

## **LABOR PRODUCTIVITY AND LABOR COMPENSATION IN NORTH MACEDONIA: SECTORIAL APPROACH**

Predrag Trpeski, Ph.D. <sup>1</sup>

E-mail: <predrag.trpeski@eccf.ukim.edu.mk>

Borce Trenovski, Ph.D. <sup>2</sup>

E-mail: <borce.trenovski@eccf.ukim.edu.mk >

Kristijan Kozheski, MSc <sup>3</sup>

E-mail: <kozeski@eccf.ukim.edu.mk >

Gunter Merdzan, MSc <sup>4</sup>

E-mail: <gjunter.merdzan@eccf.ukim.edu.mk>

### **ABSTRACT**

Starting from the mid-1970s, there has been a significant disbalance in labor markets in almost all world economies. The postulates of classical economics that the causality between labor productivity and workers' compensation is positive, and that the increase in marginal labor productivity is followed by a directly proportional increase in workers' compensation, no longer stand on solid foundations. In the last few decades, there has been a significant distortion of the functional distribution of income, especially between labor and capital. The widely held thesis that "a rising tide will lift all boats," implying that increased labor productivity will be equally distributed among workers, is becoming less relevant. The world, especially EU economies notice a significant disruption in the relationship between productivity growth and labor compensation.

In the paper, an attempt is made to analyze the state of the labor market in the Republic of North Macedonia, through the prism of productivity and labor compensation. Given the fact that there are significant differences in the degree of efficiency and productivity in individual sectors, this analysis focuses on the relationship between the distribution of productivity and labor compensation in different industries. Based on the results of the study, the Republic of North Macedonia exhibits the phenomenon of Reverse Decoupling, where the trend of labor productivity lags behind the trend of workers' compensation. In contrast, productivity and workers' compensation show significant differences by different sectors.

**KEY WORDS:** LABOR PRODUCTIVITY, COMPENSATION, GREAT DECOUPLING.

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<sup>1</sup> Affiliation: Ss. Cyril and Methodius University in Skopje, Faculty of Economics – Skopje, Department of Economics Blvd. Goce Delcev 9-v 1000 Skopje, Republic of North Macedonia

<sup>2</sup> Affiliation: Ss. Cyril and Methodius University in Skopje, Faculty of Economics – Skopje, Department of Economics Blvd. Goce Delcev 9-v 1000 Skopje, Republic of North Macedonia

<sup>3</sup> Affiliation: Ss. Cyril and Methodius University in Skopje, Faculty of Economics – Skopje, Department of Economics Blvd. Goce Delcev 9-v 1000 Skopje, Republic of North Macedonia

<sup>4</sup> Affiliation: Ss. Cyril and Methodius University in Skopje, Faculty of Economics – Skopje, Department of Economics Blvd. Goce Delcev 9-v 1000 Skopje, Republic of North Macedonia

## INTRODUCTION

Labor productivity is one of the most important indicators of an economy's capacity to improve production with a given amount of factors of production. Hence, economic policymakers, as well as economists from the academic community, analyze the sustainability of production factors in the direction of future economic growth. However, productivity is one of the factors that determine the economic growth of an economy, it should be analyzed in a wider context in which the rest of the socio-economic factors that have a significant impact on its formation will be included.

Developing countries require additional, skilled labor, whereas developed countries have an abundance of labor but a chronic shortage of capital. Most often, employees in developing countries are dominated by workers with primary and secondary education, who have limited skills. Hence, when a combination of inadequate investments and a low level of capital accumulation, accompanied by increased pressure on labor supply, results in a lack of productive employment. In other words, unlike developed countries, developing countries face an increase in unproductive employment, that is, an increase in employment with a simultaneous downward trend in the movement of labor productivity. However, it should be emphasized that until the beginning of the COVID-19 pandemic, interest rates on the international capital market were at a fairly low level, so developing countries had available additional capital at attractive interest rates. In addition, developed countries, international institutions through aid programs, and FDI from private investors in the previous period injected significant financial resources into developing countries.

The subject of analysis in this paper is the trend of movement of labor productivity, workers' compensation, and the level of employment, in the case of the Republic of North Macedonia. Although the increase in the labor productivity of workers is the only way for long-term sustainable growth of wages, this mechanism of the increase in labor productivity and wages is far from its optimum, that is, from its equilibrium state, especially in developing countries, mostly because of excess labor supply. Hence, a significant number of developing countries fall into the trap of an imbalance in the relationship between productivity and labor compensation. Already in 1954, Nobel laureate Arthur Lewis stated that a significant part of the labor market functions within the framework of informal economic flows, while also a significant part of the workers works in the unpaid sectors, i.e. they are self-employed on their farms, activities in which the marginal productivity is usually too small, if not equal to zero (Patrick Belser, ILO, 2013). In other words, they receive less compensation than their labor productivity in the form of compensation.

In the case of the Republic of North Macedonia, unlike the rest of the developing countries, in the previous period, low rates of increase in labor productivity were observed, while in the last few years, they also observed a negative value. On the other hand, in most of the countries in Europe, labor productivity has seen a positive trend in the past years, it has seen far more intensive growth rates compared to labor compensation. Such tendencies caused the emergence of the so-called phenomenon of the "Great Decoupling" between the growth of labor productivity and the growth of workers' compensation in most countries in Europe, the United States, and Japan (Pasimeni, 2018; Theodoropoulou, 2019; Bivens & Mishel, 2015; Dean, 2007).

This analysis focuses on trends, as well as the causal relationship between productivity and labor compensation, and the level of employment in the case of the Republic of North Macedonia. The economy of North Macedonia is constantly characterized by low levels of labor productivity, as well as a lack of additional capital. Labor productivity is the basic component on which the degree of growth of a national economy depends. Intensification of labor productivity growth is one of the main goals of economic policy makers, while the analysis of the effectiveness of measures is the task of economists in the academic community.

Thus, for the first time, a sector-by-sector analysis of productivity, labor compensation, and employment levels is provided. Hence, the analysis of trends, as well as the causal relationship, with the application of econometric models, enables a detailed analysis of the type and degree of the gap, that is, the so-called Great Decoupling between productivity and workers' compensation. There was a synchronized increase in North Macedonia's labor productivity and labor compensation until 2017, along with a steady increase in the number of employees. However, after 2017, there is a significant increase in workers' compensation. At the same time, in the period after 2017, there is a significant decrease in labor productivity. Compared to 2010, in 2020, labor compensation grew by 34 index points, while labor productivity by 10 index points. In light of the gap in the trend, it is considered quite reasonable to conclude that North Macedonia has reverse decoupling between workers' compensation and labor productivity. Unlike the countries in Europe, which are characterized by significant rates of increase in labor productivity, that is, rates that are far higher than the rates of increase in workers' compensation, in North Macedonia this is not a case. Hence, the increase in workers' compensation cannot "keep up" with the increase in labor productivity in European countries, in the case of North Macedonia, the most intensive increase in workers' compensation is followed by a parallel decrease in labor productivity. This tendency is observed in almost all sectors of the economy.

The paper is structured as follows: Following the introduction, the paper analyses the trend of labor productivity and workers' compensation at both the national and sectoral levels. Furthermore, the article provides an overview of empirical literature that analyses the phenomenon of the so-called "Great Decoupling" on the example of Europe, the USA, and Japan over the last few years. In addition, the methodological basis for using the econometric regression method is explained. The final part of the paper discusses and analyzes the results, and concludes.

## **LITERATURE REVIEW**

Some of the research in the field of labor productivity and labor compensation dates back to 1970. Since the beginning of the 1970s is the period when the trend of separating labor productivity from workers' compensation begins, some economists begin to analyze the causes, main determinants and repercussions resulting from the unsynchronized growth of productivity and compensation of labor. In the research, a sectoral analysis was carried out in order to examine the impact of demographic trends, especially migrations from rural to urban areas, on the growth of labor productivity and workers' wages. The main conclusion of the research is that there is a further widening of the wage gap between rural and urban areas caused by the influx of population from rural areas to urban areas (Harris & Todaro, 1970).

Prior to the Great Recession of 2008, some research suggests that the relationship between labor productivity and workers' compensation is less intense. Furthermore, whenever labor productivity is above the wage level, firms increase their demand for labor by raising wages and reducing productivity. Wages that rise faster than productivity, that is, wages that rise faster than efficiency wages, slow down the demand for labor, putting downward pressure on wages. The dynamics of the relationship between the three variables, income-productivity-employment, determines the behavior of firms because firms operating in industries characterized by rising wages above the level of productivity cannot keep up with the current level of output and employment. The only way to break this vicious cycle is to invest in technological improvement followed by increasing domestic investment and restoring the labor productivity (Škare & Škare, 2017).

The United States has been the subject of most of the empirical research conducted on the so-called Decoupling Phenomenon. Mishel and Bernstein (1994) conducted a descriptive analysis of workers' wages and income distribution. Through the research, we come to the conclusion that there is a trend of

deterioration of workers' wages, which in turn is the reason for the increase in the unequal distribution of income (Mishel and Bernstein, 1994). Brynjolfsson and McAfee's 2014 book on labour productivity, workers' compensation and unemployment is among the more recent studies examining the Great Decoupling (Brynjolfsson and McAfee, 2014). The authors state that the synchronized growth of labor productivity and workers' compensation after the 70s shows significant distortions. Namely, after these years, a significant growth of GDP and labor productivity is observed, which increases the possibilities for a higher level of well-being of workers and their families. The authors describe this phenomenon as "jaws of the snake," as employment in the private sector stagnated after the 1970s, widening the gap between GDP growth and employment growth. This phenomenon also results in a certain drop in workers' wages, which shows a higher degree of distortion compared to the increase in employment. Adjusted for inflation, household income is lower in 2010 than it was in 1997. Wages are at their lowest level historically as a share of the GDP. Although the authors state several reasons that influence such tendencies, they still believe that the high level of technical-technological progress has a decisive influence on the "Great Decoupling" between labor productivity, workers' wages and employment (Brynjolfsson & McAfee, 2014). On the other hand, the results of the research carried out by Feldstein indicate the fact that labor compensation on average records the same annual growth rates, if the same deflator is used in the calculation of the real values of labor productivity and workers' compensation. If the analysis of trends covers the period 2000-2007, in that case labor productivity records an average annual growth rate of 2.9% while compensation records an average annual growth of 2.5%, which does not represent a significant difference between the analyzed indicators (Feldstein, 2008).

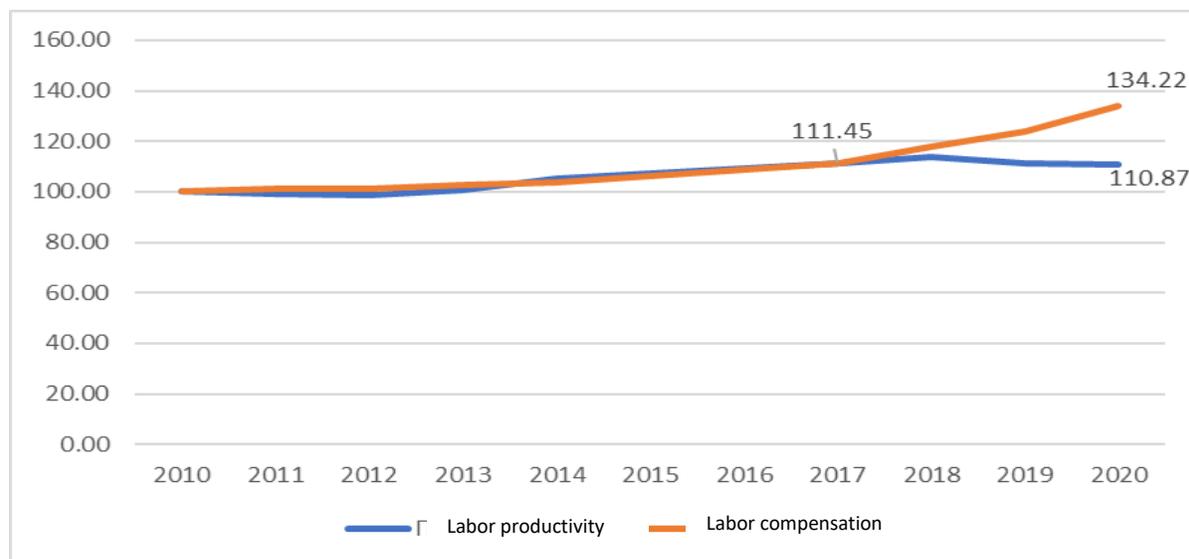
Despite Walrasian theory of labor market equilibrium's prediction that workers earn their marginal wages in the absence of market friction in OECD economies, authors found otherwise. Results suggest that unemployment rate shocks and unionization shocks both lead to a robust and significant increase in the wage-productivity gap (Elgin & Kuzubas, 2013). Also in the case of the OECD countries, other studies come to the conclusion that in the period after the financial crisis of 2009, the increase in workers' compensation cannot catch up with the increase in labor productivity. The authors confirm that in some OECD countries there is a significant loss of correlation between the increase in labor productivity and the increase in workers' compensation (Meager & Speckesser, 2011).

## **LABOR PRODUCTIVITY AND COMPENSATION ON SECTOR LEVEL**

In the period from 2010-2017, on average, labor productivity and workers' compensation observed a synchronized trend, they grew by about 12 index points. Hence, until 2017, it can be observed that the increase in labor productivity is reflected on workers in the form of higher labor compensation. However, after 2017, a certain divergence of trends in productivity and labor compensation begins. Namely, labor productivity initially began to stagnate, so after 2018 a slight downward trend begins. At the same time, workers' compensation begins to show an upward trend. Comparing 2017 to 2012, labor compensation increased by an average of 12 index points, but by 22 points for the period 2017-2020. Here, it is considered necessary to point out the increase in the statutory minimum wage in 2017, when the minimum wage was set at the level of 12,000 MKD in net amount (Minimum Wage Law, 2017). Hence, according to the scope of the workers who are included in the contingent of workers who receive the statutory minimum wage, as well as the impact of the minimum wage on wages above the minimum, it affects the increase of the average compensation of the workers. This situation of the so-called Reverse Decoupling of trends in the of productivity and labor compensation is considered unsustainable in the long run, that is, it has a significant impact on the operating costs of companies, which will have to react to this situation in two ways: First, companies will have to increase labor productivity, by replacing less productive workers with a higher level

of education, qualifications, and skills. Second, reducing the number of workers. Those with the lowest productivity levels are most likely to become unemployed. Thus, at higher levels of compensation, the increase in unemployment among this category of workers will make reintegration into the labor market difficult. Elgin and Kuzubas (2013) found that wages are determined as a result of the negotiation process between companies and workers. The bargaining power of one of the parties will depend first of all on the current situation of the labor market, with a focus on the level of unemployment. Hence, if one of the negotiating parties has significant influence over the decision on the level of workers' compensation, then the gap between productivity and compensation would be more pronounced. The level of unemployment also has a significant impact on workers' wages, a higher level of unemployment is associated with a significantly lower probability of finding a job, i.e., workers would accept to work for lower compensation. Regarding the power of the unions, it can be concluded that the increase in the bargaining power of the unions, especially in some of the industries where a significant part of the workers are members of the union organizations, affects the improvement of the bargaining power of the same. Hence, unemployment and bargaining power have a significant impact on the productivity gap and labor compensation (Elgin and Kuzubas, 2013). Hence, it can be confirmed that in countries where most workers are part of trade unions, or their labor rights are under the protection of trade unions, the relationship between labor productivity and compensation is more likely to be pronounced (Meager and Speckesser, 2011).

Figure 1. Index of labor productivity and labor compensation in North Macedonia for the period 2010-2020 (2010=100)



Source: Author's calculations

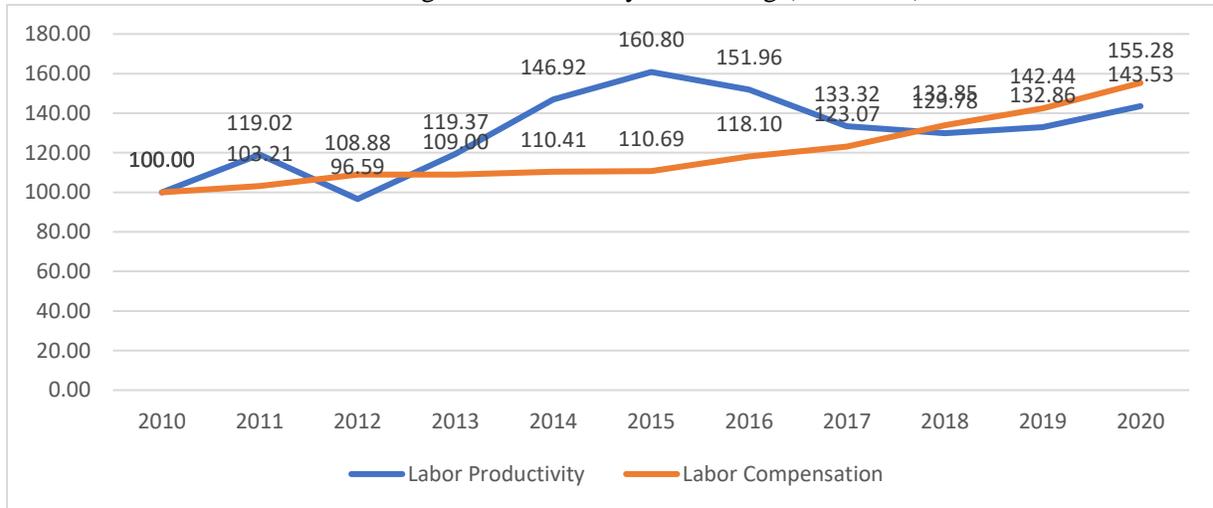
It is necessary to expand this analysis to the level of individual sectors due to the significant differences in labor productivity and compensation between industries. Hence, the analysis of labor productivity and compensation focuses on individual sectors, which according to the National Classification of Activities (NKD), and according to the available data, are grouped into several groups. Hence, the analysis of labor productivity and compensation focuses on individual activities, which according to the National Classification of Activities (NKD), but also according to the available data, are grouped into several groups. The annual gross salary of the workers is taken as an indicator of the compensation of the labor. Hence, workers' compensation includes contributions for pension, disability and health insurance, which employers set aside on behalf of workers and pay into the respective funds. This indicator of workers' compensation,

among others, is characterized by one major drawback. It does not include the various bonuses, financial rewards and compensations, as well as the material benefits received by some of the workers. However, it should be emphasized here that in the Republic of North Macedonia only a small part of the workers enjoy such benefits, that is, they are not the case for the average worker. Hence, it is considered that the gross salary as an indicator of workers' compensation is the closest to their real financial compensation that they receive based on the employment relationship. According to the trend of labor productivity and workers' compensation in individual activities, they can be grouped into two groups: First, activities in which a significant increase in labor compensation is correlated to labor productivity. Second, activities in which the increase in compensation cannot "catch up" with the increase in labor productivity. During this period, workers compensation increases are followed by stagnant and downward labor productivity growth, at the level of individual activities, a certain degree of heterogeneity is observed in the trend of movement. Activities where a more intense increase in compensation is observed in relation to labor productivity, that is, where there is an appearance of the phenomenon of the so-called "Reverse Decoupling" are the following: Construction, Wholesale and retail trade, motor vehicle repair, Transportation, Accommodation facilities and food service activities, Information and communications, Real estate activities, Professional scientific and technical activities, Administrative and service activities, Public administration and defense, Education, Activities for social and health care, Art entertainment and recreation; Other service activities. The trend of labor productivity and labor compensation in the Agriculture, Forestry, Fisheries sector can be divided into two time periods, 2013-2018, and 2018-2020. In the period 2013-2018, there is an intense increase in labor productivity, which reaches 160 index points in 2015, while after 2015 the trend of decreasing labor productivity begins. In the same period, workers' compensation has started to grow since 2015, while starting from 2017 it has seen a more intense upward trend. During this period, labor productivity growth is significantly higher compared to worker compensation growth. In the period after 2018, there is a higher index of increase in labor compensation, compared to the increase in productivity, that is, there is a Reverse Decoupling. If we consider the fact that Agriculture, Forestry and Fisheries is the third largest sector after services and industry, thus its participation in GDP is on average stable and covers around 7-8% of GDP. Hence, the increase in labor productivity in the agricultural sector not only affects the increase in efficiency in the production of primary products, but also has a significant impact on GDP growth and on the improvement of foreign trade with focus on export of agricultural products. The increase in labor productivity in agriculture is primarily the result of structural adjustments and technical-technological changes that were made in this sector in the previous period. The importance of agriculture can also be analyzed through the fact that agriculture is a sector that absorbs a significant number of employees. In 2020, from the total number of employed persons, 10,575 workers worked in agriculture, of which 41.4% received a monthly net salary in the amount of up to 18,000 MKD. The workers who received a monthly net salary in the amount of 18,000 to 22,000 denars were 27.7% of the total employees in this sector. Only 30.9% of employees in the Agriculture, Forestry and Fisheries sector receive a monthly net salary in an amount higher than 22,000 MKD. Such data on agricultural employees further confirm the importance of this sector for ensuring the livelihood of many employees and their families. However, the Great Decoupling in the trend of productivity and labor compensation in the period 2013-2018 confirms that the increase in productivity is not transferred in an appropriate proportion to the workers. As a result, while the Agriculture, Forestry, and Fisheries sector, which provides primary goods, differs from other sectors in its specialization, policies to assist workers, as well as boosting the level of education, skills, and qualifications of agricultural employees, are required in order for increases in workers' compensation to be in optimal proportion with increases in labor productivity.

In the sectors Mining, Manufacturing, Electricity Supply, labor productivity growth compared to labor compensation growth show significant differences throughout the period. In the period 2010-2017, the workers' compensation growth index grew by 15.55 index points, which in 2017 amounted to 115 index

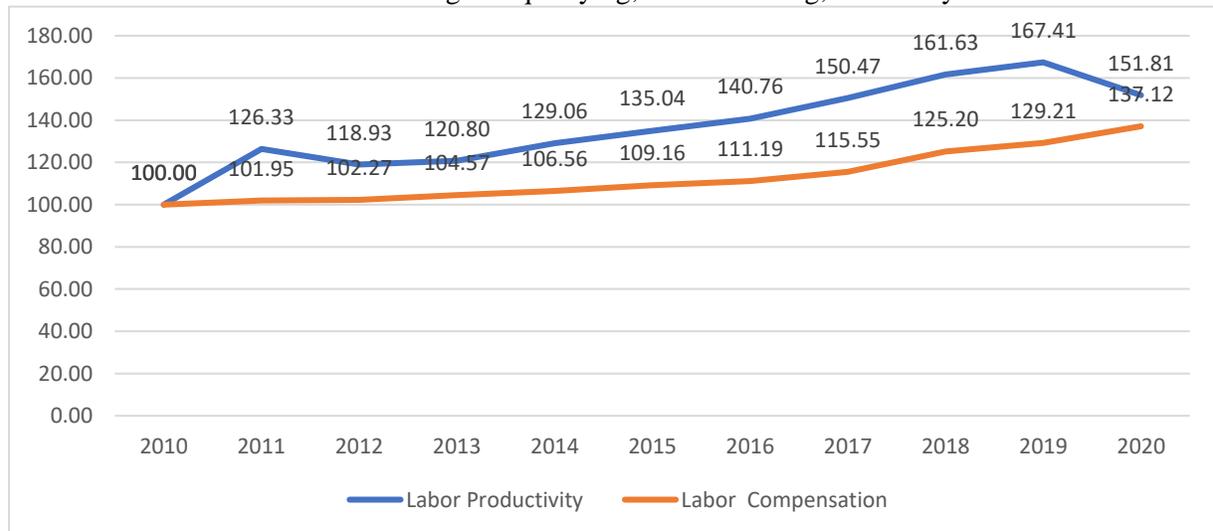
points. At the same time, the increase in labor productivity in 2017 was 150 index points, thus compared to 2010 it increased by 50 index points. A certain drop in labor productivity, or a convergence in the patterns of productivity and workers' compensation, is shown in the year after 2018. The policies that lead to the rise in labor productivity are of utmost importance when the industrial sector's significance, that is, its relationship to economic development, investments, exports, and employment, is taken into account. Therefore, in the future, it is objectively necessary to implement measures and regulations that boost labor productivity while also solidifying the link with workers' compensation.

Figure 2. Index of labor productivity and labor compensation in North Macedonia for the period 2010-2020 in Agriculture, forestry and fishing (2010=100)



Source: Author's calculations

Figure 3. Index of labor productivity and labor compensation in North Macedonia for the period 2010-2020 in Mining and quarrying; Manufacturing; Electricity

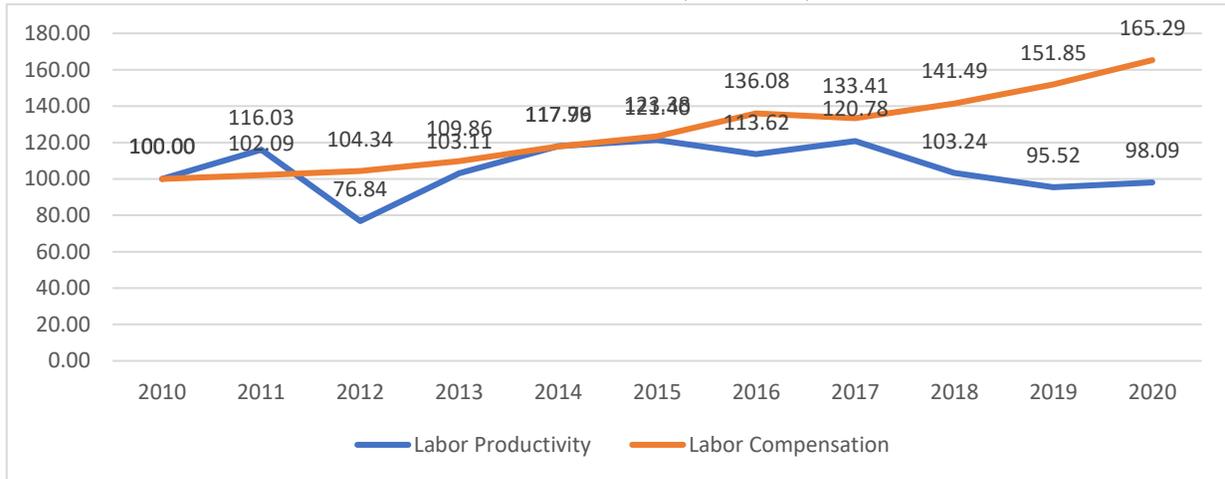


Source: Author's calculations

The strongly pronounced decoupling in the trends between productivity and labor compensation is also observed in the Construction sector. Workers' compensation, on average, records a continuous upward trend

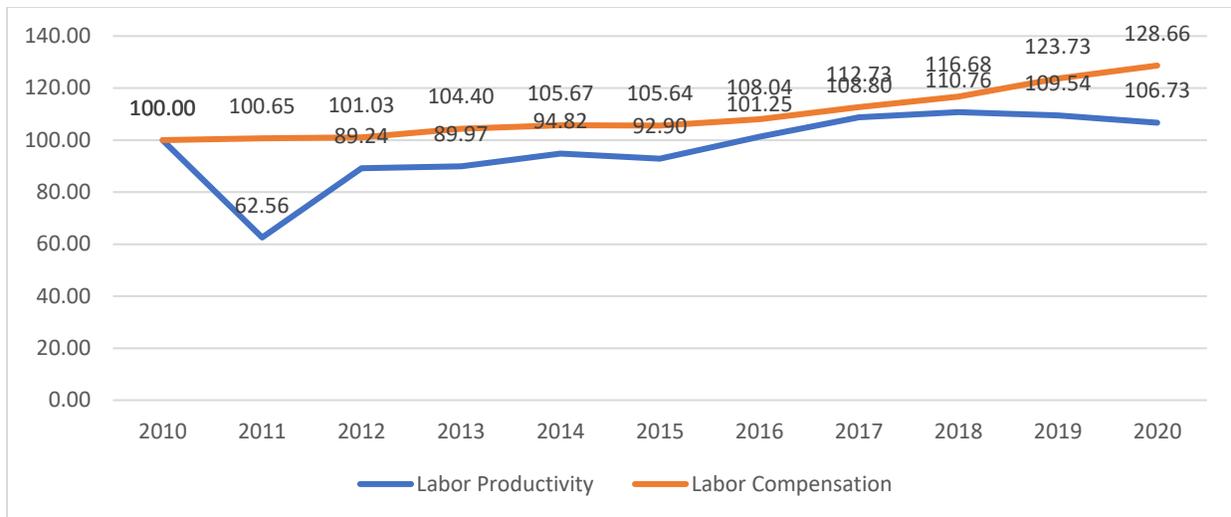
throughout the entire period. However, starting from 2015, more intensive increase compared to 2010 are observed. On the other hand, the labor productivity growth in 2012, compared to 2010, took 76.84 index points, that is, a drop of about 23 index points. After a certain stabilization in 2013 and 2014, in the period after 2015 the trend of labor productivity is characterized by a pronounced downward trend. The phenomenon of the so-called "Reverse decoupling" is most pronounced in the Construction sector, where after 2017 there is a significant increase in workers' compensation, followed by a simultaneous downward trend of labor productivity. In 2020, workers' compensation records 165 index points, while labor productivity records 98 index points. Hence, relative to 2010, workers' compensation grew by 65 index points, while labor productivity fell by 2 index points, which implies that it is below the 2010 level. The trend in labor productivity and workers' compensation in the Wholesale and Retail Trade, Motor Vehicle Repair, Transportation and Warehousing sectors, have a more intensive increase in workers' compensation, compared to the increase in labor productivity. In the period 2015-2017, there is a certain convergence of trend of productivity and compensation of labor, but after this period the increase of labor compensation is followed by a downward trend of labor productivity.

Figure 4. Index of labor productivity and labor compensation in North Macedonia for the period 2010-2020 in Construction (2010=100)



Source: Author's calculations

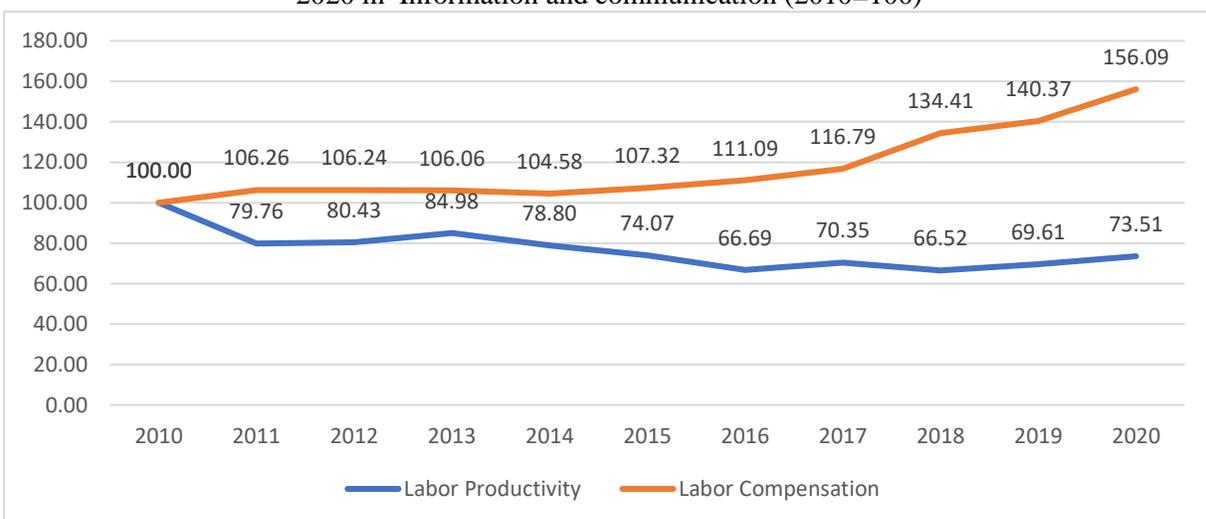
Figure 5. Index of labor productivity and labor compensation in North Macedonia for the period 2010-2020 in Wholesale and retail trade; repair of motor vehicles and motorcycles; Transportation and storage; Accommodation and food service activities (2010=100)



Source: Author's calculations

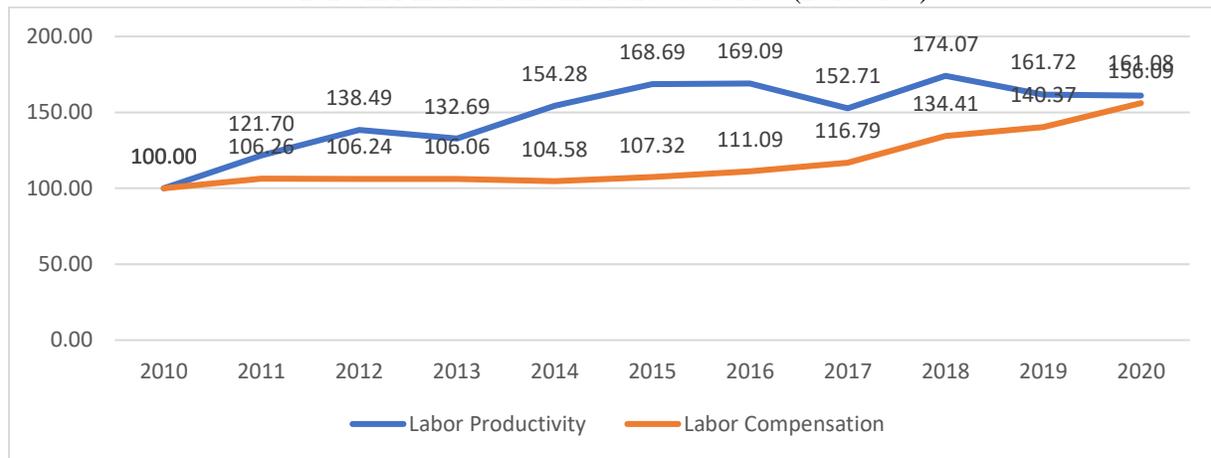
Similar to the Construction sector, a significant decoupling in information and communications trends represents some specifics of the Macedonian economy. The increase in labor compensation in 2020 compared to 2010 is 56 index points, while on the other hand, labor productivity has decreased by about 27 index points, compared to 2010. Which implies that the downward trend of labor productivity in this sector, throughout the analyzed period, indicates the conclusion that labor productivity has not yet reached the level of 2010. In contrast to this sector, in the Financial and Insurance sector, labor productivity in the period 2010-2017 recorded significantly higher growth indices compared to workers' compensation. However, after this period, with the exception of 2018, a certain stagnation of labor productivity is observed. On the other hand, in the period after 2017, a more significant increase in workers' compensation is evident, which contributes to a certain leveling in 2020 between the indices of productivity growth and labor compensation.

Figure 6. Index of labor productivity and labor compensation in North Macedonia for the period 2010-2020 in Information and communication (2010=100)



Source: Author's calculations

Figure 7. Index of labor productivity and labor compensation in North Macedonia for the period 2010-2020 in Financial and insurance activities (2010=100)



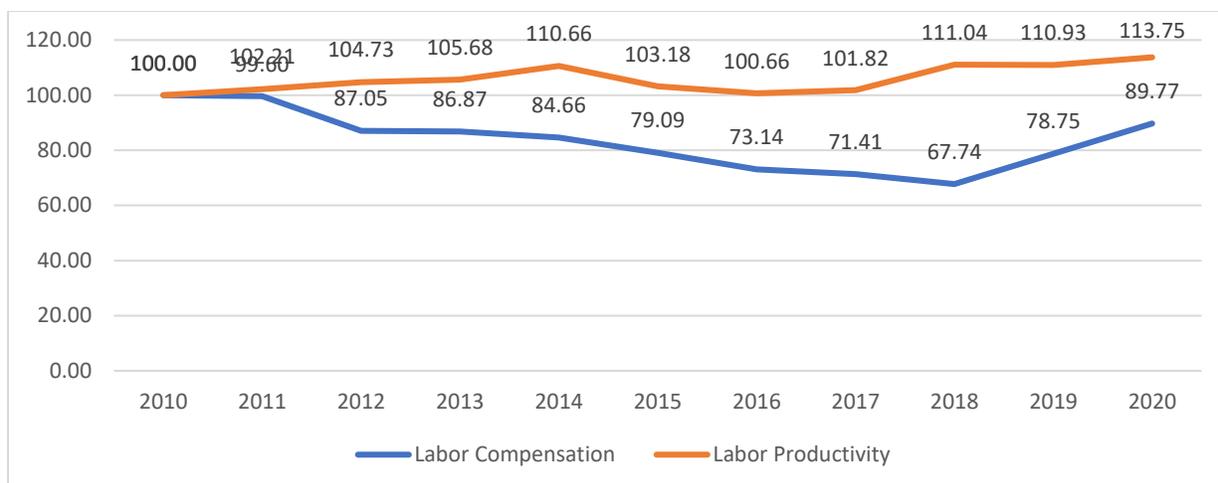
Source: Author's calculations

The Great Decoupling phenomenon is observed in the case of the sectors related to Real Estate, Administrative and auxiliary service activities. The trend of workers' compensation in real estate related activities can be divided into three periods. First, in the period 2010-2014, when a certain upward trend is observed, so that in 2014 a value of 110 index points is observed. Second, in the period 2014-2017, when workers' compensation recorded a downward trend to reach 102 index points in 2017, that is, only 2 index points more than in 2010. Third, the period 2018-2020, a period in which workers' compensation records the most intensive growth rates, with which in 2020 it reaches 113 index points. At the same time, the trend of labor productivity takes a pronounced downward movement, which reaches its lowest value in 2018, when compared to 2010 it is 68 index points, i.e. it decreased by 32 index points. In the period after 2008, labor productivity recorded a positive trend, to reach 90 index points in 2020, which has not yet reached the productivity level of 2010.

Professional, scientific, and technical activities as well as administrative and auxiliary service activities are defined by a trend of labor productivity that is characterized by a bigger increase in workers' pay than the increase in labor productivity. The workers' compensation, specifically, saw a linear trend of rise from 2010 to 2017, and after this time there was a more significant increase in the workers' compensation. When it hits 85 index points in 2012, the labor productivity trend also indicates a considerable decline. Up until 2018, when it reaches 102 index points, worker productivity is below the level of 2010. However, it also shows a declining tendency in the subsequent time, and in 2020 it hits 90 index points. Hence, decoupling workers' compensation from labor productivity sees a decoupling of 42 index points.

There is a more pronounced gap between the trend of labor productivity and the trend of workers' compensation in the sectors of professional, scientific, and technological activities, administrative, and auxiliary service activities, especially after 2017. It should be noted that the labor productivity growth indices for the period of 2011–2017, when compared to 2010, have a value below 100 index points, indicating that labor productivity in this era does not approach the level of 2010. After seeing a definite increase in 2018, labor productivity began to decline in the months that followed, and in 2019 it reached 86 index points. Workers' compensation and productivity will diverge by 42 index points in 2020.

Figure 8. Index of labor productivity and labor compensation in North Macedonia for the period 2010-2020 Real estate activities (2010=100)



Source: Author's calculations

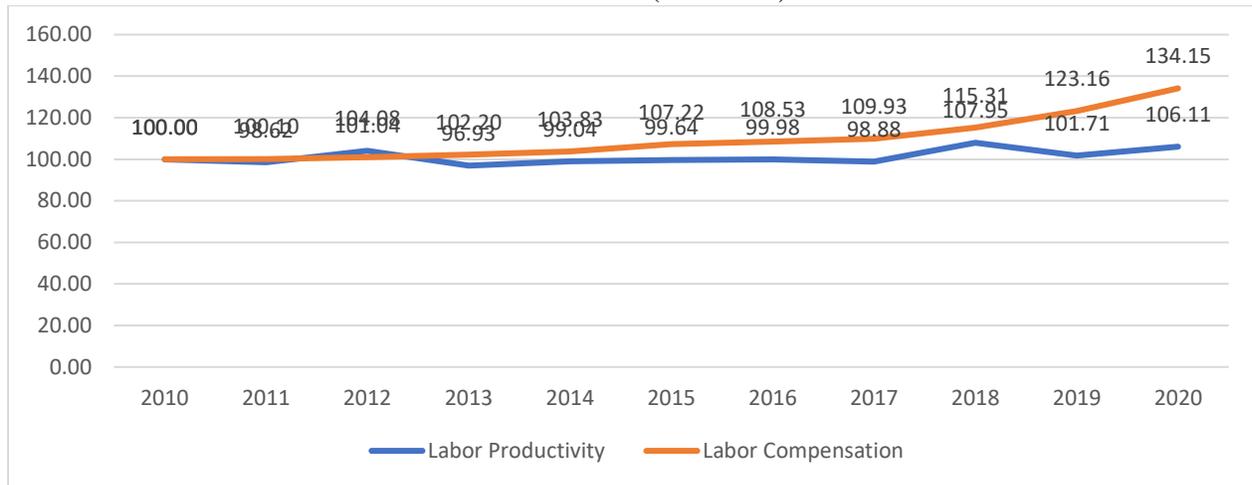
Figure 9. Index of labor productivity and labor compensation in North Macedonia for the period 2010-2020 Professional, scientific and technical activities; Administrative and support service activities (2010=100)



Source: Author's calculations

A pronounced trend of increase in workers' compensation compared to labor productivity is also observed in the sectors of Public Administration and Defense. As for the trend of labor productivity in the Public Administration and Defense, it does not notice certain changes in the period 2010-2017, that is, it moves around the level of 2010. In the period after 2017, a certain increase in the trend can be observed, in 2020 it reaches 106 index points. Hence, in contrast to workers' compensation, which throughout the entire period recorded a positive trend, especially intensified after 2017, in 2020 it reaches 134 index points. It can be concluded that in 2020, the difference between productivity and labor compensation amounts to 28 index points.

Figure 10. Index of labor productivity and labor compensation in North Macedonia for the period 2010-2020 Public administration and defence; compulsory social security; Education; Human health and social work activities (2010=100)



Source: Author's calculations

## DATA AND METHODOLOGY

The empirical analysis used data on labor productivity, workers' compensation, and the number of employed persons by individual activities. The data are taken from the database of the State Statistics Office, for the period of 2010-2020. The selection of the variables in the model (the indicators for the compensation and productivity of the workers) was made after consulting the relevant empirical literature (Feldstein, 2008; Pasimeni, 2018; Bivens and Lawrence, 2015). The selecting of the average monthly gross salary, as an indicator of the compensation of workers in separate activities in the case of the Republic of North Macedonia, was made based on the fact that the gross salary includes the benefits for health, pension and disability insurance, that is, the amount of the gross compensation is the closest to the actual amount that the workers receive. It should be clarified here that this amount is the closest to the actual amount that the average worker in North Macedonia receives based on employment. Namely, the gross salary does not include the various financial and material compensations, bonuses, or other benefits that some of the workers receive. However, considering the fact that only a small part of the workers receives this type of financial-material benefits, that is, on average, the average Macedonian worker is excluded from this type of compensation, it is considered that the gross salary is an optimal indicator for the workers' compensation. Regarding the econometric model, it was applied using the least squares model (OLS). Although simple, the regression model applied in this way leads to significant results that describe the systematic relationship between the increase in labor productivity and the increase in workers' compensation. A double-logarithmic regression model is used in the model to obtain mutually comparable coefficients regarding the influence of workers' compensation and the level of employment on the movement of labor productivity, as well as to arrive at mutually comparable values for the gap between productivity and compensation of the labor. The regression model applied in this analysis has the following form (Chris Brooks, 2016):

$$\text{Log}(\text{Productivity of Labor})_{ii} = \beta_0 + \beta_1 \text{Log}(\text{Labor Compensation})_{ii} + \beta_2 \text{Log}(\text{Unemployment})_{ii} + \varepsilon_{ii}$$

## RESULTS DISCUSSION

Results from the econometric model shows that there is a statistically significant causal relationship between labor compensation and labor productivity in most of the analyzed sectors. However, the results of labor compensation coefficients show that workers' compensation has a different impact on the determination of labor productivity, in different sectors. Namely, it can be noted that on the example of the Agriculture, Forestry, Fisheries sector, there is a statistically significant positive relationship between the trend of compensation and labor productivity. An increase in workers' compensation of 1% contributes to a proportional increase in labor productivity. In this direction, it can be concluded that the increase in compensation and labor productivity have an optimal ratio, that is, they are close to the optimal relationship, which implies that the increase in labor productivity is transferred entirely to the workers, in the form of higher compensation. However, as stated above in the analysis, the trend of labor productivity in the last period shows a downward trend. The results of the coefficient of employment provide part of the answer for the downward trend of labor productivity in this sector. Namely, the statistically significant negative relationship between the increase in employment and the decrease in labor productivity is an indicator of the trend of increasing unproductive employment in developing countries. According to the obtained results, it can be concluded that the increase in employment in the Agriculture, Forestry, Fisheries sector by 1% contributes to the reduction of labor productivity by an average of 2%. This trend confirms the previously mentioned tendency to increase the number of non-productive employment in developing countries, especially in sectors with low added value.

Regarding the results of the analysis of the relationship between workers' compensation, employment and labor productivity in the Construction sector, it can be noted that the increase in workers' compensation in construction leads to a half increase in labor productivity. Hence, the coefficient value of 0.5 indicates that an increase in workers' compensation of 1% lead to statistically insignificant increase in labor productivity of up to 0.5%. The trend of compensation and labor productivity analyzed above corresponds to the obtained results of the regression analysis. Also, the negative relationship between the increase in employment and the labor productivity is noticed. Namely, an increase in employment of 1% in the Construction sector contributes to a decrease in the productivity of workers in this sector by 0.6%, however this relationship is statistically insignificant.

There is a statistically significant, positive, over-proportional relationship between an increase in workers' compensation and a rise in labor productivity in the Wholesale and Retail Trade, Transport and Storage, Accommodation and Service Services sectors, in contrast to the previously analyzed relationships in Agriculture, Forestry, Fisheries and Construction. Namely, at a significance level of 95%, it can be concluded that an increase in workers' compensation of 1% will contribute to an increase in labor productivity of about 1.2%. Here, it should be noted that the synthesized data for several sectors, which are analyzed in one regression estimation, can be cited as a drawback. However, due to data limitations, there are no available data on the share of individual sectors in the gross domestic product. Regarding the relationship between labor productivity and workers' compensation, it can be stated that there is also a positive but statistically insignificant relationship between the increase in employment and the increase in labor productivity in the sectors. Also, the analysis of productivity and labor compensation in the Financial and Insurance sector shows the existence of a statistically significant positive relationship. Namely, an increase in labor compensation of 1% will contribute to an increase in labor productivity by an average of 1.9%. On the other hand, within this sector, a positive but statistically insignificant relationship is observed between the increase in employment and labor productivity.

The trend of productivity and compensation of workers in the Information and Communications sector shows the existence of a positive and statistically significant relationship between these two variables.

Namely, the increase in the compensation of workers who work in this sector contributes to the increase in labor productivity by an average of 0.8%, which indicates the existence of a positive relationship, but also according to the intensity and the existence of prerequisites for a certain decoupling between the mentioned variables. The employment coefficient within this regression estimation shows that an increase in employment of 1%, on average, contributes to a decrease in labor productivity by 0.8%. As a result, employment in this sector is also increasing, but labor productivity is decreasing at the same time.

It is also observed that there is a positive, statistically insignificant relationship between the movement of compensation and labor productivity in the sectors Professional, scientific and technical activities and Administrative and auxiliary services. On the other hand, within this sector, there is a tendency of a negative relationship between employment and labor productivity. The coefficients of the two variables in this regression estimation show a statistically insignificant causal relationship. However, in addition to the statistically insignificant coefficients, a certain degree of decoupling of compensation and labor productivity can be observed within this sector, as well as the evident negative relationship between employment and labor productivity.

In the sectors Public Administration and Defense, Mandatory Social Insurance, Education, Health and Social Protection Activities, there is a statistically significant positive relationship between the increase in compensation and labor productivity. However, it must be noted that in these sectors, an increase in workers' compensation of 1% leads to an increase in labor productivity of 0.5%, which implies an increase in labor productivity in a lower intensity. Also, the relationship between employment movements and labor productivity in these sectors is negative. Namely, the increase in employment in these sectors leads to a statistically significant decrease in worker productivity. An increase in employment of 1% contributes to a decrease in labor productivity by 0.47%.

In the Real Estate, the results show the existence of an inverse relationship between the increase in employment and labor productivity. Namely, the increase in the employment of workers from 1 affects the decrease of labor productivity by 0.82%. At the same time, the increase in labor compensation in this sector by 1% affects the increase in labor productivity by 0.9%, which indicates an optimal ratio, a relationship that does not deviate significantly compared to other sectors. In the Arts, Entertainment and Recreation and Other Service Activities sector, the results show a statistically insignificant but positive relationship between the increase in labor compensation and worker productivity. Also within this sector there is a statistically insignificant, negative relationship between employment and labor productivity.

Table. Results of a regression analysis between labor productivity, labor compensation, and employment

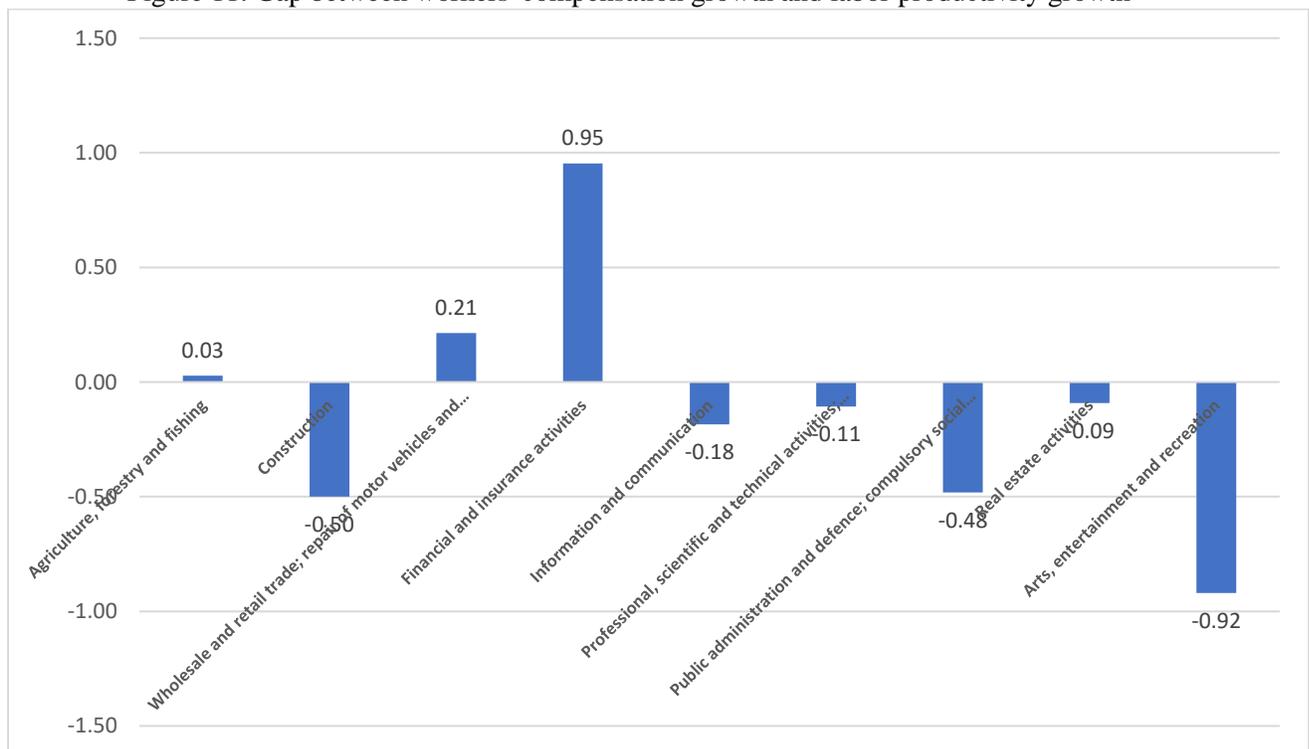
<b>Sector</b>	<b>Labor Compensation Coefficient</b>	<b>Employment Coefficient</b>	<b>Labor Productivity and Labor Compensation Gap</b>
Agriculture, forestry and fishing	1.027918*	-2.092690*	0,03
Construction	0.500382	-0.658409	-0,50
Wholesale and retail trade; repair of motor vehicles and motorcycles; Transportation and storage; Accommodation and food service activities	1.214254**	0.221102	0,21
Financial and insurance activities	1.953761*	0.166723	0,95
Information and communication	0.815563**	-0.821491*	-0,18
Professional, scientific and technical activities; Administrative and support service activities	0.892498	-0.426039	-0,11

Public administration and defence; compulsory social security; Education; Human health and social work activities	0.518119**	-	-0,48
Real estate activities	0.907799**	-0.815486*	-0,09
Arts, entertainment and recreation	0.079325	-0.424031	-0,92

Note: \* \*\* \*\*\* significance levels of 1%, 5% and 10%, respectively.

Analysis of the gap between compensation and labor productivity shows that in sectors such as Agriculture, Forestry, Fisheries, Real Estate Activities there is almost no decoupling between compensation growth and labor productivity growth. Hence, it can be concluded that in these two sectors the increase in labor productivity corresponds to the increase in workers' compensation. On the other hand, in the sectors of Construction, Art, Entertainment and Recreation and other service activities, Public Administration and Defense, Mandatory Social Insurance, Education, Health and Social Protection Activities, there are significant disproportions between workers' compensation and their contribution, i.e. labor productivity. In these sectors, the increase in workers' compensation contributes to a disproportionate increase in labor productivity. On the other hand, the increase in workers' compensation in the Wholesale and Retail Trade, Financial and Insurance sectors contributes to a disproportionate increase in the productivity of workers in these sectors.

Figure 11. Gap between workers' compensation growth and labor productivity growth



Source: Author's calculations

## CONCLUSION

The increase in labor productivity provides a solid basis for further increases in workers' compensation. Labor productivity growth will have different positive effects on workers' compensation depending on the type and stage of development at the national level, as well as within individual sectors.

In this research, the subject of analysis was the trend of labor productivity, workers' compensation and the number of employees, as well as their causal relationship by individual sectors-activities. The sector analysis of the so-called phenomenon of the "Great Decoupling" between productivity and labor compensation aimed to provide detailed results, at the sectoral level, on the movement of productivity and labor compensation, as well as the relationship between employment and labor productivity. Such an analysis for the first time makes it possible to analyze the degree of the so-called "Great Decoupling" between productivity, labor compensation and the number of employees in individual sectors in North Macedonia.

In North Macedonia until 2017, at the national level, there is a synchronized trend in productivity and labor compensation, with a simultaneous constant increase in the number of employees. However, after 2017, there is a significant increase in workers' compensation. At the same time, in the period after 2017, there is a significant decrease in labor productivity. Compared to 2010, in 2020, labor compensation grew by 34 index points, while labor productivity by 10 index points. Hence, it is considered quite justified to draw the conclusion that the gap in the trend of "Reverse Decoupling" between workers' compensation and labor productivity is the case in the Republic of North Macedonia. The emergence of the concept of the so-called Reverse Decoupling of trends of labor productivity and workers' compensation, following world trends, also shows a significant change in the distribution of income in almost all sectors in North Macedonia. The widespread thesis that "a rising tide will lift all boats" for several years now does not correspond to practice, that is, there is an ever-lower increase (in some sectors and stagnation) of labor productivity in relation to the growth of workers' compensation. Hence, it can be concluded that the pronounced increase in workers' compensation in the period after 2017 is the case in almost all sectors. It is the result of the increase in the legal level of the minimum wage, a level below which the employee must not be paid. This conclusion is based on the fact that during this period there is a significant decline (and in some sectors stagnation) of labor productivity, which is followed by an increase in the number of employees in individual sectors. At the same time, the increase in employment in almost all sectors in the Republic of North Macedonia, which is followed by a simultaneous decrease in labor productivity, is considered unsustainable in the medium and long term. Hence, companies in the direction of improving labor productivity will be forced to reduce the number of employees or to improve capital performance. There are several factors that go into dealing with this situation, including the material-financial, personnel, and capital resources available to the enterprises, as well as the availability of additional technology and capital. But one thing is certain: the trend of increasing non-productive employment cannot be sustained indefinitely.

In most of the activities of the Republic of North Macedonia, an increase in employment follows a parallel decrease in labor productivity, as shown by the movement of labor productivity and by the regression analysis. Hence, it is considered completely justified to state the thesis to what extent the increase in employment contributes to the increase in labor productivity. An econometric analysis indicates that North Macedonia has a significant share of unproductive jobs. The strongly expressed low labor productivity is the result of the shortcomings of the domestic economy, in particular in terms of the level of education of the workforce. One of the factors contributing to the low productivity of Macedonian workers is their lack of education, their lack of skills, their lack of capital, as well as their technical-technological level.

## REFERENCES

- Bivens, J., & Mishel, L. (2015). Understanding the Historic Divergence Between Productivity and a Typical Worker's Pay - Why It Matters and Why It's Real.
- Brooks, C. (2019). *Introductory Econometrics for Finance*. Cambridge University Press.
- Dean, B. (2007). *The Productivity to Paycheck Gap: What the Data Show*. Center for Economic Policy Research (CEPR).
- Elgin, C., & Kuzubas, T. U. (2013). Wage-Productivity Gap in OECD Economies. *Open-Assessment E-Journal*, 1-21.
- Feldstein, M. S. (2008). *Did Wages Reflect Growth in Productivity?* National Bureau of Economic Research.
- Harris, J., & Todaro, M. (1970). Migration, Unemployment and Development: A Two-Sector Analysis. *American Economic Review*.
- Karabarbounis, L. a. (2014). The Global Decline of the Labor Share. *Quarterly Journal of Economics*.
- Lawrence, M. (2012). *The Wedges Between Productivity and Median Compensation Growth*. Economic Policy Institute.
- Lawrence, M., & Gee, K.-F. (2012). *Why Aren't Workers Benefiting From Labour Productivity Growth in the United States?* International Productivity Monitor.
- Lewis, A. (1954). *Theory of Economic Growth*.
- Meager, N., & Speckesser, S. (2011). *Wages, productivity and employment: A review of theory and international data*. European Employment Observatory.
- Pasimeni. (2018). *The Relation between Productivity and Compensation in Europe*. European Economy – Discussion Paper 079.
- Patrick Belser, ILO. (2013). Wages in Developing Countries. In *Perspectives in labor economics for development*. Geneva: ILO.
- Sherk, J. (2013). *Productivity and Compensation: Growing Together*. The Heritage Foundation.
- Škare, M., & Škare, D. (2017). Is the great decoupling real? *Journal of Business Economics and Management*.
- Stansbury, A., & Stansbury, A. (2018). *Broken?, Productivity and Pay: Is the Link*. Peterson Institute for International Economics.
- Theodoropoulou, S. (2019). *Convergence to fair wage growth? Evidence from European countries on the link between productivity and real compensation growth, 1970-2017*.

