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# The Impact of Gender on Mid-Career Labour Income: The Case of Bulgaria

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# The impact of gender on labour income in life course perspective[1]

## The case of Bulgaria

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**ABSTRACT**

In this paper, we attempt to find an answer to the question "How gender determines labour income over the life course?" In the first place, we estimate gender impact in different life course phases (early, mid- and late-careers) using Mincerian regressions. Secondly, we analyze the differences in payment of men and women in their mid careers. Finally, we study the gender pay gap among employees with tertiary education by occupational position and sector (private and public). The data set we use is from the Structure of Earnings Survey conducted by the National Statistical Institute in 2002 and 2006, which includes over 300,000 observations. Findings show that the gender effect is greatest in mid-career, and it remains at slightly lower levels over late career, while the lowest gender pay gap is observed in early-career. We also find a significant wage differential among zero-skilled men and women; such discrepancy is also observed among employees with tertiary education on the top occupational positions, especially in the public sector. In the time of economic growth the gender pay gap on the top occupational positions is decreasing while the gender pay gap for the zero skilled human capital is increasing. As expected, men are better paid regarding to most labour income determinants. In particular: the trade union effect is much stronger for men; as well as private companies tend to pay

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more to men, holding all other factors equal. The only advantage women have is higher returns to each additional year of education.

## 1 INTRODUCTION

Bulgaria as an ex-socialist country historically had the highest female employment rate among the European countries. In 2009 the employment rate for women aged 25-54 with at least one child is 74.3% compared to 68.2% average for EU-27 (European Commission, 2011). The female employment dropped significantly in the 1990s, reflecting the severe socio-economic transformations that marked the country's move from a state run toward market-oriented economy. The economic development which started at the end of the 1990s and led to stable high growth rates after 2000 led to positive outcomes on the labour market regarding women participation.

In contrast to many West European countries, and similar to the most East and Central European countries, in Bulgaria the proportion of part-time employed is very low with no gender differences and full time employment with short brakes for maternity leave is the norm in the Bulgarian society (Table 1). A tiny percent of 2.3 among the female employed workforce aged 15-64 who in parallel look after children or elderly report about flexible working time while almost all of them (94%) have fixed working time[2]. As a consequence Bulgaria has faced the problem of very low fertility (TFR — below 1.4).

Further negative demographic tendencies are stable high levels of mortality, and intensive rates of emigration; together; these result in a permanent loss of population (Kotzeva, 2006). The negative demographic situation could be explained additional to the high employment participation and missing opportunities for flexible work arraignments by the parallel effects of three groups of factors: 1) severe economic crisis and decreasing living standards of the majority of the population; 2) a shift in attitudes of the young generations, as indicated comprehensively in the Second Demographic Transition theory (Lesthaeghe, R. & Van de Kaa, 1986); 3) reduction of social expenditures by the state for families and children during the 1990s and until 2005. Critics label the situation as a "demographic crisis", which is expected to grow deeper in perspective. An incentive, by which the state strives to neutralize the effects of low birth rate, is increased paid parental leave in terms of its length and wages

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[2] Labor Force Survey 2010. National Statistical Institute. http://www.nsi.bg/otrasal.php?otr=26&a1=735&a2=741&a3=2504#cont. Last access 20 July 2011

compensation[3]. Women are pressed to keep their strong labour force attachment because most of the children's benefits are linked to their employment status.

Although the relatively long paid maternal leave young women with higher education and qualification prefer to return early to work and do not use the full length of their paid maternal leave (Stoilova 2007). On the contrary, among women with lower education, there is increased difficulty in returning to the same work (Stoilova, Haralampiev, 2008). While in the category of women with tertiary education 85.5% rely on return to the same work, among women with secondary education the proportion falls to 59.7%; among those with basic education, it falls even lower, to 21.4%, and among those with primary education, it is 25.0%[4]. This shows the increasing importance of education for the labour status of women in Bulgaria.

Bulgaria is among the countries with very high expectations that women will contribute to the family budget (Stoilova, Haralampiev 2010: 354-356). This means that women with small children would opt for paid work not only taking into consideration their chances for professional realization and income, but also according to the possibility for balancing work and family; respectively, they would avoid positions in which this balance would be made difficult. For example women in Bulgaria choose more frequently public instead of private sector, prefer permanent contracts to shorter and more unstable work relations; they are less presented at managerial positions (Stoilova, Haralampiev 2008). The positive effect of the permanent labour contract and of the longer lasting exchange between employee and employer in service relations against contracts with shorter terms for stratification is well argument (Breen 1997). However, we do not know whether the permanent contract preferred by women in Bulgaria results in higher income during the life course.

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[3] Since January 1, 2007, 90% compensation was introduced on the mother's salary until the child reaches the age of 10 months, and since 2009 the length has been increased to the age of 1. In general, the paid leave is used mostly by the mothers, although the law provides the same rights for fathers as well. During the second year the paid leave amounts to the minimal salary in the country.

[4] Gender and Generations Survey, wave 2004.

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*Table 1. Selected labour market and education statistics for Bulgaria, 1999-2009*

| Indicator | Countries | 1999 | 2004 | 2009 |
|---|---|---|---|---|
| **Persons working part-time** (% of total employment) | | | | |
| *Male* | EU – 27 | 6.4 | 7.1 | 8.3 |
| | **Bulgaria** | **-** | **2.1** | **2.0** |
| *Female* | EU – 27 | 28.5 | 30.0 | 31.5 |
| | **Bulgaria** | **-** | **2.7** | **2.7** |
| **Gender pay gap in unadjusted form** (in %) | EU – 27 | - | 17.7 [2006] | 17.1 |
| | **Bulgaria** | **-** | **18.9 [2002]** | **15.3** |
| **Share of women among tertiary students** (as % of the total students) | EU – 27 | 53.2 | 54.8 | 55.5 |
| | **Bulgaria** | **59.5** | **52.5** | **55.6** |

*Source: European Commission. Eurostat*
*(http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/ Last access: 20 July 2011)*

Over the years of social transformations in Bulgaria, women's work situation has becoming stratified to a considerable degree. The socially significant gender differences tend to grow in proportion to higher age and to lower human capital. Conversely, the negative social positioning associated with the female identity, decreases in proportion to women's higher educational status and occupational position (Stoilova, Slavova 2006). The greatest differences in payment between women and men occur among those with primary or lower level of education (women get 69.8% of men's income) and those with basic education (70.8%); the differences are smaller between men and women with a higher education at bachelor's or master's degree level (75.5%), and they are smallest between people at doctoral degree level (88.7%) (Stoyanova, Kirova 2008:123). Although women are increasingly participating in paid work over the last decades, gender pay gap is still persisting. The remaining gender pay gap could be observed irrespectively of the fact that women are more likely than men to attain tertiary education (Table 1). Having in mind the achieved equality between men and women in education, and the similar labour marked involvement predominantly on full time basis the persisting gender pay gap seems to require a deeper explanation. The income inequalities have not been investigated in the life-course of women with different educational levels in the Bulgarian context yet.

The economic dynamics of the country over the last decade encompasses both a period of stable growth and positive labour market development (2001 – 2008), as well as a period of the decline and labour market aggravation following the global economic crises (2008 – 2010). Thus, choosing the time spam 2002-2006 seems to be adequate and appropriate if we look for stable positive developments of the labour market. Hence we try to answer the question about the effect of the positive economic developments over the gender pay gap on the top and on the bottom of the educational levels. The macroeconomic growth for the period of 2002-2006 was stable and significant, as well as the increase in average wages

(average economic growth for the period 2004-2007 was about 6.5%, and the increase in wages reached 20% in 2007 on annual basis). The level of unemployment started to decrease gradually after 2005 dropping under 7% in 2007 (Table 2). Furthermore, 2006 was the year in which the contract for EU accession of Bulgaria has been signed. This political proceeding has positively influenced the foreign investments in Bulgaria and has led to rapid transformation of the labour market into a rather competitive one.

The transformation of public and private sector over this period shows significant increase in employment in the private sector, as well as a constant increase in wage levels in both sectors. However, official data still shows greater incomes in public sector than these in private one there are doubts on the reliability of the data. The underestimation of the private sector earnings could be explained due to the presence of a significant share of the shadow economy, the earnings which are not reported for tax reasons. For the purpose of reducing the informal economy in Bulgaria, a legal mechanism was adopted in 2002, obliging employers to register each labour contract at the National Insurance Institute (NOI). A similar effect came about through the introduction of minimum thresholds for social security payments in 2002, which influenced the wage negotiations between social partners (Stoilova 2009:77). The regulation putting the income received during parental leave for caring for a child aged up to 1 depending on the previous labour income of the mother is in the same direction of decreasing the unregistered incomes. The effect can be observed in the higher levels of the registered wages for 2006.

Over the recent years of economic crisis, the unemployment rate increased significantly. However, the unemployment rate among women is still lower than that of men. Plausible explanation of this phenomenon could be found in the pre-crisis labour market indicators: share of employed women in public sector is relatively high after 2006 (58% in 2010), and this sector suffered significantly less than the private one during the crisis (Table 2). Public sector is seen as giving more stable labour positions in comparison to private sector. This is a reason that women choose jobs in the public sector more frequently than men.

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*Table 2.  Economic structure and labour market development (2002-2010) (%)*

| Macroeconomic indicators | 2002 | 2003 | 2006 | 2007 | 2009 | 2010 |
|---|---|---|---|---|---|---|
| GDP (real growth) | 4.7 | 5.5 | 6.5 | 6.4 | -5.5 | 0.2 |
| Annual average inflation | 5.8 | 2.3 | 7.3 | 8.4 | 2.8 | 3.0 |
| **Labour market indicators** | **2002** | **2003** | **2006** | **2007** | **2009** | **2010*** |
| *Annual Enterprises survey on employment, wages and salaries and other labour costs* | | | | | | |
| Nominal wage growth | 7.3 | 6.1 | 11.3 | 19.5 | 11.8 | 6.3 |
| Nominal wage growth in public sector | 10.9 | 6.4 | 10.0 | 18.2 | 9.6 | 4.9 |
| Nominal wage growth in private sector | 6.6 | 6.8 | 13.2 | 21.5 | 12.6 | 6.2 |
| Share of employed in public sector | 37.8 | 36.7 | 29.5 | 27.1 | 25.1 | 26.9 |
| Share of employed in private sector | 62.2 | 63.3 | 70.5 | 72.9 | 74.9 | 73.1 |
| **Share of employed women** | 49.2 | 49.0 | 48.5 | 48.4 | - | 48.6 |
| **Share of employed women - public sector** | 52.5 | 51.7 | 55.6 | 56.2 | - | 58.0 |
| **Share of employed women - private sector** | 46.6 | 47.2 | 45.2 | 45.1 | - | 45.1 |
| *Labour Force Survey, 15+* | | | | | | |
| Employment rate | - | 42.4 | 46.7 | 49.0 | 49.4 | 46.7 |
| Employment rate - men | - | 46.8 | 51.8 | 54.4 | 54.9 | 51.3 |
| Employment rate - women | - | 38.4 | 42.0 | 44.0 | 44.4 | 42.4 |
| Unemployment rate | - | 13.7 | 9.0 | 6.9 | 6.8 | 10.2 |
| Unemployment rate - men | - | 14.1 | 8.6 | 6.5 | 7.0 | 10.9 |
| Unemployment rate - women | - | 13.2 | 9.3 | 7.3 | 6.6 | 9.5 |
| | | | | *SOURCE : NSI* | | *Note: *preliminary data* |

In this article, we discuss several types of inequalities: those in returns to education for early-, mid- and late employment careers; between men and women with the same education level and in the same period of their lives; between women with different education and in the same period of their employment career. As described in this section, on the basis of results from previous studies, we are characterizing gender as an individual characteristic that differentiates the returns to education. This also serves as the foundation for outlining the main theories that underlie the analysis; for the selection of the analytic dimensions and the formulation of the main hypotheses, which are presented in section 2. Section 3 and 4 present data description, model specification, as well as main findings from conducted empirical analysis using the SES survey of the NSI for the years 2002 and 2006. Section 5 of the article includes conclusions and discussion.

## 2 THEORIES, ANALYTICAL DIMENSIONS AND HYPOTHESES

The theoretical background of our analysis is based on T. Parson's thesis for the selection of the most competent professionals at the top positions as a mechanism to abolish prescribed roles and statuses. This process could be seen as beneficial for improving the access of women with higher education to

managerial positions. Functioning of economic markets through the selection of the most competent for the top positions is a mechanism both for guaranteeing a maximal efficiency and productivity on one hand, and of an equal treatment and abolishment of all prescribed roles and statuses, on other (Parsons, 2005: 251). This process is beneficial for women and allows them to escape from prescribed roles and negative expectations towards their competence on leading positions. The same mechanism in public sector is guaranteed through the selection after open competition and regarding competences and obtained certificates. *We ask the question: if women on top positions in a private sector as well as in a public sector would benefit equal from the tertiary education as measured by their income?*

Another useful theoretical thesis is that of G. Becker on the effects of age and gender on the earning of workers and returns to secondary and higher education. In Gary Becker's classical study of the consequences of investment in personal knowledge and skills, a thorough investigation is presented of the connection between the effects of investment in human capital and the return to this investment for the individual. In his study, Becker assesses the empirical level of returns to secondary and higher education, the connection between human capital and income, between the personal prosperity in different age groups, as well as the returns to different levels of education in some specific labour force groups, including the group of women. Differentiated analyses for men and for women make it possible to register the size of the income differences by educational levels. (Becker 1993:234).

In his essay „The Allocation of Time and Goods over Time"[5], Becker studied the distribution of time and goods over the whole life-cycle and discussed the differences between, and advantages of, a comparison between age groups and the search for the cohort effect. In our analysis, we interpret age and life-cycle differences. The second issue pointed by Becker - the historical and cyclical changes in the economy, „the effect of age on the earnings of workers with the same technological knowledge" (Becker 1993: 235), could not be followed by this analysis. We choose to compare between two years, 2002 and 2006, and to investigate the dynamics of income differentiating between men and women in a phase of the economy that is characterized by stability and growth. *In the analysis we seek to answer the question: how does a period of economic growth (the year 2006 exemplifies favorable, upward economic development) reflect on differences in remuneration by gender and education?*

We apply the concepts of "bounded rationality" (Arum, Müller 2004:12, Blossfeld, Hofmeister 2006) and "doing gender" (West, Zimmerman 1987) in

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[5] Published in the collection *The Economic Approach to Human Behavior* (Gary Becker 1976)

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order to explain the socially constructed gender roles and their effects on gender inequalities in the labour market and for the persisting gender pay gap. For sociologist in contrast to economists rational action means not the most efficient action but the one, who fits better to the specific socio-cultural and institutional context. They use the concept of "bounded rationality" (Arum, Müller 2004:12, Blossfeld, Hofmeister 2006) for interpreting the position in the labour market. According to this concept, individuals calculate their available present or *potential* resources, chances and obstacles in making decisions regarding positioning in the labour market, and before that, in making decisions as to a longer or shorter education, and as to education with an academic or practical orientation. Moreover, the assessment of individual resources is always made in view of the existing, preliminary (institutional and socio-cultural, gender-specific) framework conditions.

We further use the concept of "doing gender", which takes account of the fact that individual choices are taken always in a specific cultural and institutional context , in this case, the reality is producing gender (West, Zimmerman 1987). The emphasis is laid on the individual social action, and the choices men and women take on a micro level considering the macro levels institutions and cultural norms. The notion of gender takes into account the socially constructed nature of gender, emphasizes choice of a certain type of behavior as directed by the expectations of other people as to required behavior, which, according to the occasion and context, in respect to the labour market placement may differ to various degrees for women as compared with men.

Several empirical studies focus on the doing gender effects and their measurement in the Bulgarian context, demonstrating the process in which women and men position themselves in different segments of the labour market and choose jobs with different characteristics, not primarily in accordance with their human capital but rather with the possibilities to balance paid and unpaid work.

Chances for attaining managerial positions are lower for women than for men. Women less often attain leadership status than men, all other things being equal, including education level (Stoilova, Haralampiev 2008). In addition to family formation, factors that lead to abandonment of plans for career growth are self-underestimation, and women's fear of assuming responsibility at the work place, which results in their remaining at lower work positions and income levels. Restriction of professional ambitions and career growth, metaphorically known as the "glass ceiling" (Abdela 1999), was registered in Bulgaria in the 1990s (Burke, Todorova, Kotzeva & McKeen, 1994).

Gender-specific pay differences between men and women exist in all parts of the world and all countries according to analyses made by the World Bank. Bulgaria holds the 40th place in a ranking of 134 countries by the global gender gap index, especially with regard to the economic participation and opportunity index

(World Economic Forum 2009:10). The country ranks close to Estonia (36th place), Rumania (34th) and Slovenia (31st), and is ahead of countries like Hungary (56th), Slovakia (69th), and Czech Republic (71st). Within this index, the remuneration gap is captured through a ratio of estimated female-to-male earned income and a qualitative indicator calculated through the survey on wage equality for similar work. In Bulgaria, the gender-specific pay gap has the value of 18.9 in 2002 and 15.3 in 2009, which means that women's remuneration amounts to 81% (2002) and 85% (2009) of men's[6] (Table 1). The 15-percent gender pay gap means that women work 60 days per year without pay[7].

The factors that influence the gender pay gap can be divided conceptually into three groups (Gender in Transition 2002:25-27):

1. Gender structure of labor market institutions, e.g. gender gap in labor force participation; characteristics of jobs, e.g. voluntary and involuntary crowding, differences in preferences, characteristics related to horizontal and vertical labor market segregation.

2. The second group of factors includes productivity and market skills, i.e. human capital. Here the gender pay gap reflects educational, professional, organizational, leadership skills of the labor force.

3. The third group of factors comprises the unexplained component related to the elasticity of supply of labor and 'unequal treatment' of women in the labor market. The weight of unexplained component is relatively large in the gender wage differential in the countries of transition.

Present analysis focuses on the first two groups of factors – characteristics of the jobs and of the human capital, and is viewing gender as an individual characteristic that is contributing to the explanation of income inequalities. *The central thesis is that men and women make different decisions concerning their placement on the labour market. The characteristics of the work place differ considerably in the case of men as compared with women and this leads to the reproduction of pay gaps within the same level of the human capital.*

In analyzing the effects of gender on the income chances of individuals, we will trace separately the effects at the top and at the bottom of educational inequality. The hypothesis is: That the gender gap is remaining on each educational level.

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[6] The indicator is calculated as the % difference between the average gross wage per hour for men and women.

[7] The comment was made by Iliana Yotova, a Bulgarian member of the European Parliament, www.actualno.com, Last access 10.03.2011.

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More concretely, our study will address two questions:

- What are the differences in remuneration between men and women with zero-skilled human capital[8]?

- What are the differences in payment on the top human capital levels — among employees with tertiary education on top occupational positions[9]?

Another hypothesis is that the longer career contributes less to the income increase of women as compared to men, due to the lower positions taken on the occupational ladder and the brakes taken for family reasons. We will investigate the income differences between women and men in different life phases expecting that in the phases of family formation and the raising of small children the income gap between men and women will be grater. *The question is whether the differences disappear in earlier or later life phases – before and after raising small children?* Human capital will be analyzed in the present paper through educational level, work experience, and the occupational position.

From the characteristics of the job, which contribute to income differentiation among women and men we will consider the employment sector (public or private), the size of the enterprise, the existence of collective bargaining, and the type of contract. We know from relevant literature that with the increase of enterprise size, the chances that enterprises will operate in the grey sector decrease (Belev 2003). Those working in larger firms have higher registered incomes. As an independent variable in this analysis, we have included the existence of collective bargaining. The importance of the effect of collective bargaining grows in proportion to the increase of work flexibility in the course of globalization, and also in proportion to the decrease of employee participation in management in the course of privatization of enterprises in Central and Eastern Europe. With respect to the share of people who depend completely on the

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[8] The concept of "zero-skilled human capital" refers to individuals without education and experience. This indicator is important for gender inequalities at the bottom of the social structure. Mulligan, C., Sala-i-Martin, X., "A Labour-Income-Based Measure of the Value of Human Capital: An Application to the States of the United States", Working Paper No. 5018, National Bureau of Economic Research, 1995

[9] For the purposes of the current analysis we define top human capital levels as those of employees with tertiary education on top occupational positions, similar to the concept of "leading human capital" which includes in addition a selection of top 10% paid employees developed in Simeonova-Ganeva, R., Panayotova, N. (2009) Human capital, leading human capital and labour incomes: How education determines labour income in the Bulgarian economy? Agency for Economic Analysis and Forecasting, Working Paper Series, No.3/ 2009.

employer, Bulgaria is in first place (69.8%), while the percentage is smallest in Holland: 29.8%. The probability of bargaining to occur between workers and employers, measured through responses indicating "we decide together with the employer", is highest in Holland (27.6%) and Sweden (27.2%), and is considerably lower in the post-communist countries in course of transition: Slovenia (15.4%), Czech Republic (11.8%), Bulgaria (7.4%), and Romania (6.4%)[10]. With the last hypothesis we intend to investigate *if the existence of collective bargaining will guarantee equal chances to men and to women for increasing the income.*

## 3 DATA AND METHODOLOGY

The gender effect is estimated on the basis of empirical data from the Structure of Earnings Survey (SES), conducted by the National Statistical institute in 2002 and 2006. SES is based on Eurostat methodology and is conducted every four years. SES is aimed to give detailed and comparable at European Union level information on distribution and relationships between the level of remuneration, individual characteristics of employees and these of their employer. So far, this is the only large-scale labour survey which includes both observations on wages and educational attainment, and freely allows for estimation of Mincer-type equations[11]. The first observation conducted in Bulgaria was in 2002, and the latest — in 2010, but the data for the latter have not been processed yet and are not available for further analysis.

All of the analyzed observations refer to employees on a full-time basis (which amount to 97.4% of all studied employees). The sample size for 2002 includes 148,942, and that for 2006 — 176,276 employees. The information for employees used in the paper includes the following characteristics: gender, age, educational attainment, years of experience, sector of employment (public or private), occupation (vertical positioning), presence of a collective bargaining, size of the enterprise, presence of permanent employment contract, and gross monthly wage. The differences in remuneration of men and women regarding

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10 Wallace, Claire (2003) "Work Flexibility in Eight European countries: A cross-national comparison", Sociological Series 60 (www.ihs.ac.at/publication/soc/rs60.pdf).

[11] Equation specification introduced by Mincer (1974) in a model studying factors determining labour incomes. The main factors in his specification are years of education and years of experience of the employee. Presently, his approach is conventionally used in measuring returns to education, returns to experience, gender effects, and other effects on labour incomes. Hence, such specifications are often refered as Mincerian equations in the literature.

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three phases of life are referred to: early careers (ages 15 to 34), mid-careers (35 to 49), and late careers (over 50 years old).

## 4 RESULTS

### *Step 1: Comparison between wage gaps in early, mid and late careers*

The first step includes running separate traditional Mincerian equations for each stage of the career development, namely early-career, mid-career and late-career. This approach will allow us to check for presence of gender pay gaps and identify at which stage they are most distinctive. The specified model for each stage in career path for 2002 and 2006 is as follows[12]:

$$
\ln(wage_i) = \beta_0 + \beta_1 Edu_i + \beta_2 Experience_i + \beta_3 Experience^2{}_i + \beta_4 Male_i
$$
$$
+ \beta_5 Occupation_i + \beta_6 \Pr ivate_i + \beta_7 Size_i + \beta_8 TradeUnionContract_i
$$
$$
+ \beta_9 Tenure_i + u_i
$$

Where $wage_i$ is the gross monthly wage of employee i, $Edu_i$ is the educational attainment of the employee, $Experience_i$— his or her years of experience, $Male_i$ is a dummy variable indicating gender of employee i, $Occupation_i$ is his or her vertical positioning in the company, $Private_i$ is a dummy variable indicating the private ownership of the company, $Size_i$ is the size of the firm, measured on the basis of the number of employees (banded variable following the European definition of SMEs and large enterprises), *Trade Union Contract$_i$* is a dummy variable indicating the availability of a trade unions contract for the employee, and *Tenure$_i$* is a dummy variable indicating presence of a permanent contract.

*Table 3:*        *Estimation of gender pay gaps in the three phases of life course through semi-log regression (labour income is measured by gross monthly wage)*

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[12] A standard Mincerian equation is used with addition of some control variables for the occupational level, the size of the enterprise, type of ownership, and labour contract arrangements.

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| Dependent variable: ln(Gross monthly wage) | 2002 | | | 2006 | | |
|---|---|---|---|---|---|---|
| **Factors** | Early career | Mid career | Late career | Early career | Mid career | Late career |
| **Gender (male=1)** | 0.19*** | 0.24*** | 0.22*** | 0.17*** | 0.20*** | 0.19*** |
| **Years of education** | 0.04*** | 0.03*** | 0.03*** | 0.04*** | 0.04*** | 0.04*** |
| **Years of experience** | 0.04*** | 0.02*** | 0.02*** | 0.05*** | 0.03*** | 0.02*** |
| **Years of experience^2** | -0.002*** | -0.0005*** | -0.0003*** | -0.003*** | -0.0006*** | -0.0004*** |
| **Occupational level (vertical positioning)** | -0.05*** | -0.05*** | -0.06*** | -0.07*** | -0.07*** | -0.07 |
| **Private sector impact/ ref. public sector** | 0.03** | 0.04*** | no effect | 0.22*** | 0.19*** | 0.11*** |
| **Company size impact** | 0.13*** | 0.11*** | 0.10*** | 0.13*** | 0.11*** | 0.09*** |
| **Trade Unions effect/ ref. no trade union** | 0.08*** | 0.11*** | 0.11*** | 0.15*** | 0.14*** | 0.11*** |
| **Permanent contract effect/ ref. other contract** | -0.03* | 0.01 | 0.04** | 0.04*** | 0.05*** | 0.06*** |
| **Constant** | 4.35*** | 4.63*** | 4.76*** | 4.62*** | 4.83*** | 5.06*** |
| **Method of estimation** | LS | LS | LS | LS | LS | LS |
| **Adjusted R-squared** | 0.31 | 0.33 | 0.37 | 0.35 | 0.39 | 0.41 |
| **Number of observations** | 43 564 | 65 925 | 39 453 | 47 209 | 64 293 | 46 973 |

*** $p < 0.01$   ** $p < 0.05$   * $p < 0.10$

*Source: Own calculations on the basis of SES data, NSI*

*Note:        1) Early career — between 15 and 35 years old; 2) Mid career — over 35 and up to 50 years old; and 3) Late career — over 50 years old.*

The coefficients $\beta_1$, $\beta_2$... represent the returns to the relevant factors, while $\beta_4$ particularly measures the gender effect on the wage level.

All selected factors have a significant impact on income, measured by the gross monthly wage. The estimation output is presented in Table 4. The gender effects measured in the above specified and estimated models are described in Table 5.

*Table 4:        Gender effects in the different stages of career path in 2002 and 2006: Average male effect (%)\**

| Year | Early careers | Mid careers | Late careers |
|---|---|---|---|
| **2002** | 21 | 27 | 25 |
| **2006** | 19 | 23 | 20 |

*Source: Own calculations on the basis of SES data, NSI*

*Note:        \*The effects are calculated on additional exponential transformation of the estimated coefficients in Table 1.*

The wage dynamic over the career stages shows that there is a substantial gender gap at the start of the career. However, this gap expands over the next stage of

the career, and at the final stage — it slightly shrinks. A main conclusion we may infer is that the most distinctive gender gap is observed in mid-career, which amounts to 27% in 2002 and 23% in 2006. Therefore, for the next step of our empirical analysis, we choose to go deeper into the mid-career phase and to further study the gender differences in the labour incomes here.

### Step 2: Study of gender differences in mid career

The in-depth study of gender differences in mid-career is done on the basis of the following specified model (estimated separately for 2002 and 2006):

$Male\ worker s:$  $\ln(wage_i) = \alpha_0 + \alpha_1 Edu_i + \alpha_2 Experience_i + \alpha_3 Experience^2_i +$
$+ \alpha_4 Occupation_i + \alpha_5 \Pr ivate_i + \alpha_6 Size_i + \alpha_7 Contract_i + u_i$

$Female\ worker s:$  $\ln(wage_i) = \gamma_0 + \gamma_1 Edu_i + \gamma_2 Experience_i + \gamma_3 Experience^2_i +$
$+ \gamma_4 Occupation_i + \gamma_5 \Pr ivate_i + \gamma_6 Size_i + \gamma_7 Contract_i + u_i$

where the notation is the same as the one in the previous models. The summary of the estimation output is displayed in Table 6.

In the table, we track two types of conclusions. Firstly, we check for the intrinsic level of returns to men and women for the various factors. The first four columns in the table refer to the effects on labour income, with the effects being calculated for men and women separately. Secondly, we investigate the gender difference in the returns for each factor, thus calculating gender gaps. The last two columns refer to the calculated gender gaps. For example, the impact of one additional year of education for men in 2006 is 3%, while this return is 5% for women. Therefore, the gender gap in this case is (5%-3%) = 2%. Thus, we would come to conclusion that women have a labour market advantage in having higher returns to education than men[13]. A further check of the impact of trade unions in 2006 shows that on average, men have benefited more from trade union agreements as they have had 26% increase on their labour incomes. The return to women has been only 5%. Thus, while both men and women display positive trade union effect, for men, this impact is 21% higher. Hence, the gender gap in this case is 21%.

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[13] The same effect is also observed in other studies, for example Staneva, Murhpy and Arabsheibani (2010).

*Table 5: Estimated impact of gender on labour incomes in mid career*

| Factor | Male workers | | Female workers | | Gender Gap | |
|---|---|---|---|---|---|---|
| | 2002 | **2006** | 2002 | **2006** | 2002 | **2006** |
| Labour income of zero-skilled human capital[14] | 100% | **100%** | 81% | **77%** | -19% | **-23%** |
| Raise in income by one additional year of education | 2% | **3%** | 4% | **5%** | +2% | **+2%** |
| Raise in income by one additional year of experience | 3% | **3%** | 2% | **2%** | -1% | **-1%** |
| Raise in income by one step in the occupation ladder | 5% | **7%** | 5% | **6%** | 0% | **-1%** |
| Impact of private ownership of the company/ ref. public company | -1% | **25%** | 10% | **17%** | +11% | **-8%** |
| Impact of each additional level of company size | 13% | **12%** | 9% | **11%** | -4% | **-1%** |
| Trade union effect/ ref. no trade union | 18% | **26%** | 6% | **5%** | -12% | **-21%** |

*Source: Own calculations on the basis of SES data, NSI*

Some of the results remain stable over the two years of observations. However, following the overall macroeconomic and labour market developments over the transition, we are prone to assume that namely in 2006, the labour market has largely stabilized and therefore shows non-transition but rather competitive market tendencies. Therefore, we have chosen to focus on this year of observation since it is more representative in terms of competitive market gender relations, and better comparison with other market economies can be made.

The results clearly show that there are certain gender differences in the mid-career. The greatest gap is in the wage of zero-skilled human capital, which represents the payment of workers with no education, experience, etc. In this case, women earn on average 23% less than men for 2006. The effect of economic growth does not contribute to the decrease of the gender pay gap at the bottom of the educational stratification. At the opposite the gender pay gap for the zero-skilled human capital is 19 for 2002 and 23 for 2006. The second

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[14] Estimation of payment of zero-skilled employees is based on Mincerian regression in which the intercept term is interpreted as the labour income of these employees. Some authors use other approaches for the estimation of these incomes, but for this specific case the estimates of the Mincerian intercept seem adequate (Simeonova-Ganeva & Panayotova, 2009).

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observed effect is for the private sector — here, women are generally underpaid by 8% as compared to men.

The next step of the empirical analysis is devoted to a closer look at the gender effects in the group of employees with tertiary education (bachelor, master and PhD degree).

### Step 3: Gender differences in mid career for the employees with tertiary education

The first computations refer to figuring out the average wages for male and female workers among employees with tertiary education (in total, 15,637 observations for 2006). Subsequently the gender gaps in percentages are estimated. The results are summarized for the top-two occupations (high service class positions); gender and type of ownership of the company (Figure 1).

The highest gender gaps are observed in the top vertical positions in the company. Male managers on the top occupational level (1,420 observations in the sample) earn on average 18% more than female managers (1,158 observations in the sample). In the second top occupational position — analysts — men earn 25% more (2,556 men in the sample against 6,034 women). Female workers with tertiary education are better positioned compared to male ones only at the lowest levels of the occupational ladder — for example taking routine activities, which require direct contact with clients, for these occupational positions women workers are better paid (36%).The public sector demonstrates more dominant role of male factor — here gender gaps are substantially bigger as compared to those for the entire economy.

*Figure 1:* *Top two occupational levels in mid-career in the entire economy, public and private sectors: average monthly wages of employees with tertiary education, 2006 (in Bulgarian leva; gender gap is shown in percent)*
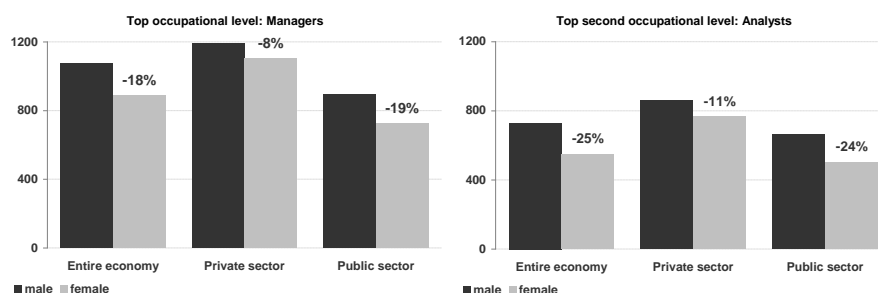


*Source: Own calculations on the basis of SES data, NSI*

A further estimation is performed to capture gender difference by using the specification of equation (1) in step 1 for employees with tertiary education only (results are shown in Table 7). The overall gender effect for these employees shows that men are on average paid by 18% better than women.

All included factors have a significant impact in explaining labour incomes. The three estimated models in this case include: 1) human capital variables, namely educational attainment and years of experience; 2) human capital factors plus gender; and 3) human capital factors, gender plus factors, describing the characteristics of the job. The trade unions effect is also observed in this particular case when added as only one control variable. However, due to the fact, that this effect is highly related to that of company size and the private/public divide, it is not explicitly observed when the latter are included as control variables. The statistical output shows that the addition of the gender factor as well as of the job characteristics contributes significantly to the estimation power of the model.

*Table 6: Employees with tertiary education in mid career - estimated impact on labour income of the factors: human capital, gender, and job characteristics.*

| Dependent variable: ln(Gross monthly wage) | Mid-career employees with tertiary education in 2006 | | | |
|---|---|---|---|---|
| **Factors** | Human capital factors | Gender | Job characteristics: Trade Unions | Job characteristics factors |
| **Constant** | **4.10\*** | **4.08\*** | **4.08\*** | **4.57\*** |
| **Years of education** | **0.13\*** | **0.13\*** | **0.13\*** | **0.09\*** |
| **Years of experience** | **0.02\*** | **0.02\*** | **0.02\*** | **0.01\*** |
| **Years of experience^2** | **-0.00\*** | **-0.00\*** | **-0.00\*** | **-0.00\*** |
| **Gender (male=1)** | - | **0.19\*** | **0.19\*** | **0.16\*** |
| **Occupational level (vertical positioning)** | - | - | - | **-0.15\*** |
| **Private sector impact/ ref. public sector** | - | - | - | **0.21\*** |
| **Company size impact** | - | - | - | **0.09\*** |
| **Trade Unions effect/ ref. no trade union** | - | - | **0.04\*\*** | **0.01** |
| **Permanent contact effect/ ref. other contract** | - | - | - | **0.00** |
| **Method of estimation** | LS | LS | LS | LS |
| **Adjusted R-squared** | **0.04** | **0.06** | **0.07** | **0.24** |
| **Number of observations** | **15 637** | **15 637** | **15 637** | **15 637** |
| | | | \* p < 0.01 | \*\* p < 0.05 |

*Source: Own calculations on the basis of SES data, NSI*

## 5 DISCUSSION AND CONCLUSIONS

On the basis of the empirical analysis, we may conclude that all explored factors have a statistically significant effect on the level of payment. As expected, men are better paid regarding to most labour income determinants. In particular: the

trade union effect is much stronger for men; as well as private companies tend to pay more to men compared to women, holding all other factors equal.

The gender effect is greatest in the mid-career, and it remains at slightly lower levels over late careers, while the lowest gender gap is observed in the early-career. The wage dynamics over the career stages shows that there is a substantial gender gap at the start, in the mid and at the final stage of the career development. As we expected, the most distinctive gender gap is observed in mid-career, which is in the phase of family formation and raising small children. Women in their mid-thirties and forties make their choices and preferences to those segments and positions in the labor market that equip them with opportunities to maintain their work-life balance. Thus, the rationale of women's lower paid positions in mid-career lies in their choices, embedded in the specific cultural and institutional context of the society. Socially prescribed roles for women to work and raise family simultaneously is a possible explanation of the females' preference to jobs which better fit this expectation, even if these jobs are less paid.

There is a significant wage differential among zero-skilled men and women. The macro-economic growth increases the gender pay gap for men and women without education. Possibly because such men dominated sector as construction has contributed significantly to the observed increase in the wages between 2002 and 2006. In addition we find a substantial gender discrepancy on the top occupational positions among employees with tertiary education. Human capital and jobs characteristics are the strongest predictors of the gender differentials in payment. As we presupposed, gender effects on individual incomes exist at the top *and* at the bottom of educational stratification, being more pronounced at the lower educational and occupational positions. The greatest gap is in the wage of zero-skilled human capital, where women earn on average 23% less than men. We explain this fact by the gender segregated market where lower skilled positions are better paid in male dominated sectors (construction, transport, etc.) compared to the analogical positions in the female dominated sectors (healthcare, education, services, etc.).

Another interesting finding is that gender pay gap among employees with tertiary education in private sector is significantly lower than that in the public one. Our results show that the gender pay gap at the two highest occupational levels is smaller in the private companies as compared to the high service class positions in the public sector. We assume that this effect indicates the breaking through of traditionally differentiated standards and norms for male/female jobs still promoted in the public sector of economy and the implementation of new more universal standards for professional roles in the private sector. The latter provides a better environment for a decline of gender based income inequalities in the labor market for the high educated women.

Although gender pay gap remains on the bottom and on the top level of human capital, women have demonstrated more gains from education compared to men. As shown by the results, on average women's return to each additional year of education is 2% higher than that of men. Thus, our analysis confirms the emancipative potential of education that could ameliorate gender effect in income inequalities in a contemporary society.

Also, an important finding is the estimated effect of trade unions. Women benefit on average 21% less than men from trade union agreements between workers and employers. The rationale behind this fact is that trade unions function in large size companies that are predominantly presented in the male dominated industries as well as in the state run enterprises. In contrast, women's occupations are allocated mainly in services and in small-size private companies where employers ignore collective bargaining.

Finally, on the basis of our study we can conclude that human capital and jobs characteristics, especially public-private, as well as vertical segmentation and trade union agreement contribute to a better understanding of the significant gender pay differentials in the contemporary labor market situation in Bulgaria.

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