms.
- Public sector productivity measures typically look at efficiency (the ratio of inputs to outputs) and effectiveness (the achievement and quality of outcomes).

- Most studies dedicated to performance measurement focus on companies, so they are conducted at the microeconomic level and mostly for the private sector.
- Various national and international institutions, bodies dedicated to labour analysis, statistical institutes calculate, collect and publish the values of indicators measuring labour productivity, both in various geographic areas and over long time horizons.
- Productivity analysis in the public sector is still in its infancy and there are various controversies about the values of the indicators reported, with experts believing that, depending on the indicator used, different messages can be conveyed to the public.
- The public sector is a major employer in most economies. Globally, the public sector accounts for 16% of total employment and 38% of formal employment according to Worldwide Bureaucracy Indicators (WWBI) (World Bank, 2021).
- The share of public sector employees in total employees in Romania amounts to between 17 and 23% over the period 2008-2021, which is quite high compared to the EU average.
- Labour productivity developments in the EU have shown a general upward trend according to both indicators. Productivity increases have been more pronounced on an hours-worked basis than on a per person basis, as hours worked per person have followed a long-term downward trend.
- For Romania, both productivity measures (per employed person and per hour worked) in the public sector are close to the national total productivity (over the period 2008-2021) and are increasing from period to period, with Romania showing higher increases than many other EU countries.
- Although productivity growth rates are high, Romania is in the lower echelon of the EU average, ahead of Bulgaria, but also countries such as Greece, Estonia, Portugal and Poland, in terms of labour productivity and has a labour cost well below the EU average, in the penultimate position in the ranking of European countries.
- The correlation between the performance management system and labour performance is positive and strong for the public system in Romania.

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