

## SHORT-TERM CHANGES IN WAGE DISTRIBUTION AFTER MINIMUM WAGE INCREASES IN ROMANIA

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### Abstract

*In this paper we focus on identifying the short-term changes of the net wage distribution in terms of gender inequalities. The case of Romania is discussed for the year 2014, using quarterly data. The AMIGO database with observable data at individual level is used. The period chosen for investigation corresponds to a time when the minimum wage registered two successive increases. Since the minimum wage policy is generally assumed to have several implications on the national wage distribution, the analysis will investigate the short-term quarterly dynamic of the wage distribution based on both individuals' social-demographic and economic characteristics. Our findings suggest that male employees are better represented than females in the higher wage deciles. Slight decreases among employees living in urban areas as compared to those living in rural areas were noticed during 2014, as well as among the graduates of tertiary education. Moreover, a short-term decreasing tendency of the adult employed population (25-44 years) was noticed in favour of those ageing between 45-64 years, while the share of the elderly (over 65 years old) did not register any changes during the whole year 2014.*

**Keywords:** wage distribution, minimum wage, micro-datasets, socio-demographic factors, economic factors

**JEL Classification:** J31, C81

### 1. Introduction

In this paper we aim to identify the most relevant changes in wage distribution in terms of gender inequalities. The case of Romania is discussed for the year 2014, using quarterly data. The AMIGO database with observable data at individual level is used. The choice of the year 2014 was based on data availability reasons and corresponds to a certain period of time which was intensively affected by two successive minimum wage adjustments. In 2014, the minimum wage registered the following changes: the first one occurred in January 2014 when the gross minimum wage rate increased from 800 to 850 lei, followed by a second increase in July 2014 up to the level of 900 lei.

Since the minimum wage policy is generally assumed to have several implications on the national wage distribution, the analysis will investigate the short-term quarterly dynamic of the wage distribution based on both individuals' social-demographic and economic characteristics.

Quantifying the net impact of minimum wage upon Romanian wage inequalities can only be conducted if proper microdata are used and microsimulation techniques are applied rigorously. Since

the AMIGO database does not provide information on individuals' net wage but only the association with the corresponding decile in the wage distribution, the current paper will focus explicitly on studying wage inequalities and their short-term dynamic under the two successive adjustments of the minimum wage rate.

The literature review on the topic of wage inequalities is quite vast at international level (see, among others, Hosmer et al., 2013; Fournier and Koske, 2012; Tansel and Bircan, 2011; Buchinsky, 2001; Pereira and Martins, 2000). However, it is less generous at national level. For the case of Romania, some studies have focused on identifying the main determinants of wages (Andreica et al., 2010; Vasilescu, et al. 2010; Militaru et al., 2011), while others on wage inequalities between the public and the private sectors (Voinea and Mihăilescu, 2011). Identifying the main determinants of wage inequalities and wage distribution is of extreme importance, as it provides support to policy makers in order to reduce wage inequalities.

This paper is organized as follows: Section 2 briefly presents the data used in this study, Section 3 describes the main findings of the analysis, while the last section concludes.

## 2. Data description

In this study we analysed the changes registered in wage inequalities, using the AMIGO database that provides survey micro-data for the period Q1 2014 - Q4 2014. The chosen period corresponds to a time when the minimum wage registered two successive increases in Romania. Since the minimum wage policy is generally assumed to have several implications on the national wage distribution, the analysis focused on the short term quarterly dynamic registered during 2014.

The AMIGO database consists of a national representative survey micro-data that is collected on quarterly bases. Our analysis only focused on employed persons, having the following sample sizes for the period Q1 2014 - Q4 2014: 15372 individuals for Q1, 15631 for Q2, 15718 for Q3 and 15523 individuals for Q4 2014. Individual information regarding professional status, occupation, work, main and secondary activity and hours worked were available.

The following information at individual level was considered in our analysis structured as categorical variables:

**Table 1. The types of information at individual level**

| Types of information              | Individual characteristics | Sub-categories  |
|-----------------------------------|----------------------------|---|
| Socio-demographic characteristics | Age                        | <i>age15-24, age25 44, age45 64, age 65+</i>  |
|                                   | Residence area             | <i>Urban and Rural</i>  |
|                                   | Levels of education        | <i>ISCED 0 for no education, ISCED 1-2 for primary or lower secondary education level, ISCED 3-4 for secondary or non-tertiary secondary education level and ISCED 5-8 for higher education level</i> |
|                                   | Gender                     | <i>Male and Female</i>  |
| Economic variables                | Economic sectors           | <i>Industry, Constructions, Agriculture, Private services, Public services and Other sectors</i>  |
|                                   | Major occupations          | <i>GM0, GM1, GM2, GM3, GM4, GM5, GM6, GM7, GM8 and GM9</i>  |

Source: authors own computations using AMIGO database

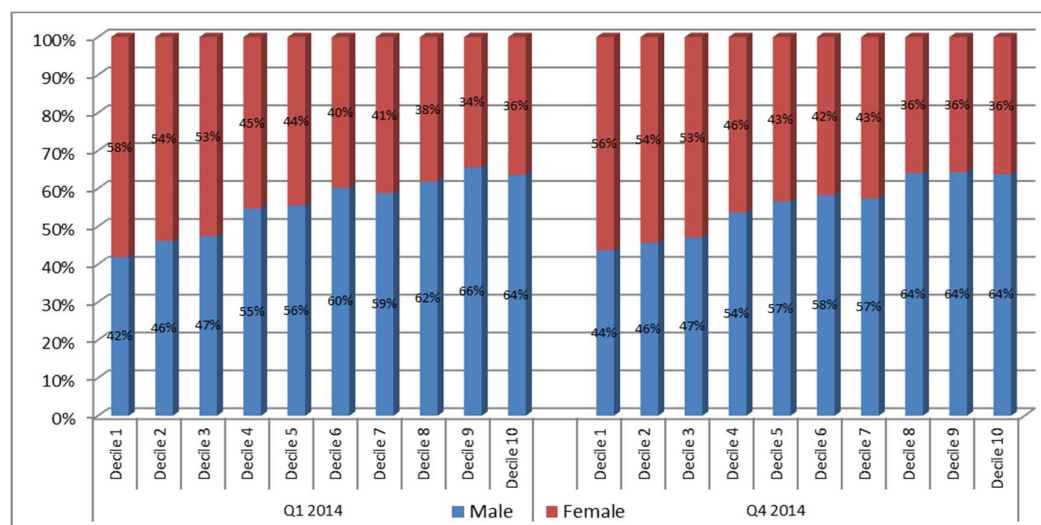
Some data transformation was required in order to group the initial economic sectors into the following 6 sectors: *Industry, Constructions, Agriculture, Private services* (by grouping (G) Wholesale and retail trade; repair of motor vehicles and motorcycles, (H) Transportation and storage, (I) Accommodation and food service activities, (J) Information and communication, (K) Financial and insurance activities, (L) Real estate activities, (M) Professional, scientific and technical activities, (N) Administrative and support service activities), *Public services* (by grouping (O) Public administration and defence; compulsory social security, (P) Education, (Q) Human health and social work activities, as well as (R) Arts, entertainment and recreation), and *Other sectors* (including (S) Other service activities, (T) Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use, as well as (U) Activities of extraterritorial organisations and bodies).

Finally, although the information regarding individuals' occupation was available in the database at 3 digits codes, for the current study's purpose we only considered in the analysis the main major groups of occupations (1 digit).

### 3. Main findings

As shown in figure 1, male employees are better represented than females in the higher wage deciles. This trend is sustained throughout the four quarters of 2014, being actually notable starting with the 4<sup>th</sup> decile. For example, for the first quarter of 2014 the proportion of male employees in the 4<sup>th</sup> decile exceeded the female employees share by 10 percentage points, while the discrepancies continued to widen over the last 6 deciles, reaching a 28 percentage points difference in the last decile. In addition, it is noted that the employed women are best represented in the first decile, where the female share was higher by about 16 percentage points than the male share in the first quarter and slightly decreased in the last quarter to only 12 percentage points

Overall, during the year 2014, the share of male employees in the upper deciles followed a slightly decreasing trend, while females' representativeness in the 4<sup>th</sup> -9<sup>th</sup> deciles experienced modest improvements.



Source: authors own calculations using AMIGO database

Fig. 1 Gender distribution of net wages

In order to better explain the level of wage inequalities in Romania over the period under review the analysis was extended upon the main socio-economic determinants of gender gap. The summary of the results is presented in Table 2.

Concerning the average wage gap between men and women over the four quarters, we report that women employed are at a distance of a decile from male employees, fluctuations occurring at an average level, especially between the 5<sup>th</sup> and 6<sup>th</sup> decile of the net wage distribution.

Regarding the residence area, although both men and women have predominantly urban residence, the share of women employed in the urban area exceeds on average by about 7 percentage points the proportion of men.

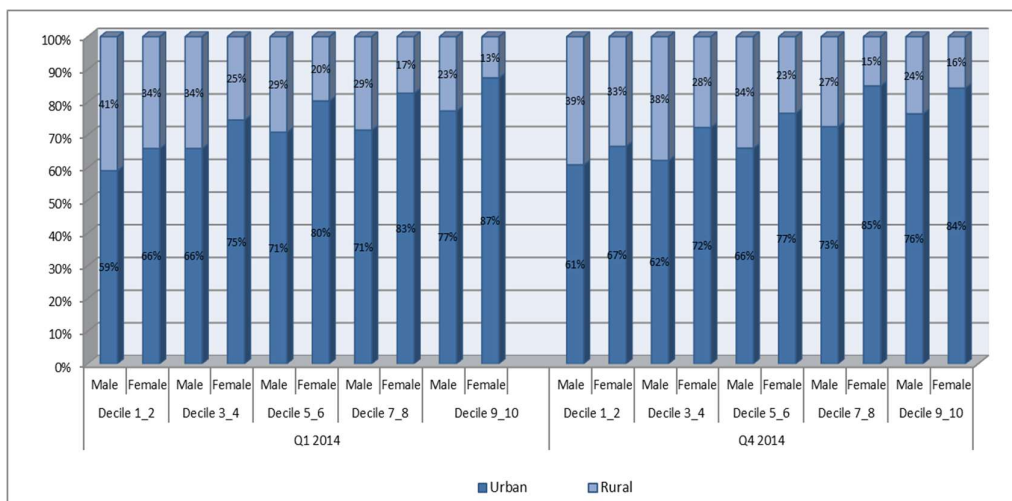
**Table 2. Gender differences in net wage distribution and main socio-economic characteristics on Q1 2014 - Q4 2014**

| Variables               | Q1 2014 |        | Q2 2014 |        | Q3 2014 |        | Q4 2014 |        |
|-------------------------|---------|--------|---------|--------|---------|--------|---------|--------|
|                         | Male    | Female | Male    | Female | Male    | Female | Male    | Female |
| Net wage average decile | 5.70    | 4.84   | 5.86    | 4.76   | 5.76    | 4.99   | 5.75    | 4.92   |
| Urban                   | 0.69    | 0.76   | 0.69    | 0.75   | 0.68    | 0.75   | 0.68    | 0.76   |
| Rural                   | 0.31    | 0.24   | 0.31    | 0.25   | 0.32    | 0.25   | 0.32    | 0.24   |
| age15_24                | 0.05    | 0.04   | 0.04    | 0.04   | 0.05    | 0.04   | 0.05    | 0.04   |
| age25_44                | 0.51    | 0.55   | 0.50    | 0.56   | 0.50    | 0.54   | 0.49    | 0.54   |
| age45_64                | 0.44    | 0.40   | 0.45    | 0.40   | 0.45    | 0.41   | 0.46    | 0.42   |
| age65plus               | 0.00    | 0.00   | 0.00    | 0.00   | 0.00    | 0.00   | 0.00    | 0.00   |
| EDUC0                   | 0.00    | 0.00   | 0.00    | 0.00   | 0.00    | 0.00   | 0.00    | 0.00   |
| EDUC1                   | 0.10    | 0.08   | 0.12    | 0.09   | 0.11    | 0.09   | 0.11    | 0.08   |
| EDUC2                   | 0.69    | 0.65   | 0.68    | 0.63   | 0.69    | 0.65   | 0.70    | 0.66   |
| EDUC3                   | 0.21    | 0.27   | 0.20    | 0.28   | 0.20    | 0.27   | 0.20    | 0.26   |
| Industry                | 0.35    | 0.30   | 0.35    | 0.30   | 0.35    | 0.30   | 0.35    | 0.30   |
| Construction            | 0.12    | 0.02   | 0.13    | 0.02   | 0.14    | 0.02   | 0.13    | 0.02   |
| Private services        | 0.34    | 0.38   | 0.34    | 0.38   | 0.34    | 0.39   | 0.34    | 0.38   |
| Public services         | 0.14    | 0.29   | 0.13    | 0.29   | 0.13    | 0.28   | 0.13    | 0.28   |
| Agriculture             | 0.04    | 0.01   | 0.05    | 0.01   | 0.05    | 0.02   | 0.05    | 0.02   |
| Other sectors           | 0.00    | 0.01   | 0.00    | 0.00   | 0.00    | 0.00   | 0.00    | 0.00   |
| GM0                     | 0.02    | 0.00   | 0.02    | 0.00   | 0.01    | 0.00   | 0.02    | 0.00   |
| GM1                     | 0.02    | 0.02   | 0.02    | 0.01   | 0.02    | 0.01   | 0.02    | 0.01   |
| GM2                     | 0.14    | 0.23   | 0.14    | 0.24   | 0.14    | 0.24   | 0.14    | 0.24   |
| GM3                     | 0.07    | 0.10   | 0.07    | 0.10   | 0.07    | 0.11   | 0.07    | 0.10   |
| GM4                     | 0.04    | 0.10   | 0.04    | 0.09   | 0.04    | 0.09   | 0.04    | 0.09   |
| GM5                     | 0.12    | 0.27   | 0.12    | 0.26   | 0.12    | 0.26   | 0.12    | 0.26   |
| GM6                     | 0.01    | 0.00   | 0.02    | 0.01   | 0.01    | 0.01   | 0.01    | 0.01   |
| GM7                     | 0.29    | 0.12   | 0.29    | 0.12   | 0.30    | 0.12   | 0.30    | 0.12   |
| GM8                     | 0.21    | 0.09   | 0.21    | 0.09   | 0.21    | 0.09   | 0.21    | 0.09   |
| GM9                     | 0.08    | 0.08   | 0.08    | 0.08   | 0.08    | 0.08   | 0.08    | 0.08   |

Source: authors own calculations using AMIGO database

When decomposing at wage deciles, we notice a deepening of the gender differences in favour of female employees as they advance in wage distribution. Thus, if in the first quarter of 2014, for instance, the differences between the share of employed female and male employed in urban areas in the first two deciles were around 7 percentage points, the differences increased within the distribution, reaching about 10 pp in the last two deciles. However, by the end of 2014 these differences slightly narrowed, especially within the first six wage deciles.

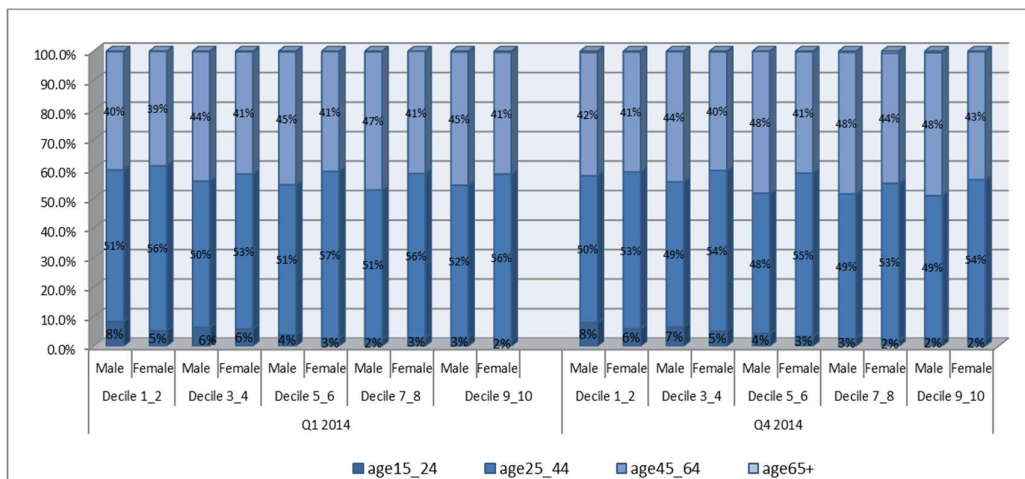
When analysing age subgroups, it is noted that the percentage of adult women (25-44 years) occupied in Romania is higher than the share of employed men belonging to the same age subgroup. However, the situation is reversed for the case of 45-64 age group when the share of male employees is about 4.5 pp higher than women.



Source: authors own calculations using AMIGO database

Fig. 2 Wage deciles distribution on gender and residence area

When decomposing at wage deciles, the most noticeable discrepancies are recorded for deciles 5 and 6 throughout all quarters of 2014, while a slight decrease in time is recorded for the 7<sup>th</sup> and 8<sup>th</sup> deciles (referring to the 4<sup>th</sup> quarter of 2014 vs. the first quarter of 2014).



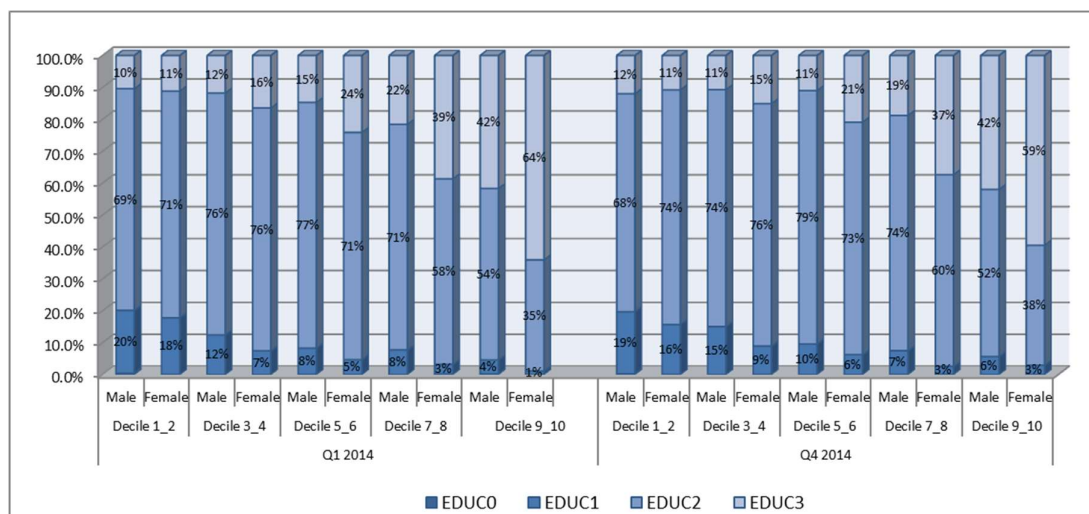
Source: authors own calculations using AMIGO database

Fig. 3 Wage deciles distribution on gender and age subgroups

As regards the level of education, we find that women with higher education (ISCED 5-8) outnumber men on average by approximately 6 pp, while the share of men with medium educational level exceeds that of women by about 4 pp in the case of primary or lower secondary education graduates (ISCED 1-2).

These differences particularly deepen in case of secondary or non-tertiary secondary education (ISCED3-4) graduates, when the percentage of male employed persons exceeds by approximately 6.5 pp the share of women employed and of the same educational level. At wage decile level, most notable cases are those corresponding to the 9<sup>th</sup> -10<sup>th</sup> and 7<sup>th</sup> -8<sup>th</sup> deciles respectively, when the share of women with higher education significantly exceeds the number of men within the same wage decile.

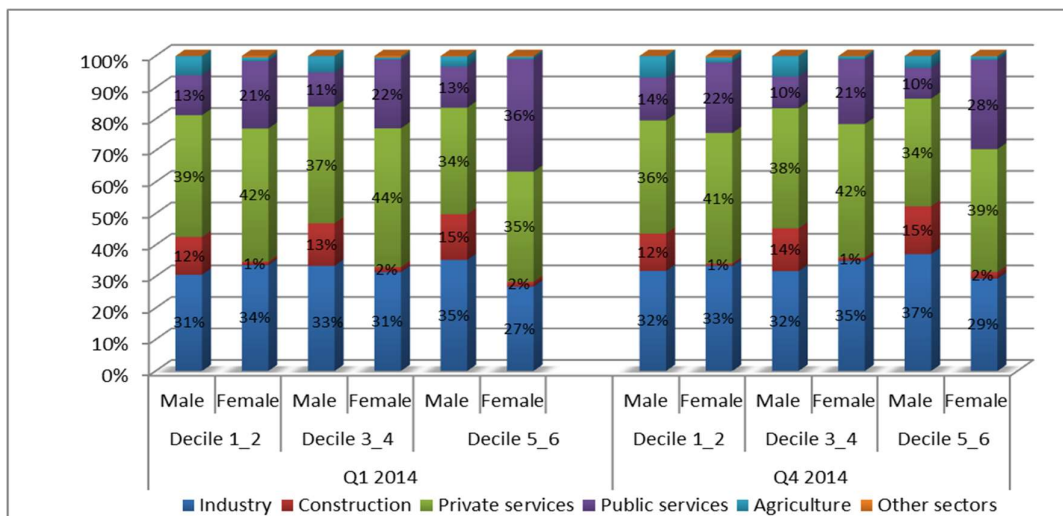
The analysis of gender differences in relation to the main sectors of activity revealed some particularities. Thus, it is noted that in the sectors of Industry, Construction and Agriculture the share of men exceeds the share of women employed, while women are much better represented in public services (significant difference of about 15 pp) and private services (by 4.5 pp).



Source: authors own calculations using AMIGO database

Fig. 4 Wage deciles distribution on gender and education level

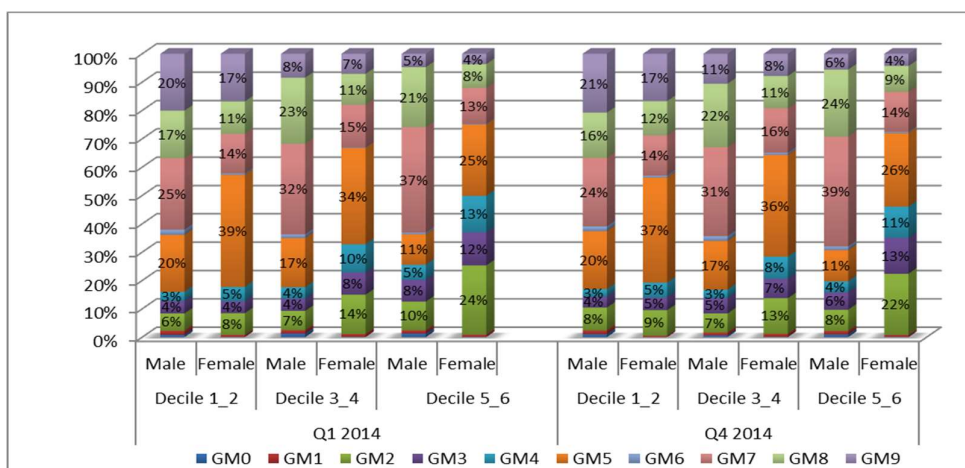
At wage deciles level, we notice significant differences in males versus females among all the economic sectors considered, generally confirming that a female majority is operating in Public and Private Services, while male employees are better represented in Construction and Industry sectors.



Source: authors own calculations using AMIGO database

Fig. 5 Wage deciles distribution on gender and economic sectors

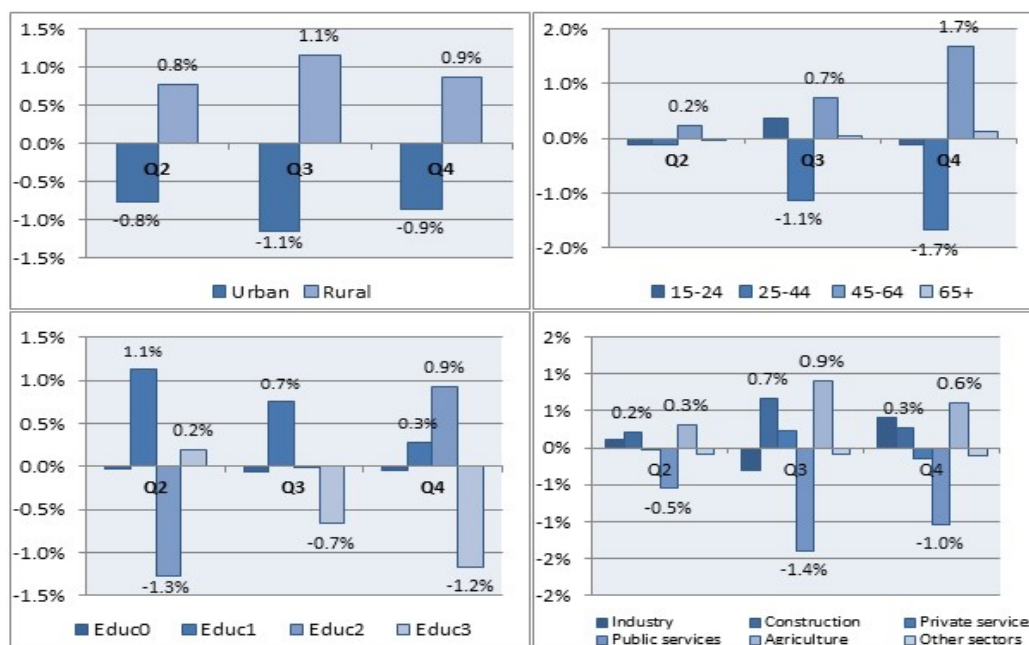
Last but not least, with regard to the major occupational groups of people working in the labour market, men are predominantly more numerous in the following major groups: GM0 - Armed Forces (1 per cent more than women), GM1- Members of the legislative, executive, senior public administration heads, senior officials and senior officials (1 per cent more than women), GM6 - Qualified workers in agriculture, forestry and fishing (1 pp more), GM7 - Qualified workers Assimilated (17.5 pp more) and GM8 - Plant and Machine Operators; Assemblers of machinery and equipment (12 pp more) compared to women. On the other hand, the share of women employed in GM2 - Specialists in various fields of activity, GM3 - Technicians and other technical specialists, GM4 - Administrative officers and GM5 - Service workers outstripped the proportion of men by approximately (10 pp, 3 pp, 5 pp and 14 pp respectively).



Source: authors own calculations using AMIGO database

Fig. 6 Wage deciles distribution on gender and major groups of occupations

When analysing the changes in dynamic recorded during the four quarters of 2014 on the main socio-economic characteristics of the persons employed, some relevant aspects are worth mentioning.



Source: authors own calculations using AMIGO database

**Fig. 7** The quarterly variations of the socio-economic characteristics of individuals

Thus, compared to the first quarter of 2014, after the two successive adjustments of the minimum wage, we notice mainly slight decreases among employees living in urban areas as compared to those living in rural areas, as well as among the graduates of tertiary education. Moreover, there is a modest increasing trend registered in the number of graduates of primary or lower secondary education, but with decreasing rhythms.

At the same time, one can observe a short-term decreasing tendency of the adult employed population (ageing between 25-44 years), in favour of those ageing between 45-64 years, while the share of the elderly (over 65 years old) did not register any changes during the whole year 2014. The short-term dynamics of young employees was slightly oscillating, with small increases registered only in the third quarter of 2014.

Last but not least, regarding the economic characteristics of the analysed individuals, the comparative analysis in dynamics during the year 2014 did not reveal any noticeable variation in the structure of the employed population in the economic sectors and major occupational groups. At most, we can notice a slight reduction of 1 pp in the share of employees in GM5-service workers, as well as of those in Public Services during the last two quarters of 2014.

#### 4. Conclusions

In this paper we aimed to identify the most relevant short-term changes in the net wage distribution in terms of gender inequalities. The case of Romania was discussed for the year 2014, using quarterly data observable at individual level. The choice of the year 2014 was based on data availability reasons.

The period of investigation corresponds to a time when the minimum wage registered two successive increases. Since the minimum wage policy is generally assumed to have several implications on the national wage distribution, the analysis investigated the short-term quarterly dynamic of the wage distribution. Moreover, due to the two successive increases of the minimum wage rate, we conducted a comparative analysis of the quarterly changes occurring during the period Q1 2014 - Q4 2014 upon gender wage inequalities. Both social-demographic and economic characteristics at individual level were investigated.

As a limitation of our study, we are aware of the data availability restrictions that prevented us from quantifying the net impact of minimum wage upon wage inequalities. However, we believe that this study brings valuable insights on the most relevant short-term changes in gender wage inequalities under a period of intense adjustments in the minimum wage level.

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