

POPULATION DECLINE, LABOR FORCE CHANGES AND GDP GROWTH

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Abstract

Romania's population is undergoing a decline in demographic figures and a shift in the population structure, as older generations tend to retire moving to the top part of the age pyramid. This types of transitions are followed by a decrease in economic growth, as a result of a shrinking workforce, lower productivity levels, a more moderate savings rate, and smaller investments. Looking at the labor market in Romania, it is apparent that it is in decline, with a considerable portion of the population approaching retirement, and a lack of workers to take their place. But this reality has not caught up yet with the Romanian economy that is growing at a constant pace. To better understand this phenomenon, a closer look at the labor force is in order using the employment to population ratio, which helps in explaining how the labor force contributes to constant economic growth. The research method is statistical with the aim of determining the changes over time of the employment to population ratio, in relationship to the total population and GDP growth. The expected results are that economic growth is maintained and encouraged by a steady working group of the population that in time has become more proficient and productive thus leading to a constant increase in GDP.

Keywords: Employment to Population Ratio, GDP, Total Population, Economic growth, Productivity

Classification JEL: C12, J11

1. Introduction

A declining population is often associated with decreased productivity, decreased savings, and overall decreasing levels of growth. This is not the case in Romania, where despite a shrinking population, GDP growth is constant due to, in part, a stable employment to population ratio which hovers at a consistent level, covering to a suitable extent the workforce necessities of the labor market.

The constant need for workers will become more noticeable on the part of employers as segments of the active population continue to retire. Thus an increase in demand will begin to push the employment to population ratio in the direction of the population levels with tremendous changes in economic growth.

A generally held belief in economic theory is that the workforce will follow the same direction as a whole as the total population of a nation. If a country has a declining population, it's workforce will accordingly, follow the general trend of the entire population. This same aspect holds true for a scenario where population is experiencing growth. The size of a workforce does not necessarily mean a country is wealthy, there are countries with a small aging population that are wealthy and countries with a significantly young population that are poor (Mankiw, 2011).

This article focuses on the employment to population ratio, a macroeconomic indicator that represents the part of the population that work, produce, spend and save, helping to turn the economic wheel. Furthermore, an explanation of GDP growth is attempted based on a component of the workforce, namely productivity

The expected results are that the steady level of the employment to population ratio, can explain to some degree the steady growth of the gross domestic product (GDP), and at the same time signal a warning, that a significant correction in growth is on the horizon.

2. Theoretical Framework

In current times, population aging is a characteristic feature of demographic changes taking place in many countries and regions. Population projections for Europe show little differences in projected levels, while future changes in the age structure are consistently indicative of an aging population and declining workforce (United Nations, 2017).

Since the '60, Romania's population has changed considerably as a result of high birth rates that surpassed the death rates, thus leading to an increase in the population, reaching a total of 23,2 Million in 1992, then „22,435,205 persons in 2000, reaching 19,913,193 people in 2014” (Cristea et al., 2016, p. 29).

Cristea and Mitrică (2016) presented the fact that, „at a global level, the number of older people is increasing by 2.6% per year, at a faster rate than the annual increase of the entire population, which is increasing by 1.2% per year” (Cristea, Mitrică, 2016, p. 65).

Given the rhythm and the permanent character of population aging, young people are in the process of becoming a numerical minority that coexists with several older generations.

In such circumstances, intergenerational and gender interdependencies should be treated as critical. These interdependencies are affected mainly by social policies.

Cristea et al.(2010), presented the fact that “the economic growth registers irregular evolutions in time, in which the expansion periods follow periods of stagnation. The economic growth rate on long-term is determined by fundamental factors, such as: the economic organization, its productive capacity due to technology, demographic and educational factors affecting workforce”.

The demographic transition process requires a sophisticated political approach, companies must not only guarantee the provision of adequate services, but they must also be economically viable, taking into account the complexity of the interactions between demography and society (Radu & Radu, 2014).

Radu (2007) presented the fact that the elderly are a significant consumer of goods and services, and the active segment of the population is the most crucial factor in the production of these products and services (Radu, 2007).

Prettner (2012) found the existence of a positive relationship between aging and economic growth, as the elderly tend to save more. Making available resources for investments that ultimately positively affect economic growth (Prettner, 2012).

To analyze the sources of economic growth, it is useful to think of the role human capital plays, influenced by the accumulated knowledge (from education and experience) as well as by the skills and expertise of a worker. Usually, the higher the level of education, the higher the productivity of work (Pîrvu, 2012).

Over decades, apparently small differences of a few percentage points in the annual growth rate of human capital make an enormous difference in GDP and GDP per capita. One of the most essential components in the economic growth models, apart from physical capital and technology, is human capital (Pîrvu, 2012).

With the decline of human capital, the economy will shift from traditional production means (employing young workers) to new capital-oriented production (employing retired workers). Therefore, according to this line of argument, an aging population does not affect either production or growth dynamics (Elgin & Tumen, 2010).

Modern economies rely more on machines than on labor, thus a fall in the labor force will not have a significant effect on productivity. As such, labor can be replaced by machines. This means that a drop in younger working groups does not affect economic growth (Elgin & Tumen, 2010).

The primary model attempting to explain economic growth through factors of production with a focus on human capital is the model introduced by Solow (1956). Which describes how

different factors of production, such as capital and labor, affect productivity growth and how the accumulation of elements of production and productivity increase lead to steady economic growth (Solow, 1956).

Thus economic growth can be sustained by a shift in needs from one generation to another, delaying a slowing down in production and growth.

According to Investopedia the employment to population ratio” is a macroeconomic indicator that reveals the ratio of the labor force currently employed to the total working-age population of a specific region” (Investopedia, 2017).

The method of which the ratio is determined is by dividing the number of employed individuals of both sexes and age groups of 15 years and older by the total number of people of working age that live in a specific region as follows (1.1) (OECD, 2002):

$$(1.1) \quad \text{Employment to population ratio} = \frac{\text{Labor Force Employed}}{\text{Total Working Age Population}} \times 100$$

The employment to population ratio is the desired indicator used in the analysis of labor markets, due to its ease of interpretation making it an easy way to draw comparisons over considerable periods of time. Another benefit of using the employment to population ratio is that it incorporates the impacts of labor force participation and unemployment, making it a useful tool when those counteracting forces mentioned earlier change the output of employment.

3. Results and Discussions

Romania’s population has been undergoing a steady decline (Figure no. 1.) from 23,2 Million in 1991 to 23 Million in 1992. This decline accelerates as time passes, in 2003, Romania's population was 21,7 Million, 20,5 Million in 2009 and reaching 19,8 Million in 2016.

Drawing a comparison line between economic growth as measured by gross domestic product (GDP) and total population growth, an inverse correlation can be observed. As population declines, GDP increases, this, however, is not a trend that will last, since population growth is one of the main components of economic growth.

This changes in GDP compared to population growth can in effect be attributed to the post '90 economic expansion and job growth being reflected in the employment to population ratio, that is moving along similar lines with the gross domestic product.

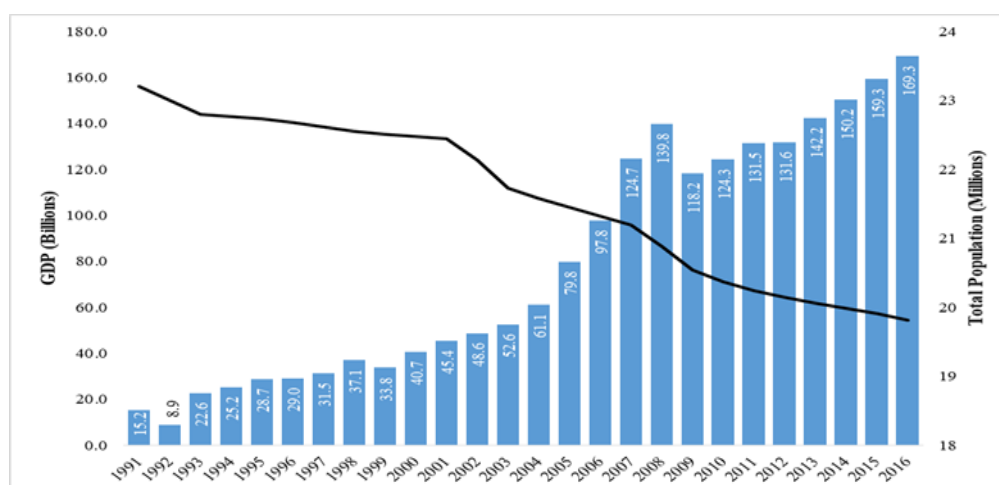


Figure no. 1. Total Population and GDP Growth 1991-2016

Source: Own creation, based on EUROSTAT, INSSE Data

Romania's GDP had seen two periods of decline one in 1992, when GDP, decreased from 15,2 Billion in 1991 to 8,9 Billion in 1992. The second noticeable decrease was recorded in 2009 when GDP fell from 139,9 Billion in 2008 to 118,2 Billion in 1992 as a result of the financial slump that took roots in 2008-2009.

Between 1993 and 1998, GDP grew from 22,6 to 37,1 Billion, followed by a small correction in 1999 where the gross domestic products hit 33,8 Billion. In the period spanning from 2000 up until 2008, GDP grew from 40,7 Billion to a maximum of 139,8 Billion, an increase of 343%, after the 2009 correction, GDP grew from 124,3 Billion in 2010 to 169,3 Billion in 2016.

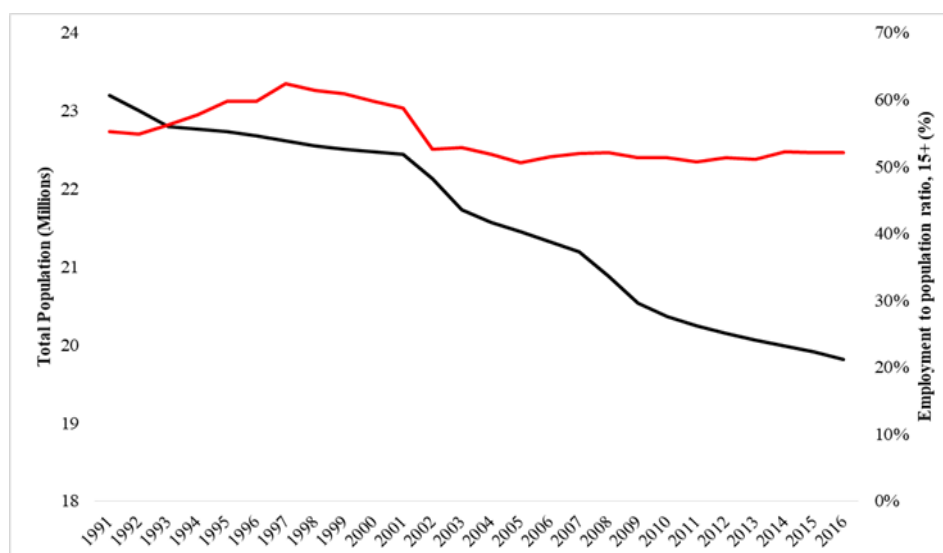


Figure no. 2. Total Population and Employment to population ratio 1991-2016
Source: Own creation, based on EUROSTAT Data

The employment to population ratio is a much more adequate measuring tool that helps determine the real earning power of a population by accurately plotting the part of the workforce that is actively involved in the workplace.

As can be observed from Figure no. 2, even under the shadow of a declining population the employment to population ratio is steady at a level above 50% for the period in question. Since 1991, the employment to population ratio, hovers at 55 %, moving steadily upwards to 62% in 1997, followed by a gradual decline to 51% in 2006. Between 2007 and 2016 the employment to population ratio hovers between 51% and 52% with a recorded value of 52% in 2016.

The employment to population ratio can explain to some degree why economic growth has persisted, even with decreasing demographics, all the while taking into account the fact that it hit a plateau, with growth being suppressed by de effects of a shrinking workforce.

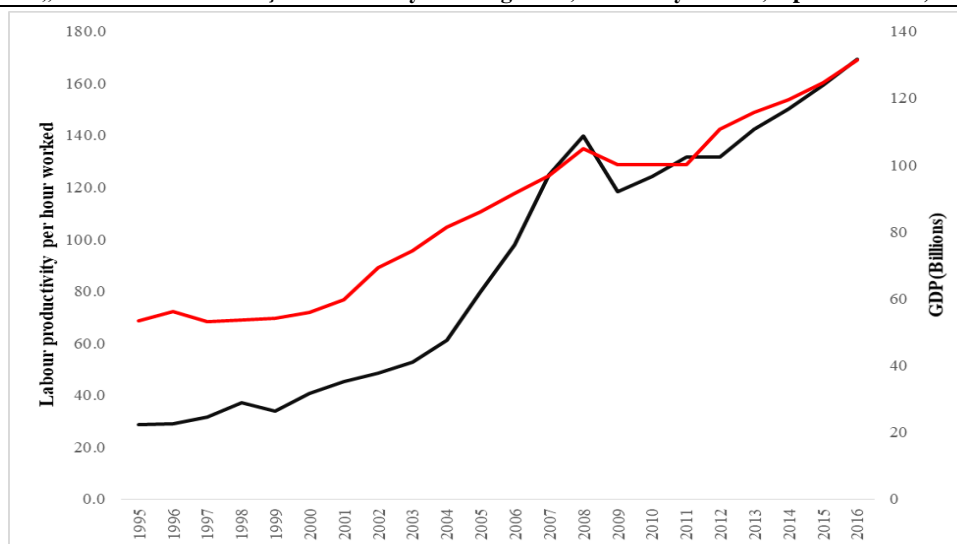


Figure no. 3. Labour productivity per hour worked and GDP 1995-2016
Source: Own creation, based on EUROSTAT Data

To get better understand how the employment to population ratio sustains a stable GDP growth trend, a look at the changes over time of both indicators is required. The labor productivity per hour worked rose from 53,4 units per hour in 1995 to 91,4 units per hour in 2006, when GDP growth caught up to the rise in productivity. From 2007 to 2016 both indicators moved in tandem in a similar direction, GDP growth resulting from the constant increase in labor productivity which reached a level of 131,5 units per hour and GDP to 169,3 Billion Euros.

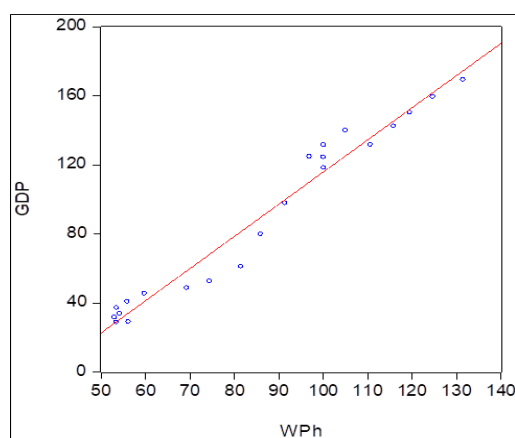


Table no. 1. Covariance Analysis between GDP and WPh
Source: Own creation, based on EUROSTAT Data

Covariance Analysis: Ordinary
Date: 10/18/17 **Time:** 19:21
Sample: 1995 2016
Included observations: 11

<i>Correlation</i>	<i>WPh</i>	<i>GDP</i>
<i>t-Statistic</i>		
<i>WPh</i>	1	0.98211
<i>GDP</i>	0.98211	1

The active link between labor productivity and GDP is to a great extent confirmed by the help of covariance analysis, where a high correlation of 0.98 can be observed. This indicates that the employment to population indicator can explain through the increase in productivity the constant growth in GDP.

4. Conclusions

Despite a steady population decline, Romania's gross domestic product (GDP) has seen a steady growth, to some extent defying the shrinking workforce that is one of the leading components of economic growth.

To a certain degree, this fact can be explained by the employment to population ratio, which has held a steady level over the period between 1991 and 2016, stabilizing in the last decade despite a smaller and smaller workforce.

This is a concerning fact, new job growth needs to be sustained by rising employment levels, a shrinking work-force will fail to deliver the necessary workforce thus, over the following decades a reversal in GDP growth will be observed.

The growth in GDP that can be observed in the period in question, can be to a certain degree explained by the rise in productivity, that has seen increasing levels due to a better prepared workforce, better machinery and equipment and due to a shift to more productive sectors of the economy.

More emphasis by governing bodies must be placed on increasing birth rates, raising the retirement age, increasing productivity and migration back to the workforce to cover the domestic needs.

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