

Determinants of earnings in Macedonia: assessing the difference between low-paid and highly-paid employees

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Abstract

The problem of 'low-pay' as a relatively new social phenomenon in Europe has received considerable attention over the past 20 years. The analysis of the low-pay in low income countries, where the average earning is already low by international standards is more complex and represents a challenging task. The stylised facts show that earnings are not uniform across the population, but they vary according to a number of socio-economic and demographic characteristics. The aim of this paper is to assess the earning function of employed workers in Macedonia by paying attention to the difference between low-paid and highly-paid employees. For this purpose, we estimate Mincer type model that explains wage income as a function of education, experience and other employee- and job-specific characteristics. As a result, we come up with a clear picture of the earnings determinants and we formulate appropriate policy recommendations.

Keywords: earnings, low-pay, highly-paid, Mincer equation

Introduction

The aggregate compensation received by employees from their employers represents the most significant part of total household incomes. Namely, this income category in almost all economies is higher than other forms of personal income such as: income from investment, self employment, pensions and various government welfare programmes. For instance, the income from wages and salaries in Macedonia in 2015 represented 56.5 percent of total disposable household income. This is even

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more pronounced among urban population where wages and salaries represent more than 61 percent of total disposable household income. Although income from self-employment plays an important role among the rural population, the income from wages and salaries for this category still accounts for almost one half of total disposable household income.

Personal earnings from work are an important category in the economy since higher earnings mean higher consumption as well. If total consumption grows, this will boost sales throughout the industries, increasing productivity which in turn is conducive to a further growth in earnings. According to the Keynesian multiplier assumption, income increase will be followed again by growth in consumption, giving rise to a positive feedback loop. Having in mind the importance of the wage share in total household income, we can assume that the wage level determines to great extent the level of the living standard, poverty and social exclusion in the society.

The problem of ‘low-pay’ as a relatively new social phenomenon in Europe has received considerable attention over the past 20 years (Schnabel, 2016). The low-pay phenomenon is a comparative concept designating a proportion of workers who are below certain threshold, whose determination is often a subject of debate and experiment (Lee and Sobeck, 2012). As discussed by Lucifora *et al.* (2005), various measures of low-pay might be applied in practice. Generally, it can be defined as a relative measure, most commonly as a percentage of the median wage, or as an absolute level of pay below which one is assumed to be in poverty. According to the OECD criterion, those who earn less than two-thirds of the median wage can be considered low-wage workers. In most developed countries, this threshold is typically higher than the individual poverty level or minimum living standard which makes the relative indicator more meaningful. In addition, the advantage of the relative low-pay indicator is its appropriateness for cross-country comparisons. Bycontrast, the analysis of low-pay in low income countries, where the average earning is already low by international standards is more complex and represents a challenging task. Namely, it is not uncommon to encounter a situation where a threshold of two-thirds of median wage is still not sufficient to allow workers to escape poverty and to reach the minimum living standard (Lee and Sobeck, 2012). As a consequence, the evidence of low pay in less developed countries is rather scarce and usually based on thresholds designating some socially acceptable remuneration. However, the difficulty of determining what is socially acceptable in an objective way leads researchers and policy makers to adopt different thresholds expressed either as proportion of median wage or in absolute terms (Oosthuizen, 2012; Rani and Belser, 2012). In this context, some research focuses on workers earning the minimum wage, some define the low-paid category as workers with earnings in the lowest percentiles of the respective distribution, while other use a fixed cut-off which could be the minimum wage or benchmark at a point in time (McKnight *et al.*, 2016; Clarke and D’Arcy, 2016).

We trace the genesis of the real wage decline in Macedonia back to the outset of transition when, as in many other transition countries, wages considerably decreased due to the process of transitional restructuring. For instance, the index of real wages in 1992 fell to 58.4 percent of the 1990 level. This period was followed by a period of stabilisation when the index of real wages varied around 70 percent of the 1990 level. After the 2001 political crisis, real wages started to grow and, in 2008, finally reached the pre-transition level. Macedonia has not remained apart from the negative global macroeconomic tendencies engendered by the recent economic crisis. Although recession started later, after three consecutive years of real wage decline, since 2014, the real wage growth index has manifested a continuous increasing trend.

Apart from creating hardships for workers and their families, low paid work imposes a financial burden for countries' welfare systems. The costs for improving the living conditions of vulnerable segments encompass the social financial assistance, permanent social assistance, cash assistance for orphans, child allowance, benefits for care givers, one-time cash benefits, salary supplements for family members who face reduced work opportunities because of responsibilities to take care of children with disabilities, housing, health insurance benefits etc. In addition, the administration of all these programs requires a complex system of social assistance and it is associated with sizeable government spending. For instance, the current social assistance system in Macedonia is fragmented, consisting of many types of programmes rather than having a single comprehensive program, while the total spending on social assistance in 2016 was about one percent of GDP (Petreski and Mojsoska-Blazevski, 2017).

The aim of this paper is to assess the earning function of employed workers in Macedonia by paying attention to the difference between low-paid and highly-paid employees. For this purpose, we estimate Mincer type single equation model that explains wage income as a function of education, experience and other employee-specific and job-specific characteristics. As a result, we come up with a clear picture of the differences in earnings determinants between low-paid and highly-paid employees which we consider as the main value added of this paper. Comprehending the determinants of earnings can help policy makers develop policy interventions for those who are at the highest risk of poverty and eventually put the country on a path to increased growth and prosperity. Consequently, the paper is structured as follows. In section 1 we explain the main features of the method based on estimation of Mincer type equation. The data and sample used for estimation are presented in section 2, while section 3 is dedicated to the definition of low-employment. The empirical analysis consisting of models estimation and interpretation of results is the subject of section 4. The conclusions and policy implications are discussed in the last section.

1. Method

Understanding individual earnings is important in answering the question of what is behind generating and maintaining human well-being in society. In addition, comprehending the determinants of earnings can help policy makers develop policy interventions for those who are at the highest risk of poverty and eventually improve household welfare and standard of living. According to the human capital theory, the differences in earnings among workers can be explained by differences in their productivity. In this context, the stylised facts show that earnings are not uniform across the population, but vary according to a number of socio-economic and demographic characteristics (Polachek, 2007).

In econometric terms, the earning function represents a single equation model that explains monthly wages by using observed personnel and job related characteristics. Usually, the dependent variable is expressed as a logarithm of wages in order to estimate the percentage change of wage due to a unit change of a given independent variable and assuming *ceteris paribus* conditions. Hence, the general form of the earning function is as follows:

$$\ln(w_i) = \alpha + \beta \mathbf{X}_i + u_i \quad (1)$$

where, $\ln(w_i)$ is the natural log of monthly wages, \mathbf{X}_i is the matrix of observed characteristics of individuals such as: age, education, experience etc., while u_i is a random disturbance term and represents unobserved abilities.

The most widely used specification of empirical earnings equation and starting point for our analysis is the Mincer function which is a single equation model that explains wage income as a function of schooling and experience.

$$\ln(w_i) = \alpha + \beta_1 s_i + \beta_2 x_i + \beta_3 x_i^2 + u_i \quad (2)$$

where, s_i is years of schooling as a continuous variable, x_i is labour market experience, x_i^2 is squared experience. The equation (2) has become the 'workhorse' of empirical research on earnings determination and has been estimated on thousands of data sets for a number of countries (Lemieux, 2003).

The coefficient β_1 in (2) can be viewed as the average rate of return to years of schooling to wage employment. The reason for introducing squared experience in the earning function is because it is concave, i.e. earnings rise more quickly for the young while earnings growth slows down during mid-career and probably diminishes by the end of the career (Polachek, 2007). In the context of SILC, labour market experience is expressed as a number of years spent in paid work and represents a summary measure of the labour force experience of the individual. This covers the number of years since the respondent started his/her first regular job whether as an employee or self-employed. When a person had a job, but was

temporarily absent because of maintaining leave injury or temporary disability, slack work for technical or economic reasons, the related period is to be taken into account in the computation of the number of years spent in paid work.

The earnings function can be used to estimate returns at different schooling levels by converting the continuous years of education variable into a series of dummy variables: D_p , D_s and D_t for primary, secondary and tertiary level of education respectively. If we consider the primary education as a reference category, the specification of the model will be as follows:

$$\ln(w_i) = \alpha + \beta_s D_s + \beta_t D_t + \beta_2 x_i + \beta_3 x_i^2 + u_i \quad (3)$$

Although most applications of Mincer equation attempt to estimate the returns to schooling for a country, region, or level of schooling, lately there has been an interest in more disaggregated information such as returns for certain population groups categorised according to specific characteristics such as: ethnicity, gender, minority groups, persons with disabilities, and so forth. Estimating Mincer equations for different groups such as males and females or ethnic groups can be used to study the extent of labour market discrimination (Patrinos, 2016).

In the case of Macedonia, returns on education and experience have been estimated by several authors, while obtained results have been generally in line with the theoretical assumptions (Lehmann, 2010; Petreski and Mojsoska-Blazevski, 2015; Petreski *et al.*, 2016). Regarding disaggregation, separate estimates have been provided only with respect to gender (Lehman, 2010) and youth (Petreski *et al.*, 2016). In our analysis, we focus on determinants of earnings by distinguishing between low-paid and highly-paid workers in Macedonia which has not previously been a subject of research.

2. Data and sample

The analysis in this paper draws from an examination of micro data from the Survey on Income and Living Conditions (SILC), which is conducted under the regulations of the European Parliament and the Council¹. These regulations include definitions, rules for the frame of the survey, sample, rules for monitoring households, lists of main and secondary variables, variables in terms of housing conditions, social and financial exclusion, material deprivation and other rules applied by all European countries (Eurostat, 2008). The advantage of SILC as a household survey consists in its extensive coverage as it captures earnings in both formal and informal sectors and it can account for the combined pay of individuals who have several jobs. However, since the data are collected directly from

¹ Regulation EC No.1177/2003.

individuals in a household, they have higher measurement error than surveys based on company records (Lee and Sobeck, 2012).

The Macedonian State Statistical Office conducted SILC for the first time in 2010 as a new source of data on poverty and social exclusion. The survey has been carried out constantly every year; however, in this research, the results for 2015 are used. The primary focus of the survey is collecting data on the income and living conditions of different types of households, which provide indicators of poverty and social exclusion comparable to other European Union countries.

The survey is also conducted in accordance with international classification systems. The main classifications used are ISCED 2011 for levels of education, ISCO 08 and NACE Rev.2 for economic activity. The purpose of the survey is to establish a common framework for the systematic collection of data on income and living conditions. The survey is the basis for calculating the structural indicators for a comparative analysis at the EU level and redistribution of income and manifestation of poverty and social exclusion.

The target population in SILC consists of all persons in private households aged 16 and over. Persons living in collective households and institutions are excluded from the target population. Some people are observed for 4 years with their income and living conditions in order to obtain data on certain long-term indicators. The reference period for earned income is 12 months of the previous calendar year.

The sampling design for this survey consists of stratified two-stage samples. In the first stage, a simple random sample from the population of primary sampling units is drawn. In the second stage, a simple random sample of secondary sampling units (households) is drawn by using a random number generation. Stratification is done by regions (8 regions - NUTS3) and degree of urbanization (urban or rural), resulting in a total of 16 strata. The sample size in 2015 was 5115 households. All regions by type of settlement are covered proportionally to the target population. Therefore, the entire territory of Macedonia is with appropriate geographical representation in the survey.

All individuals aged 16 and above are categorised according to their most frequent activity status. The most frequent activity status is defined as the status that individuals declare to have occupied for more than half the number of months during the reference year. The categories of the most frequent activity status are employed, self-employed, unemployed, retired and other inactive persons.

In our research, we focus on the category of employed which are defined as persons who work for a public or private employer and who receive compensation in the form of wages, salaries, fees, gratuities, payment by results or payment in kind. The employed persons in the sample are identified according to the self-defined current economic status. The self-defined current economic status captures the person's own perception of their main activity at present. It is in principle determined on the basis of how most time is spent, but no criteria have been specified explicitly. It differs from the ILO concept to the extent that people's own perception of their

main status differs from the strict definition used by ILO. For instance, many people who would regard themselves as full-time students or homemakers may be classified as ILO-employed if they have a part-time job. Similarly, some people who consider themselves 'unemployed' may not meet the strict ILO criteria of taking active steps to find work and being immediately available.

The concept of 'current' implies that any definitive changes in the activity situation are taken into account. For instance, if a person has lost a job or has retired recently, or his/her activity status has otherwise changed in a definitive manner, then the situation as of the time of the interview should be reported. In this sense, 'current' overrides any concept of averaging over any specific reference period. If the person combines different part-time jobs as an employee that result in the equivalent hours of a full-time job, the person should consider him/herself a full-time employee. In this context, 'work' means any work for pay or profit, while pay includes cash payments or payments in kind.

3. Defining low-pay employment

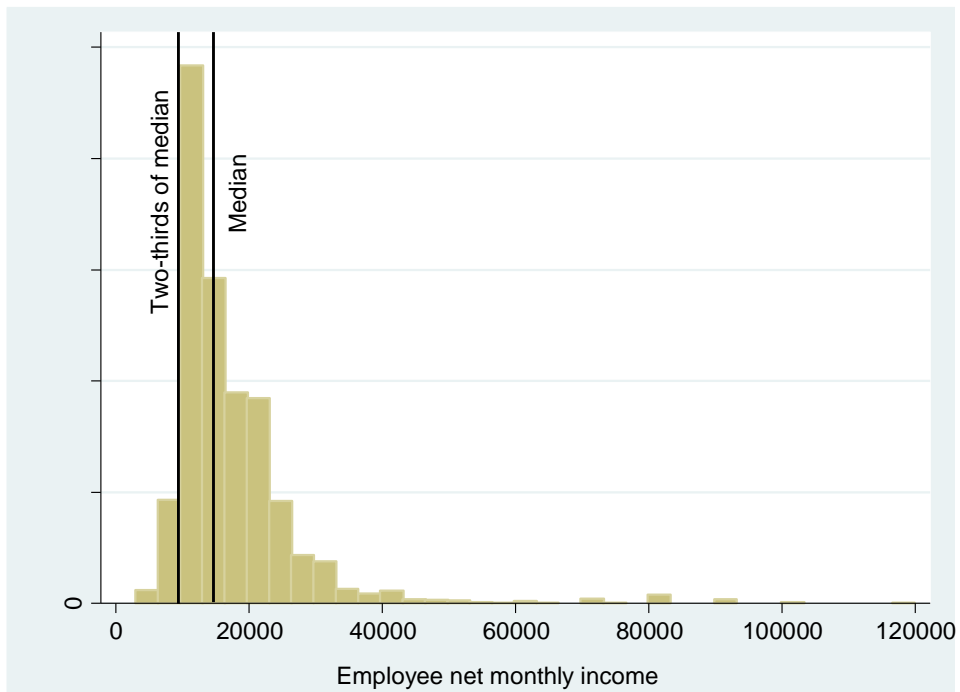
In the context of SILC, we get information about employee cash or near cash income instead of wages from companies' administrative records. Employee income is defined as the total remuneration in cash or in kind, payable by an employer to an employee in return for work done during the reference period. It can be expressed as gross or net income, where gross means that neither taxes nor social contributions have been deducted at source, while net refers to the case when taxes and social contributions are deducted. The data for both gross and net employee cash or near cash income are collected on a yearly basis. We express these variables in terms of average monthly amount by dividing the annual income with the number of months declared in the status of employment. Furthermore, in order to disentangle the influence of hours worked, a derived estimate of hourly earnings can be calculated by using the number of hours worked. However, within the SILC, we only have available the number of hours usually worked per week in the main job, which might introduce another source of error. Namely, by using the number of hours usually worked instead of the exact number of hours, the derived hourly earnings variable could be biased (Lee and Sobeck, 2012). Hence, in what follows, we will base our analysis on the employees' net monthly income. The distribution of employees' net monthly income for 2015 is presented in Figure 1.

From Figure 1 we can notice that the distribution of earnings is right-skewed since the median employee income is 15000 MKD² (245 Euro), which is lower compared to the average income of 17570 MKD (286 Euro). According to this, the incidence of low-pay in Macedonia, calculated as a share of employees whose net monthly income is less than two-thirds of median income is 12.3%, which is

² MKD stands for Macedonian Denar.

relatively low by international standards. In addition, from Figure 1, it is noticeable that the highest concentration of population is between the median income and two-thirds of median which makes the low-pay indicators be highly sensitive to small changes of the threshold. Furthermore, the relatively low position of the median income implies an asymmetric distribution of the net monthly income with respect to the median.

Figure 1. Distribution of employees' net monthly income, 2015



Source: Author's representation

In the case of low income countries, the median employee's income can be positioned low, which would cause the usual OECD low-pay threshold to be even lower than the statutory minimum wage or the country's poverty threshold. For instance, the statutory minimum wage in Macedonia was 9.590 MKD (156 Euro) in 2015 and was further increased to 12000 MKD (195 Euro) in 2017³. Moreover, the at-risk-of-poverty monthly threshold in 2015 was 13713 MKD (223 Euro). Having in mind that both the new statutory minimum wage and the at-risk-of-poverty threshold are higher than the standard relative threshold, in addition of using the two-

³ Minimum wage law, Official Gazette of the Republic of Macedonia No.11/2012, 30/2014, 180/2014, 81/2015, 129/2015 and 132/2017.

thirds of the median threshold, there is room for experimenting with alternative absolute thresholds.

The incidence of low-pay in Macedonia, as in other countries around the world, is far from being a uniform problem across workers and across jobs. The structure of sub-samples of low-paid and highly-paid employees according to personal characteristics and job-related characteristics is presented in Table 1 and Table 2 respectively.

Table 1. The sub-samples structure according to personal characteristics

Personal characteristics	Low-paid	Highly-paid
Gender		
Male	168 (42.9%)	1708 (61.4%)
Female	224 (57.1%)	1075 (38.6%)
Place of living		
Urban	237 (60.5%)	1740 (62.5%)
Rural	155 (39.5%)	1043 (37.5%)
Age (years)		
15-24	51 (13.0%)	171 (6.1%)
25-34	99 (25.3%)	662 (23.8%)
35-49	147 (37.5%)	1075 (38.6%)
50-57	63 (16.1%)	571 (20.5%)
58-over	32 (8.2%)	304 (10.9%)
Education		
Primary	12 (3.1%)	20 (0.7%)
Secondary	337 (86.0%)	1981 (71.2%)
Tertiary	43 (11.0%)	782 (28.1%)
Marital status		
Never married	99 (25.3%)	528 (19.0%)
Married	276 (70.4%)	2159 (77.6%)
Widowed	7 (1.8%)	46 (1.7%)
Divorced	10 (2.6%)	50 (1.8%)
General health		
Very good	88 (22.4%)	889 (31.9%)
Good	247 (63.0%)	1632 (58.6%)
Fair	38 (9.7%)	212 (7.6%)
Bad	18 (4.6%)	46 (1.7%)
Vary bad	1 (0.3%)	4 (0.1%)
Suffers from any chronic illness		
Yes	34 (8.7%)	155 (5.6%)
No	357 (91.3%)	2621 (94.4%)

Source: Authors' calculations

According to the personal characteristics, women are much more likely to be low paid than men, while the place of living (urban/rural) does not seem to be an

important dividing line with respect to wage levels. Regarding the age of employees, in both sub-samples, we can observe a bell-shaped distribution. With respect to education, the most represented among low-paid employees are workers with the secondary level of education, whereas those with tertiary education are considerably more represented among highly-paid workers. Finally, concerning the health conditions, among the low-paid employees, we can observe only a slight increase of the proportion of those with bad general health or those who suffer from a chronic disease.

Table 2. The sub-samples structure according to job-related characteristics

Job-related characteristics	Low-paid	Highly-paid
Type of contract		
Temporary	100 (25.5%)	283 (10.2%)
Permanent	292 (74.5%)	2500 (89.8%)
Managerial position		
Non-supervisory	371 (94.6%)	2452 (88.1%)
Supervisory	21 (5.4%)	331 (11.9%)
Occupation		
Managers	16 (4.1%)	123 (4.4%)
Professionals	13 (3.3%)	454 (16.3%)
Technicians and associate profess.	17 (4.3%)	336 (12.1%)
Clerical support workers	13 (3.3%)	195 (7.0%)
Service and sales workers	97 (24.7%)	479 (17.2%)
Skilled agricultural, forestry etc.	9 (2.3%)	18 (0.6%)
Craft and related trades workers	89 (22.7%)	466 (16.7%)
Plant and machine operators	66 (16.8%)	431 (15.5%)
Elementary occupations	72 (18.4%)	281 (10.1%)
Experience (years)		
0-5	163 (41.6%)	711 (25.5%)
6-10	57 (14.5%)	442 (15.9%)
11-15	43 (11.0%)	344 (12.4%)
16-20	41 (10.5%)	317 (11.4%)
21-25	31 (7.9%)	311 (11.2%)
26-30	26 (6.6%)	295 (10.6%)
31-35	21 (5.4%)	222 (8.0%)
36-over	10 (2.6%)	141 (5.1%)
Change of job since last year		
Yes	71 (18.1%)	190 (6.8%)
No	321 (81.9%)	2593 (93.2%)
Size		
Small	257 (65.6%)	1660 (59.6%)
Medium and big	135 (34.4%)	1123 (40.4%)

Source: Authors' calculations

Regarding the job-related characteristics, it is noticeable that temporary employed workers are much more likely to be low-paid than permanently employed workers. Moreover, higher proportions of low-paid jobs are associated with non-supervisory positions and careers in small companies. With respect to the accumulated human capital, it is obvious that low-paid workers are predominantly those with a shorter period of previous experience, while highly-paid workers mark a more even distribution. Concerning the occupation, the highest probability of being low-paid is faced by workers in services and sales, followed by craft and related trades workers and workers in elementary occupations. On the other hand, among the highly-paid jobs, professionals are considerably represented in addition to sales and services, craft and related trades workers. Hence, those in low-skilled occupations such as elementary occupations are more affected by the risk of being low-paid. Finally, low-paid workers are noticeably more likely than highly-paid workers to have changed job since last year and to work in a small company.

4. Empirical analysis

According to the human capital theory, real wages are equal to worker's marginal product, and marginal product in turn depends on a worker's human capital (Smith, 2001). The human capital of a worker increases with the years of experience, though at a diminishing rate. Thus, workers' earnings should peak rather late in one's working life and then level out. A decrease in mean monthly labour earnings in later working years is often due to health problems or a need to reduce working hours. This drop in labour earnings is particularly pronounced for workers older than the normal retirement age.

The estimated Mincer earning function for the entire sample of employed workers, as well as separately for low-paid and high-paid workers is presented in Table 3. The applied estimation technique is weighed least squares where as weights are used personal cross-sectional weights. The referent category for educational dummy variables is primary education.

From Table 3, we can notice that returns to education are expectedly much higher among highly-paid workers than among low-paid workers. Namely, the wage premium for secondary education of highly-paid workers is 20.8 percent, while this coefficient for low-paid workers is 15.5 percent. Regarding the wage premium for tertiary education, it is noticeable that, among highly-paid workers, it is almost 2.5 times higher than the wage premium for secondary education, whereas no statistically significant impact of tertiary education is observed among low-paid workers. In addition, the work experience is almost twice as worthy for earnings of highly-paid workers than for low-paid workers. For instance, an additional year of work experience would increase the income of highly-paid workers by 1.38 percents, while for the low-paid workers by 0.69 percents. In addition, the squared experience

term is negative and statistically significant for highly-paid workers suggesting a concave earning profile, but this is not the case for low-paid workers.

Table 3. Estimated earnings function, dependent variable is $\ln(w_i)$

Explanatory variables	Entire sample	Low-paid	Highly-paid
Constant	9.062993*** (0.000)	8.91026*** (0.000)	9.303567*** (0.000)
Secondary	.341147*** (0.000)	.1555245** (0.015)	.2085921*** (0.000)
Tertiary	.6905065*** (0.000)	.1042028 (0.164)	.5233999*** (0.000)
Experience	.0180716*** (0.000)	.0069543** (0.048)	.0138513*** (0.000)
Experience-square	-.0002865*** (0.000)	-.0001474 (0.171)	-.0002059*** (0.001)
Number of observations	3175	392	2783
R-squared	0.1846	0.048	0.1716
Prob > F	0.0000	0.0079	0.000

Note: p-values are in parentheses; **/** indicate significance at 10/5/1 percent level.

Source: Authors' calculations

We further extend the basic Mincer equation by taking into consideration other personal characteristics of employed such as: gender, marital status, place of living, general health conditions and suffering from chronic illness.

The gender pay gap is one of the empirically well proved peculiarities of earnings distribution. The literature on the determinants of gender pay gap has produced a number of theories helping to explain the persistence of this phenomenon. One strand of literature favours the importance of differences in individual characteristics, where lower earnings among women are attributed to the role of motherhood in labour supply or higher incidence of part-time work. On the other hand, the second strand of literature is focused on the role of social norms and perceptions such as occupational segregation. Alternatively, the gender pay gap might be explained by the so-called phenomenon of statistical discrimination. In the case of Macedonia, a strong gender discrimination in terms of vertical distribution of jobs and higher probability for women to be in low-paid and unpaid family jobs than men has already been documented (Kazandziska *et al.*, 2012). In addition, estimation based on the Labour Force Survey data shows that females' wages are about 18-19 percent lower than males' wages (Petreski and Mojsoska-Blazevski, 2015).

Marital wage premium is the situation when married people (usually men) have significantly higher earnings than non-married. The plausible explanation of the marital wage premium among married men is the increase of their productivity

due to the need of providing the necessary living conditions for their families. According to the selection theory, the direction of causation is the other way around, *i.e.* it is assumed that people with higher earnings possess certain characteristics that render them more attractive on the marriage market (Strike, 2012).

The impact of the place of living (urban/rural) on individual earnings is not clear-cut and generally depends on the role of agricultural production. If the agricultural production is conducted on as a small-scale basis, as a strategy of last resort, then it is generally associated with low earnings, while in the case of large-scale farming, it might generate significant revenues (Collins, 2016). In this context, some authors find out that living in rural areas at the outset of transition increases the risk of being low paid due to the fact that subsistence farming has been generally used as a coping strategy for surviving (Bernabè and Kolev, 2005; Bruck *et al.*, 2007).

The measurement of self-perceived health in the context of SILC is by its very nature subjective. The notion is restricted to an assessment coming from the individual and not from anyone else. The reference is to health in general rather than the present state of health, as the question is not intended to measure temporarily health problems. It is expected to include different dimensions of health such as: physical, social and emotional function and biomedical signs. In this case, five answer categories are presented: two are at the upper end of the scale (very good and good), two are at the lower end of the scale (bad and very bad), and at an intermediate category 'fair', which should be translated into an appropriately neutral term (nor good nor bad). However, we recode this variable into a binary which takes value 1 in the cases when the general health condition is perceived as bad or very bad and 0 in other cases.

Regarding the chronic (long-standing) illness or condition, it is important to get information whether the respondent has a chronic condition, not if he/she really suffers from it. The main characteristics of a chronic condition in the context of SILC are that it is permanent and may be expected to require a long period of supervision, observation or care. In order to be classified as long-standing, health problems should have lasted or are expected to last for 6 months or longer, therefore temporary problems are not of interest. We can assume that this category of employees encompasses mostly the disabled, who are considered as a vulnerable labour market segment at a high risk of low-pay.

The estimated results of the earning function for the entire sample and for the sub-samples of low-paid and high-paid workers are presented in Table 4. From Table 4, we can notice that the wage premium for secondary education as in the previous specification is statistically significant and higher for highly-paid employees, while the wage premium for tertiary education is almost 2.5 times higher and statistically significant only for highly-paid workers. In addition, experience has a positive and statistically significant impact on earnings for highly-paid workers. Similarly, it is noticeable that experience is almost twice as worthy for highly-paid as for low-paid

workers, while negative squared term suggests concave earning profiles for both low-paid and highly-paid workers. Being female appears as a statistically significant factor in the earning function. Namely, on average, women have an 18.93 percent lower income than men. The polarisation with respect to gender is higher among highly-paid than low-paid workers. Namely, the highly-paid women earn on average a 16.61 percent lower income than men, while for the low-paid workers this discrepancy reaches only 4.17 percent. Furthermore, we identify a positive and statistically significant marital wage premium of 3.55 percent only for highly-paid workers, while living in rural areas has a positive impact on earnings for highly-paid workers but a negative though not statistically significant impact for low-paid workers. Finally, general health and chronic illness do not appear as statistically significant determinants of earnings for neither category of workers.

Table 4. Estimated earnings function, dependent variable is $\ln(w_i)$

Explanatory variables	Entire sample	Low-paid	Highly-paid
Constant	9.101741*** (0.000)	8.937776*** (0.000)	9.320762*** (0.000)
Secondary	.3433835*** (0.000)	.1492643** (0.017)	.2157436*** (0.000)
Tertiary	.7298266*** (0.000)	.0993734 (0.186)	.5697624*** (0.000)
Experience	.0154005*** (0.000)	.0056547 (0.126)	.0124125*** (0.000)
Experience-square	-.0002341*** (0.001)	-.0001176 (0.270)	-.0001808*** (0.006)
Sex (1=female)	-.1893578*** (0.000)	-.041741* (0.078)	-.1661332*** (0.000)
Marital status (1=married)	.0524795*** (0.004)	.0335279 (0.321)	.0354981** (0.040)
Place of living (1=rural)	.037075** (0.020)	-.0119893 (0.628)	.0427171*** (0.007)
General health (1=bad or very bad)	-.0789392 (0.201)	.0168279 (0.861)	-.0333085 (0.513)
Chronic illness (1=yes)	-.0484735 (0.221)	-.0938246 (0.250)	.0120128 (0.717)
Number of observations	3175	392	2783
R-squared	0.2421	0.0822	0.2233
Prob > F	0.0000	0.0198	0.0000

Note: p-values are in parentheses; ***/**/* indicate significance at 10/5/1 percent level.

The failure of classical skills-related arguments to explain the substantial part of the observed variation in wages has caused an interest in the workplace as a determinant of wage inequality. Hence, we need to disentangle employee-specific

from job-specific determinants of wage level and wage inequality (ILO, 2016). Therefore, we estimate a third specification where, among explanatory variables, are included job-related variables such as: type of contract, size of the enterprise, number of hours usually worked per week in main job, whether the employed holds a managerial position, whether he/she has changed job since last year, having an elementary occupation and being self-employed.

The type of contract in the context of SILC refers to the main job. If multiple jobs are held or were held, the main job should be the one in which the greatest number of hours are usually worked. The possible options are: temporary job if the work contract is on limited duration and permanent job if the work contract is on unlimited duration. A job may be regarded as temporary if it is understood by both employer and employee that the termination of the job is determined by objective conditions such as reaching a certain date, completion of an assignment or return of another employee who has been temporarily replaced. In the case of a work contract on limited duration, the condition for its termination is generally mentioned in the contract. According to the human capital theory, the employed with temporary contracts are assumed to have lower productivity compared to those with permanent contracts.

The number of hours corresponds to the number of hours the person normally works in his/her main job. This covers all hours including extra hours, either paid or unpaid which the person normally works but excludes the travel time between the home and the place of work as well as the main meal breaks. Persons who usually also work at home are asked to include the number of hours they usually work at home. Apprentices, trainees and other persons in vocational training are asked to exclude the time spent in school or in other special training centres.

The managerial position assumes supervisory responsibility which includes the formal responsibility for supervising a group of other employees whom the respondent supervises directly, sometimes when doing some of the work that he/she supervises. It implies that the supervisor takes charge of the work, directs the work and sees that it is properly conducted. Therefore, it is assumed that having a managerial position is associated with the probability of having higher wages.

The change of job since last year refers to whether the individual left a job or changed from one to another since the last interview. For employees, a change of job means a change of employer, not moving from one set of duties to another with the same employer. Nevertheless, a change of contract with the same employer is still considered a change of job.

Regarding the size of the establishment, in the context of SILC, it has been estimated according to the number of persons working at the local unit. The enterprise is considered small if it has less than 50 persons employed. The previous estimates show that, in the global context, firm size matters, which means that for identical schooling and experience, workers in bigger firms tend to earn more than workers in small firms (Montenegro and Patrinos, 2013).

We consider an elementary occupation a job where the knowledge and experience necessary to perform it is mostly simple and routine, involving the use of hand-held tools and, in some cases, considerable physical effort, and, with few exceptions, only limited personal initiative or judgment. The main tasks consist in selling goods on the streets, door keeping and property watching, as well as cleaning, washing, pressing and working as labourers in the fields of mining, agriculture and fishing, construction and manufacturing. Most occupations in this major group require skills at the first ISCO skill level. In this context, we expect that working in an elementary occupation entails a large negative effect on worker earnings.

The estimated results of the earning function for the entire sample and for the sub-samples of low-paid and highly-paid workers are presented in Table 5.

Table 5. Estimated earnings function, dependent variable is $\ln(w_i)$

Independent variables	Entire sample	Low-paid	Highly-paid
Constant	9.111126*** (0.000)	8.885256*** (0.000)	9.419445*** (0.000)
Secondary	.253453*** (0.000)	.127357 (0.024)	.1645774*** (0.009)
Tertiary	.5984666*** (0.000)	.0845677 (0.219)	.481856*** (0.000)
Experience	.0103952*** (0.000)	.0046468 (0.162)	.0092721*** (0.000)
Experience-square	-.0001237** (0.064)	-.0000988 (0.287)	-.0001171* (0.069)
Sex (1=female)	-.1732972*** (0.000)	-.0413015** (0.065)	-.1540907*** (0.000)
Marital status (1=married)	.0486289*** (0.005)	.0254231 (0.423)	.0355818** (0.036)
Place of living (1=rural)	.0359713** (0.020)	-.0220704 (0.353)	.0452556*** (0.003)
General health (1=bad or very bad)	-.0712765 (0.247)	.0242685 (0.757)	-.0161308 (0.749)
Chronic illness (1=yes)	-.0146815 (0.699)	-.0753463 (0.305)	.028189 (0.389)
Type of contract (1=permanent job)	.0807874*** (0.001)	.0273447 (0.270)	.0406414* (0.075)
Managerial position (1=yes)	.1349087*** (0.000)	-.0841624* (0.077)	.1243747*** (0.000)
Hours usually worked per week in main job	.0028048** (0.003)	.002184** (0.056)	-.000116 (0.899)
Change of job since last year (1=yes)	.0040811 (0.904)	-.0073007 (0.881)	.0075646 (0.823)
Size of establishment	-.1190939*** (0.000)	-.0040755 (0.881)	-.1068787*** (0.000)

(1=small)	(0.000)	(0.846)	(0.000)
Elementary occupation	-.1486848***	-.0160897	-.1356721***
	(0.000)	(0.635)	(0.000)
Number of observations	3175	392	2783
R-squared	0.2937	0.1372	0.2633
Prob > F	0.0000	0.0038	0.0000

Note: p-values are in parentheses; ***/**/* indicate significance at 10/5/1 percent level.

Source: Authors' calculations

From Table 5, we can notice that the results obtained from the estimated extended earning function are robust and consistent with the results from previous specifications. In particular, we find out that being employed permanently increases the workers' earnings and its impact is higher for highly-paid than for low-paid workers. For instance, having a permanent job would increase the highly-paid worker's earnings by 4 percent, while the increase for low-paid workers is not statistically significant. In addition, having a supervisory position is a statistically significant determinant which, on the average, positively affects the earnings of highly-paid workers by 12.43 percent. The number of hours usually worked per week in the main job positively affects the earnings of low-paid workers, but it is not a statistically significant determinant for the earnings of highly-paid workers. In this context, an additional hour usually worked per week would increase the earnings of low-paid workers by 5.6 percent. These findings are reasonable since a significant share of low-paid workers are temporarily employed and work less than full-time. By contrast, the majority of highly-paid workers are permanently employed and presumably have full-time employment arrangements, thus making the number of hours usually worked per week insignificant as an explanatory variable for this category. Working in a small company or having an elementary occupation will, on the average, decrease earnings for the entire sample by 11.9 and 14.9 percent respectively, though we do not find a statistically significant impact for the sub-sample of low-paid workers.

Conclusions and policy implications

In this paper, we make an attempt to estimate the earning function for employed workers in Macedonia by putting an emphasis on the differences between low-paid and highly-paid workers. For the entire sample, as well as for both sub-samples, we confirm the assumption of the basic Mincer model meaning that education and experience represent significant determinants of workers' earnings. Generally, returns from secondary education are less valuable for low-paid than for highly-paid workers. In addition, returns from tertiary education are considerably higher compared to secondary education which is characteristic only for highly-paid workers, while for low-paid workers, tertiary education does not appear as a significant determinant. Similarly, the experience is almost twice as valuable for

highly-paid as for low-paid workers and in both cases it manifests a concave earning profile over the working life cycle. These findings might be further utilised in formulating policy guidelines for reforms in the education system.

Regarding the personal characteristics we identify female workers as particularly vulnerable since, on the average, they have lower earnings compared to male workers. This is observed in both sub-samples of low-paid and highly-paid workers. By contrast, being married and living in the rural area have a positive impact on earnings only for highly-paid workers. Although not statistically significant, the negative impact of living in rural areas on earnings of low-paid workers suggests differences in the role of agricultural production. Namely, large-scale farming, which is more productive, is characteristic for highly-paid workers, while subsistence farming is a typical strategy of last resort for low-paid workers. Finally, the bad general health condition and/or suffering from chronic illnesses do not appear as statistically significant determinants of earnings.

With respect to job-related characteristics, we have revealed that higher earnings are associated with permanent work arrangements, being on a managerial position and having a higher number of working hours. In this context, particularly low-paid workers are at a higher risk of having temporary work contracts which, in turn, renders the number of working hours to be a more decisive factor in their earning function. Finally, working in a larger company and possessing more advanced skills appears as statistically significant for higher earnings only for highly-paid workers. According to the obtained results, we can further formulate several policy recommendations.

First, the improvement of training possibilities of low-paid workers would increase their skill endowment and possibility to move from a low-paid to highly-paid contingent. This can be done by an appropriate design and greater funding of active labour market programs, as well as by improving vocational education and training. Namely, the active labour market policies have to be designed carefully in order to target the most vulnerable labour market segments, particularly with respect to increased employability of workers with low level of qualifications. The accent of reforms in vocational education and tertiary education study programmes should be put on upgrading the teaching curricula by including both theoretical knowledge and practical skills. Given that awareness among the social partners involved in the process of designing new curricula and of modernising the existing ones is still at a relatively low level, incentives should be created among employers to participate in designing study programmes for the formal vocational education and training as well as for the informal vocational education of adults.

Secondly, having in mind the identified gender segmentation, measures are needed for narrowing the gender earning gap. The concept of inclusive growth has to strengthen the opportunities for decent employment of vulnerable labour market segments, such as women. In this context, specifically tailored programs should target the female population in order to increase labour force participation and

productivity of female workers. In addition, changes of the labour legislation should take into account the principle of equal remuneration for equal work. This means that employers should be required to formulate job descriptions for every job position in their company in terms of competencies and skills needed as well as expected results and outputs. As a consequence, the formulation of wages will be based on measurable criteria.

Thirdly, the improvement of the position of low-paid workers can be done by providing more stable work arrangements. A potential strategy for this is by increasing the role of unionisation and its impact on wage levels in the process of collective bargaining. In this context, the role of trade unions should be particularly strengthened in the private sector. Namely, in most of the newly established firms, which are generally smaller, employees are not organised in trade unions, while in the big companies, it is questionable whether trade unions operate completely independently from company owners. Another issue is the fragmentation of trade unions and formation of new trade union federations and confederations, which substantially diminishes their bargaining power. As a consequence, the crucial changes in the labour code, such as the recent increase of the statutory minimum wage are initiated by the government and not by trade unions.

Finally, legislation changes that cover wage setting as well as its implementation are required. One strand of changes includes tax system reforms, such as the introduction of progressive tax rates and tax subsidies for low-paid workers. At the moment, a subject of personal income tax exemptions are only salaries paid to employees in Technological and Industrial Development Zones, who presumably face a low risk of low pay. Another strand is the already mentioned increase of the statutory minimum wage, which is expected to exert an upward pressure on wages. However, an assessment of its impact on the overall wage level should be a subject of further comprehensive analyses.

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