WAGE INEQUALITY DECOMPOSITION OF ROMANIA

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Abstract: *Income inequality has risen during the last decades, thus making its way into the agenda of decision makers. Effects of increased income inequality include negative effects on economic development and slowing down poverty reduction. Nowadays, drivers and effects of income inequality are still under debate and studies consider all types of income sources for analyses. An important income source for individuals represents wage earnings. While some research papers on income inequality concern the household income inequality, other research works regarding labour market study the wage inequality. This paper studies wage inequality of Romania by types of employers (for example state/public, mixed or private) for the 2008-2012 period. The study reveals that change of wage earnings inequality across the period considered can be due to within-group inequality and within-group change in population share.*

1. Introduction

Income inequality analysis considers various type of income, for example, gross and net wage earnings, wage hourly earnings, household income, economic activity based income and individual income (Chivu et al 2015, Belfield et al. 2017, Carvalho and Rezai 2015).

Despite a decrease of income inequality between countries at global level, income inequality within countries have increased (Haller et al. 2015). Some consequences of increased income inequality are the growth of social costs, high social erosion, and a negative effect on economic development (Dabla-Norris et al. 2015, Barros et al. 2015).

In a series of papers, it was shown that wage earnings inequality plays an important role in the larger context of the income inequality of a society (Fields and O'Hara, 1999, Fields, 1979, Antonczy et al. 2010, Baumgarten, 2013, Fields, 2003). The reason behind this fact is that for most individuals the only type of income is a wage earning (Fields, 2004).

In the literature, some authors attribute the increase or decrease of wage inequalities to the individual characteristics of the workers, as well as of the jobs. However, these are not the only factors influencing the wage inequalities, for example, other factor can be technological changes (Berman et al., 1994) or changes in the organization of production (Peck, 1992, Storper and Scott, 1990).

In this paper, we analyse the wage inequality of Romania for the 2008-2012 period considering decomposition of change of wage inequality taking as groups different companies and institutions (state, mixed or private owned, and not only).

Public-private wage inequality plays an essential role in a society, along with the public-private wage gap. The wage differentials between public and private sector workers has been studied intensively during the last decade, an important role having labour market unions (Foguel et al., 2000, Card, 2001, Melly, 2005, Katz and Krueger, 2012, Voinea and Mihaescu, 2012, Ramos et al. 2014)

This paper is organized as follows. Section 2 presents the methodology used, while Section 3 discusses the wage inequality of Romania. Section 4 concludes the paper.

2. Methodology

In this section, we present the methodology used in the paper, which is based on mean logarithm deviation measure and its decomposition into four components. The mean log deviation index is an entropy based inequality measure, being more sensitive to changes in the upper tail of the income distribution for larger positive values. This index is estimated from grouped data using the method introduced in 2016 by Von Hippel et al. The software used is R.

2.1. Data

The analysis is based on grouped data provided by the National Institute of Statistics of Romania (INS). The data are composed of 11 wage earnings categories by types of employers: state/public, majority state (over 50%) and majority private (over 50%) (in other words, mixed companies), Romanian, cooperative, nongovernmental organization, foreign and public of national and local interest. These 8 types of employers represent the groups considered for decomposition of the mean log deviation index of wages. The data are provided by INS for the 2008-2012 period. The grouped data represent the base gross wage (in RON) for month October for each year. In Table 1, we displayed the data for Romania for October 2012. From Table 1, we notice that 88.13% of the employees had a base gross wage below 3000 RON, while 35.41% of employees had a base gross wage below 1000 RON.

Table 1: Base gross wage în October 2012, in Romania, grouped based on income bins

Bin	Minimum	Maximum	Employees	Share
1	0	800	642105	17.61
2	801	1000	648600	17.80
3	1001	1500	864776	23.72
4	1501	2000	574020	15.75
5	2001	3000	482974	13.25
6	3001	4000	190942	5.23
7	4001	5000	92214	2.52
8	5001	6000	47115	1.29
9	6001	7000	29356	0.80
10	7001	8000	20817	0.58
11	Over 8000		52142	1.43

Source: INS

2.2. Estimating Income Inequality with Grouped Data

Estimation methods for grouped data were introduced due to the fact that income data are often given using this format. These type of data can be used for income segregation of individuals among neighbourhoods. For these areas, individual incomes are rarely given, rather grouped or bin data are available. In this paper, we estimate wage inequality using the multimodel generalized beta estimator (MGBE) and robust Pareto midpoint estimator (RPME), both developed in R. It is worth mentioning that these two methods usually produce very good estimates of the mean and Gini coefficient, but poor estimates of the MLD index (Von Hippel et al., 2016). The estimated Gini coefficient for the wage inequality in October 2008 in Romania is 37.80, while the estimate for October 2012 is 37.28, indicating a slight decrease of the wage inequality.

2.3. Decomposition of Mean Log Deviation Index

The mean log deviation index (MLD), also known as second Theil index is defined by:

$$I_0 = \frac{1}{n}\sum_{i=1}^{n} \log\left(\frac{\mu}{x_i}\right)$$

where x_i represents the income of individual I, and μ the mean income of the population composed of n individuals. The MLD index can be approximately decomposed into changes in within subgroup inequality, changes in the population shares on the 'within group' and between group and relative changes in the subgroup means (Mookherjee and Shorrocks 1982). The decomposition is given by:

$$\Delta I_0 = \sum_j \overline{s_j} \Delta I_{0,j} + \sum_j \Delta s_j \overline{I_{0,j}} + \sum_j \Delta s_j (\overline{\lambda_j} - \overline{\log \lambda_j}) + \sum_j (\overline{\theta_j} - \overline{s_j}) \Delta \log \mu_j$$

where s_j represents the population share of group j, Δ is de difference operator from time t to time t+1, $I_{0,j}$ is the MLD within group j, μ_j is the mean wage in group j, $\lambda_j = \mu_j/\mu$ where $\mu(t) = \sum_j s_j(t)\mu_j(t)$ and $\theta_j = \lambda_j s_j$. The bar over a variable indicates an average value of start and end period values, for example

$$\overline{s_j} = \frac{1}{2}[s_j(t) + s_j(t+1)]$$

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3. The Labour Market and Wage Earnings

The labour market of Romania underwent certain changes during the transition from a communist society to a market based society. During the process of privatization, restructuration and closeout of multiple state firms the structure of the employment has changed with more people starting to work in the private sector (Cindrea 2007). For the 2008-2012 period, this can be observed in Table 2. While in 2008, the private sector, counted for 67.73% of employees, in 2012 the percentage increased to 70.37%. The state-companies accounted for 7.25% of employees in 2008, which

reduced to 6.05% in 2012. In this paper, we try to quantify the effect of structural change of private-public employers, and not only, on the change in wage inequality of Romania for 2008-2012 period. The MLD index of the wage inequality for the period considered by type of employers is displayed in Figure 1.

Table 2: Structure of labour market în 2008, 2010 and 2012, byt forms of ownerxhip

Ownership/Year	Share of public employment (%)		
	2008	**2010**	**2012**
State	7.25	6.62	6.05
Majority State	0.95	1.34	1.13
Private Majority	3.54	2.85	2.32
Romanian	57.21	56.13	57.61
Cooperative	0.97	0.88	0.62
NGO	0.38	0.49	0.42
Foreign	9.17	9.54	11.69
National and local interest	20.50	22.11	20.12
Public	**27.75**	**28.74**	**26.17**
Private	**67.73**	**67.06**	**70.37**
Mixed	**4.50**	**4.20**	**3.46**

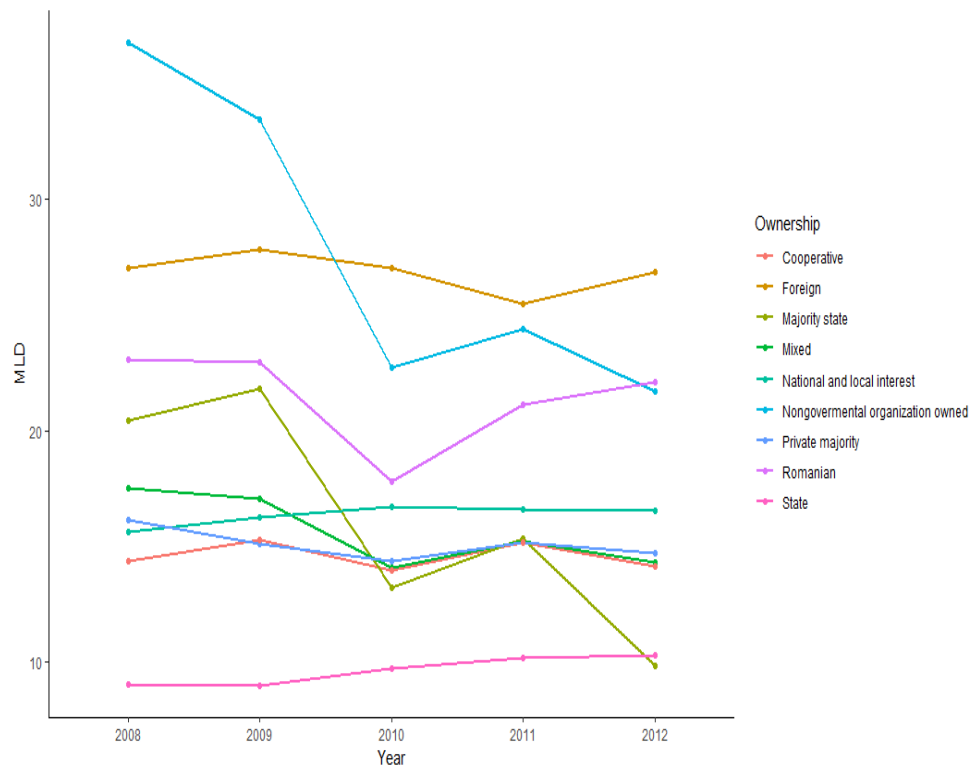*Source:* INS, **Author's calculations**

Table 3: Decomposition of mean log deviation (x 100) în wage earsnings by forms of ownership for the 2008-2012 period în Romana

Period	MLD at start of period	Overall change in MLD	Within group inequality	Within-group-changes in population share	Between group changes in population share	Between group inequality
2008-2010	20.804	-2.55	-2.63	0.07	0.00032	0.00097
2010-2012	18.254	2.43	2.12	0.31	0.00119	0.001104
2008-2012	**20.804**	**-0.1167**	**-0.46**	**0.34**	**0.0007**	**0.0028**

Source: Author's calculations

The wage inequality of state companies increased sightly during the short period from 9.059 in 2008 to 10.314 in 2012, while the wage inequality for foreign companies decreased from 27.032 in 2008 to 26.860 in 2012, being notably higher. A higher wage inequality is also attributed to the Romanian private-owned companies (23.112 in 2008 and 22.117 in 2012).

Looking across the wage earning distribution, changes in wage inequality within employees grouped by type of companies (state, foreign, mixed etc.) acted to decrease the overall MLD by 0.46. However, within group changes in population share acted to increase the MLD value by 0.34 (Table 3). This means that structural change in the private-public labour share may have played a role in increasing wage inequality in Romania for the 2008-2012 period. And, just as income inequality within countries contribute to global inequality, so thus the wage inequalities of employees from different companies contribute to wage inequality. In 2008, the absolute wage gap (defined as the difference of mean wages) of public-private sectors was 184 RON, which reduced to 132 RON in 2012.

Figure: Mean log deviation inequality measure of wage earnings by type of employers for the 2008-2012 period in Romania
Source: Author's calculations

4. Conclusion

Structural changes in labour market share of different companies play an important part in the structure of wages of a society. The labour market of Romania underwent certain changes during the transition from a communist society to a market based society with more people starting to work in the private sector (70.37% of employees worked in the private sector in 2012). These changes have intensified after Romania became a member of the European Union in 2007. Considering these changes, a natural question that arises is "How all these changes effected the wage inequality of Romania?". Using grouped wage data, in this paper, we estimated the wage inequality of Romania for the 2008-2012 period based on mean log deviation index, which decreased sightly from 20.804 in 2008 to 20.68 in 2012. In this paper, we showed that change in wage inequality can be linked to within changes in wage inequalities of employees from different companies categorized by type of ownership. The decomposition applied of the MLD index revealed that wage inequality within employees grouped by type of companies appeared to decrease the overall MLD by 0.46. However, within group changes in population share acted to increase the MLD value by 0.34. Future work is required on how structural

changes in labour market share effect wage inequality based on new estimates and indicators.

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