Is there a trade-off between employment and labour productivity in new EU member states?

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Taking into consideration the EU objective set by the Europe 2020 Strategy, i.e. to become a smart, sustainable and inclusive economy, which at the same time implies a growth in employment and labour productivity, our main research question is if there is a trade-off between employment and labour productivity, in a panel of twelve new EU member states, in the 2000-2010 period. The results of our study show that between 2000 and 2010, there was a trade-off between growth in employment and growth in labour productivity, fact which requires taking some measures, in these countries, which should allow the creation of new jobs but the increase in labour productivity as well.

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Introduction

The increase in labour productivity and the one in employment represent the objectives stipulated in the European strategies, such as the Lisabon Strategy and Strategy 2020. Moreover, one of the core elements of the International Labour Organization's Global Employment Agenda addresses the twin issues of promoting higher productivity and creating employment opportunities in order for countries to improve standards of living for their citizenry and obtain long-term sustainable growth.

However, the economic literature and practice prove the fact that the objective according to which increased labour productivity should be combined with employment growth is a rather difficult one to achieve. We affirm this taking into consideration that employment, productivity and aggregate output are linked, by the so-called „fundamental identity": aggregate output equals the product of employment and labour productivity. This means, for example, that any given rate of output growth can be achieved either with high productivity growth and low employment growth, or, conversely, with low productivity growth and high employment growth.

On the other hand, we have to take into account that in real life, output levels are not fixed and unchanging; therefore both factors of the above multiplication could in principle grow at the same time. In practice there are a number of preconditions to allow for such growth (Gacs, 2005), among them the trends in population growth, changes in the age and qualification structure of the population, labour market institutions, the sectoral structure of the economy etc.

The question- *How does labour productivity affect employment?* has concerned economists and ordinary citizens for centuries. In the economic literature it is unanimously accepted that rapid and sustained productivity growth in the advanced industrialized nations had an important role in achieving a high level of standards of living and in eradicating mass poverty in these countries. The technological

innovations and capital-intensive investments that were the mainsprings of this productivity growth are now feared as instigators of mass job destruction, for which they have often and rightly been held responsible. This „creative destruction" of employment means that less productive firms will leave the market, and new more productive ones will take their place, perhaps in different industries, different sectors and even different locations. Thus, analysing what is gained as opposed to what is lost as the result of increasing productivity becomes critically important and the basis for developing responsible employment policies (ILO, 2005).

How does employment affect productivity? is our main research question in this paper. Empirical studies carried out for different periods of time and different countries, show that there is trade-off between employment and productivity whose intensity depends in time and from one country to the other.

Using a cross-country regression relating the change in productivity (measured as output per-worker) to the change in employment for the period 1960-1997 (Beaudry & Collard, 2002) have identified that the change in employment results in a large and systematic reduction of labour productivity for a panel of 18 OECD countries (richest industrialized countries). The same estimation methodology is used by (Cavelaars, 2005), but for all OECD countries from 1960 to 2000. The author has identified a negative impact of employment on labour productivity for the period 1961-1980, but the trade-off disappears in the period 1980-2000.

A series of theoretical and empirical studies focused on estimating the impact of employment on labour productivity for different periods and different countries, by using elasticity of productivity to employment. Most find a negative elasticity of hourly productivity with regard to the employment rate and to working time. For exemple, (Bourlès & Cette, 2005; Belorgey et al., 2006; Bourles et al., 2010) have calculated a negative elasticity of hourly productivity with regard to the

employment rate and to hours worked of around 0.4 – 0.6 for different periods and countries. (Cette et al., 2011) find that the elasticity of productivity per hour to working time is negative and decreases with working time, but its coefficient is not strongly significant.

However, these results are contradicted by (Van der Horst et al., 2009). From the empirical analysis on 15 OECD countries, for the period between 1970 and 2003, the authors have found a positive trade-off between employment rate and productivity. They have found that employment tends to boost productivity, thus questioning the compromise relationship between employment and productivity. The study carried out by the specialists of the European commission at the EU-15 level (European Commission, 2007) identified a negative relationship for the 1960-2006 period for EU15 Member States, but less pronounced in the '90s. The fact that in the recent years, trade-off has been less pronounced comes as good news for European policy makers, because it implies that their efforts to boost GDP per capita via an increase in labour utilization and labour productivity are only slightly constrained by a negative relation between employment and productivity.

The relationship between employment and productivity in the new member states of the European Union

Generally, the research on the impact of employment on labour productivity start with the hypothesis according to which, in the log run (over a period of 10 years or more), there will be trade–off between employment and productivity, put another way low productivity growth is the price for high employment growth, or vice versa.

The key objective of this paper is to investigate the impact of employment on labour productivity in the 2000-2010 period, in a panel of twelve European Union countries (the 10 countries that joined the EU in 2004 and Romania and Bulgaria). The majority of the

countries analysed in this study are countries from Central and Eastern Europe, which have gone through a process of transformation of their economic systems from planned to market economies and of their political systems from communist ones to democracies of a capitalist-type. Specific patterns of the transition process have strongly influenced the overall development of these countries over the last two decades and consequently also the relationship between employment and labour productivity. Another reason for which we have chosen to analyse the relationship between productivity and employment in these countries is that of seeing if the catching-up process of the new member states for reducing the economic gaps compared to the EU average has significantly affected this relationship.

For reaching the objectives set, the methodology used was, mainly, the statistical one (descriptive methods) this being used for the statistical data processing and interpreting, data offered by EUROSTAT on employment (expressed by annual growth of employment and employment rate) and labour productivity (measured per employed population). "The study of many economic variables, which usually are correlated through descriptive analysis of data, is very important and it represents an useful piece of information for complex and detailed analyses" (Gabor et al., 2010), for local, regional or national characterizations. In order to study the intensity of the relationship between the two variables for 12 countries of the EU we have applied the Spearman correlation coefficient and we have used the regression analysis.

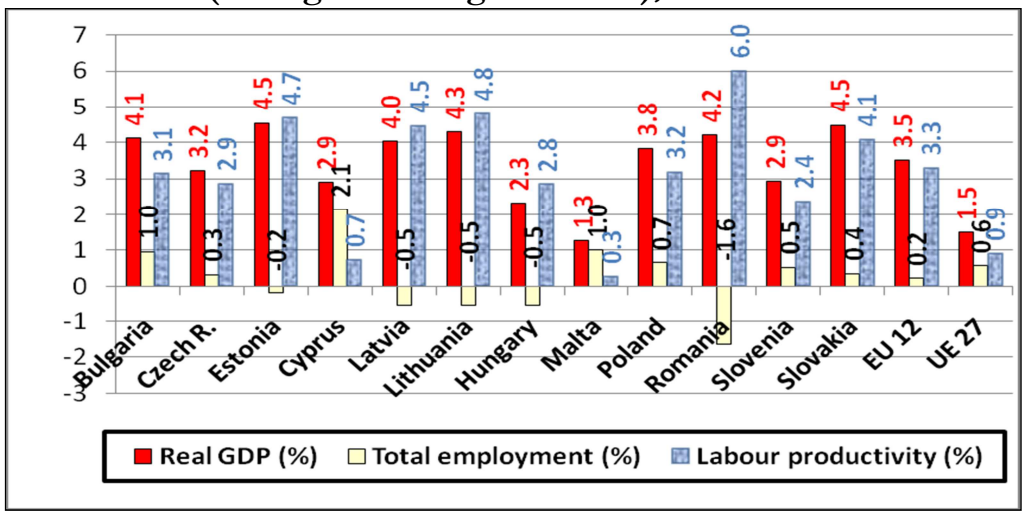
Combining employment growth with labour productivity growth was and will remain one of the most difficult problems of economic growth. The relationship of inverse proportionality which is set between productivity and employment in the economic activity has the most different shapes, expressing the character of economic growth. Data in figure 1 show the decomposition of the growth of aggregate

output- gross domestic product (GDP), in accordance with the "fundamental identity", into the contribution of employment growth and the contribution of labour productivity growth in the twelve EU countries (ten countries in Central and Eastern Europe –Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia, and two Mediterranean countries -Malta and Cyprus). Labour productivity has been calculated as output, respectively GDP, per employed population.

Between 2000 and 2010 the average annual growth rate of GDP in 7 of the 12 countries was over 3.5% (the average recorded by the 12 countries), a lot over the average rate of economic growth recorded, in the same period, at the EU- 27 level (of 1.5%) as well as at the EU-15 level (of 1.37%). We have to take into consideration that these ex-communist countries, which inherited a predominantly industrial economy, had to cover huge gaps, as compared to the developed countries in the North-Western Europe, being found in a catch up and restructure process of their economies.

Although the rhythm of economic growth, in the last 11 years (2000-2010), has been more than double compared to the one recorded in EU-15, in 2010, significant gaps were recorded between the countries in the East and West of the EU, as well as inside the newer Member States. Thus, in all countries analysed by us GDP/capita is below the average recorded in UE-27 (20,900 euro/capita), the highest level being recorded in Cyprus (16,600 euro/capita), and the lowest in Bulgaria (2,700 euro/capita), according to data presented in figure 2. Significant gaps are to be found also when we refer to labour productivity: in 2010, only five countries managed to achieve over 70% of the level of labour productivity per person employed de 100% din EU-27(figure 5).

Figure 1
Employment, productivity and real GDP in twelve EU countries (average annual growth - %), 2000-2010



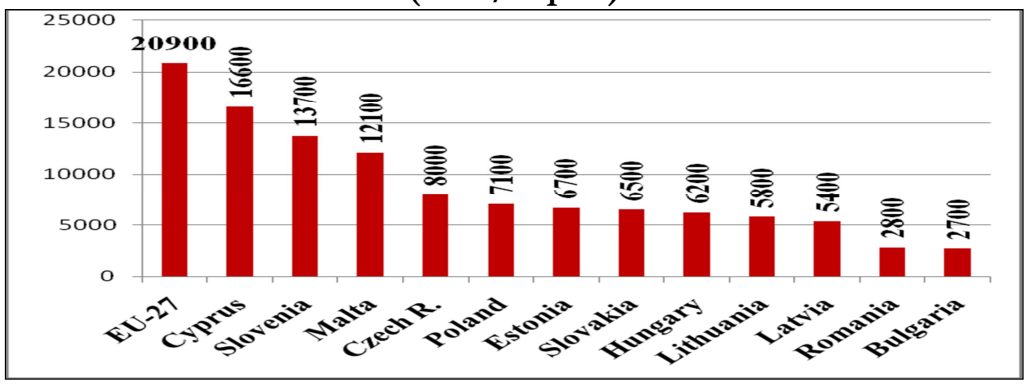
Source of data: Own calculations based on data provided by EUROSTAT

In five countries (Estonia, Latvia, Lithuania, Hungary, Romania), the economic growth was achieved only due to the increase in productivity, because employment fell. We mention that in these countries productivity growth was superior to the economic growth (figure 1). Romania distinguishes itself, the country where the highest reduction of the employed population happened, but also the highest growth in labour productivity. In the rest of the countries the employment growth as well as productivity growth contributed to economic growth. However, here two situations are to be noticed: in the two Mediterranean countries, economic growth was much more labour-intensive, with employment growth contributing with 75% of output growth; in the other five countries in the centre and east of Europe (Bulgaria, Czech R., Poland, Slovenia and Slovakia) economic growth was achieved almost exclusively on productivity growth. We can practically notice three models of economic growth in the twelve

countries from 2000 to 2010: an economic growth with job losses, in five countries (jobless growth), an economic growth with high employment intensity, in two countries, and an economic growth with low employment intensity, in other five countries. But generally, between 2000 and 2010, at the EU-12 level, as well as at the EU-27 level, output growth was generated with low employment intensity. This means that annual average economic growth of 3.5% was generated by an annual average productivity growth of 3.3% and by an average employment growth of only 0.2%.

Figure 2

GDP per capita in twelve European Union countries, in 2010 (euro/capita)



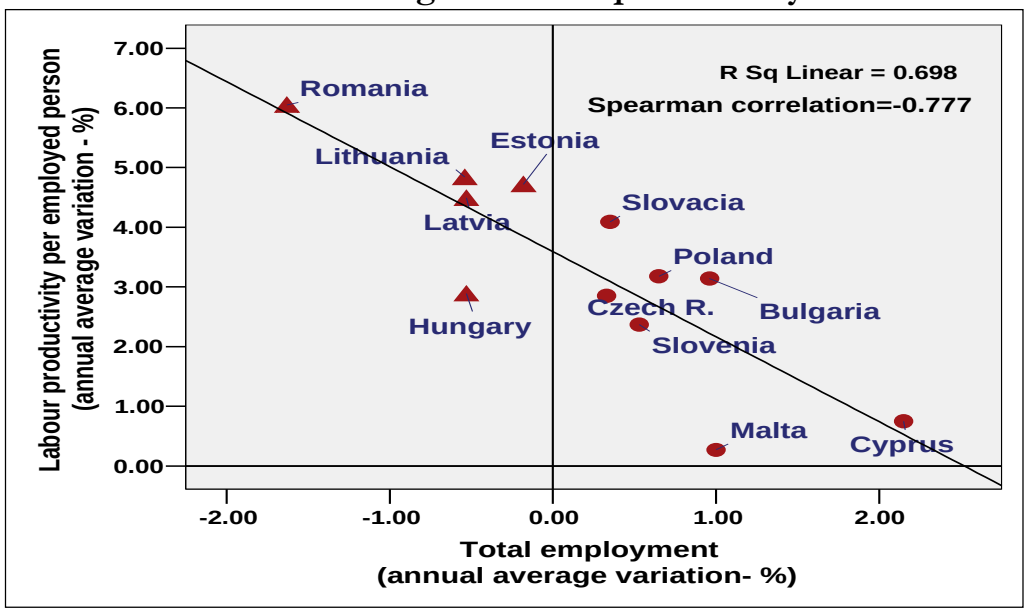
Source of data: EUROSTAT

Data in figure 3 provides a snapshot of the negative interaction between employment and productivity growth from 2000 to 2010 in EU-12. Seven of the twelve countries are in the northeast quadrant, exhibiting both productivity and employment growth. Within this group Malta and Cyprus are differentiated, countries where employment growth is superior to the productivity growth. The five countries in the northwest quadrant record a fall in employment accompanied by productivity growth, the lost jobs being the price paid for an increased productivity. After using the regression and

correlation analysis on data regarding the employment growth and labour productivity growth (figure 3) for twelve EU countries, 2000-2010, we have found a negative significant relationship between productivity and employment growth (Spearman correlation= -0.777).

Figure 3

Negative correlation between annual change in employment and annual change in labour productivity



Source of data: Own calculation based on data in figure 1

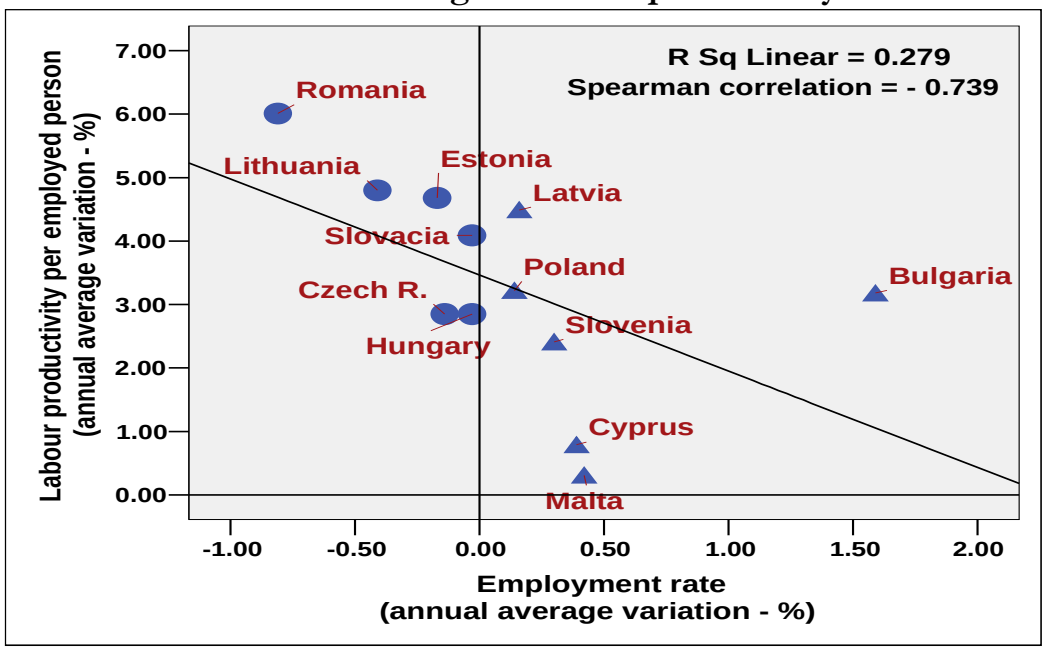
According to data presented in figure 4 the trade-off between employment and productivity is confirmed also when we analyse the relationship between labour productivity growth and growth in employment rate (20 to 64 years).

Although the EU objective was and will still remain that of increasing the employment rate, we can notice that Romania, Lithuania, Estonia, Czech Republic and Hungary recorded a fall in the employment rate in the 2000-2010 period. In 2010, according to data in figure 5, only three

countries recorded an employment rate over the average in EU-27 of 68.6%, more precisely Cyprus (75.4%), Czech Republic (70.4%) and Slovenia (70.3%), countries which also recorded a higher development level compared to the rest of the analysed countries. The economic reality supported by the statistical data in figure 5 shows that the value of the employment rate achieved by the rest of the countries in 2010 is far from the target set in Europe Strategy 2020: an employment rate of 75% for the population aged 20-64.

Figure 4

Negative correlation between annual change in employment rate and annual change in labour productivity



Source of data: Own calculation based on data in figure 1and EUROSTAT

Furthermore, we find a significant negative trade-off between growth in productivity per hour worked and employment rate (20 to 64 years) from 2000-2010 (Spearman correlation coefficient= -0.704). However

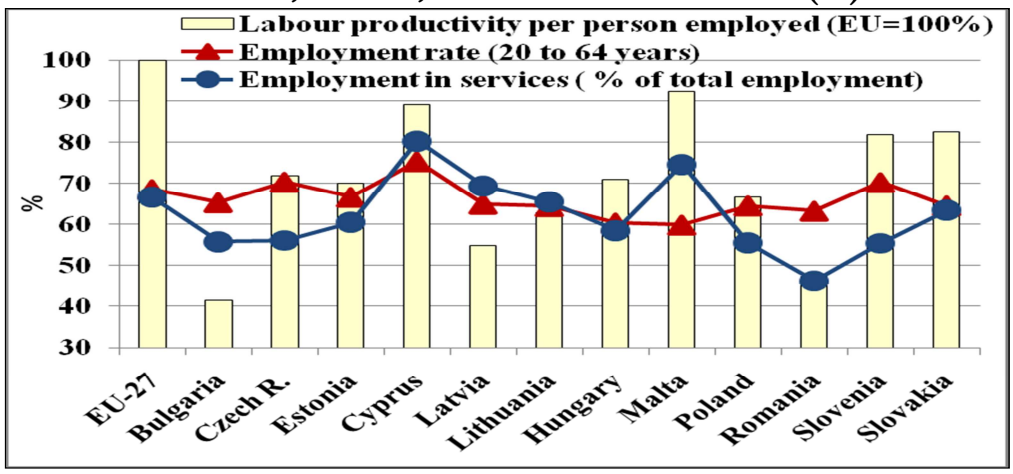
the very low value of the Spearman correlation coefficient, of -0.140 calculated based on data on the growth in hourly productivity and growth in annual average hours worked in EU-12, in the same period, shows that between the two variables there is a very low negative correlation.

The reduction of employment (expressed by employed population and employment rate) or the relatively low employment growth was determined by a series of factors, among which the structural transformations of these economies, taking into consideration that former communist countries in the east and centre Europe inherited an economy based on industry and agriculture, and less on services.

The countries of the European Union have experienced considerable structural change over the past few decades resulting in continuing shifts away from the primary sector (especially agriculture) and traditional manufacturing towards services and knowledge-intensive jobs (Georgescu &Herman). In the last decade (the period between 2000 and 2010), in all 27 EU countries, there has been an employment growth in the services sector, but the highest growth is recorded in the east and central EU (the newer Member States). At the same time, at the EU level one can notice that in countries with a similar stage of development, there is variation in the size and dynamics of the employment in services, which can be determined by the differences in the institutional framework affecting the degree of flexibility of labour and product markets.

Figure 5

Labour productivity, employment rate and employment in services, in 2010, in twelve EU countries (%)



Source of data: EUROSTAT

Statistical data in figure 5 show that, in 2010, Cyprus and Malta, Mediterranean countries, had the highest shares of employment in services, a lot above the average recorded in EU-27, especially in those countries which are characterized by a high level of economic development and a high productivity, fact which proves that the change in the economy's structure, meaning the increase in the services share, provides the necessary conditions for economic development.

Conclusion

The empirical studies carried out for different periods of time and countries, show that, on the one hand, there is a negative relationship between labour productivity and employment, whose intensity depends on time and a country or another, and on the other hand, they emphasize that the increase in labour productivity can and has to generate jobs, especially in the long run.

The results of our study show that in the 2000-2010 period for a panel of twelve European countries there was trade-off between growth in employment and growth in labour productivity. This compromise appears more often as a result of the structural changes that take place in economy. The structural changes made by the central and east European countries of the EU prove to be insufficient under the circumstances in which labour productivity as well as the employment rate is a lot below the average level recorded by EU-27. It is alarming that, in five of the twelve analysed countries, Estonia, Latvia, Lithuania, Hungary, and Romania respectively, the dynamics of the labour productivity and employment has been inverse, meaning that labour productivity has increased, and employment has fallen.

Through our study we aim to emphasise the necessity of taking some measures to increase labour productivity in the new member states, being known that they record significant negative gaps compared to the old member states. In order to increase labour productivity there is need for structural changes so as to have a growth in the importance of non-agricultural sectors in production and employment. Public and private investments are needed which should create decent and productive jobs.

On the other side, growth in education has historically been an important source of growth in labour productivity (Forbes et al., 2010). Our previous research at the EU level (Herman, 2012), shows that there is a positive correlation, of average intensity, between labour productivity and the level of higher education, which confirms the hypothesis according to which people's high level of education is a premise in order to obtain a high level of labour productivity. Within the European single market, information, capitals, people, as well as goods and services circulate fast and free. Moreover, the economic rationality is different at global level compared to the national one. Therefore, radical mutations occur in each member state's strategy in terms of the educational system (Popovici, 2011).

These measures need to take into consideration also the improvement of the conditions on the labour market, so as to assure a high employment rate, reaching the objective set by the EU through the Europe 2020 Strategy – reaching an employment rate of 75% for the population aged 20-64.

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