The Relationship between Labour Productivity and its Explanatory Factors in Romania

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ABSTRACT: The aim of the paper is to analyse Romania's labour productivity in relation to certain economic indicators such as government expenditures on tertiary education, gross fixed capital formation, changes in real wages, total population categorized by different age groups, using empirical data collected from Eurostat and the National Institute of Statistics in the case of Romania, covering the period 2002-2018. In order to examine the relationship beetwen labour productivity and the factors above mention, I used the Scatter Plot Graphs, as well as the Pearson correlation coefficient, to identify trends and solutions for increasing labour productivity. I have demonstrated that the increase of labour productivity depends on government expenditures on education, investments, wages and workers age. In this context, I proved that the people aged between 50-65 years have a low productivity capacity which make the employers to be more skeptical when hiring them, thus highlighting the need to introduce national active ageing programs for people over 50 years.

KEYWORDS:- education, growth, human development, labour productivity

I. INTRODUCTION

Labour productivity is a key concept that continues to be in the center of economic debates, due to its impact on several economic dimensions and on the economic progress on the short, medium and long-term.

One of the most important aspects of the labour productivity that has to be considered is that human work in many fields can be displaced with machines and robots and in this way the productivity of a company increases. Automation also advanced additional risks for social disintegration. In this context, human resources have to be able to adapt and learn for their entire active life, so that they will be able to fill in the new positions that can appear in the labour market.

The main motivation for choosing this subject lies in the actuality of this concept and also, in identifying a way to promote human capital development and labour productivity in Romania, taking into consideration the latest unfavorable developments in terms of competitiveness, which are also highlighted in the Alert Mechanism Report 2020, published by European Commission [1].

The objective of this paper is to analyse the relationship between labour productivity and its determinats (population aged between 15-24, 25-49 years and 50-64 years, changes in real wages, government expenditures on tertiary education, gross fixed capital formation) in Romania. In order to reach this objective, I have structured this paper in four sections. First part, provided a general perspective on the main results of the economic experts, specialised in this field. In Section II, I have described the methodology I have used to examine the relationship between labour productivity and its determinants, while in Section III, I have presented the main finding of the paper. The concluding remarks were presented in Section IV.

II. LITERATURE REVIEW

Labour productivity is an important driver of long-run economic development. Generally, the discussions in the literature make reference to the measures that can be taken to improve labour productivity. There are a lot of analyses on the labour productivity in relation to wages, economic growth, social welfare and many other economic indicators. The relationship between labour productivity and real wages is a permanent source of debate in economic growth research and is used by specialists as an instrument to carry out macroeconomic policies.

In his model, Lewis [2] stated that poverty and low wages will persist as long as the opportunity cost of labour to the capitalist sector remains down. The importance of increasing labour resources for the development of the national economy is well acknowledged. In order to reach an employment rate as high as possible, it is necessary to assure the conditions for the human capital to perform proactively and creatively. It is in the interest of the entire society that the economies, should be more able to anticipate and absorb change.

On the other hand, the increase of labour productivity means a change of the working process, which reduces the working time, in order to produce a higher amount of practical value, as Marx mentioned [3].

In order to measure out productive employment, as the main driver of development, three main indicators are used in the economic literature [4]: labour productivity, the proportion of vulnerable workers and the share of working poor (working poverty rate). Economic growth and living standards within an economic system depend on labour productivity, a hypothesis also supported by Porter [5] which stated that labour productivity of a country is the most important determinant of the living standard on the long term. Strong economies that are able to provide high living standards are the ones that contributes to higher levels of economic conditions [6]. In the same context, the economic systems that meet as many as possible needs of the present generation, will be able to not compromise the ability of future generations` needs. [7].

The optimisation of the labour productivity, using the same manpower, is based on the division of labour, influenced by three factors: i. The use of machines that are helping individuals through work, shortening the working hours; ii. Skills of the people that are completing the tasks; iii. Avoiding the waste of time when changing the work tasks [8].

The growth in labour productivity and quality of jobs is often interlinked with constructive transformation [2]. Moreover, Erkut [9] stated that the transformation of a state economy from one stage of growth to the other can be translated into a context of a self-government economic evolution.

The main goal of management should be to secure the maximum prosperity for the employer and to increase his labour productivity, as Taylor [10] mentioned, but this theory involves both parties, the employers and the employees. The model analyse the choice of a fit workforce with further instruction, a good definition of the individual work steps and the correct distribution of responsibility, made in co-operation with management. Another theory was based on the good management principles like control, organization, planning and coordination in order to achieve an increase of productivity [11]. Barnard [12] based his theory on labour productivity on the relation between formal and informal groups that results in the decision-making process. The target`study was not the increase of labour productivity, but to make significant use of the efficiency of an workplace, as a whole to increase the productivity, that, in the end results in an increase of the labour productivity.

According to Kretschmer, expenses that are made on information and technology have a positive impact on the labour productivity [13]. In other words, in order to achieve competitiveness and modernisation, a state needs to accomplish the following goals:

Table 1. Structure of the goals to reach high labour productivity

- assure a direct impact on the growth of the new jobs, based on the development of small and medium businesses;

- reduce discrepancies between supply and demand on the labour force market, by implementing a continuous training system on medium and long term for the population;

- creating special programs addressed to a group of people with difficulties on integration on the labour market: young people, disabled persons, etc;

- determining ways for employing dismissed people, that are fighting against long term unemployment;

- support measures orientated to lead to the increasing of the participation rate by prolonging the activity period for elder persons;

- fighting against working without official forms and creating measures which shall encourage employers to comply with the legislation;

Source: Own processing using Microsoft Office 2016

However, technology (through automation channel) can also affect social development by replacing individuals with machineries which argue the need to parametrize the technological progress, in order to promote sustainable development [14]. A good way forward is to promote a moderate income inequality which is also favourable for reaching an equilibrium between wages and productivity, this could be achieved by strengthening the inclusive feature of institutions, respectively by promoting participatory life [15]. Inclusive institutions also increase the resilience of labour market to shocks and bring efficiency to a higher level in this field [16].

III.   RESEARCH METHODOLOGY

This study is based on examining the evolution of labour productivity and its drivers in Romania. In this context, I have used the quantitative analysis approach for the time period 2002-2018. The relationships were analysed using the indicators mentioned in Table 2. For this case study, the relationships were assessed in Microsoft Office Excel, using Scatter Plot Graphs technique.

In this context, I have used the Pearson statistical correlation, using its formula - the ratio beetwen the covariance of two series and the product of the standard deviations computed for each series.
Therefore, I have calculated Pearson correlation coefficient (using Microsoft Office Excel) at the level of Romania, covering the period mentioned above.

 In this regard, I analysed the following:
a. the correlation between real labour productivity and total general government expenditures on tertiary education (as a percentage of GDP);
b. the correlation between the percentage change of the gross fixed capital formation and real labour productivity;
c. the correlation between real labour productivity and wages;
d. the correlation between labour productivity and the share of different population age categories (15-24 years, 25-49 years, 50-64 years).

The statistical data used in this paper are published by Eurostat and the Romanian National Institute of Statistics.

Table 2. Structure of the indicators

Variable	Source
Real labour productivity (%)	Eurostat
Government expenditures on tertiary education (% of GDP)	Eurostat
Gross fixed capital formation (%)	Eurostat
Real wages (%)	National Institute of Statistics
Population aged between 15-24 (%)	Eurostat
Population aged between 25-49 (%)	Eurostat
Population aged between 50-64 (%)	Eurostat

Source: Own processing using Microsoft Office 2016

IV.   RESULTS AND INTERPRETATIONS

In order to achieve sustainable development, it is necessary that labour productivity of the labour market to be accompanied by adequate educational skills and fair educational policies. Based on the data provided by Figure 1 in RO, during the 2002-2018 period, the process of productivity growth varied substantially across the years. I have found a positive relationship between the labour productivity and government expenditure on tertiary education. In this case, the correlation coefficient is +0.35, a value that prove the existence of a positive relationship.

Figure 1. The relationship between real labour productivity and government expenditures on tertiary education in Romania in the period 2002-2018
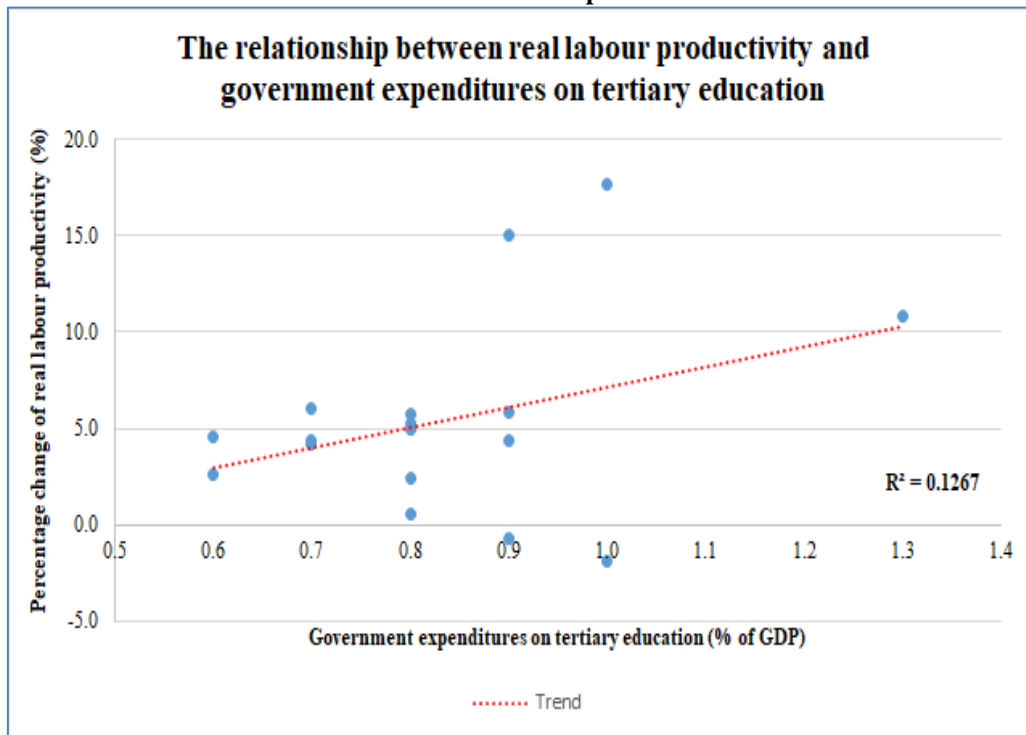
Source: Own processing using Microsoft Office Excel 2016, Eurostat database and National Institute of Statistics

In order to increase labour productivity it is important for the government spending overall to be efficient. Efficient public spending on education exercise positive effects on productivity and on long-term growth. However, I could not state that relationship is marked by a high efficiency, since studying correlation is not enough for interpreting the results in terms of efficiency. The effect can be explained by the fact that the support of the tertiary education system could promote new skills on labour market, which may ease the work of tertiary graduates and may increase the productivity at the level of the companies. Of course, there are also weaknesses in Romanian educational sector, since there are large gaps between the educational skills and those needed on labour market.

Figure 2. The relationship between real labour productivity and real wages in Romania in the period 2002-2018
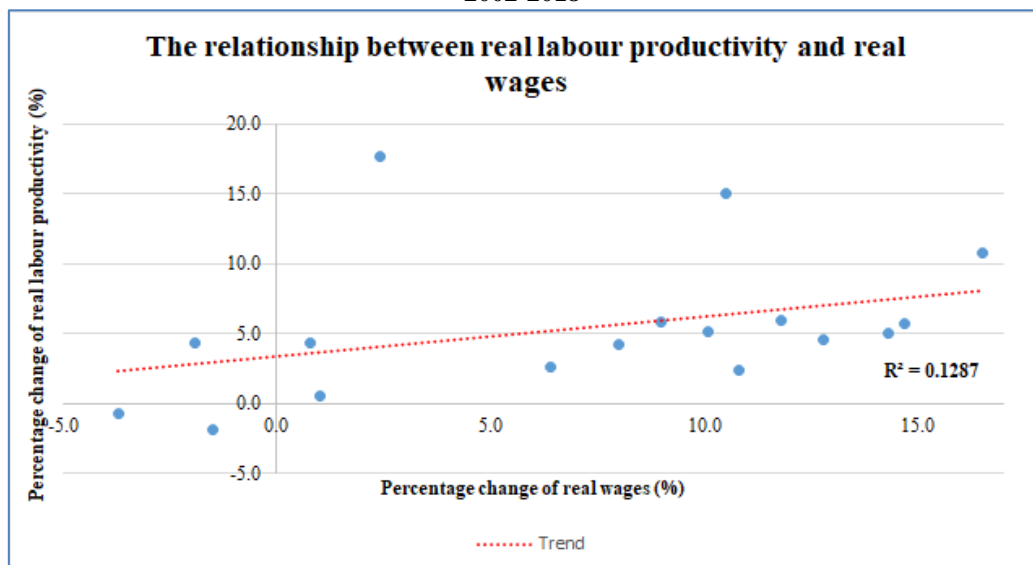
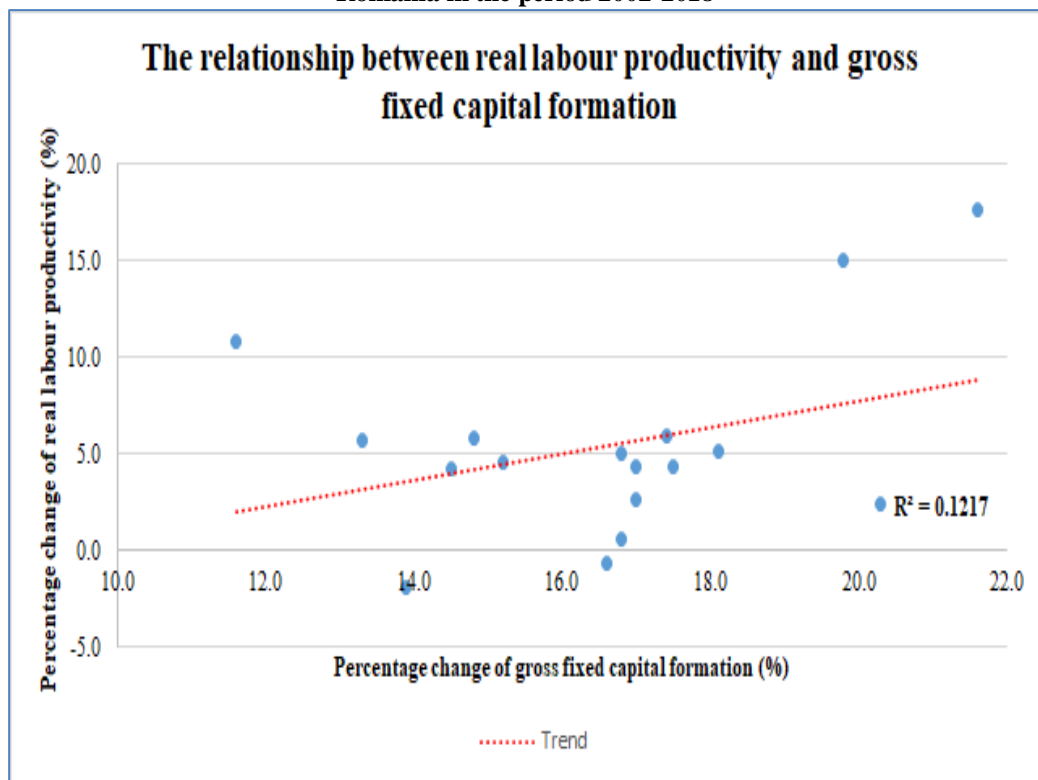**Source: Own processing using Microsoft Office Excel 2016 and Eurostat database**

Data from Figure 2 illustrate a positive correlation between labour productivity and wages in the case of the Romanian economy (Correlation coefficient being 0.35 – this indicating a positive relationship). Thus, in the 2008-2016 period, labour productivity and wages went hand in hand which means that both indicators increased, but labour productivity increased faster than wages. The major differences between wages and productivity can produce several imbalances, such as decreasing competitiveness when productivity is lower than wages, or increasing social inequality when productivity is higher than wages, the most desired hypothesis being related to reaching an equilibrium between these.

As can be seen in the Figure 3, in Romania, an increase in the percentage change of gross fixed capital formation generates a hike in the percentage change of real labour productivity. The correlation coefficient is +0.34, which confirms the positive positive relationship between investments and labour productivity. In fact, a high share of investments are oriented to produce new productive equipments and tools which can enhance the productivity at the level of workers, but also the productivity at the level of the company through automation channel.

Next, I analysed the correlation between the total population in Romania categorized by age groups and labour productivity. I have found a correlation coefficient of +0.48 (Figure 4), which indicates a positive relationship between the share of population aged between 15 to 24 years in total population and labour productivity change. Actually, this category of population have a higher capacity to produce goods and services than the older ones.

Figure 5 shows a low positive relationship between the share of population aged between 25 and 49 years in total population and labour productivity change, this being further argued by the corresponding correlation coefficient of +0.16. In this category age, population, usually, enters in the routine and a large part of the individuals do not set higher goals, entering in a lamentable trap of low productivity.

Figure 3. The relationship between real labour productivity and gross fixed capital formation in Romania in the period 2002-2018

Source: Own processing using Microsoft Office Excel 2016 and Eurostat database
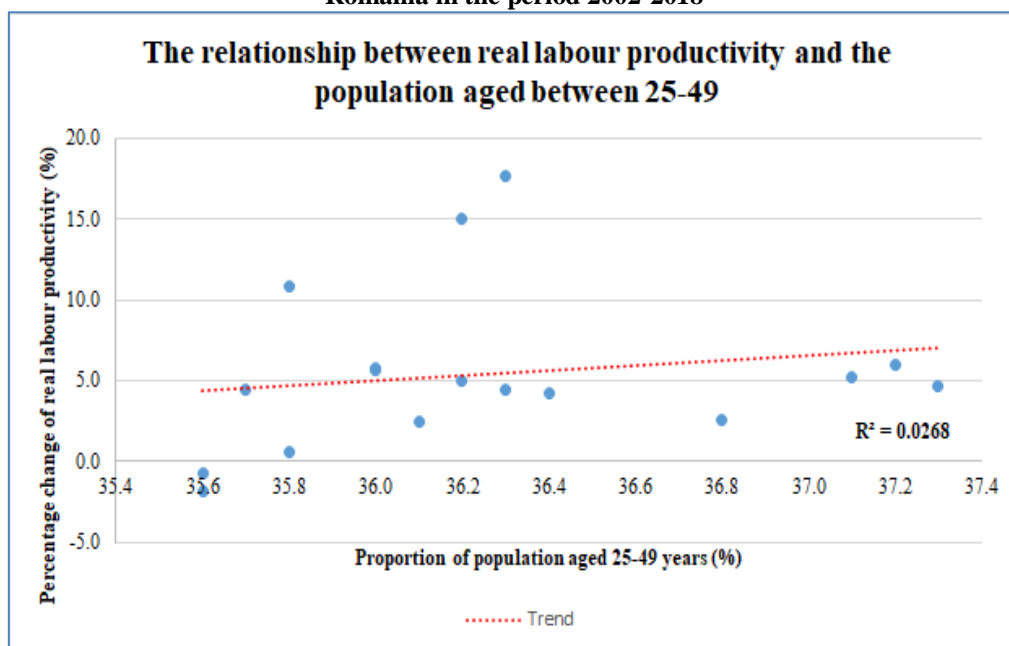
Figure 4. The relationship between real labour productivity and population aged between 15-24 in Romania in the period 2002-2018
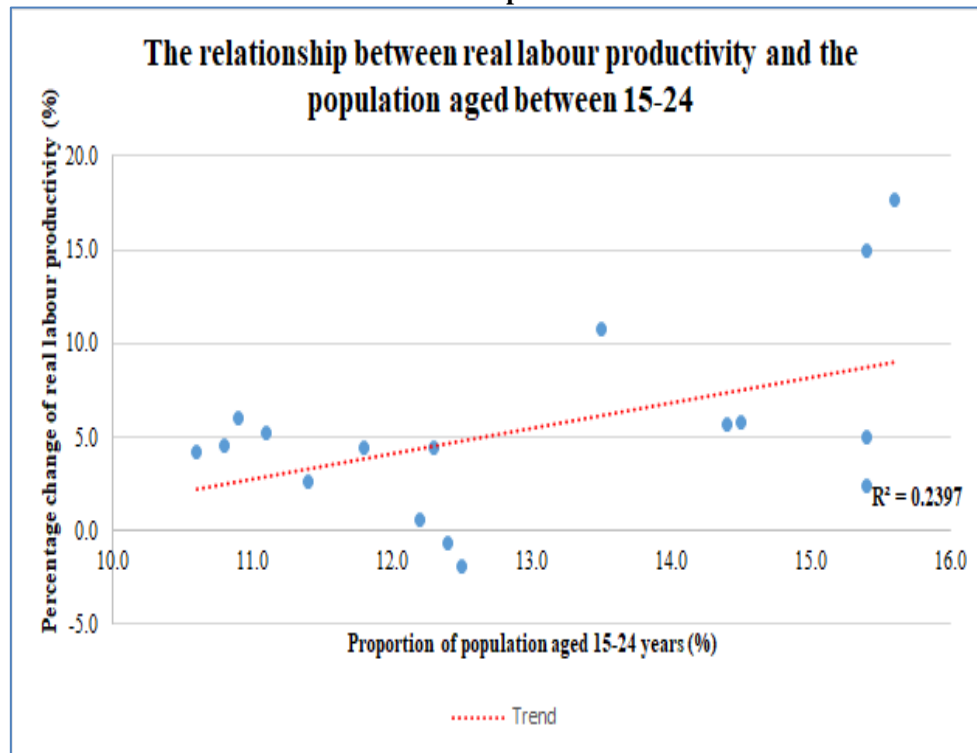
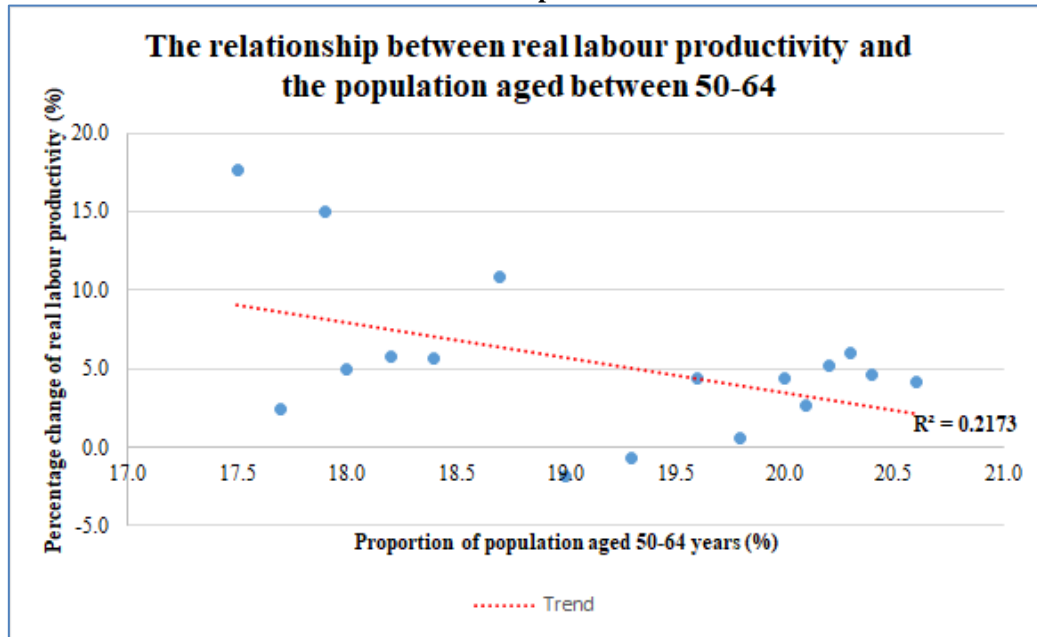**Source: Own processing using Microsoft Office Excel 2016 and Eurostat database**

On the other hand, Figure 6 shows a moderate negative correlation (-0.46) between the labour productivity change and the share of population aged between 50 and 64 years in total population. This effect could be also explained by the fact that people close to retirement start to be counterproductive in their job related tasks. Even in the case of the exceptional cases, people aged in this age group are affected by different kind of illness which lowers the productivity at the level of their employers. Therefore, it is important to create new tools for their integration, supported by a legal framework that assists active ageing programs.

Figure 5. The relationship between real labour productivity and population aged between 25-49 in Romania in the period 2002-2018

Source: Own processing using Microsoft Office Excel 2016 and Eurostat database

Figure 6. The relationship between real labour productivity and population aged between 50-64 in Romania in the period 2002-2018

Source: Own processing using Microsoft Office Excel 2016 and Eurostat database

V. CONCLUSION

The labour productivity growth is recognized both by growth theory and developmental practice to be associated with high rates of economic growth. The most inflexible labour force on the market are older people. Young people can adapt easy to economic changing conditions, being able to change their jobs. In this fact, an investment made by the government is the key factor in solving the productivity level.

It is necessary that the social policy should start from the need for a radical change in approaching this subject. To create conditions for people to be able to actually take part in the active social life, it is necessary that the legislative guarantees should be ensured urgently in parallel with a continuous increase of the individual responsibility level. It is important to ensure the protection and social welfare measures for certain categories or groups of persons able to work, by actions which will contribute to securing the workplace, to attain permanent and rising incomes, as an essential premise for improving the living conditions of the active population.

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