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# ANALYSIS OF LABOUR INCOME IN THE CONTEXT OF THE STRUCTURE OF LATVIAN NATIONAL ECONOMY

## АНАЛИЗ ТРУДОВОГО ДОХОДА В КОНТЕКСТЕ СТРУКТУРЫ НАРОДНОГО ХОЗЯЙСТВА ЛАТВИИ

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**Abstract.** This empirical paper seeks to examine the wage share in Latvia from 2008 to 2013, applying detailed breakdown of national economy by sectors and industries, in order to investigate the impact of employment structure on the wage share and its alterations during a short-term period. The conducted research showed that an aggregate wage share of the whole economy mostly changed because of varying employment share rather than changing wage share inside the particular subdivision of national economy.

**Keywords:** labour income, wage share, employment, national economy, structure, inequality.

### 1. Introduction

The world is slowly recovering from the recent crisis and prolonged recession, though economy and labour market are still far from sustainable positions. Nevertheless nowadays the world is also dealing with another major economic and social problem – inequality.

Economists generally think of three similar rates of economic imbalances: inequality of wealth, income and consumption [1]. Income inequality is the most commonly used metric. The analysis of income inequality comprises studying disparities of income distribution among nations, as well as among social groups. Nowadays economists are more concerned about inequality within nations. In every society three parts can be marked out in the income inequality: inequality in labour income; inequality in the ownership of capital and the income to which it gives rise; and the interaction between these two terms [2]. In economics there is such a factor as labour share, which is considered to be a highly informative macroeconomic factor to explore, when analysing income inequalities within and across countries.

In macroeconomics it is generally assumed that total value added is produced with two major input factors – capital and labour. Therefore, one part of value added is attributed to capital – capital share (it should be noted that in this case capital income includes corporate profit, net interest, rental income, and proprietor income), and another part is ascribed to labour input factor – labour share. The

labour income share is considered to be a good indicator of the extent to which national income (or GDP, or gross value added) is distributed among capital owners and workers. Thus, the labour income share is defined as the share of GDP or gross value added, which is paid to workers.

The labour share or labour income share is also frequently called the wage share; however, there is a difference. While labour share includes all compensation to employees, the wage share takes into account only wages and salaries paid to the employed people. To our concern, as wages and salaries represent a considerable part of labour income and, consequently, disposable income, it is particularly necessary to make assessment of wage share and its changes.

Furthermore, almost over the last three decades economists increasingly emphasize their attention to the widespread opinion of decreasing labour as well as wage income share's in the total value added in favour of capital share during a long- and mid-term period.

Moreover, nowadays economists are also concerned about the structure of national economy. As *Stiglitz* noted in his work [3], structural transformation of national economy has a big effect on developing sustainable economic strategy.

Accordingly, this paper focuses on the examination of wage share, as the factor of income distribution, in Latvia from 2008 to 2013, applying division of national economy by three main sectors and ten groups of industries, in order to investigate the impact of employment structure on the wage share and its alterations during a short-term period. Methods applied – structure and dynamics analysis, comparison, decomposition and variable-weights apportionment method.

## 2. Methodology. Measures of the wage share and its changes

The labour income share can be calculated using data from national accounts. A widely used approach is to compute labour income share as the share of employee compensation in GDP, while employee compensation incorporates wages, salaries (in cash and in kind), all other bonuses and allowances, plus social contributions of the employer. Broadly speaking, the labour share measures the ratio of total labour compensation to gross domestic product. In this paper the author used the wage share (*WS*) – the ratio of wages and salaries (*W*) paid to employees to GDP or value added (*VA*) where it was possible to obtain. Accordingly, for calculations of wage share the following basic formula was used:

$$WS = \frac{W}{VA} \quad (1)$$

For almost two decades the debates about labour share's measurements and its improvements have been appearing continuously (consequently about the wage share, too). As *Kruger* [4] and *Gollin* [5] pointed out, the main drawback of this basic computation method is that compensation for employees does not include the labour income of the self-employed, while a part of income earned by self-

employed obviously represents the labour income. While such adjustment isn't made, the wage share's values are underestimated. Therefore, the author have adopted *Gollin's* third adjustment [5] to the number of self-employed, as the third *Gollin's* adjustment focuses on imputing employee compensation for those workers who are self-employed, and this adjustment implies that the self-employed command essentially the same wages as people who work as employees [5].

Accordingly,  $TE$  is a number of total employment (employed people), but  $E$  – a number of employees, while the total employment ( $TE$ ) comprises the number of employees ( $E$ ) and self-employed ( $S$ ), thus wage share adjusted by the number of self-employed ( $WS_{adj}$ ) for the whole economy, making decomposition of national economy on  $i$  sectors ( $i =$  primary sector, secondary sector, tertiary sector), either  $i$  industries, for each time period  $t$ , can be calculated using the following formula(2):

$$WS_{adj\ i,t} = \sum \frac{W_{i,t}}{VA_{i,t}} \times \frac{TE_{i,t}}{E_{i,t}} = \sum \frac{W_{i,t}}{VA_{i,t}} \times \left( \frac{E_{i,t} + S_{i,t}}{E_{i,t}} \right) = \sum \frac{W_{i,t}}{VA_{i,t}} \times \left( 1 + \frac{S_{i,t}}{E_{i,t}} \right) \quad (2)$$

In terms of this research the author applied the first part from the right side of the equation (2) for calculating wage share for total economy in the years 1995-2014, while in the years 2008-2013 with decomposition of economy by sectors and industries, the author used the last part from the right side of equation (2).

Furthermore, in order to understand how the structure of national economy impacted the income of and its distribution among employed people during the years 2008 – 2014, the weights were used. Considering the three concepts of inequality proposed by *Milanovic* [6], the author took over the second concept, which implies that the difference of income inequality lies in the fact that the size of the population of the countries are taken into account. Thus, in contrast to the number of existing research papers, where labour share was applied, weighted by the share of value added (based on research of: *de Serres et al.* [7], *Lawles* [8], *Giovannoni* [9]), the author examined the wage share in the sectors and industries of national economy weighted by the share of employees in the corresponding subdivision of the economy. Furthermore, to have a better look at the composition of wage share's changes a shift-share decomposition was also made, partially adopted methodology of *Arpaia* [10], *de Serres et al.* [7] and *Giovannoni* [9]):

$$\Delta WS_{i,t} = \underbrace{\sum \Delta ws_{i,t} \cdot \overline{\alpha}_{i,t}}_{\text{Effect of share's varying within sector}} + \underbrace{\sum \overline{ws}_{i,t} \cdot \Delta \alpha_{i,t}}_{\text{Effect of changing sector's weights}} \quad \text{where} \quad \alpha_{i,t} = \frac{E_{i,t}}{TE_t} \quad (3)$$

In accordance with (3), the shift of wage share ( $\Delta WS_{i,t}$ ) of specific subdivision  $i$  (which stands for the particular sector, or industry) of national economy, in time period  $t$ , results from the changes of sectoral labour share ( $\Delta ws_{i,t}$ ) when sector's weights ( $\overline{\alpha}_{i,t}$  – average change of weights, employment

share, where  $E$  – number of employees in the corresponding subdivision,  $TE$  – total number of employees in the economy) remain constant. On the other hand, the shift of wage shares ( $\Delta WS_{it}$ ) can occur from changes in sector's weights ( $\Delta \alpha_{it}$ ), while the wage share remains constant ( $\overline{ws}_{it}$  – average wage share). In other words, the first summand represents changes of the wage share in the sector, while the second summand – the effect of a change in employment structure in the economy. This method of decomposition could be applied to the whole economy, as well as to the division of national economy by sectors or industries.

In order to conduct the research of wage share and its changes in Latvian national economy, the data was obtained for the years of 1995-2014 with precise analysis of the years 2008-2013. In order to conduct a validation research, a statistical data of GDP, value added and employment was mainly received from the State Committee on Statistics of Latvia.

Furthermore, the structure of national economy accordingly to *C. Clark's* division by the three sectors (agriculture, industry and services or the primary, secondary and tertiary sectors) was used in this paper, being the most applicable and traditional in economics. While to getting a more comprehensive assessment of the wage share in Latvia, the decomposition of national economy by ten groups of industries in terms of NACE Rev.2 was also made.

### **3. Latvian GDP and labour income in 1995-2014**

Latvia has been an independent country for almost twenty five years and for more than ten years it is a member-state of the European Union. During this period Latvia has undergone considerable changes on its way of development and growth. The first decade of the reestablishment of independence was marked as time of extensive economic, social and political changes.

In the early 1990s Latvian industrial sector experienced major problems in comparison with agriculture and services. Along with the reestablishment of independence Latvia and specifically industrial sector lost its main channels of raw material resources and sales area of the former Soviet Union. Moreover, the obsolete industrial equipment and technologies impeded manufacturing of modern production that would meet global demand standards. Thus, industrial production declined sharply, causing high unemployment [11]. During this period importance of agriculture in the structure of Latvian national economy in terms of output and number of employees also declined, while the services experienced the raise of significance [12]. These changes, as well as high unemployment and sharp growth of inflation in the mid-1990s, the development of banking system and its crisis in 1995 and crisis in Russia in 1998, also reflected in the volume of Latvian GDP (see Fig. 1).



**Fig. 1.** GDP and Wages & salaries (at basic prices of 2010), in millions of euros, in the years 1995-2014, and growth rate as change from the previous year, in % [Source of data for calculations: 13]

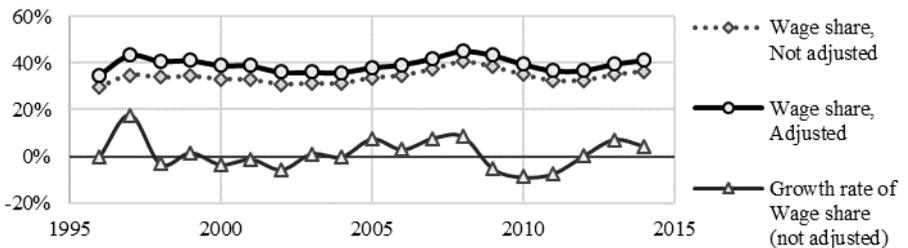
Latvian GDP showed a hardly notable growth only around of the 2000s. Latvian GDP, as the main indicator of economic situation and growth, represented a raise after Latvia became a member-state of the European Union (in 2004 GDP - 18,0 millions of euros, but in a year GDP increased to 20,6 million of euros). Although, the recent crisis heavily affected Latvia, when GDP from its peak value at 27,3 millions of euros in 2007, in two years GDP declined to 17,0 millions of euros. Along with GDP changes, the amount of wages and salaries of employees changed as well, which forms a notable part of labour income and plays the main role in the spending of the household. The peak value of gross wages and salaries was observed in 2007 – 10,2 millions of euros were paid to employees. Although, it is obvious from the data of Fig.1 that the amount of wages and salaries did not diminish over the corresponding period – that is the changes of wages and salaries were comparable to GDP fluctuations. Nevertheless, despite the fact that GDP growth already recommenced in 2010, the amount of wages and salaries paid to employees continued to drop till 2011, and only in 2012 it increased by 5,2% in comparison with the previous year (see Fig.1)

As the author used the data for GDP calculations at basic prices, applying GDP deflator (in 2010 = 100 point), according to Fig.1 it can be observed that at the beginning of the observation period GDP and wages and salaries drop by 4,8% and 4,77% respectively (though the data at market prices [13] would display an increase, due to high inflation rates during that period – in 1996 prices increased by 17,5% in comparison with the previous year [11]). Furthermore, the data of Fig.1 confirm that during the research period growth the growth rate of labour income was negative due to obvious economic issues in Latvia: to the early 2000s – while economic transformation after the renewal of independence, and during the crisis of 2008-2011, otherwise the growth rate of wages and salaries was positive. The growth rates of wages and salaries in pre-crisis years were even higher than the growth rates of GDP, for instance, in 2007 the growth rate of gross wages and salaries was 26.3%, while GDP increased by 17.2% in comparison with the

previous year – such things as rapid rise of wages that did not correspond to the productivity growth concerned by almost all economists during that period and the years after.

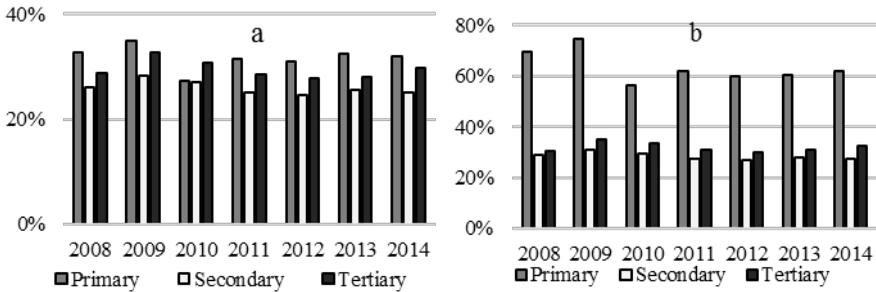
#### 4. Wage share in Latvian national economy

Regarding the described facts in the previous section, it is evident that the cyclical growth and decline of GDP affected also the wage share and its fluctuations. According to the section 2 of this paper, the system of national accounts does not consider compensation of self-employed as labour income, while it partially represents a labour income. Therefore Fig.2 displays both the unadjusted wage share to the number of self-employed in the economy and the adjusted wage share, and the difference is obvious. The highest rate of both adjusted and unadjusted wage share was observed in Latvia in 2008 – 45,2% and 40,6% respectively. However, during the next two years the wage share decreased to 32,6% and 36,7% in 2011. This decline is also visible from unadjusted wage share`s negative growth rates (Fig. 2). As well, the highest distinction of wage shares was in late-1990s, while as time goes by a distinction became restrained – a number of self-employed declined (in 1997 – 193,6 thousands, in 2011-97,7 thousands). At first, this can be explained with the structural transformation of national economy, and, secondly, the negative impact of crisis also appeared in reduction of total employment. While regarding prevalent concern of wage share decline, during the observed period such decline in Latvia was not evident (see Fig. 2).



**Fig. 2.** Wage share (% of GDP) in the whole economy adjusted and unadjusted to the number of self-employed, and unadjusted wage share`s growth rate (in comparison with the previous year, in %), in 1996-2014 [Source of data for calculations: 13]

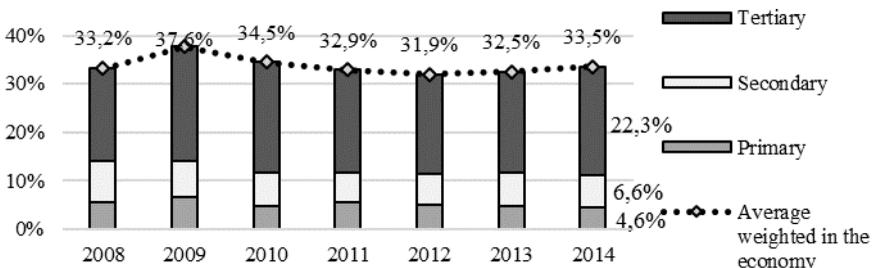
Referring to the number of self-employed, its number differs in the sectors of national economy; therefore, there is an apparent distinction of adjusted and unadjusted wage share in the sectors of national economy (Fig. 3). While unadjusted wage share (Fig.3. a) in the primary and tertiary sectors were approximately at one level (in 2014 32,1% and 29,7%, accordingly), and slightly lower in the secondary sector (25,0%), after applying weights to the wage share (Fig.3. b), the data has changed visibly.



**Fig. 3.** a) Wage share (%) unadjusted to self-employed, b) Wage share (%) adjusted to the number of self-employed, in the main sectors of national economy, in 2008-2014

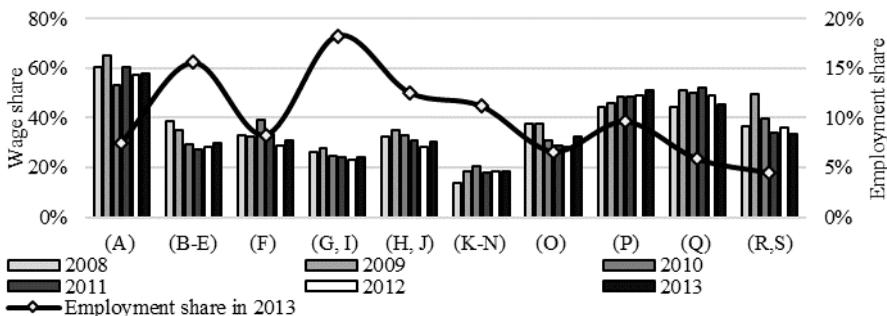
[Source of data for calculations: 13]

In the primary sector the wage share increased to 62% in 2014, while in 2009 it peaked at 74,8%. However, in the other sectors it did not rise much: in the secondary sector – 27,6%, in the tertiary – 32,5%. First of all, it is obvious that self-employed are mostly engaged in less capital intensive industries (primary sector), nevertheless, the other sectors also engaged self-employed, but to a less degree. Secondly, this adjustment allows evaluating income distribution among workers more completely. While examining the wage share of the whole Latvian economy and understanding which sector contributes more, there was calculated an average weighted by the share of total employment in the corresponding sector (Fig. 4):



**Fig. 4.** Adjusted wage share (%) weighted by the number of employed in the corresponding sector, in 2008-2014 [Source of data for calculations: 13]

According to the data of Fig.4, to labour in average was assigned about 1/3 of the value added. The greatest influence on the average wage share in the national economy had the tertiary sector – its impact on the average wage share was almost three times greater than the impact of the secondary sector. The obtained results corresponds to the structure of national economy. Nevertheless, the tertiary sector comprises more industries than others sectors. Therefore, in order to investigate the impact of employment structure on the wage share and its alterations more entirely, was conducted a further division of national economy by 10 groups of industries.

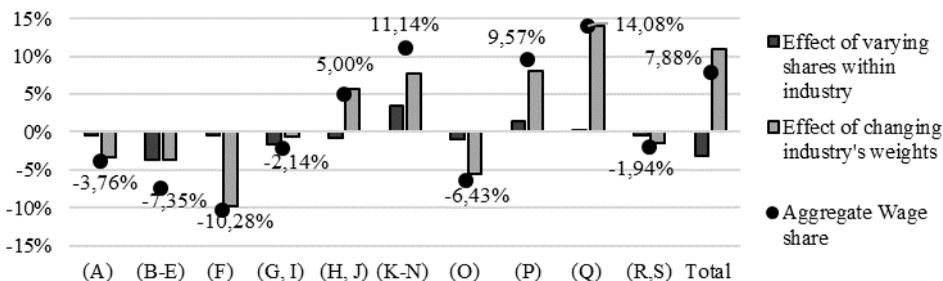


**Fig. 5.** Adjusted wage share (% in 2008-2013) and employment share (% in 2013) in the industries (A-S) of national economy [Source of data for calculations: 13]

During the research period the distribution of labour income across industries of Latvian economy was rather different. The highest wage share was in *agriculture, forestry and fishing (A)*, about 57-60% (see Fig. 5). As previously discussed, this disparity occurred because of the large number of self-employed in this subdivision of national economy. The next followed *education (P)* and *human health and social work activities (Q)* with wage share of 48-50% and 45-52%, accordingly. However, it should be noted that these industries in 2013 employed only 10% and 6% of total number of employed, correspondingly. Consequently, it means that a minor part of labour force got higher return on their labour input. Though, *trade, accommodation and food service activities (G, I)* with the wage share of 24-27%, in 2013 engaged the most – 18% of employed, while on the other side, these industries would be more appealing to capital owners as the capital share is higher there than in the others industries of national economy. In addition, the lowest wage share of 13-18% over the research period was recorded in *financial, insurance, scientific and administrative activities; real estate activities (K-N)*, while the share of employment was 11%. Regarding the industries that comprises secondary sector: *industry and energetic (B-E)* that accounted for 16% of employed in 2013, while the wage share during the research period declined from 35,3% to 29,9%; and *construction (F)* – employment share was 8%, but wage share varied between 39%-30%.

## 5. Decomposition of the aggregate adjusted wage share`s change

Furthermore, in order to evaluate the effect of the wage share`s and employment structure`s changes in the industries of national economy on the alteration of the aggregate wage share of national economy, a decomposition of changes was made by two effects (see Fig. 6). During the research period from 2008 to 2013, the aggregate adjusted wage share of the total economy increased by 7.88%.



**Fig. 6.** Decomposition of aggregate adjusted wage share's change from 2008 to 2013 in the industries (A-S) of national economy [Source of data for calculations: 13]

The main part of this rise (11%) was due to the changes in the weights that is because of reallocation of labour force among industries. While an overall effect of varying shares within industries was negative (-3,1%), the positive effect of changing industry's weights was observed in *transportation, storage, information and communication* (H, J); *financial, insurance, scientific and administrative activities; real estate activities* (K, N); *education* (P); *human health and social work activities* (Q). A positive aggregate change of wage share was also observed in these industries. While in *agriculture, forestry and fishing* (A); *industry and energetic* (B-E); *construction* (F); *trade, accommodation and food service activities* (G, I); *Public administration and defence; compulsory social security* (O); *others services* (R, S) the change of both wage share and employment share was negative. Positive change of wage share was only in *financial, insurance, scientific and administrative activities; real estate activities* (K, N) and *education* (P) 3,5% and 1,4% respectively. In *trade, accommodation and food service activities* (G, I) an aggregate change was also negative (-2,14%), which was mostly because of the wage share decrease (-1,6%), while dropping of employment accounted for -0,6%. The highest decline of the wage share was observed in *industry and energetic* (B-E). These results can also be explained by the overall economic situation in Latvia. In 2008 there was observed a relatively small decline of the economic activity and the data of the GDP in 2013 approved that economy still had not returned to the pre-crisis level.

## 6. Conclusions

Despite the widespread opinion that in a long-term period the wage share decreases, in Latvia during a short-term period unadjusted and not weighted wage share was approximately constant in values, that is, if a decrease was observed, it was mostly associated with the cyclical changes of the economy.

According to the made analysis, it is possible to conclude that the higher rate of wage share in value added is ascribed to the primary sector (around 60%). It also results from the large part of self-employed in agriculture. While in the secondary and tertiary sectors the wage share is around 30%.

However, as the main part of employees is engaged in the services, this sector also affects an average wage share of the economy the most. While applying a more detailed breakdown of national economy by industries, it was observed that industries with relatively high wage shares engaged relatively low share of employees (*public administration and defence; compulsory social security; education; Human health and social work activities*). Furthermore, in some industries of the service sector with relatively small wage share were employed more people (*trade, accommodation and food service activities; transportation, storage, information and communication; financial, insurance, scientific and administrative activities; real estate activities*), which, consequently, means that a minor part of labour force got higher return on their labour input.

The conducted analysis also displayed that during the research period an average wage share of the whole economy mostly changed because of reallocation of employees from the agriculture and industry to the services. As well positive aggregate wage share changes were observed only in almost all industries of the tertiary sector, while in agriculture, industry, construction, trade and public administration industries there was a negative effect of wage share's changes.

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