

# LABOR SHARE TRENDS IN THREE BALTIC COUNTRIES: LITERATURE REVIEW AND EMPIRICAL EVIDENCE

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**Abstract.** *Long-term stability of relative shares of production factors – labor and capital – was an implied fact for a long time. However, recently empirical data have become available, and several authors have presented a conclusive evidence showing a worldwide decline in labor share, which is especially manifested in continental Europe.*

*Despite the recent scientific interest in the stability of labor share, the trend analysis for small open economies such as the Baltic countries is very limited in the scientific literature. Therefore, this article aims at analyzing theoretical literature and empirical evidences on the changes in functional income distribution with the focus on the Baltic countries while also providing interpretations of the possible causes for this shift. Authors primarily focus on labor share trends in Lithuania, Latvia, and Estonia, while stressing the importance of the correct measurement of this indicator.*

**Key words:** *labor share, Baltic countries, small open economies, functional income distribution.*

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## Introduction

Income distribution is a widely discussed topic among politicians, scientists and in society. In the last few decades, there has been a great deal of research analyzing the gap between the rich and the poor, skilled and unskilled workers. Inequality of income among individuals and households has captured attention of scientists from all over the world. Nevertheless, another important aspect of income distribution has been forgotten by scientists until the late 1990s. Functional income distribution, which explores dissemination of value created among main factors of production – labor and capital – has been comparatively under-researched in the scientific literature. This fact is rather surprising, since the functional income distribution reveals the relationship between employers and employees, which has a great effect on many aspects of economic and social life. According to Rodriguez and Jayadev (2010), understanding income distribution between labor and capital is essential for grasping the dynamics of the entire economy. Changes accruing to functional income distribution have significant macroeconomic implications, since they affect national growth rates, aggregate demand, and other factors. At the

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same time, functional income distribution can have implications on separate individuals through changes in wages and employment. For instance, if increasing foreign investment and productivity gains are absorbed by foreign capital owners, the standard of living among the local population can develop much slower than expected, i.e. wage moderation would take place (Decreuse, Maarek, 2007). Furthermore, according to Daudey and Garcia-Penalosa (2007), changes in labor share can also significantly affect the GINI coefficients, which point to increasing income inequality among households<sup>1</sup>. Despite its obvious importance, this macroeconomic aspect of income distribution for a long time was explained by the theoretical conception that income shares are stable over a long, run, and until lately there were insufficient empirical data to prove otherwise.

Recently, the discussion on changes in income distribution between capital and labor has been revived. One of the most recent contributions in this respect was made by Piketty (2014); his book focusing on capital and inequality attracted immense interest from the economists worldwide. Piketty (2014) argued that the returns from capital are growing faster than the economy itself, thus capital owners are able to retain more wealth than others. This stressed the importance of changes in income distribution between labor and capital.

Furthermore, several other authors have presented a conclusive empirical evidence showing a worldwide decline in labor share, especially manifested in continental Europe (Blanchard, 1997; Berthold, Fehn, Thode, 1999; Rodriguez, Jayadev, 2010; EC, 2007; Giovannoni, 2008, etc.). Once empirical evidence was available, economists started to study not only the dynamics of factor shares but also factors responsible for the changes in income shares of labor and capital (Bertolila, Saint-Paul, 2003; Bertoli, Farina, 2007; Diwan, 2001; Giovannoni, 2008; Guscina, 2006; Harrison, 2005; Rodic, 1998; Slaughter, Swagel 1997; Stockhammer, 2009). There is no generally accepted single theory of functional income distribution or a unified measurement of factor shares. Most of attempts to analyze dynamics in income shares look at panel data of groups of countries, for instance OECD (Stockhammer, 2009; Guscina, 2006; Bertolila, Saint-Paul, 2003; Blanchard, 1997). There have also been several attempts to analyze changes in the functional income distribution in single countries such as the US, Germany, France, Italy (Poterba, 1997; Stockhammer, Hein, Grafl, 2007; Hein, Vogel, 2007; Torrini, 2005). Nevertheless, research has been mostly limited to large countries, while small open economies<sup>2</sup> such as the Baltic countries (Lithuania, Latvia, and Estonia) are rarely mentioned in the research related to functional income distribution. According to Stockhammer, Onaran, and Eder

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<sup>1</sup> Factor distribution of income is also regarded as a key component of income inequality by Dauley and Garcia-Penalosa (2007), Guscina (2006), Checchi and Garcia-Penalosa (2010).

<sup>2</sup> The authors define small open economies as active participants in the international trade and price takers in the world market.

(2009), small open economies might have essential differences from large economies, which might cause economy to shift from wage-led to profit-led due to larger import and export shares. This research will aim at filling this gap in the scientific research through the analysis of the *functional income distribution in the Baltic countries*.

Lithuania, Latvia, and Estonia as the Baltic countries have undergone a rapid economic restructuring by moving from fully centrally planned socialist to rather liberal open market economies, while opening their borders and leaving their citizens' incomes vulnerable to international competition. Their labor shares were very volatile and, as in other continental European countries, have declined over the medium term. At the same time, wages have lagged behind productivity in recent years and unemployment persisted after the economic crisis despite high levels of emigration. Thus, this research will aim at analyzing changes in the functional income distribution in the Baltic countries and will discuss their macroeconomic implications.

### **Definition of income distribution: personal versus functional**

Before starting the analysis, it is important to clearly outline the main terminology and concepts used in this research. We shall start from the general concept of income distribution.

Classical economists were mainly concerned with income distribution between the main factors of production (labor, capital, and land), however, later this focus has shifted towards income at the microeconomic level, among households and individuals. Therefore, income distribution in scientific literature is generally separated into *personal income distribution* and *functional income distribution*. Research on personal income distribution is mainly oriented towards the equal distribution of income among the representatives of different types of households, employee classes, skilled and unskilled workers who possess different levels of education, experience, etc. This type of research often employs micro level data obtained from surveys and other similar sources, and measures of inequality, such as the GINI coefficient. Whereas, functional income distribution is often associated with macroeconomic analysis, which refers to income distribution among the main production factors – capital and labor, i.e. relative income received by owners of the factors of production.

Personal income distribution, micro or household level analysis often focuses on households' disposable income obtained from various sources such as labor, capital, self-employment or social benefits and aims at showing the difference between household consumption and welfare. Functional income distribution, on the other hand, strictly separates income sources, and its research aim is to analyze macroeconomic processes. Changes accruing to the functional income distribution have significant macroeconomic implications, since they affect national growth rates, aggregate demand and other fac-

tors. Thus, two approaches complement each other. Nevertheless, most literature on income distribution tends to focus on changes in wage inequality, and much less attention is devoted to the macroeconomic aspect of the issue.

Often improvements in national macroeconomic indicators are assumed to be proportionally translated into incomes of individual households without actual research (Atkinson, 2009). Nevertheless, this is often not the case. For instance, the effect of globalization on economic growth was rather immense, but income inequality has amplified in the majority of countries. Furthermore, capital is concentrated in the hands of few percent of population and now constitutes a larger share of national income than before in the majority of countries (Dew-Becker, Gordon, 2005). This argument is also supported by Piketty (2014), who was able to present extensive data in this respect. Piketty also points out that this process has cumulative effects, thus capital owners might even further extend their wealth when compared to those who retain only labor income. Thus, this research will move in the lines of most recent renewed interest in functional income distribution and will show whether national income in the Baltic countries is proportionally distributed between the owners of capital and labor.

## **Overview of theoretical research on the topic of functional income distribution**

Before proceeding to an overview of recent scientific contributions in the field of functional income distribution, it is important to understand its origins and history.

Income distribution has always been a fundamental concern of economic theory. Its roots can be traced to the works of classical economists such as Adam Smith, Thomas Malthus, and David Ricardo. Later on, their followers have developed different theoretical and conceptual points of view and divided themselves into different schools of thought. However, all of them tend to focus on the basic economic concepts including factors of production and remuneration (profits and wages) for their inputs. One of the approaches to the distribution of income is neoclassical which sees resource allocation and factor prices as the central issues of income distribution. It postulates that each factor of production is paid its marginal product, and factor prices are determined by relative factor supply and demand interactions in a perfectly competitive market. For instance, wages above the “natural” level would increase the supply of labor and increase prices. This school of thought has provided us with the marginal productivity theory of distribution, which assumes a competitive market in both product and labor markets, ensuring the fair distribution of income. Therefore, profits and wages depend on the scarcity / abundance of factors, preferences, and their productivity (technology). Furthermore, assuming that factor endowments do not change, the labor demand curve will be determined by technology, and the labor supply curve will depend on prefer-

ences (Stockhammer, 2009). This relationship can be easily expressed by an aggregate production function with two factors of production (capital and labor), such as the standard neoclassical Cobb–Douglas aggregate production function where capital and labor are determined by production technology, which in turn correspondingly increases the marginal products of capital and labor in order for employees and employers to benefit equally from technological progress (Kristal, 2010).

In neoclassical economics, the factor substitution plays a significant role in ensuring a balance between savings and investment. To generalize, if the elasticity of substitution between capital and labor is equal to 1 and there are constant returns to scale as assumed by the Cobb–Douglas production function, then the relative factor shares should remain stable.

Up until the end of the 20<sup>th</sup> century, scientists observed the phenomena of stable factor shares over a long period of time; therefore, the constancy of factor shares was more implied than explained by the neoclassical marginal productivity theory. On the other hand, Solow (1957) offered an explanation of constancy by relaxing assumptions of the Cobb–Douglas production function, which was in line with marginal productivity theory of neoclassical economists. He tried to explain the observed constancy in terms of labor-intensive technological progress which compensated the observed increase in the capital–labor ratio, as the capital and technologically augmented labor ratio remained constant, i.e. the technological substitution of capital and labor.

Another view, coming from rather different theoretical perspective, is expressed by the so-called post-Keynesian economists such as Kaldor (1957) and Pasinetti (1962). Some call these theories “heterodox” rather than Keynesian, since Keynes himself did not explicitly concentrate on income distribution in his *General Theory* (Giovannoni, 2008). His focus was more laid on short-term determinants of output and employment (Stockhammer, 2009). Nevertheless, Keynes provided valuable suggestions in respect of the effects of income distribution on employment, the level and composition of aggregate demand. He assumed diminishing marginal returns, thus with a fixed amount of capital prices would be higher when the output increased, leading to an inverse relation between employment and the purchasing power of money wages. This also suggested an inverse relation between labor share and effective demand, output and employment (Kregel, 1978).

According to Kregel (1978), the distribution of income in the post-Keynesian theory extended Keynes’ ideas by stressing the role of investment in determining not only output and employment, but also the relative shares of labor and capital in the economy. As opposed to the neoclassical view, they stipulated that propensities to save from wages and profit differ, thus the critical role in determining the division of income between profits and wages should be attributed to aggregate savings and investment. Post-Keynesians

did not recognize the role of technology or bargaining power in their models (Stockhammer, 2009) and assumed that since the propensity to save from profits is higher, the level of investment divided by national output should determine the share of profits in the national income (Kaldor, 1957), i.e. post-Keynesian theories see factor shares as endogenously provided by the investment behavior of firms. Nevertheless, such view has also received its fair share of criticism. The main fault related to Kaldor's work is often associated with over-restrictive assumptions. He made assumptions that the productivity of capital and labor, as the well as capital-labor ratio and the distribution of income are constant over a long term. Thus, Kaldor is often associated with the stability of factor shares; this phenomenon is also often called a "stylized fact of economic growth". Solow (1957) was one of those who questioned this fact and criticized Kaldor's assumptions. Nevertheless, Pasinetti (1962) further corrected Kaldor's model to assume that the share of profits also occurs to workers, i.e. they also receive profits. Thus, their overall propensity to save does not match the propensity to save from wages and even though workers' saving behavior affects the distribution of profits between the two classes, their decisions have no influence on the overall functional income distribution<sup>3</sup>. The main conclusion of Kaldor's calculations is that income distribution is associated with the investment rate, which in turn is a variable of demand. For example, increasing demand for investment (assuming full employment) would increase the total aggregate demand, prices, and profit rates. From this we can see that the capital share depends on the investment-output ratio. Therefore, calculations based on Kaldor's model are often associated with demand-based explanations (Giovannoni, 2008).

The theories of both schools of thought generally assumed full employment and perfect competition, which makes them still rather distant from reality. For instance, the notion of full employment in neoclassical economics is essential, and if this assumption is relaxed, the relationship between wages and the marginal product of labor is no longer clear (Stockhammer, 2009).

On the other hand, the contribution of Marxian and post-Marxian economists to the topic of income distribution was a bit different but also significant. Followers of Marxian theories, such as Goodwin (1967), stress the importance of class struggle on income distribution and perceive the labor share as an inverse function of unemployment. At the same time, it stresses the relationship between labor share and capital accumulation.

Kalecki's (1938) work was one of the first to relax some of the assumptions. He looked at an economy as if without driving forces to the state full employment, i.e. not self-clearing as in neoclassical theories. He allowed for an imperfect competition, assumed that firms have the power to set prices (which are not very responsive to changes

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<sup>3</sup> For more detailed mathematical calculations of this relationship, you can refer to Bertoli and Farina (2007).

in demand) by producing under full capacity, and the policies of the State have the power to restore full employment and change the income distribution. Furthermore, he postulated that the degree of monopoly would have an effect on income distribution. Nevertheless, he did not elaborate much on the factors which might have an influence on the degree of the monopoly itself. He mentioned that the bargaining power of workers would have an effect on a monopoly, but it is unclear how this power would be exerted. Kalecki assumed that marginal propensity to save is higher for capital, thus consumption is expected to increase when wages rise (Stockhammer, Onaran, and Ederer, 2009). Thus, increase in nominal wages will be translated into increase in prices at the expense of competitiveness loss and would not affect the functional income distribution, since prices are not responsive to demand (Stockhammer, 2009). Nevertheless, this cost transferring might be limited in open economies due to international competition and therefore might reduce profits instead (Dunhaupt, 2013). Therefore, from the theoretical perspective, we can conclude that different paradigms offer different approaches to the issue, but only Kalecki's (1971) model was the one at the time that did not rule out possible changes in the functional income distribution.

A more recent theoretical contribution on the role of functional income distribution in macroeconomic models was presented by Bertola, Feollmi, and Zweimuller (2005). In the fourth chapter of their book "Income Distribution in Macroeconomic Models" they present an extensive overview of growth models from the perspective of income distribution. Their overview includes the explanations of the Harrod–Domar growth model which identified the conditions of steady growth, and is often followed when discussing the interactions among factor shares, saving propensities and steady growth rates. They discuss the implications of the neoclassical growth model in which factor ownership is a determinant of the saving behavior of an individual. Another important contribution was from Bertola et al. (2005) who also overview the topics of exogenous productivity growth, the bounded marginal product of the accumulated factor and the relationship between optimal savings and sustained growth. Nevertheless, much attention in this work is given to policy implications on factor shares, i.e. distortionary taxation.

Bertoli and Farina (2007) have also analyzed the interplay between factor shares and economic growth. They focus on the possible impact of a significant change in the functional income distribution on interpersonal income inequality. The article also presents an extensive overview of the literature on functional income distribution by different schools of thought and other researchers. The authors try to explain labor share movements by the sectorial composition of production, country-specific factors, the impact of technological progress and institutional changes. Bertoli and Farina (2007) suggest that according to their literature analysis there should be a positive association between the size of the capital share and economic growth. However, in the recent decade, the

growth of OECD and European countries was sluggish and did not reflect this statement. The authors suggest that there might be methodological issues to produce a consistent measurement of factor shares, accounting for self-employment, or changes in the sectorial composition of production. For these reasons it is difficult to compare the findings and to find them consistent.

Another recent and extensive theoretical contribution comes from Hein (2012), his book “The macroeconomics of finance-dominated capitalism – and its crisis” where the redistribution of national income between capital and labor is stressed. The author argues that financialization has affected long-term developments. The primary focus is put on the channels through which financialization impacts changes in the distribution, investment in capital stock, and consumption. Hein further extended his research in the following year (Hein, 2013), where he integrated the financialization factor into the Kaleckian approach and summarized the channels through which financialization and liberalization have contributed to labor share decline since the early 1980s in advanced capitalist economies.

One of the most recent theoretical overviews of current developments in labor share is presented by Dunhaupt (2013) who focuses on the evolution of labor share in selected OECD countries. This work summarizes different theoretical perspectives and available empirical literature on potential explanations of labor share declines. Dunhaupt also provides extensive recommendations depending on the theoretical perspective of how to stabilize the falling labor share.

To sum up, there are clear differences among different schools of thought. Nevertheless, most of economic models provided by neoclassical, Keynesian and Marxian economists use over-restrictive assumptions of closed economy, and the full employment (Stockhammer, 2009) and relaxation of these assumptions might be problematic in the overviewed models. Stockhammer (2009) further adds that such restrictive assumptions are far from the analyzed situation which is very dynamic, and the medium term should be preferred to the long term in the analysis. This is especially relevant to the Baltic countries which have experienced a rapid liberalization process, structural unemployment, declining labor unions, structural changes, etc.

### **Analysis of empirical studies on the trend of labor share**

Besides Kalecki’s remark about a possibly changing factor shares in an open economy, until recently it has been assumed that relative shares of production factors – labor and capital – are stable over a long term. According to Bertoli and Farine (2007), this phenomenon was even called Bawley’s Law in honor of Arthur Bowley who demonstrated that labor share had remained constant over time, therefore scientific interest to it diminished. Most theoretical growth and capital accumulation models base the factor of share

stability on one of the following factors: the elasticity of substitution among the factors of production is always one, or technological change is only labor-augmenting (Acemoglu, 2003). Nevertheless, Acemoglu (2003) raises an interesting question, why would the firms oriented to profit maximization choose to invest into the innovations that only improve labor-intensive technologies? Recently, after the empirical findings contradicting the status quo started to emerge in the scientific literature, the interest to the functional income distribution has returned.

Numerous authors have presented a conclusive empirical evidence showing a worldwide decline in labor share, which is especially manifested in continental Europe. First scientific attempts to empirically analyze the functional income distribution in the last two decades tended to focus on the trend of labor share itself. Blanchard (1997) was one of the first to question theoretical assumptions on the stability of factor shares over time. He tried to explain the medium term movements in factor shares in OECD countries using the developed model for employment and capital accumulation in a monopolistically competitive market where there are costs associated with the labor–capital ratio adjustments. Blanchard tested this model and tried to explain factor share movements for a particular country (France). He found that relative factor prices did not reflect factor share movements in continental European countries during the period of 1980–1995. This divergence from a stable level, according to the author, can be due to a long time span needed for the adjustment of factor proportions to factor prices. On the other hand, he did not rule out the possibility that the relations between factor prices and quantities have shifted due to the division of rents between workers and employees or capital-biased technological change. Blanchard also tried to prove the effect of bias technological change, but his empirical evidence was weak.

Giammarioli, Messina, Steinberger, and Strozzi (2002) studied the evolution of labor share in selected European Union (EU) countries and the United States (US) with the help of the dynamic labor demand model over the period of 1960–1998. They found that the labor share in continental Europe fell starting the 1980s and onwards, whereas in Anglo-Saxon countries it remained rather constant. They also confirm the importance of employment protection legislation and union power to movements in labor share, i.e. the tighter the legislation, the higher the fluctuations in labor share for similar fluctuations in economic conditions, whereas the de-unionization process in most EU countries is assumed to translate into reduced wage demands and the downwards shift of the equilibrium schedule.

Later, the general decline in labor share was confirmed by the results of Rodriguez and Jayadev (2010). Their research showed a statistically significant downwards time trend of labor share across two large samples (UNIDO and UN datasets). Authors highlighted this trend as a general phenomenon which is not limited to the developed coun-

tries. They also found a decline in labor share across sectors, which could not be solely explained by shifts in production to sectors with a lower average labor share. Another research confirming this trend was performed by Guerriero (2012) who had looked at a sample of 89 countries over the period of 1970–2009 and once again confirmed that labor shares are not constant over time and across countries. She found a general decrease in labor share and extended her research by using the per capita Gross Domestic Product (GDP) measure to relate economic development to labor share. Nevertheless, the author concludes that the relationship between these factors, once labor share is properly adjusted for self-employment, is not straightforward.

An important contribution related to labor share trend developments was also made by the European Commission (2007, ch5) who decomposed labor share into real wage, capital–output ratio, and capital–labor ratio (inverted) in order to show the negative trend of labor share in the EU countries. They found a decline in the labor share trend when comparing two periods (1960–1980 and 1981–2006) in all EU-15 countries. Furthermore, they have stressed that the changes in labor share caused by its components – real wages and productivity – do not fully explain its movements, since short-term developments, such as business cycle fluctuations which effect real wages and productivity, make up only one part of the equation. Long-term trend developments conditioned by structural changes in the underlying economic factors play also an important role. These results further confirmed the lack of stability of factor shares as previously assumed by the early models. The reason for this might be that in a certain economic setting (i.e. intensifying globalization) real wages could be rising due to improvements in labor productivity, whereas labor share might be declining because of the intensifying competition and converging factor prices due to the mobility of capital (EC, 2007). On the other hand, Young (2010) looked at labor share along the lines of Solow (1957) research, studying the US economy in separate sectors, and has found that the relative stability of the aggregate labor share in the US is due to offsetting shifts in different industries.

Despite the abundant research on the stability of labor share, the trend analysis of labor share for small open economies, including the Baltic countries, is very limited in the scientific literature. This is often due to the lack of time series data which for the Baltic countries are available at most from 1993 and allow the analysis only over the medium term. Nevertheless, there is some research related to labor share trends, which includes the Baltic countries. One of them is the International Labor Organization (2011) report which looked at European countries (including Lithuania, Latvia, and Estonia) as a group and found significant fluctuations in their aggregate labor share in the past several years. Nevertheless, this research did not reflect country-specific fluctuations, or the fluctuation in the labor share of small open economies, since it focused solely on the aggregate measure of labor share despite the possible differences between large

and small economies. Sileika, Tamasauskiene and Barteliene (2010), on the other hand, performed a comparative analysis of wages and labor productivity in Lithuania, and as part of their research they looked at the labor share change in Lithuania over the period of 2001–2008. Their findings suggest that labor share in Lithuania increased by 6% over the analyzed period. However, this research shows labor share fluctuations only over a short period of time and can provide biased results on the medium-term interpretation due to timing of the economic cycle reflected in the selected start and end dates of the indicator (Meager, Speckesser, 2011). Also, the authors do not adjust the labor share for changes in self-employment, nor take into account changes in tax rates. However, they recognize the importance of labor share studies. Similar results were obtained by Meager and Speckesser (2011) who also found a labor share increase in Lithuania and Latvia over the period of 1990–2008. Nevertheless, this study also does not adjust for self-employed and use the GDP as an output measure which might also distort the calculations due to differences in tax rates over the analyzed period. The authors recognize the problems with this indicator by stressing its measurement issues. Adjusting for self-employment is important for the Baltic countries since the share of self-employed in the total employment has acted differently in all three countries. It has substantially declined in Lithuania (from 18.7% in 1995 to 10.5% in 2014), suffered a moderate decline in Latvia (from 14.9% in 1995 to 11.7% in 2014), and increased in Estonia (from 6.8% in 1995 to 8.6% in 2014)<sup>4</sup>. Thus, the differences in employment structure over time and among the countries might create serious problems while measuring the labor share trend and comparing it among different countries<sup>5</sup>.

The EC (2007), on the other hand, incorporated the new EU member states (among them the Baltic countries) in its research and found that the adjusted labor share declined in all three Baltic countries as well as in other new EU members and the EU-15 countries. Furthermore, they stressed that the components of labor share (labor productivity and wages) are not able to fully explain the behavior of factor shares. Thus, as seen from the overview of the labor share trend research, there are substantial differences among the results obtained by different authors. Therefore, changes in the functional income distribution in small open economies such as the Baltic countries should be further investigated starting with the correct measurement of the labor share.

## **Measuring labor share**

As mentioned above, labor share measurement issues are widely discussed in the literature. They can also create significant discrepancies among the results if adjustments are not made. Thus, it is important to define the precise measure of the labor share.

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<sup>4</sup> Authors' calculations based on AMECO data (self-employed/total employment).

<sup>5</sup> In more detail, labor share measurement issues are discussed in the section "Measuring labor share".

The most commonly used measure in determining the labor share is the income which is obtained by dividing the compensation of employees by output. The compensation of employees is a preferred measure of income to wages and salaries, since it reflects the total remuneration paid by the employer to the employee (wages, salaries, and employers' social contributions, bonuses, etc.). The main reason behind the use of GDP as an output measure in labor share calculations is the availability of data for a broad scope of countries. When the output is computed using GDP as a measure, indirect taxes are subtracted. However, if the measure of gross value added (GVA) is available for researched countries, it is a preferred measure (Bertoli, Farina, 2007; Arpaia, Perez, Pichelmann, 2009; Rodriguez and Jayadev, 2012; Guerriero, 2012). Therefore, for the purpose of this research, we will use GVA as an output indicator. Its mathematical expression would be the following:

$$LS_t = \frac{EC_t}{Y_t},$$

where  $LS_t$  is labor share,  $EC_t$  is employees' compensation, and  $Y_t$  stands for output.

This calculation reflects the labor share of income over time, calculated using the aggregate data, and disregards the income of self-employed, by attributing it to the share of capital. Scientific community considers it as a significant drawback, especially when analyzing the change in labor share over a longer period of time or using this measure for international comparisons. Even though some authors do not use any corrections and perceive all income of self-employed as capital (Diwan, 2001; Daudey and Garcia-Penalosa, 2007), previous researches show that factor shares are sensitive to methods applied to correct for self-employment (Torrini, 2005). According to Gollin (2002), self-employment represents not only the income of self-employed, but also reflects the level of disguised unemployment. Therefore, the measure of employee compensation used without adjustment for self-employment can reflect a lower than actual labor share due to the fact that self-employment can mask the trend of informal employment (Guerriero, 2012). Whereas, Krueger (1999) argues that an increase in the ratio of employees' compensation over output could be explained by growing high wage sectors and shrinking low wage sectors, such as agriculture, where self-employment was the dominant form of employment. From this, we can assume that changes in the composition of national income might lead to a different level of labor share than that estimated without adjustment for self-employment.

Therefore, different ways of adjusting for self-employment are proposed in the literature. For instance, Guscina (2006) perceives the self-employed income as a mix of capital and labor. Therefore, in her calculations she attributes two thirds of self-employed income to labor share and one third to capital. This method was first proposed by Johnson (1954). It is logical to assume that self-employed income includes some capital and some labor income. The disadvantage of this approach is that it assumes the same mix of capital and

labor in different countries and economic sectors. Besides, most of proprietors (lawyers, dentists, barbers) work in generally labor-intensive industries; therefore, it is logical to consider their income as wages. More accurate approaches involve micro level data such as sex, age and education to estimate wage equations (Young, 1995). However, it is difficult to control the abilities of self-employed, and these calculations are highly data-demanding. Therefore, this is a complex approach, and it is often avoided due to the lack of data for a longer and continued period. Five types of often used adjustments for self-employment are overviewed, and an additional estimation method is proposed by Guerriero (2012). Nevertheless, one of the most common (Bentolila, Saint-Paul, 2003; Harrison, 2005; Torrini, 2005; IMF, 2007) and straightforward adjustments is the one proposed by Gollin (2002). He suggested a pragmatic assumption that wage rates of employees and self-employed are the same, which makes it rather simple but often a sufficient correction. Based on Gollin's assumption, the adjusted labor share is scaled up by the proportion of self-employed in the labor force. This approach is especially handy because data on actual earnings of self-employed are rare and often underreported, whereas data on the composition of labor force are often present (Guerriero, 2012). Its mathematic expression would be the following:

$$ALS_t = \frac{\frac{EC_t}{E_t} * TE_t}{Y_t},$$

where  $ALS_t$  is the adjusted labor share for self-employment,  $TE_t$  is total employment, and  $E_t$  is the number of employed persons. This could be simplified to

$$ALS_t = \frac{EC_t}{Y_t} * \frac{TE_t}{E_t}.$$

This estimation of labor share provides us with its better estimate. The advantage of this approach is that it eliminates guessing but attempts to account for self-employed income. One should be careful with this estimation if there are substantial differences between the incomes of employees and self-employed; also, if self-employed possess substantial amounts of capital, then the labor share will be overstated. Nevertheless, according to Young (2010), such adjustments do not appear significant enough to distort the calculations.

### **Labor share trend analysis in the Baltic countries**

As discussed in the literature overview, the labor share trend shows a declining tendency in the majority of countries in the last two decades. As is seen from the figure below, the Baltic countries are not an exception. Colored lines in the figures show the adjusted labor share measure taken from the AMECO database, whereas black lines show the underlying trend over the analyzed period.

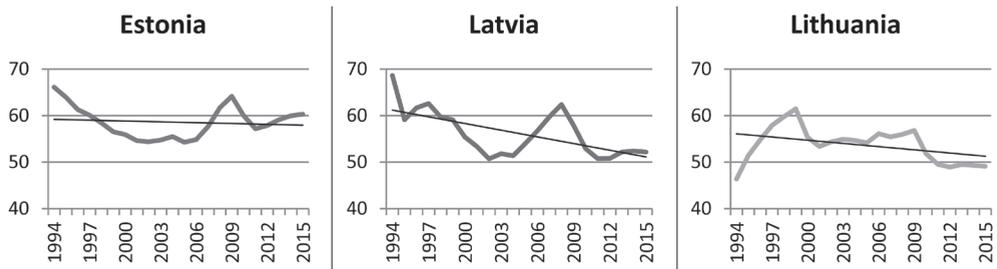


FIG. 1. Adjusted labor share<sup>6</sup> in the Baltic countries, 1994–2015 (in % of GDP at factor cost)

Source: authors' compilation based on the AMECO database.

The adjusted labor shares in all three Baltic countries follow the downwards trend. This is consistent with the general development for labor share across Europe. Nevertheless, in Lithuania and Latvia the labor share in national income has declined substantially, whereas in Estonia the declining trend has been modest in the past twenty years. Also, the adjusted labor share in the Latvia and Lithuania has been around or slightly below 50% of the national income in recent years, which is much lower than the EU-27 average of around 65% since 2010<sup>7</sup>. This can be seen in Fig. 2 which shows the level of wages across the countries.

One could argue that the low level of wages could be attributed to the comparatively low levels of productivity when compared to other countries. Nevertheless, for example, monthly earnings in Lithuania are much lower than in most European countries. Based on the Eurostat data, we can see that the average gross monthly wages in Lithuania reach only 24.5% of the EU-27 average in 2010, whereas the productivity in Lithuania in 2010 amounted to 62.6% of the EU-27 average<sup>8</sup>.

The low levels of labor share mean that in the Baltic countries a larger part of “economic pie” is retained by profit owners than in other countries. This might be not only an inequality issue between workers and capital owners, but also have deeper economic implications, such as effect on economic growth. According to the post-Keynesian theory, the marginal propensity to consume is higher from wages than profit, thus, the increase in labor share should have a positive effect on the economy. This statement is also supported by Stockhammer (2009). According to his research, a one percent increase in the European labor share is translated to a 0.17% increase in the GDP.

<sup>6</sup> Labor shares are adjusted to the income of self-employed. More information about the labor share adjustment is provided in the section “Measuring labor share”. These calculations also correspond to the adjustment used by the AMECO.

<sup>7</sup> Calculations based on the AMECO data on adjusted wage share (as a percentage of GDP at factor costs) for the EU-27.

<sup>8</sup> Authors' calculations based on Eurostat database data.

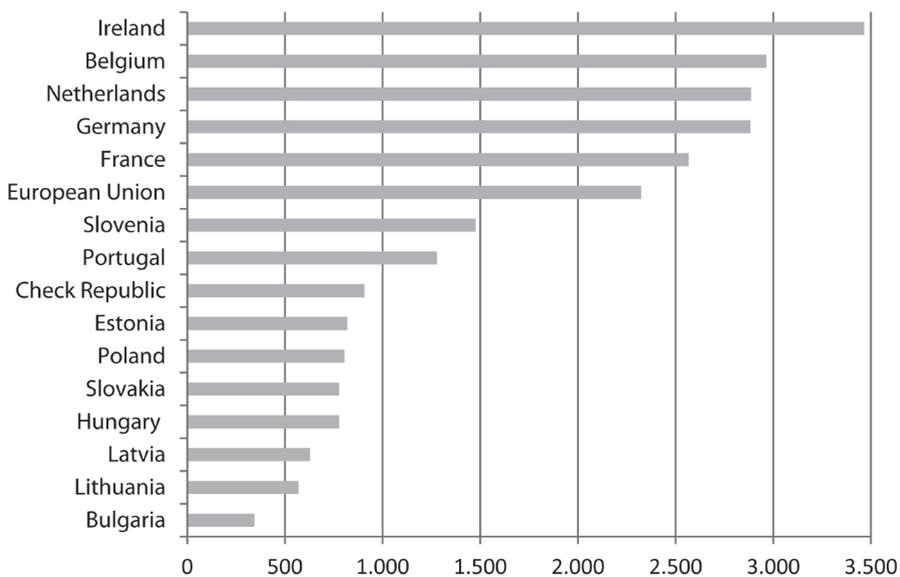


FIG. 2. Average gross wages in Europe in 2010 (in Euros)

Source: authors' compilation based on the Eurostat database.

Interestingly enough, after regaining independence the labor shares in three Baltic countries had rather different starting points (see Fig. 1). The Lithuanian labor share is reported below 50% in 1994, whereas in Latvia and Estonia it is close to 70% of the national income. Thus, large differences in estimations might show that the time series can be sensitive to the starting points of the trends. Furthermore, the analyzed time period is too short to state a clear trend of labor shares in the Baltic countries over a long period of time. Nevertheless, according to Stockhammer (2009), a medium-term analysis is more realistic than the long-term one from the perspective of theoretical economic models, since economies not always perform at full capacity and are open to external markets which are often restricted by most economic theories over the long run. Besides, a medium-term analysis is also more relevant to policy makers (Arpaia, Perez and Pichelmann, 2009).

Furthermore, labor shares in Latvia seem to show a high volatility, whereas Lithuanian and Estonian labor shares have weaker variations. Over the period of 1994–2015, the coefficient of variation for Latvia's labor share amounted to around 8.8%, whereas in Lithuania and Estonia such variations were 7.1% and 5.9%, respectively<sup>9</sup>. Some would say that these countries have undergone large structural transformations, thus the vari-

<sup>9</sup> Calculations of variation coefficients are based on the AMECO data (standard deviation of the adjusted labor share divided by the mean). The same calculation methods are used by the EC (2007) and Arpaia, Perez and Pichelmann (2009).

ation can be, at least partially, explained by the need of real wages to adjust to the productivity levels (EC, 2007). According to Feldstein (2008), it is important to consider changes in the overall compensation of employees rather than a narrower measure of wages, since the latter measure includes not all benefits provided by the employer, which might differ among countries and in time; thus, selecting the compensation of employees' measure instead of wages makes national and international comparisons more precise. This argument is also supported by Bosworth and Perry (1994).

From the empirical standpoint, the data show that productivity has been constantly increasing over the analyzed period, with short-term exemptions. At the same time, wages in the analyzed countries have also risen, but they underperformed the productivity growth; thus, the wage gap has persisted and might be one of the factors putting pressure on the labor share (see Fig. 3).

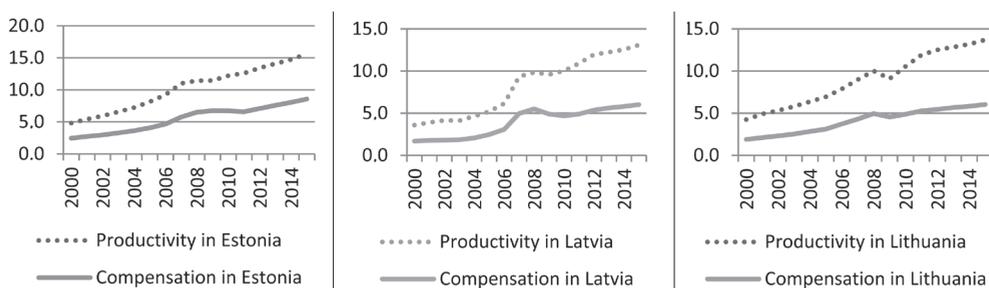


FIG. 3. Labor productivity and compensation of employees in the Baltic countries in 2000-2015 (EUR/hour)

Source: authors' compilation based on the AMECO database.

Note: labor productivity is measured as an output per hour of labor input (GDP at factor cost to total hours worked), and wages are measured as an employee's compensation per hour worked.

Economists in general agree that productivity growth should be followed by wage growth, and this raises the living standards (Cashell, 2004). According to Cashell (2004), this relationship is based on the assumption of diminishing marginal productivity under which an additional hired worker will be less productive than the previous one unless the demand for goods produced increases or the technology advances to increase productivity. Thus, increasing productivity should increase the demand for labor, which in turn will push wages up. However, as seen from Fig. 3, productivity growth is not fully realized in compensation increase, i.e. the wage gaps over time have persisted in all three countries. This might be due to the fact that productivity adjusts much quicker to the changing economic conditions than wages due to wage rigidities which condition a slower adjustment. According to Meager and Speckesser (2011), since the increase in wages does not fully realize the gains in productivity and wage gaps persist, relationship

between wages and productivity cannot fully explain labor share developments. This finding is also supported by the results of the EC (2007). Furthermore, the Baltic countries have undergone substantial economic and structural changes over the last twenty years; besides, their labor shares are rather volatile, therefore, it would be interesting to investigate not only the trend but also the driving forces behind these changes (Paceb-utaite, 2014).

## **Conclusions**

The shares of production factors were assumed to be stable over the long-run. However, this has been questioned by scientists in the last two decades. The availability of empirical data made it possible to show that labor shares are declining in the majority of countries. Multiple research has been conducted on this topic, however, the majority focus on the groups of countries such as OECD or large countries such as the USA, Germany, etc. This could be explained by data availability issues. However, in this dynamic and rapidly globalizing world it is also important to analyze small and open economies, such as the Baltic countries which have undergone substantial changes in the last twenty years by moving from social to market economies.

The analyzed literature stressed the importance and different views of measuring factor shares. Based on the theoretical analysis, the authors tried to propose a correct measurement of the labor share. The focus of this article has also revealed that there might be differences between small and large economies in respect of the functional income distribution, especially when considering structural differences and the level of openness, which further stressed the importance of the research.

After analyzing the literature, the authors have found that the labor share in the Baltic countries has been following the overall European trend downwards. However, the labor shares of the three small and open Baltic countries have showed a significant short-term volatility. Furthermore, the overall levels of labor share are low in these countries as compared with the European level.

At the same time, the wage levels do not reflect the growth in productivity, allowing a wage gap to form. Nevertheless, the size of the wage gap is still not able to explain the decline in the labor shares; thus, it would be logical to conclude that there must be other factors affecting the labor share decline. Thus, the further research could focus on the effect of exogenous factors on the labor share. Some of the factors could be the declining bargaining power of employees, globalization, macroeconomic policies of the state (minimum wage, active labor policies, etc.), increasing emigration which is very relevant for the Baltic countries, changes in the size of the shadow economy, and others.

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