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**The public-private sector wage gap in Kosovo and Albania: an empirical perspective**

## 1. Introduction

The public sector wage setting can have an important effect on labour market efficiency and macroeconomic outcomes (Depalo et al., 2013). If the government offers higher remuneration to its employee's compared to the private sector, it may absorb the highly skilled workers. Thus, the private sector employment would be crowded out unless wages increase. This could lead to increases in taxes, higher budget deficits and/or diversion of public resources from productive uses. If, alternatively, the public sector offers less competitive wages than the private sector, the former might find it difficult to attract and retain well qualified employees thus seriously impacting the quality of services provided by the public sector (ibid). The public sector employment accounts for a considerable share of total employment in many countries and could largely influence the labour market, more precisely the wage setting and other employment practices.

However, different from theoretical expectations several other factors have influenced the potential wage difference between public and private sector in Kosovo and Albania. Post-independence in Kosovo, very large increases in public sector wages were evident. More precisely, wages in the public sector have almost tripled in nominal terms and grown three times faster than nominal GDP; in addition, considerably outpaced private sector wages and in some cases also public wages in neighbouring countries (IMF, 2016). Employment in the public sector (public administration, education and health) in Kosovo accounts for around 30 percent of total employment; however, the figure represented might be lower due to the existence of private sector in education and health (KAS, 2015).<sup>1</sup> In Albania however, the public sector accounts only for a minor share, as the private sector constitutes for more than 80 percent of total employment (INSTAT, 2014).

The positive pay gap in favour of the public sector, which is unjustified by productivity considerations, might be conducive to a dramatic misallocation of resources. The wage gap is currently in favour of public sector in both countries (KAS, 2010; INSTAT, 2015). Despite

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<sup>1</sup> The share of employees in public sector is calculated by adding the share employed in Health, Education, Public administration and defence and Administrative and support service activities.

structural problems, nepotism and mobbing are major challenges of employment in public sector in Kosovo (ICCJ, 2014). Regarding Albania, patronage, partiality and nepotism are considered as some of the main corrupt practices at the workplace (UNDP, 2014). Hence, addressing problems of clientelism and nepotism in public sector is considered as a key step towards improving the government effectiveness (WB, 2011).

The prevalence of political influence in recruitment of public servants disrupts independence and accountability of recruitment process by prioritizing political allegiance over quality of service provision. The findings from Public Pulse Survey 2015 also suggest that family connections, bribes and political affiliations are the main impediments of merit-based employment in public sector in Kosovo (UNDP, 2015). Only a fair share (around 15%) of respondents believe that employment in public sector is based on theoretically expected credentials namely education, professional experience and vocational training. Therefore, public sector may fail to retain well-qualified employees given the non-merit and corrupted recruitment process; suggesting that theoretical expectations of higher wages (in public sector) attracting highly qualified employees may not necessarily hold. In other words, educated individuals may end up in private sector despite the wage gap in favour of public sector. They may also end up performing low skilled jobs due to very high unemployment rates.

In addition to the above, the similarities between Kosovo and Albania make the investigation of public/private pay differential interesting. Initially, both countries have undergone in-depth restructuring of the economy, which requires understanding, in particular, the role of the public and private sector. Both Kosovo and Albania have a similar background in terms of labour market characteristics. They record underperforming labour market indicators – a large share of inactive population (INSTAT, 2015; KAS, 2015), which indicates the high under-utilization of capacities and persistent high unemployment rates (Table A.1).

Moreover, the labour market institution set-up is similar as both countries have a minimum wage setting system. According to the current legislation, the recruitment of the public civil servants in both countries is based on a decentralized employment procedures, in other words a bureaucratic process set in place, something that cannot be inferred for the private sector. Moreover, the private wage sector in both countries might be underestimated due to large scale of informality. Although the two countries speak the same language, have very similar cultural background and

are located in the same region, they use different currencies. Albania uses its local currency (lek) while Kosovo has adopted Euro and consequently wages are more sensitive to external influences. The extended presence of international institutions in Kosovo may also constitute an important source of differences in the wage pay gap between public and private sector.

This said, assuming a competitive labour market, it is of interest to analyze whether or not public sector wages are above the comparable private sector wages and to what this difference could be attributed to. Moreover, given various similarities highlighted above, it is important to investigate whether the results are different in Kosovo compared to Albania. To the best of our knowledge, this is the first attempt in empirically investigating the factors determining the public-private wage gap in both countries. Finally, this study aims to contribute to the existing research in this field and to the policy making process by providing accurate and up to date estimations of the public-private sector wage gap in Kosovo and Albania. It adopts the more advanced methodological approaches that address the double sample selection problem and the use of quintile regressions in order to provide a clearer picture of the wage gap along the wage distribution. To this end, nationally representative data from Kosovo Household Budget Survey of 2011 and Albanian Living Standard Measurement Survey of 2012 are used.

In short, this paper is organized as follows: Section 2 presents a literature and empirical review of studies analyzing the public and private sector pay gap. Section 3 presents the data used in the study and the descriptive statistics. A description of the methodological approach used in the study is provided in Section 4 whereas the empirical results are presented in Section 5. Section 6 concludes.

## **2. Theoretical and empirical review**

Public sector pay is of great relevance and importance for both policy makers and economists. The public sector employment accounts for a considerable share of total employment in many countries and could largely influence the labour market, more precisely the wage setting and other employment practices (Hyder and Reilly, 2005). Of note is the fact that the wage setting, the processes of recruitment and promotion are different between the public and private sector. Public sector as an employer is limited via regulations on the wage bill due to budget constraints whereas private sector wage setting is dependent on the productivity, profit-maximizing goal and

business cycles. That said, the public sector wage setting policy instruments could have considerable implications on both public and private earnings inequality and wage gaps between sectors. In addition, the policy instruments may have implications for public finances and potential consequences for the quality and efficiency of the public sector, and possibly of the whole economy.

From an economic perspective, if public sector pays higher wages than the private sector, it could lead to queues of prospective workers considering risk-averse agents' preferences for a well-paid and stable public sector job (Hyder and Reilly, 2005). Bourdabat (2004) finds that willingness is higher among the educated. "Furthermore, such a policy could lead to higher budget deficits, push up taxes and/or divert public resources from productive uses" (Chatterji et al., 2009, p.2). However, if the public sector wages are lower than those in the private sector, then the former could be seriously disadvantaged in terms of attracting and retaining the high quality employees in a competitive labour market. As a result, the declining relative pay in the public sector may lead to a loss of quality which is empirically found to be the case for men employees (Nickell and Quintini, 2002). Consequently, government's duty and commitment to provide high quality provisions in the public sector could be undermined. In addition, it could also undermine the government's ability to compete against the private sector – thus lowering the trust of employees towards the public sector.

Understanding the pay determination has been generally considered as one of the prerequisites for understanding the potential wage gap between the public and private sector. A commonly used explanation is that the determination of wages in the public sector depends on the political constraint whereas that in the private sector on the profit constraint (Bender, 1998; Heitmueller, 2006). According to Mizala et al., (2009), the public sector may have higher incentives to overpay the workers as means to acquire their political support and cooperation. This could be done mainly for two reasons: one is due to the difficulty for the society to penalize governments for paying higher wages to their servants. The second reason may be the fact that the public sector servants are generally organized and form an important interest group that can pressure the government. The same study argues that the public sector can afford overpaying the public servants given it can pass the cost to people via higher taxes. Owners of private sector firms, on the other hand, are driven by the market instruments and the profit constraints (Tansel, 2004).

However, wages may be higher in private sector due to compensation for lack of several non-income (fringe) benefits (Heitmueller, 2006). As accounting for such benefits in empirical studies is generally not possible, it may lead to an observed private sector wage premium.

The findings of most studies suggest that there is a significant pay differential between private and public sector. It is worth mentioning that very few of these studies have accounted for selectivity bias problems by employing specific techniques among their empirical analysis (Boyle et al., 2004; Hyder et al., 2005; Chatterji et al., 2009; Heitmuller, 2006 and Depalo et al., 2013).

The findings of research on the public-private wage gap however are inconclusive. Skyt-Neilsen and Rosholm (2001), Boudarbat (2004), Panizza (2000), Tansel (2004), Papapetrou (2006), Mizala et al., (2009), Aminu (2011), Giordani et al., (2011), and Depalo et al., (2013) find a wage differential in favour of the public sector. Results also suggest that the wage differential in favour of public sector is due to public employees being more educated and more experienced in Ireland (Boyle et al., 2004); due to higher education levels in Pakistan (Hyder et al., 2005) whereas due to experience, education and occupation in Croatia (Rubil, 2013). Moreover, Giordano et al., (2011) find for ten euro-area countries a conditional pay gap in favour of the public sector, even after controlling for differences in employment characteristics between the two sectors.

Van der Gaag et al., (1989) and Lindauer and Sabot (1983) found mixed results with regards to the size and direction of the pay gap, whereas Depalo et al., (2014) find that the overall pay gap between public and private sector displays a non-trivial cross-country heterogeneity. On the other hand, results of Olivier et al., (2008) suggest that wage differences across sectors over time diminish.

Public-private wage gap has been also estimated separately for men and women and the evidence is again mixed and inconclusive. Ognjenovic (2011) and Tansel (2004) and Hospido and Benito (2013) found a wage premium in favour of men in public sector although the later finds that the gap is 41 per cent for men and 43 per cent for women. Findings of Heitmueller (2006) suggest that there is a considerable wage premium for man private sector employees whereas Ajwad and Kurukulasuriya (2002) and Al-Samarrai and Reilly (2005) find no public sector wage effect.

Some of these differences may be attributed to the context and institutional settings and labour market policies of the countries under investigation, while the appropriate use of empirical techniques may partially justify the inconclusiveness of the findings. According to Van der Gaag and Vijverberg (1988) when estimating the public-private wage differentials controlling for selection bias is important. The study suggests that controlling for selection bias reduces the premium in the public sector and moreover, in some cases it may lead to the premium being in favour of private sector.

Given wages in either sector can be compressed, the mean public-private sector wage gap only provides an imperfect picture of the whole distribution (Hospido, 2013). To address this limitation, several studies have applied quantile regression methods to analyze the whole distribution of the public-private wage gap. However, the quantile regression results suggest that the public sector wage premium does not hold for all wage quantiles. Foley and O'Callaghan (2009), Boyle et al., (2004), Papapetrou (2006), Depalo et al., (2014; 2013), Mizala et al., (2009) and Rubil (2013) find a wage difference in favour of public sector, and the gap is highest at the lower parts of the distribution. In contrast, findings of Hospido and Benito (2013), Chatterji et al., (2009) and Imbert (2011) suggest that the gender wage gap is larger at the top of the wage distribution, i.e., higher quantiles.

With regards to gender, according to Bender (2003) men are better-off at the high end of the private sector pay distribution compared to their public counterparts, whereas low-paid public sector men earn less than low-paid private employees. However, there is no indication for this 'double imbalance' amongst wage distribution of women. Hyder (2005) on the other hand, suggests that the wage gap in favour of men is much higher in the private sector than in the public sector throughout the entire wage distribution. On the other hand, the findings of Imbert (2011), Olivier et al., (2008), Boyle et al., (2004) and Disney (2007) suggest that premium in the public sector is significantly higher in favour of women. Lucifora (2004) suggests that women are less discriminated by the public sector only at the lower bottom of the wage distribution while men are better off at the upper part of the wage distribution.

Although to our best knowledge there are no studies focusing specifically on the public-private pay gap with special references to Kosovo and Albania, several studies have investigated the returns to education in both countries as well as gender wage gap. Hoti (2011) investigates the

private returns to education in Kosovo and findings suggest that the 'level of completed education' is positively correlated with employment, hence earnings. Havolli (2011) investigates the main determinants of Kosovan migrants' earnings. Similar to Hoti's findings, the empirical results suggest that education is an important determinant, and is positively correlated with earnings of the migrants and their families.

Motivated by a few studies which suggest that the gender wage gap in Kosovo is small and insignificant, Pastore et al., (2013) investigates the gender wage differential in Kosovo and returns to education by gender. The results suggest that, on average, there is either little or no significant gender wage gap. This is line with the findings of other studies which suggest that the gender wage gap in Kosovo is around 8% in the private sector and insignificant in the public sector (World Bank, 2003); there is no significant gender difference in earnings (Havolli 2011); and that the gender wage gap in Kosovo is fairly small (Oostendorp, 2009). Hence, considering the lack of gender wage differential at the mean of the wage distribution, Pastore et al., (2013) use the Machado and Mata decomposition (2005) and decompose the wage gap at different percentiles of the entire wage distribution. Results suggest that the earnings of women tend to be higher than those of men at the lower and upper tail of the distribution, stemming both by the better compensation and characteristics of women.

Gjipali and Kristo (2011) investigate the gender pay discrimination in Albania, both in urban and rural areas, and the private returns to schooling. In general, the study finds that higher educational attainment leads to higher earnings in the labour market and similar results have been reported by the World Bank (2006). Moreover, the results suggest that employees in the private sector are compensated more than in the public sector (Gjipali and Kristo, 2011). The gender wage gap in Albania has been also estimated by Miluka and Grown (2010). Their findings suggest that the main factors contributing towards a gender wage disparity are the educational attainment, work experience and, amongst other, occupational segregation. Moreover the study finds that labour market discrimination exists in Albania and it mostly stems from the different rewards in the labour market. The empirical evidence elaborated above suggests that the labour market in both countries tend to reward higher levels of education. Thus, the wage gap is expected to be lower in higher wage quintiles or highly skilled occupations (Depalo et al., 2013).

### 3. Data and Descriptive Statistics

#### 3.1 Kosovo

Data from Kosovan Household Budget Survey Database (HBS) 2011 are utilized for analysis on Kosovo. The Kosovan HBS provides statistical data and detailed information regarding the consumption expenditures and income, demographics information on each individual member of the household, as well as other specifics relating to households and their standard of living in Kosovo. The data are collected throughout the year from 2,274 households selected randomly and the sample is representative of the rural and urban areas of Kosovo.

The sample of employees contains only full-time working-age individuals who reported monthly net earned income. The net monthly earnings of employees, which refers to the monthly amount of money received by the employee in his/her main job is considered given wage in Kosovo is paid on monthly basis. The resulting overall sample consists of 8,649 working age individuals from which 50.5 percent are men and 49.5 percent women. Table 1 presents the distribution of employed individuals in public and private sector according to gender.

The sample of employed individuals consists of a total of 1,683 individuals from which the majority are men (in both sectors) and roughly 40 percent are employed in the public sector. However, it should be noted that there is missing information for 65 individuals hence, they are excluded from estimations. In terms of specific industries, women in the public sector are mainly employed in education and health, whereas in the private sector mainly in trade and services (Table 2). As far as men are concerned, in the private sector they are mainly employed in trade and services, and in the public sector in education and health.

Table 3 presents the distribution of public and private employees across professions. Public employees are more likely to be employed in professional occupations compared to their private counterparts, whereas private employees are more likely to be employed in the medium skilled occupations. However, it is not clear a priori whether such patterns are supply or demand driven.

**Table 1.** Distribution of individuals in the public and private sector by gender in Kosovo (%)

<b>Sector</b>	<b>Total</b>	<b>Man</b>	<b>Woman</b>
Public Sector	39.87	63.79	36.21
Private Sector	60.13	84.88	15.12
Overall employment	19.45	76.47	23.53

**Table 2.** Distribution of man and woman individuals across industries in the public and private sector

<b>Industries</b>	<b>Public Sector (%)</b>		<b>Private Sector (%)</b>		<b>Industries</b>
	<b>Men</b>	<b>Women</b>	<b>Men</b>	<b>Women</b>	
Utilities	6.84	0.76	3.42	0.25	Mining and Quarrying
Public Admin. & Social Work	10.41	12.63	10.49	4.04	Manufacturing
Education & Health	15.77	48.23	9.01	1.01	Construction
			13.36	12.37	Trade
Arts, Entert. & Recreation	1.71	0.76	5.91	1.77	Post & Telecommunication
-	-	-	21.83	12.63	Services
-	-	-	1.86	2.53	Other
Total	100.00	100.00	100.00	100.00	Total

**Table 3.** Distribution of individuals in the public and private sector according to profession

<b>Occupation</b>	<b>Public Sector (%)</b>	<b>Private Sector (%)</b>
Armed Forces	1.19	3.47
Professionals	57.08	13.04
Medium Skilled	34.28	65.51
Low Skilled	7.45	17.98
Total	100.00	100.00

**Table 4.** Mean wage in public and private sector and according to gender (in €)

<b>Gender</b>	<b>Public Sector</b>	<b>Private Sector</b>
Man	326.06	291.24
Woman	300.05	268.16
Average wage	316.6	287.8

Table 4 presents mean wage figures in public and private sector and according to gender. On average, public sector employees earn higher wages than private sector employees (the wage difference is 10%). Figures according to gender underline that male employees earn a higher wage compared to their counterparts in both sectors. Table 5 reports the average wage levels at the 10<sup>th</sup> to 90<sup>th</sup> percentiles of the wage distribution by sector for Kosovo. Data suggest that the wages at the abovementioned quintiles are in general higher in the public sector. In contrast, at the highest quintile the wage is relatively higher in the private sector; more precisely, the wage gap is 40 percent in favor of private sector. The figures also suggest that men earn more than their women counterparts in both sectors, largely across all wage quintiles.

**Table 5.** Monthly wage across quintiles in public and private sector and according to gender (€)

<b>Sector</b>	<b>Q10</b>	<b>Q20</b>	<b>Q30</b>	<b>Q40</b>	<b>Q50</b>	<b>Q60</b>	<b>Q70</b>	<b>Q80</b>	<b>Q90</b>
<b>Public</b>	200	245	264	300	320	340	350	380	420
<i>man</i>	200	249	280	313	326	350	360	393	447
<i>woman</i>	200	233	250	280	300	320	339	350	386
<b>Private</b>	150	160	200	200	250	270	300	350	420
<i>man</i>	150	170	200	200	250	280	300	350	420
<i>woman</i>	120	150	161	200	200	220	300	350	450

There are notable differences in the characteristics of public and private sector employees in Kosovo. On average, public sector employees are older, generally professionals and highly educated (tertiary), live in urban areas, are more experienced (potential experience), and receive a higher share of remittances (Table B1.2 and B1.3).

The Chi-square test is used to test for differences in the proportions of the binary variables between public and private sector employees, and shows statistically significant differences, except for secondary level of education (Table B1.4). For continuous variables, a t-test of differences between the means of public and private sector employees is significant for every variable, at least at 5% significance level (Table B1.5). These results indicate that the employees in public sector on average display significantly different characteristics from those in the private sector.

### 3.2 Albania

During the transition from communism period Albania experienced high fluctuations in economic growth, macroeconomic instability, and several structural changes which were later translated into labour market changes. At the beginning of the 90s the labour market was liberalized. During this period most of the manufacturing facilities and other industries became obsolete, and this brought by high unemployment rates. The considerable growth of the private businesses afterwards contributed to a decrease in unemployment rates, although long-term unemployment was still high, especially among women (Çuka et al., 2003). The changes in the labour market were concentrated in the first phase of the transition period, characterized mainly by increased unemployment, a decrease in the employment rates of the public sector, high rates of informal employment, and various other changes in the employment features. Employment in the public sector fell at very high rates during this period. However, rates of generation of new vacancies in the private sector were very low to compensate for that loss.

Labour market participation rates are actually high, but one of the main features of the Albanian labour market is the high gender gap (Table A.3). Participation rate of women in the labour market has shown an increasing trend in the last two decades, but a persistent gap of 15-19 percentage points lower than that of men. The employment rates of women are also considerably low compared to those of men (53.3 to 39.2% in 2015). Unemployment rates remain in double figures for both genders. Regarding sector's contribution to total employment, the public sector employment rates vary between 17 – 21 percent for the period 2000 – 2015 (Table A.4).

Data for this study come from the 2012 Albanian Living Standards Measurement Survey (LSMS), a nationally-representative survey of 6,671 households carried out by the Albanian Institute of Statistics. This survey was conducted from June to August 2012 and contained different modules in order to collect detailed information for the living standards in Albania. The *household module* included all the core LSMS modules as defined in Grosh and Glewwe (2000), plus additional modules on migration, fertility, subjective poverty, agriculture, non-farm enterprises, and social capital. The design of the sample for the Albanian LSMS is considered a stratified two stage cluster sampling design in which the Primary Sampling Units (PSUs) were represented by the census Enumeration Areas (EAs) while the Second Stage Sampling units (SSUs) were the households (denoted as HUs). The EAs were stratified according to geographic

criteria:

- i) Large geographic areas: “*Mountain Area*”, “*Coastal Area*” and “*Central Area*”;
- ii) Their belonging to “*Urban*” area (big towns), “*Other Urban*” areas (small towns) and “*Rural*” areas.
- iii) Tirana town was considered as a separate stratum.

The selection of the EAs within each stratum was carried out by means of a Probability Proportional to Size (PPS) design; the measure of size was represented by the number of households living within each EA. The second stage units were selected by means of systematic sampling. The data for our purpose includes only individuals 16-64 years old.

Table 6 presents cross tabulations of sector of employment with gender. In total, there are 3,151 employed individuals in the database, of which 58 percent are employed in the private and 42 percent in the public sector. Men constitute for 64.4 percent whereas women for 35.6 percent of the employed individuals. Majority of men are employed in the private sector (72.6 percent) whereas in the public sector the percentages of employed men and women are similar (53 to 47 percent).

**Table 6.** Distribution of individuals in the public and private sector according to gender

		<b>Private sector</b>	<b>Public sector</b>	<b>Total</b>
<b>Man</b>	Count	1326	702	2028
	% within gender sex	65.4%	34.6%	100.0%
	% within public	72.6%	53.0%	64.4%
<b>Woman</b>	Count	500	623	1123
	% within gender sex	44.5%	55.5%	100.0%
	% within public	27.4%	47.0%	35.6%
<b>Total</b>	Count	1826	1325	3151
	% within gender sex	57.9%	42.1%	100.0%
	% within public	100.0%	100.0%	100.0%

An important determinant of wages is profession. Using the ISCO 2008 classification of professions the individuals of the dataset are classified by profession. Table 7 presents the percentages of the employed by profession and sector of employment. It can be noted that a majority of professionals are employed in the public sector, 45.4 percent, compared to only 9.7

percent of the professionals employed in the private sector. The public sector also employs a higher percentage of armed forces, managers, and technicians, whilst employment in private sector dominates in other profession groups such as clerical assistants, services and sales force, skilled agriculture workforces, craft and related trades workforces, plant or machine operators and elementary occupations.

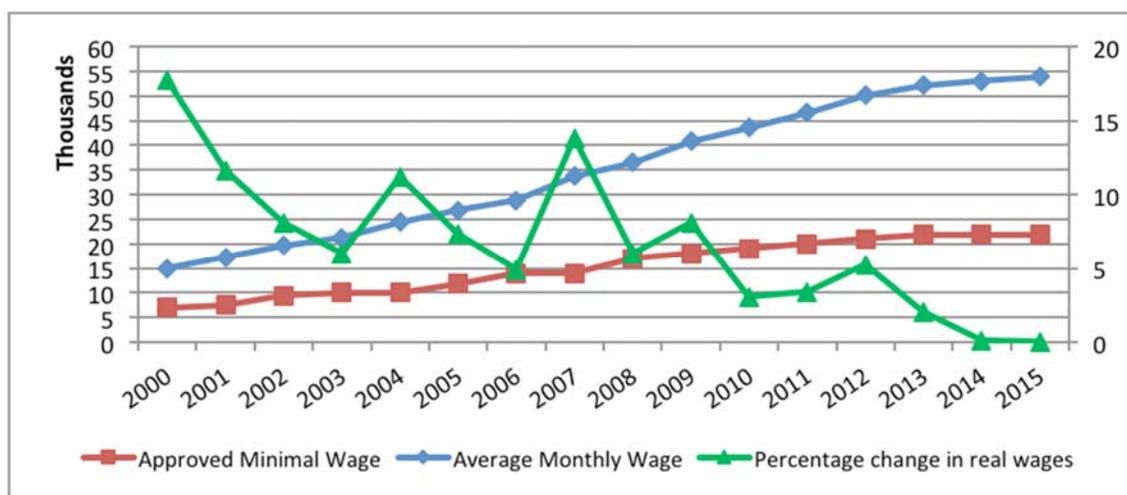
**Table 7.** Distribution of individuals in the public and private sector by profession in Albania

<b>Profession</b>	<b>Private sector</b>	<b>Public sector</b>
Armed forces	0.05%	3.77%
Managers	0.82%	3.32%
Professionals	9.69%	45.43%
Technicians	5.70%	16.98%
Clerical assistants	3.56%	2.79%
Services and sales forces	17.96%	10.11%
Skilled agriculture work forces	3.50%	0.60%
Craft and related trades workforces	28.31%	5.43%
Plant or machine operators	14.57%	4.45%
Elementary occupations	15.01%	6.94%

In Albania, both the minimal and average (nominal) wages have increased continuously in the last years. Figure 1 presents a graphical view of the evolution of the minimal and average wage in the primary vertical axis and the change in real wages in the secondary. Despite the continuous raise in the minimal and average wages, it may be noted that real wages have fluctuated around a decreasing trend, and during 2014 - 2015 there has been no changes in real wages.

Instead of the monthly wage in the estimations for Albania the daily wage is used. This decision is made given that the public sector employees are all employed in full-time basis, but that is not the case in the private sector. Table 8 presents the descriptive statistics of the daily wage in public and private sector as well as according to gender. The figures indicate that gender wage gap is more pronounced in the private sector. As expected, both men and women working in the public sector have higher wages compared to those working in the private sector.

**Figure 1.** Minimal wage, average monthly wage, and percentage change in real wages in Albania during 2000 – 2015



Source: Albanian Institute of Statistics, 2016

**Table 8.** Mean daily wage in public and private sector by gender in Albania (in ALL)

	Public sector			Private sector		
	N	Mean	Std. Deviation	N	Mean	Std. Deviation
Daily wage	1,319	1,194	466	1816	1,087	766
Man	697	1,249	518	1320	1,162	832
Woman	622	1,133	391	496	8,89	503

**Table 9.** Daily wage across quintiles in public and private sector and by gender in Albania (in ALL)

Average daily wage	Deciles of daily wage									
	1	2	3	4	5	6	7	8	9	10
<b>Overall</b>	272	504	666	806	912	1004	1177	1333	1608	2614
Man	271	482	654	751	854	1001	1160	1328	1605	2614
Woman	262	485	645	751	863	1001	1151	1323	1552	2346
<b>Public</b>	238	509	637	761	873	1003	1152	1321	1546	2187
Man	171	506	637	759	870	1004	1158	1320	1568	2218
Woman	291	513	637	763	876	1002	1147	1322	1512	2117
<b>Private</b>	273	481	648	740	852	1000	1159	1330	1605	2734
Man	270	479	655	745	852	1000	1158	1331	1607	2810
Woman	280	484	640	733	851	1000	1161	1323	1595	2368

To complement the figures on average daily wages by sector, average wage levels at deciles of the wage distribution are presented in Table 9. The differences in wages of men and women between sectors by deciles are not always in favour of the public sector. There is no clear trend at the lower deciles, but for both genders wages are higher in the private sector for the last four upper deciles of wage. The gender wage gaps by sectors do not show a clear trend though. Women earn more in the lowest quantiles in both sectors, the gap being higher in the public sector, but at the highest two quintiles the wage gap is in favour of men, and is relatively higher in the private sector.

T-tests are conducted for the mean equality of daily wage in profession groups and public-private sectors. The mean and standard deviation of the daily wages as well as the respective p-values of the t-test statistics are summarized in Table 10. Data indicate that except for the wages of those working in the services and sales force, all the other profession groups are paid statistically different wages between the public and private wages. The public sector pays a higher average wage for someone who works in the armed forces, managers, professionals, technicians, clerical assistants, and plant and machine operations, whereas private sector employees have a higher wage if working in skilled agriculture workforce, craft and related trades workforce, and elementary occupations.

**Table 10.** Daily wage across public and private sectors by profession groups in Albania (in ALL)

	Private sector		Public sector		Sig. of t-test
	Mean	Std. Deviation	Mean	Std. Deviation	
<b>Armed forces</b>	1046.15	707.21	1216.36	409.97	0.040
<b>Managers</b>	1030.96	681.45	1949.03	1189.84	0.000
<b>Professionals</b>	982.95	718.83	1369.69	524.39	0.000
<b>Technicians</b>	1029.51	705.97	1288.78	645.61	0.000
<b>Clerical assistants</b>	1042.90	673.91	1271.86	1540.94	0.001
<b>Services and sales forces</b>	1050.97	724.65	1032.70	597.26	0.429
<b>Skilled agriculture workforce</b>	1168.10	692.33	578.86	538.24	0.000
<b>Craft and related trades work forces</b>	1039.19	716.96	1093.49	637.03	0.027
<b>Plant or machine operators</b>	1040.12	712.46	1131.05	613.91	0.009
<b>Elementary occupations</b>	1064.19	716.20	867.05	533.26	0.000

Finally, statistical tests are conducted to test whether the characteristics of man and woman workers are the same between the two sectors. For the two continuous explanatory variables, age and potential experience, the results suggest that there are statistically different average age and experience between men and women by sector of employment. Women and men in the public sector are older and have more years of potential work experience (Table B1.8). For the dummy variables, chi-square tests are separately run for men and women to test equality of proportions between the public and private sectors. The results for men indicate that the proportions are not equal for almost any binary variable, except for secondary education, belonging to services category of professions, and living in the central area. For women having secondary educational attainment, working in the clerical assistant category, in elementary occupation category, living in the central and urban areas, and speaking English there is no evidence to reject the null of independence, whilst there is evidence of statistically different proportions for the other variables (Table B1.9 and B1.10).

#### **4. Methodology**

The most popular technique used in the literature regarding the decomposition of the wage gap between the public and private sector is the Oaxaca and Blinder (O-B) decomposition technique (Depalo et al., 2013). More concretely, the O-B decomposition technique decomposes the mean differences of the log wages of the aforementioned groups into the explained and unexplained part. The explained part is attributable to the differences in the individual's characteristics (such as education, job experience, occupation, etc.), whereas the unexplained part stems from the differences in the remuneration endowments or wage discrimination (Ibid).

The procedure involves OLS regressions of separate sectoral (public and private) wage equations that specify the logarithm of wage as a function of individual characteristics (human capital and other explanatory variables). According to the Mincer earnings function, individuals' (logged) earnings depend on educational attainment, work experience and characteristics such as region, industry, occupation, gender and so on.

The separate OLS estimations of wage equations for the private and public sector are applicable only if men and women receive the same remuneration for equal productivity related characteristics. Taking into account the evidence from the above-mentioned studies, wage

equations of the public and private sector for men and women are estimated separately, which assumes that labour market differently compensates equivalent characteristics between genders (Rubery et al., 2002). Consequently, the overall average differential in earnings (log wages) between the private and public sector is decomposed into the explained and unexplained part by the Oaxaca-Blinder decomposition.

An expected problem that needs to be addressed in the empirical estimation is that of the selectivity bias due to the non-random selection of the sample of the labour market participants. A possible way to deal with this problem is the Heckman selection model. However, the OLS estimates would still be biased if the assignment to public or private employment is non-random and a further correction term for this type of self-selection is required (Maddala, 1983; Maddala and Nelson 1975; Heitmueller 2006). In general, the literature on public-private sector earning differentials has mainly accounted for the latter and widely ignored the former. In order to test, and potentially account for both types of selection, a double sample selection model is adopted in [this](#) study following Heitmueller (2006). The author argues that consistent estimates can be achieved by Maximum Likelihood Estimation (MLE). However, because of a large number of parameters to be estimated, a simple two-step Heckman approach with extended correction terms can be employed. More precisely, in the first step selection into participation and sector of employment equations are estimated and sample selection correction terms are constructed. In the second step wage equations for public and private sector are then estimated via simple OLS including the correction terms as additional regressors, respectively.

The participation into employment and sector choice equation are:

$$P_i = Z_i' \gamma + u_i \quad (1)$$

$$S_i = B_i' \mu + v_i \quad (2)$$

where  $P_i = 1$  if the individual is employed and 0 otherwise,  $S_i = 1$  and  $S_i = 0$  indicate public and private sectors and are observed only if  $P_i = 1$ ,  $Z$  and  $B$  the vectors of characteristics,  $\gamma$  and  $\mu$  the coefficients to be estimated and  $u_i$  and  $v_i$  the error terms for employment status and sector respectively.

The two selection processes may be independent, in which case the selection and outcome equations are separately estimated. The correction terms for the public sector wage equation in

this case are constructed as follows:

$$\hat{\lambda}_{i,p1} = \phi(Z_i'\hat{\gamma})/\Phi(Z_i'\hat{\gamma}) \quad (3)$$

$$\hat{\lambda}_{i,s1} = \phi(B_i'\hat{\mu})/\Phi(B_i'\hat{\mu}) \quad (4)$$

whilst those for the private sector wage equation are:

$$\hat{\lambda}_{i,p2} = \phi(Z_i'\hat{\gamma})/\Phi(Z_i'\hat{\gamma}) \quad (5)$$

$$\hat{\lambda}_{i,s2} = -\phi(B_i'\hat{\mu})/\Phi(-B_i'\hat{\mu}) \quad (6)$$

where  $\phi$  and  $\Phi$  indicate the univariate standard normal density and distribution functions, respectively. These selection correction terms will be included as additional regressors in the respective wage equations:

$$\ln(w_{1,i}) = X'_{1,i}\beta_1 + \epsilon_{1,i} \quad (7)$$

$$\ln(w_{2,i}) = X'_{2,i}\beta_2 + \epsilon_{2,i} \quad (8)$$

If the participation into employment and the sector choice equations are not independent, an alternative approach is to estimate them using a bivariate probit under the assumption that the errors of the two probit equations are correlated (Ham, 1982; Tunali, 1986, cited in Heitmueller, 2006). The bivariate probit assumes that the errors of the three equations ( $\epsilon_j$ ,  $u$ ,  $v$ ) are jointly normally distributed with zero mean and covariance matrix:

$$\Sigma_j = \begin{bmatrix} \sigma_{jj}^2 & \sigma_{jv} & \sigma_{ju} \\ & \sigma_v^2 & \sigma_{vu} \\ & & \sigma_u^2 \end{bmatrix}$$

The bivariate probit is estimated by MLE and leads to the following four selection correction terms:

$$\hat{\lambda}_{i,p1} = \phi(Z_i'\hat{\gamma})\Phi\left[\frac{B_i'\hat{\mu}-\rho Z_i'\hat{\gamma}}{(1-\rho^2)^{1/2}}\right] \times F(B_i'\hat{\mu}, Z_i'\hat{\gamma}, \rho)^{-1} \quad (9)$$

$$\hat{\lambda}_{i,p1} = \phi(B_i'\hat{\mu})\Phi\left[\frac{Z_i'\hat{\gamma}-\rho B_i'\hat{\mu}}{(1-\rho^2)^{1/2}}\right] \times F(B_i'\hat{\mu}, Z_i'\hat{\gamma}, \rho)^{-1} \quad (10)$$

$$\hat{\lambda}_{i,p2} = \phi(Z_i' \hat{\gamma}) \Phi \left[ \frac{B_i' \hat{\mu} - \rho Z_i' \hat{\gamma}}{(1-\rho^2)^{1/2}} \right] \times F(-B_i' \hat{\mu}, Z_i' \hat{\gamma}, -\rho)^{-1} \quad (11)$$

$$\hat{\lambda}_{i,s2} = -\phi(B_i' \hat{\mu}) \Phi \left[ \frac{Z_i' \hat{\gamma} - \rho B_i' \hat{\mu}}{(1-\rho^2)^{1/2}} \right] \times F(-B_i' \hat{\mu}, Z_i' \hat{\gamma}, -\rho)^{-1} \quad (12)$$

where  $F$  is the bivariate standard normal distribution function and  $\rho$  is the correlation between the error terms  $u$  and  $v$ . The wage equations in these regards become:

$$E(\ln w_{1,i} | X_i', P_i = 1, S_i = 1) = X_{1,i}' \beta_1 + \sigma_{11} \rho_{1u} \hat{\lambda}_{i,p1} + \sigma_{11} \rho_{1v} \hat{\lambda}_{i,s1} \quad (13)$$

$$E(\ln w_{2,i} | X_i', P_i = 1, S_i = 0) = X_{2,i}' \beta_2 + \sigma_{22} \rho_{2u} \hat{\lambda}_{i,p2} + \sigma_{22} \rho_{2v} \hat{\lambda}_{i,s2} \quad (14)$$

The high multicollinearity induced from the inclusion of the correction terms in the wage equations requires a solution to the identification problem, thus it is advised that the selection equation has at least one independent variable that does not belong in the outcome equation, i.e. a variable that affects selection, but not the outcome (wages).

Given the gap between private and public sector may differ across wage distribution, despite the investigation of the wage gap by using the conditional mean function, we also propose an investigation of the extent to which the public-private pay gap is not constant but varies with the quantiles of the daily/monthly wage among the two sectors. Quantile regressions capture the impact of changes in covariates along a conditional wage distribution, in very much the same way that mean regression measures the impact of changes in covariates upon the mean of the conditional wage distribution. Machado and Mata (2005) propose a quantile regression decomposition technique, which allows decomposition at different quantiles and combines a decomposition procedure and a bootstrap approach. They decompose differences in the quantiles of the two groups into a portion that is due to the coefficients and another that is due to the covariates. More recently, Chernozhukov, et al., (2013) proposed quantile and distribution regression-based estimators for evaluating counterfactual effects, and developed the respective inference theory for their estimators. The counterfactual distributions in this new approach are constructed based on the observed conditional distribution functions of the two groups, and predict the outcome that the first group would have had if they faced the second group's outcome structure. Thus, the distribution integrates the conditional distribution of the outcome variable for one group with respect to the distribution of characteristics for the other. In a latter step, the OB

decomposition procedure is applied splitting the gap into differences due to the outcome structure and due to differences in characteristics, which the authors name the composition effects. This method constitutes the second empirical approach that is used in this study in order to complement the findings from modelling the conditional mean regressions with sample selection correction.

#### **4.1 Dependent and independent variables in Kosovo estimations**

##### **4.1.1 Participation and sector selection equations and their identification**

Table B1.6 in Appendixes provides a description of variables used in estimations for Kosovo. For the purpose of this analysis three dependent variables are utilized. The employment dummy variable equals one if the individual is employed full-time and 15 to 64 years old whereas 0 if otherwise. An individual is defined as public sector worker if employed in one of the following sectors/industries according to the classification of Kosovo Agency of Statistics: Public administration (Public order and security) and Social Work, Education, Health, Recreation and Culture, and Utilities. On the other hand, an individual is defined as private sector worker if employed in one of the following sectors: mining and quarrying, constructing, manufacturing, trade, services, post and telecommunication and other.

Given endogenous selection arising from non-random selection of individuals in public-private sector employment, wages may be subject of significant bias. In order to correct for selectivity bias, an identification variable is added to the set of independent variables which affects the probability of joining one of the sectors but not the wage, known as exclusion restriction (instruments).

With regards to the identification of the participation equation, the number of children is argued to be a significant determinant of participation in the labour force, but not of the sector choice or wage (Hetimueller, 2004). Hence, the ratio of children (up to 14 years old) in the household is included in the participation equation. Although, the number of children may negatively affect labour force participation and employment, expectations are that the number of young kids may have a higher impact on participation, compared to the older ones. Remittance receipt is also expected to decrease labour market participation which is known as ‘spoil effect’ (UNDP, 2012) yet is not expected to influence earnings. Thus it can be used as an instrument in sector choice

equation. This said, an indicator of remittance receipt is also used in employment equation, which indicates whether household has received remittances during last month.

The specification of the sector choice equation is:

$$S = \mu_0 + \gamma_1 age + \gamma_2 age21_{30} + \gamma_3 age31_{50} + \gamma_4 married + \gamma_5 secondary + \gamma_6 tertiary + \gamma_7 exper + \gamma_8 espersq + \gamma_9 urban + \gamma_{10} gjakove + \gamma_{11} gjilan + \gamma_{12} mitrovica + \gamma_{13} peje + \gamma_{14} prizren + \gamma_{15} mediumskilled + \gamma_{16} professionals + \gamma_{17} othmemeberpublic + v_i \quad (15)$$

whereas the employment choice equations is:

$$E = \mu_0 + \mu_1 age + \mu_2 age21_{30} + \mu_3 age31_{50} + \mu_4 married + \mu_5 secondary + \mu_6 tertiary + \mu_7 exper + \mu_8 espersq + \mu_9 urban + \mu_{10} gjakove + \mu_{11} gjilan + \mu_{12} mitrovica + \mu_{13} peje + \mu_{14} prizren + \mu_{15} mediumskilled + \mu_{16} professionals + \mu_{17} remittances + \mu_{18} childratio + v_i \quad (16)$$

With regards to the identification of the sector choice equation, unionization is one of the commonly used instruments in the literature since public sector employees are more likely to be unionized compared to private sector workers (Heitmueller, 2004). The Kosovan HBS 2011 however does not provide information on union perception. Workers (individuals) satisfaction with the workplace (Boyle et al., 2004) as well as parental socio-economic situation (Chatterji et al., (2009) are some other instruments used in this literature yet, data on workers satisfaction is also not collected by HBS 2011. On the other hand, Bender (2003) and Hartog and Oosterbeek (1993) use the mother's and father's education, arguing that background characteristics may be related to the sector choice, but are not expected to affect wages. Although, information on parents' education levels is provided, similar to Albania the issue of missing observations is also present; hence, cannot be utilized in the sector choice equation. Instead, a variable indicating the number of other members of the household that are employed in the public sector is included for both countries. It may be argued that they may provide information on employment opportunities and how to obtain a job in the public sector.

The dependent variable in wage equation is natural logarithm of the monthly wage. Wages similar to consumption generally follow a skewed distribution, thus in order to avoid problem of non-normality the wage is converted in natural logarithm.

The specification of the wage equation (equation 17) is as following:

$$\ln(\text{wage}) = \beta_0 + \beta_1 \text{age} + \beta_2 \text{age} + \beta_3 \text{agesquare} + \beta_4 \text{married} + \beta_5 \text{secondary} + \beta_6 \text{tertiary} + \beta_7 \text{tertiary} * \text{gjakove} + \beta_8 \text{tertiary} * \text{gjilan} + \beta_9 \text{tertiary} (* \text{mitrovica} + \beta_{10} \text{tertiary} * \text{peje} + \beta_{11} \text{tertiary} * \text{prizren} + \beta_{12} \text{tertiary} * \text{ferizaj} + \beta_{13} \text{mediumskilled} + \beta_{14} \text{professional} + \beta_{15} \text{urban} + \beta_{16} \text{gjakove} + \beta_{17} \text{gjilan} + \beta_{18} \text{mitrovica} + \beta_{19} \text{peje} + \beta_{20} \text{prizren} + \beta_{21} \text{ferizaj} + \varepsilon_i \quad (17)$$

Regarding other explanatory variables, the participation equation includes age indicators (dummies for age groups 21-30 and 31-50 years as well as age and its squared term), marital status, education dummies for less than primary or primary, secondary and tertiary education, tenure and squared tenure, occupation dummies low-skilled, medium-skilled, professional occupation for Kosovo given there were no detailed categorizations, in line with Statistical Institute classification<sup>2</sup>.

The human capital theory serves as the theoretical basis for selection of the variables in the earnings function. The wage of individuals is assumed to be positively related with increases of human capital such as education, work experience, and training. According to human capital theory, more educated individuals enjoy greater employment and income-earning possibilities and the returns are expected to be non-linear. Hence, indicators of the highest level of education attained by individual are constructed to control for the impact and different returns to education. Given returns to education may differ between regions, interaction terms between region and tertiary education attainment are included as the returns are mainly expected to differ amongst individuals with tertiary education attainment across regions.

The information on years of experience of the individual is not available in the Kosovan HBS 2011. However, in line with other studies, a proxy of potential experience is constructed by considering the age of the individual minus age at starting school minus years of education (Chatterji and Mumford, 2007; Mizzala et al., 2009). Motherhood for some women may lead to employment breaks and/or part-time employment which results in the accumulation of fewer years of experience and seniority (Budig and England, 2001). Hence, when calculating the years of potential experience of mothers, it is important to account for employment breaks due to motherhood. One approach could be to assume they take 6 months to one year off from work for

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<sup>2</sup> See Tables B1.1, B1.2 and B.13 in Appendixes for descriptive statistics.

each child born, depending on the duration of maternity leave by law in the respective country. However, taking this into consideration presence of extended families it is not possible to identify the number of children born per family. Information on the relationship of individuals to the head of the household in Kosovan HBS 2011 is more limited than that of Albanian LSMS 2012. More precisely, only the spouse and children of the head can be identified whereas the rest are either classified as close family members or non-family members of the head. In addition, no information on any type of training received by individual or other job characteristics is provided by the survey. As a result, it is not possible to control for their effect in this analysis.

To control for the location of the individual, region dummies, the urban/rural location indicator are included. A marital status dummy indicator is included and equals 1 if individual is married and 0 if otherwise. Being married is expected to lower the likelihood of employment among women because of both, higher opportunity costs of employment and the traditional nature of the Kosovan society, where women are not expected to provide income for the household; whereas regarding men, being married is expected to be positively related to employment given man is considered to be the bread winner.

In addition, dummy variables indicating different professions are included in order to control for different remuneration among occupations. Namely, dummy variable equals one if individual is employed in a low skilled, medium skilled and professional occupation<sup>3</sup>. Medium and professional skilled jobs are expected to offer higher rewards compared to low skilled occupations.

Earnings may differ for employees in the same industry but across public and private sector. For instance, wages in health sector may be higher in the private than public sector and similarly for education. However, given the data availability it is not possible to control for these potential differences in Kosovo estimations, namely, it is not possible to distinguish between public and private employment in each industry (when relevant) and specifically in education and health system. Moreover, it is not possible to control for the effect of industries given the public/private employment indicator is constructed based on information on the industry. When included in

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<sup>3</sup> The classification of occupations is based on ILO classifications.

estimations the biprobit does not converge whereas in wage equations some of the industry dummies are omitted.

## **4.2 Dependent and independent variables in Albania estimations**

### **4.2.1 Participation and sector selection equations and their identification**

Table B1.7 in Appendix provides a description of variables used in estimations for Albania. The dependent variable in the participation equation is a dummy that takes the unit value if the individual is employed. The set of explanatory variables in the employment equation includes age and its square, an indicator of marriage status, education dummies for secondary and tertiary education, tenure and squared tenure, locational variables which include the urban/rural and the dummies for the strata (Coastal, Central, Mountain, and Tirana, which is the reference category).

The dependent variable of the sector choice equation takes the unit value if the individual works in the public sector and 0 if he/she works in the private sector. In addition to the independent variables of the participation equation (excluding the respective identification variables), the sector choice equation also includes a variable on the knowledge about English language, a criteria often used in recruitment practices in the public sector. English knowledge is expected to positively affect employment in the public sector.

The joint estimation of the two probit models requires some identification assumptions on the coefficients and the covariance parameters (Tunali, 1986). The estimation procedure requires that there is at least one variable included in the employment (or participation) equation that does not belong to the sector choice equation and vice versa. In addition, these variables should not be determinants of wage, thus they must not be included in the wage equations. With regards to the identification of the participation equation, different authors have used the number of children arguing that it may be a significant determinant of participation in the labour force, but not of the sector choice, nor wage. The number of children split into age groups of 0-5 and 6-14 years is included. Although, the number of children may negatively affect labour force participation and employment, expectations are that the number of young kids may have a higher impact on participation, compared to the older ones. In addition, the dependency ratio is also included, comprising information of all children, adults and other members of the household that do not have any income. A higher dependency ratio is expected to positively affect participation, but it

is not expected to be related to sector choice or to the wage level of the household members.

With regards to the identification of the sector choice equation, Bender (2003) and Hartog and Oosterbeek (1993) have used the mother's and father's education, arguing that background characteristics may be related to the sector choice, but are not expected to affect wages. Heitmueller (2004) based the selection of the identification variables on evidence that suggests that public sector employees are more likely to be members of the unions compared to private sector employees, but unable to include this variable because union status is expected to affect wages as well, he opted in favour of using a measure of their opinions and perceptions on the importance of unions. The Albanian LSMS 2012 does not include information on union perception as in Heitmueller (2004), but it includes information on parents' education levels. However, the number of missing values for both parents' education is considerable hence these variables were not included in the sector choice equation. Similar to the Kosovo models, a variable indicating the presence of any other member of the household that is employed in the public sector is included. It may be argued that they may provide information on employment opportunities and how to obtain a job in the public sector.

In the estimation for Albania, the specification of the participation equation is:

$$P = \gamma_0 + \gamma_1 age + \gamma_2 agesquare + \gamma_3 married + \gamma_4 educ02 + \gamma_5 educ03 + \gamma_6 exper + \gamma_7 espersq + \gamma_8 urban01 + \gamma_9 coastal + \gamma_{10} central + \gamma_{11} mountains + \gamma_{12} dep_{ratio} + \gamma_{13} child05 + \gamma_{14} child614 + u_i \quad (18)$$

The specification of the sector choice equation is:

$$S = \mu_0 + \mu_1 age + \mu_2 agesquare + \mu_3 married + \mu_4 educ02 + \mu_5 educ03 + \mu_6 exper + \mu_7 espersq + \mu_8 urban01 + \mu_9 coastal + \mu_{10} central + \mu_{11} mountains + \mu_{12} english01 + \mu_{13} othmemeberpublic + v_i \quad (19)$$

The dependent variable in the wage equation is the natural logarithm of hourly wage and the independent variables are age and age squared, marital status, education dummies for secondary and tertiary education, occupation dummies in accordance with the ISCO08 classification (managers, professionals, technicians, clerical support, service and sales workers, skilled agriculture, craft and related trades workers, plant and machine operators, armed forces, and the elementary occupations which are the reference category), locational variables: urban/rural dummy and dummies for the coastal, central, mountain areas (Tirana is the reference category).

The wage equation includes interactions between the tertiary education dummy and the strata dummies as the return to higher education are expected to differ among the strata. Finally, the wage equation includes the sample selection correction terms as explained in the methodology section. The specification of the wage equation is:

$$\ln(\text{dailywage}) = \beta_0 + \beta_1 \text{age} + \beta_2 \text{agesquare} + \beta_3 \text{married} + \beta_4 \text{educ02} + \beta_5 \text{educ0} + \beta_6 \text{educ03} * \text{central} + \beta_7 \text{educ03} * \text{coastal} + \beta_8 \text{educ03} * \text{mountains} + \beta_9 \text{exper} + \beta_{10} \text{expersq} + \beta_{11} \text{managers} + \beta_{12} \text{professionals} + \beta_{13} \text{technicians} + \beta_{14} \text{clerical} + \beta_{15} \text{service} + \beta_{16} \text{skilled\_agri} + \beta_{17} \text{craft} + \beta_{18} \text{operators} + \beta_{19} \text{armedforces} + \beta_{20} \text{urban01} + \beta_{21} \text{coastal} + \beta_{22} \text{central} + \beta_{23} \text{mountains} + \beta_{24} \text{english01} + \beta_{25} \lambda_p + \beta_{26} \lambda_s + \varepsilon_i \quad (20)$$

## 5. Estimation results

### 5.1 Estimation results for Kosovo

There is evidence that men and women have different wage structures, hence the empirical evidence is separately conducted for the two groups. Table 11 presents the results of the Heckman two-step model for the subsample of men, based on which the participation and sector choice inverse mills ratios are constructed. Population weights are used in the estimation of the biprobit models both for man and woman groups. These are accordingly used to control for selection bias in the OLS regressions that were estimated for the public and private sector. The estimations cannot be performed for women in Kosovo sample given the model estimated using biprobit technique is not identified since none of the identification variables in the equations appears significant.<sup>4</sup> Mother's and father's education is also used as identification variable in employment equation in another specification; however, the model is still not identified.

The figures in Table 11 indicate that both stages of the model for men are identified and the coefficients have the expected signs, except for children ratio. The results of the Wald test of zero correlation between the error terms of the two stages indicate that inverse mills ratio is highly statistically significant. Thus, it cannot be concluded that the regressions can be estimated

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<sup>4</sup> Except for remittance receipt indicator which appears significant at 10% level only and the p-value is 0.98 which is not reliable.

separately. The results of the Heckman regressions are accordingly used to construct selection terms which later are used to control for selection bias in the OLS regressions that were estimated for the public and private sector.

**Table 11.** Results of two stage Heckman model for men

Variables	Outcome equation (Individual employed in public sector)		Selection equation (Individual employed)	
	Coefficient	Std. error	Coefficient	Std. error
Age21_30	0.803**	0.348	0.543***	0.088
Age31_50	0.362*	0.182	0.208**	0.099
Married	0.096	0.254	0.278***	0.094
Secondary	0.531***	0.172	0.255***	0.066
Tertiary	0.865***	0.256	0.803***	0.105
Tenure	0.115***	0.027	0.0276**	0.012
Tenuresq	-0.0013***	0.000	-0.0002	0.0002
Urban	-0.326***	0.119	-1.078*	0.057
Ferizaj	0.252	0.231	-0.117	0.114
Gjakove	0.266	0.178	-0.162	0.101
Gjilan	-0.008	0.187	-0.057	0.999
Mitrovice	0.065	0.184	-0.303***	0.104
Peje	0.097	0.174	-0.225**	0.103
Prizren	-0.323	0.219	0.236***	0.089
Mediumskilled	0.279*	0.167	1.415***	0.069
Professionals	0.670***	0.240	1.579***	0.106
Otherpublic	1.427***	0.127		
Remittances			-0.400***	-0.109
Childratio			-0.537***	0.175
Constant	-4.800***	0.605		
Lambda	(0.360)***			
Number of obs.	4251			
Censored obs.	2964			

legend: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

### Wage equation regression results for Kosovo

Table 12 presents the wage regression results for men in public and private sector with and without correction terms. The wage regression results using correction terms for public and private sector (Model 3 and 4) are interpreted below. Education indicators appear statistically significant across the set of four estimations except for secondary education indicator in private sector. The results are in line with human capital theory, and suggest that education exerts an

increasing effect on wages which increases for increased levels of education. Holding other factors constant, compared to those with less than primary or primary education, men with secondary education employed in public sector have 20.5 percent<sup>5</sup> higher wages; whereas those with tertiary education have 53.8 and 35.3 percent<sup>6</sup> higher wages in public and private sector, respectively.

The results however suggest that there are no significant differences in returns to tertiary education across regions except for public sector in Peja and Gjakova and as expected, the returns are lower compared to those in Prishtina. More precisely, public men employees residing in Peja and Gjakova have 23.4 and 20.1 percent<sup>7</sup> lower wages as compared to those in Prishtina *ceteris paribus*. Married dummy indicator appears significant however not at convenient statistically significance levels. As expected, individuals with medium and professional occupations receive higher wages compared to those employed in low skilled occupations in both sectors. Holding other factors constant, compared to those in low skilled occupations men employed in the medium skilled occupations have 27.4 and 13.8 percent<sup>8</sup> higher wages in public and private sector, respectively whereas those employed in professional occupations have 37.0 and 51.9<sup>9</sup> percent higher wages in public and private sector, respectively. Differences in wages are not found to be statistically different at convenient levels for individuals residing in urban and rural areas in both sectors. With regards to region, differences in earnings are statistically significant only between those residing in Prizren and Mitrovica compared to Prishtina yet only for men employed in private sector. More precisely, men employed in private sector in Prizren and Mitrovica have 13.9 and 9.6 percent<sup>10</sup> lower wages compared to those in Prishtina, holding other factors constant. Age indicators appear to matter only for private sector employees and age has an inverted U-shape effect on earnings meaning marginal returns to age increase until 43 years and become negative afterwards<sup>11</sup>.

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<sup>5</sup>  $100*(EXP(0.187)-1)$

<sup>6</sup>  $100*(EXP(0.431)-1)$  and  $100*(EXP(0.303)-1)$

<sup>7</sup>  $100*(EXP(-0.236)-1)$  and  $100*(EXP(-0.267)-1)$

<sup>8</sup>  $100*(EXP(0.242)-1)$  and  $100*(EXP(0.129)-1)$

<sup>9</sup>  $100*(EXP(0.431)-1)$  and  $100*(EXP(0.303)-1)$

<sup>10</sup>  $100*(EXP(-0.150)-1)$  and  $100*(EXP(-0.101)-1)$

<sup>11</sup> Given age and tenure indicators are highly correlated, regressions including tenure indicators are estimated as a robustness check. The results remain largely the same except age which becomes statically insignificant. The main

**Table 12.** Separate OLS results with and without correction across sectors for Kosovo

<b>Variables</b>	<b>Model 1 Public No correction</b>	<b>Model 2 Private No correction</b>	<b>Model 3 Public with correction</b>	<b>Model 4 Private with correction</b>
age	0.0094 (0.0128)	0.0344*** (0.0116)	0.001 (0.014)	0.030*** (0.009)
age2	-0.000 (0.000)	-0.0004*** (0.000)	-0.000 (0.000)	-0.0003*** (0.000)
married	0.111* (0.067)	0.086* (0.052)	0.088 (0.065)	0.023 (0.047)
secondary	0.133*** (0.045)	0.020 (0.038)	0.187*** (0.062)	0.004 (0.040)
tertiary	0.332*** (0.098)	0.321*** (0.109)	0.431*** (0.129)	0.303*** (0.111)
tertiary_ferizaj	-0.122 (0.121)	-0.113 (0.144)	-0.143 (0.117)	-0.172 (0.135)
tertiary_gjakove	-0.265* (0.150)	-0.0958 (0.177)	-0.236** (0.104)	-0.035 (0.129)
tertiary_gjilan	-0.087 (0.109)	-0.074 (0.144)	-0.141 (0.107)	-0.085 (0.129)
tertiary_mitrovica	0.044 (0.115)	-0.061 (0.156)	0.033 (0.108)	-0.090 (0.124)
tertiary_peja	-0.264** (0.114)	0.035 (0.122)	-0.267** (0.115)	-0.071 (0.132)
tertiary_prizren	-0.129 (0.125)	0.043 (0.128)	-0.164 (0.123)	-0.014 (0.115)
mediumskilled	0.249*** (0.057)	0.125*** (0.037)	0.242*** (0.058)	0.129*** (0.034)
professionals	0.331*** (0.061)	0.419*** (0.066)	0.315*** (0.063)	0.418*** (0.055)
urbanrural	0.023 (0.032)	-0.052 (0.036)	0.056* (0.033)	-0.047* (0.027)
ferizaj	0.044 (0.062)	-0.119 (0.079)	0.063 (0.074)	-0.027 (0.062)
gjakove	0.039 (0.053)	-0.038 (0.066)	0.022 (0.069)	-0.062 (0.057)
gjilan	0.053 (0.063)	0.029 (0.069)	0.089 (0.067)	0.012 (0.052)
mitrovica	0.009 (0.060)	-0.131* (0.069)	-0.004 (0.065)	-0.101** (0.049)
peje	0.095** (0.044)	0.044 (0.064)	0.057 (0.071)	0.058 (0.048)
prizren	0.009 (0.086)	-0.132* (0.067)	-0.005 (0.084)	-0.150*** (0.048)

difference is statistically significant effect of education indicators on wage compared to insignificant effect in previous estimates (including tenure indicators). This could be an indication that tenure indicators have captured also the effect of education on wage.

			0.178	-0.353
			(0.582)	(0.409)
			0.087	
			(0.356)	
				-0.078
				(0.083)
Constant	5.410***	4.691***	5.113***	5.021***
	(0.253)	(0.218)	(0.512)	(0.338)
Observations	428	859	428	859
R-squared	0.243	0.239	0.239	0.266

legend: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

### Oaxaca decomposition results for Kosovo

Results of the Oaxaca decomposition for the subsample of men are presented in Table 13. The results indicate that there is a log differential wages of men of about 0.209 between the public and the private sector. The decomposition of this difference into the endowment, coefficients and the interaction between the two, indicates that most of the difference is due to the characteristics of the employees included in the regression. If men employed in the public sector would have the characteristics of their counterparts working in the private sector their wages would have been lower. If the coefficients of the public sector employees would be applied to the private sector ones, then the wages would also be lower. However, it can be said that the compensation due to better characteristics of the public sector employees is not offset by higher returns of the private sector employees had they been employed in the public sector. The difference in endowments is the only decomposition term that is significant.

**Table 13.** Bootstrapped Oaxaca-Blinder Decomposition results-Public as advantaged group for Kosovo

	Obs coef.	Bootstrapped Std.error	z	P> z	Normal based (95% Conf. Interval)	
Differential						
Prediction 1	5.58	0.014	387.61	0.000	5.47	5.61
Prediction 2	5.70	0.018	308.75	0.000	5.67	5.76
Difference	-0.21	0.023	-8.98	0.000	-0.26	-0.10
Adjusted	-0.02	0.178	-0.12	0.902	-0.37	0.11
Decomposition						
Endowments	-0.14	0.03	-4.70	0.000	-0.19	-0.013
Coefficients	-0.21	0.17	1.26	0.21	-0.12	0.29
Interaction	-0.09	0.04	-2.27	0.02	-0.17	-0.04

### Counterfactual decomposition of differences in distributions for Kosovo

Table 14 presents the results of counterfactual decomposition of differences in distributions across nine quantiles. The results suggest that if men employed in the public sector would have the characteristics of their counterparts working in the private sector, their wages would have been lower across the entire distribution, and the differences are in general statistically significant. The difference is more pronounced at the low tail of the wage distribution, whereas it considerably decreases for the highest quantiles.

**Table 14.** Counterfactual decomposition of differences in distributions across nine quantiles for men in Kosovo

	Diff. between the observable distributions	Effects of characteristics	Effects of coefficients
Quantile	Overall	Explained	Unexplained
10 <sup>th</sup>	-0.236*** (0.0483)	-0.065 (0.0681)	-0.172*** (0.0661)
20 <sup>th</sup>	-0.288*** (0.0504)	-0.105** (0.041)	-0.182*** (0.0467)
30 <sup>th</sup>	-0.300*** (0.0424)	-0.223*** (0.0172)	-0.0770* (0.0439)
40 <sup>th</sup>	-0.310*** (0.0656)	-0.310*** (0.0688)	0.000 (0.0537)
50 <sup>th</sup>	-0.247*** (0.0171)	-0.215*** (0.0451)	-0.032 (0.0432)
60 <sup>th</sup>	-0.140*** (0.0513)	-0.154*** (0.0537)	0.014 (0.029)
70 <sup>th</sup>	-0.182*** (0.0157)	-0.288*** (0.0359)	0.105*** (0.0384)
80 <sup>th</sup>	-0.103*** (0.0244)	-0.305*** (0.0547)	0.202*** (0.0542)
90 <sup>th</sup>	-0.024 (0.049)	-0.357** (0.15)	0.333** (0.154)
Observations	1,564		

legend: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

The decomposition of this difference into the endowment, coefficients and the interaction between the two, suggest that the difference is explained differently for individuals at different parts of the wage distribution (the lower part of the wage distribution and the upper ones). More specifically, for the two lowest quantiles the wage gap can be attributed to differences in returns

to characteristics, whereas for the rest of wage levels due to better endowments of men employees.

If the coefficients of the public sector employees at 60<sup>th</sup> -90<sup>th</sup> quantile would be applied to the private sector ones, then the wages would have still been higher. However, for men at the higher quantiles (60<sup>th</sup>-90<sup>th</sup>) it can be stated that the compensation due to better characteristics of the public sector employees is not offset by the higher returns of the private sector employees had they been employed in the public sector.

## **5.2. Estimation results for Albania**

There is evidence in the literature than men and women have different wage structures, hence the empirical evidence is separately drawn for the two groups. Table 15 below presents the results of the biprobit model for men, based on which the participation and sector choice inverse mills ratios are constructed. Population weights are used in the estimation of the biprobit models both for subsample of men and women. The results of the Heckman regressions are accordingly used to construct selection terms which later are used to control for selection bias in the OLS regressions that are estimated for the public and private sector. The figures in the table indicate that both stages of the model are identified and the coefficients have the expected signs. The results of the Wald test of zero correlation between the error terms of the two stages indicate that there is no sufficient evidence to reject the null. Thus, in contrast to Kosovo it can be concluded that the participation and sector choice decisions are not correlated and the regressions can be estimated separately. Nevertheless, the four selection terms are calculated as in Heitmueller (2004) and are later included in the OLS regressions in order to correct for self-selectivity due to unobservables.

The results indicate that similar to Kosovo the exclusion restrictions (identification variables) are valid. In the employment equation the variables of number of children aged 0 – 5 and 6 – 14 years are significant at the 5 per cent level. In the sector choice equation, the presence of other household members that work in the public sector significantly increases the probability of being employed in that sector.

Except for the dependency ratio, all the variables in the employment equation are statistically significant at the 5 per cent level (Table 15). Holding other factors constant, age is non-linearly

related to employment probability and has a diminishing effect. Being married is associated with a higher probability of employment compared to non-married. Both secondary and tertiary education levels have significantly higher probability of employment compared to those with primary education. Potential experience has also a non-linear U-shaped relationship with the probability of being employed. Living in the urban areas increases the probability of being employed, while living in the coastal, central or mountain areas is associated with lower probability of employment compared to those living in Tirana.

The sector choice equation results in a lower number of significant variables. Having completed tertiary level of education is associated with a higher probability of working in the public sector, *ceteris paribus*. Living in the mountain area has a positive effect, which means that there is a higher probability of being employed in the public sector compared to Tirana. This result is expected, given that the mountain area is less economically development and public institutions account for a higher percentage of employed compared to Tirana. There are no significant differences in the probabilities of being employed in the public sector between the other regions and Tirana, holding other factors fixed. Surprisingly, living in the urban area is associated with a lower probability compared to the rural area.

Table 16 presents the results of the OLS estimations with and without correction terms for the public and private sectors. Standard errors for the models are based on a simple re-sampling bootstrap method with 1000 replications, i.e. 1000 samples of size N are drawn from our sample with replacement. The coefficients of every replication are saved and used to calculate standard errors and confidence intervals.

As expected, the selection terms are not significant in the two models, and the coefficients of the other variables are only slightly affected by their inclusion. Hence, no employment or sector-choice bias is present. Age and its square, as well as experience and its square are highly correlated among them, but their exclusion results in misspecification of the model, so the decision was made to include them in the final equation. Ramsey's test of specification indicates that the null hypothesis is not rejected for all four equations presented in Table 16.

**Table 15.** Results of two stage Heckman model for men

	<b>Coef.</b>	<b>Robust Std. Err.</b>	<b>z</b>	<b>P&gt;z</b>	<b>[95% Conf. Interval]</b>	
<i>public</i>						
age	-0.041	0.136	-0.300	0.764	-0.307	0.225
age2	-0.001	0.002	-0.300	0.762	-0.004	0.003
married	0.016	0.184	0.090	0.931	-0.344	0.376
educ02	0.219	0.172	1.280	0.202	-0.118	0.555
educ03	0.901	0.325	2.770	0.006	0.264	1.537
exper	0.114	0.071	1.610	0.107	-0.025	0.253
expersq	0.000	0.001	-0.040	0.971	-0.003	0.002
urban01	-0.297	0.120	-2.470	0.014	-0.533	-0.061
coastal	0.122	0.124	0.990	0.322	-0.120	0.364
central	0.175	0.136	1.290	0.198	-0.091	0.441
mountains	0.357	0.213	1.670	0.094	-0.061	0.776
english01	-0.091	0.121	-0.750	0.452	-0.327	0.146
othmemberpublic	2.020	0.234	8.650	0.000	1.562	2.478
cons	-1.361	2.530	-0.540	0.590	-6.320	3.597
<i>employment</i>						
age	0.333	0.033	10.220	0.000	0.270	0.397
age2	-0.004	0.000	-10.580	0.000	-0.005	-0.003
married	0.208	0.095	2.190	0.029	0.021	0.395
educ02	0.185	0.087	2.130	0.034	0.014	0.356
educ03	0.723	0.061	11.910	0.000	0.604	0.842
exper	-0.107	0.020	-5.330	0.000	-0.146	-0.068
expersq	0.002	0.000	6.610	0.000	0.002	0.003
urban01	0.313	0.046	6.860	0.000	0.223	0.402
coastal	-0.140	0.071	-1.980	0.048	-0.279	-0.002
central	-0.254	0.069	-3.680	0.000	-0.390	-0.119
mountains	-0.456	0.089	-5.100	0.000	-0.631	-0.280
dep_ratio	0.142	0.165	0.860	0.390	-0.182	0.466
child05	-0.086	0.039	-2.200	0.028	-0.162	-0.009
child614	-0.095	0.031	-3.030	0.002	-0.157	-0.034
cons	-5.862	0.461	-12.730	0.000	-6.765	-4.960
/athrho	-0.305	0.436	-0.700	0.484	-1.160	0.549
rho	-0.296	0.398			-0.821	0.500
Wald test of indep. eqns. (rho = 0): chi2(1) = 0.49				Prob > chi2 = 0.4839		
Number of obs = 8496		Censored obs = 6468		Uncensored obs = 2028		

**Table 16.** Results of the OLS estimations with and without correction terms for the public and the private sectors

	OLS_Public	OLS_Public	OLS_Private	OLS_Private
Model	No correction	Corrected	No correction	Corrected
Variable				
age	0.1540***	0.1608***	0.0949***	0.0837**
age2	-0.0017***	-0.0018***	-0.0011***	-0.0010**
married	0.0122	-0.0111	0.044	0.04
educ02	0.0982*	-0.0961	-0.1223**	-0.1320**
educ03	0.3144***	0.3061***	0.1520**	0.1192
educ03_central	-0.1197	-0.1153	-0.1926***	-0.1952***
educ03_coastal	-0.1670**	-0.1644**	-0.2216***	-0.2223***
educ03_mountains	-0.3185***	-0.3130***	-0.2925***	-0.2932***
exper	-0.1007***	-0.1049***	-0.0469***	-0.0433**
expersq	0.0015***	0.0016***	0.0008***	0.0007**
managers	0.5533***	0.5538***	0.4834***	0.4831***
professionals	0.4166***	0.4192***	0.4700***	0.4677***
technicians	0.3200***	0.3225***	0.2986***	0.2976***
clerical	0.2140*	0.2166*	0.1368**	0.1362**
service	0.3070***	0.3151***	-0.1610***	-0.1619***
skilled_agri	-0.0585	-0.0621	-0.1595**	-0.1605**
craft	0.1762**	0.1809**	0.1256***	0.1255***
operators	0.3960***	0.3985***	0.2595***	0.2591***
armedforces	0.3517***	0.3566***	0.0548	0.0497
urban01	0.0465*	-0.0499	-0.0287	-0.0393
coastal	0.078	0.724	0.0125	0.0173
central	-0.0443	0.053	-0.0047	0.0041
mountains	0.1019	0.0.0862	0.0449	0.0602
english01	0.1059***	0.1047***	0.1080***	0.1086***
$\lambda_p$		-1.8031**		
$\lambda_s$		-1.2829**		
$\lambda_p$				-0.2946
$\lambda_s$				-0.1069
_cons	7.0567***	8.8844***	7.7831***	8.0414***
N	697	697	1320	1320
R <sup>2</sup>	0.3518	0.3588	0.2347	0.2348
Adjusted R <sup>2</sup>	0.3286	0.334	0.2205	0.2194

legend: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

In the public sector wage equations, holding all other factors constant, age has a significant non-linear effect on wage. The effect is positive until the age of 45 and it becomes negative afterwards. Having completed secondary schooling is only significant at the 10 percent level in the regression without selection correction terms, but there is no significant wage differential with the individuals that have completed primary studies in the selection-corrected equation. The completion of tertiary level studies has a positive and significant effect on wage, and this effect is significantly different between the regions and Tirana. For Tirana, the difference in wages with the individuals that have primary education is estimated to be approximately 37 percent<sup>12</sup> in the non-corrected equation and 36 percent<sup>13</sup> in the corrected one. Someone with tertiary education in the central area earns 21.5 percent<sup>14</sup> more than an individual with primary education and the same other characteristics. This difference is 21 percent<sup>15</sup> in the corrected equation. A man with tertiary education in the coastal area is estimated to earn 15.88 percent<sup>16</sup> more than a man with primary education (15.2 percent in the corrected equation). The wage differential between men with tertiary and primary education in the mountain areas although statistically significant, is very low, 0.4 percent<sup>17</sup> (0.7 in the selection-corrected equation), in favour of the latter group.

Potential experience is also statistically significant at the 1 percent level. Its effect is negative until 33.6 (32.8) years of experience in the non-corrected (corrected) for selection equation. With regards to the professional groups and compared to men with elementary occupations, men managers earn on average 74 percent<sup>18</sup> more, man professionals earn on average 51.8 percent<sup>19</sup> more, men technicians and associate professionals earn about 37.7 percent<sup>20</sup> more, clerical support workers earn 24 percent<sup>21</sup> more, service and sales workers earn 36 percent<sup>22</sup> more, craft and related trade workers earn on average 19.3 percent<sup>23</sup> more, the wages of plant and machine operators are about 48.6 percent higher, and a person working in the armed forces earns on

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<sup>12</sup> =100\*(EXP(0.3144)-1)

<sup>13</sup> =100\*(EXP(0.3061)-1)

<sup>14</sup> =100\*(EXP(0.3144-0.1197)-1)

<sup>15</sup> =100\*(EXP(0.3061-0.1153)-1)

<sup>16</sup> =100\*(EXP(0.3144-0.167)-1)

<sup>17</sup> =100\*(EXP(0.3144-0.3185)-1)

<sup>18</sup> =100\*(EXP(0.5533)-1)

<sup>19</sup> =100\*(EXP(0.4166)-1)

<sup>20</sup> =100\*(EXP(0.32)-1)

<sup>21</sup> =100\*(EXP(0.214)-1)

<sup>22</sup> =100\*(EXP(0.307)-1)

<sup>23</sup> =100\*(EXP(0.1762)-1)

average 42.2 percent<sup>24</sup> more, *ceteris paribus*.

The locational variables are not individually significant at the 5 percent level, but living in the urban areas is significant at the 10 percent level and the estimate indicates that the wage differential between urban – rural areas is 4.65 percent. Speaking English is beneficial as estimates indicate. An English-speaking public employee is estimated to earn on average 11 percent more than someone who does not speak English with the same other characteristics. The estimates of the wage differential due to professional background are similar in the selection-corrected regression.

With regards to the private sector regressions, the results are very similar in terms of statistical significance. Age has an inverse U-shaped relationship with wage, reaching the peak at 43.1 years in the first, and at 41.9 years in the second regression. The secondary education variable is significant at 5 percent. The wage differential between a private sector employee with secondary level education and one with the same characteristics but with primary education is about 12 – 13 per cent. The tertiary education indicator is significant at the 5 per cent level only in the regression that does not contain the selection terms. This coefficient is interpreted as the difference in wages between an employee with tertiary education and one with primary education in Tirana area, and it is estimated to be approximately 16.4 percent<sup>25</sup>. For someone living in the central area this difference is predicted to be around -4.1 percent<sup>26</sup> in the first regression and -7.3 percent in the second (corrected) regression. This difference is on average -6.7 percent<sup>27</sup> in the regression without correction terms and -9.8 percent<sup>28</sup> in the extended regression for the coastal area. A person with tertiary education that lives in the mountain area is estimated to earn on average 13.1 percent<sup>29</sup> less than a person who lives in Tirana in the first regression, and 16 percent<sup>30</sup> in the second.

With regards to occupations, the results indicate that being in a managerial position is associated

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<sup>24</sup> =100\*(EXP(0.3517)-1)

<sup>25</sup> =100\*(EXP(0.152)-1)

<sup>26</sup> =100\*(EXP(0.152-0.1936)-1)

<sup>27</sup> =100\*(EXP(0.152-0.2216)-1)

<sup>28</sup> =100\*(EXP(0.1192-0.2223)-1)

<sup>29</sup> =100\*(EXP(0.152-0.2925)-1)

<sup>30</sup> =100\*(EXP(0.1192-0.2932)-1)

with an average increase in wages by 62.2 percent<sup>31</sup> compared to elementary occupations, *ceteris paribus*; the difference between professionals and elementary occupation workers is about 60 percent<sup>32</sup>, the difference between technicians and associate professionals and elementary occupation workers is on average 34.8 percent<sup>33</sup>, clerical support workers earn on average 14.7 percent<sup>34</sup> more than workers of elementary occupations; service and sales workers earn 17.5 percent<sup>35</sup> more; craft and related trade workers earn on average 13.4 percent<sup>36</sup> more, and the wage differential between plant and machine operators and elementary occupation is estimated to be about 29.6 percent<sup>37</sup> more than a person with the same characteristics in elementary occupations, *ceteris paribus*.

### **Oaxaca decomposition**

Results of the Oaxaca decomposition for the subsample of men are presented in Table 17. They indicate that there is a log differential in wages of about 0.15 between the men employed in the public and private sector. The decomposition of this difference into the endowment, coefficients and their interaction indicates that similar to Kosovo most of the difference is due to the characteristics of the employees. If men employed in the public sector would have the characteristics of their counterparts working in the private sector their wages would have been lower.

If the coefficients of the public sector employees would be applied to the private sector ones, then their wages would have still been higher in contrast to Kosovo. However, it can be said that the compensation because of the better characteristics of the public sector employees is not offset by the higher returns of the private sector employees had they been employed in the public sector. Similar to results for Kosovo, the difference in endowments is the only decomposition term that is significant.

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<sup>31</sup> =100\*(EXP(0.4834)-1)

<sup>32</sup> =100\*(EXP(0.47)-1)

<sup>33</sup> =100\*(EXP(0.2986)-1)

<sup>34</sup> =100\*(EXP(0.1368)-1)

<sup>35</sup> = =100\*(EXP(0.161)-1)

<sup>36</sup> =100\*(EXP(0.1256)-1)

<sup>37</sup> =100\*(EXP(0.2595)-1)

**Table 17.** Oaxaca decomposition for men's regressions

	Observed	Bootstrap			Normal-based	
<b>ldailywage</b>	Coef.	Std. Err.	z	P>z	[95% Conf. Interval]	
<b>Differential</b>						
Private sector	9.204	0.013	720.760	0.000	9.179	9.229
Public sector	9.358	0.013	702.880	0.000	9.332	9.384
Difference	-0.155	0.018	-8.400	0.000	-0.191	-0.119
Adjusted	-0.043	0.368	-0.120	0.908	-0.763	0.678
<b>Decomposition</b>						
Endowments	-0.190	0.053	-3.610	0.000	-0.293	-0.087
Coefficients	0.090	0.336	0.270	0.790	-0.569	0.748
Interaction	0.058	0.072	0.800	0.422	-0.083	0.199

The same procedure is followed for women and the results follow. In the biprobit model (Table 18), both the participation and the sector choice equation are identified. Contrary to the regression for men, there is a significantly different from zero correlation coefficient between the error terms of the two stages/models.

In the employment model most of the explanatory variables are significant and have the expected signs. Age and experience have non-linear relationships of two different forms with the probability of being employed. Both secondary and tertiary education have higher probability of being employed compared to those with primary education. Being married and the presence of children decrease the probability of being employed. With regards to location variables, living in the urban areas is also associated with a higher probability of being employed, whilst living in the mountain area is associated with lower employment probability compared to Tirana.

The probability of being employed in the public sector is positively related to education, age has a nonlinear effect, and experience as well. Household members that work in the public sector positively affect the probability of working in it of other household members. Living in the mountain area is associated with a higher probability of being employed in the public sector compared to Tirana, a result that may be explained by the low economic development of the mountain area and the concentration of the industry in Tirana, as well as in the coastal and central areas of the country. The other variables are not significant at the 5 per cent level. Based on the results of these models, the inverse mills ratios are accordingly calculated and included in the OLS estimation for women which are presented in Table 19.

**Table 18.** Results of two-stage Heckman model for women

Variable	Coef.	Rob.Std. Err.	z	P> z	[95% Conf. Interval]	
<i>public</i>						
age	0.469	0.151	3.110	0.002	0.174	0.764
age2	-0.007	0.002	-3.660	0.000	-0.010	-0.003
married	0.013	0.143	0.090	0.925	-0.266	0.293
educ02	0.612	0.197	3.110	0.002	0.226	0.997
educ03	1.870	0.155	12.080	0.000	1.567	2.174
exper	-0.145	0.092	-1.580	0.113	-0.324	0.034
expersq	0.004	0.001	2.770	0.006	0.001	0.007
urban01	0.276	0.151	1.830	0.067	-0.019	0.571
coastal	0.171	0.143	1.190	0.233	-0.110	0.451
central	0.263	0.149	1.770	0.076	-0.028	0.555
mountains	0.629	0.308	2.040	0.041	0.026	1.232
english01	-0.182	0.149	-1.220	0.221	-0.474	0.110
othmemberpublic	1.214	0.293	4.150	0.000	0.640	1.788
_cons	-9.515	2.000	-4.760	0.000	-13.436	-5.595
<i>employment</i>						
age	0.645	0.062	10.350	0.000	0.523	0.767
age2	-0.008	0.001	-11.130	0.000	-0.010	-0.007
married	-0.237	0.084	-2.810	0.005	-0.403	-0.072
educ02	0.512	0.122	4.190	0.000	0.273	0.752
educ03	1.377	0.087	15.750	0.000	1.206	1.549
exper	-0.237	0.040	-5.950	0.000	-0.315	-0.159
expersq	0.005	0.001	7.580	0.000	0.004	0.006
urban01	0.634	0.067	9.510	0.000	0.503	0.765
coastal	-0.099	0.080	-1.240	0.216	-0.255	0.058
central	-0.105	0.079	-1.330	0.183	-0.260	0.049
mountains	-0.495	0.095	-5.230	0.000	-0.680	-0.310
dep_ratio	0.110	0.147	0.750	0.452	-0.177	0.397
child05	-0.127	0.051	-2.500	0.012	-0.226	-0.027
child614	-0.082	0.037	-2.220	0.026	-0.155	-0.010
_cons	-10.640	0.778	-13.670	0.000	-12.165	-9.114
/athrho	0.884	0.412	2.140	0.032	0.076	1.692
rho	0.709	0.205			0.076	0.934
Wald test of indep. eqns. (rho = 0):				chi2(1) = 4.60	Prob > chi2 = 0.0320	
Number of obs = 8365		Censored obs = 7242		Uncensored obs = 1123		

**Table 19.** Results of the OLS estimations with and without correction terms for the public and the private sectors

Variable	OLS_Public	OLS_Public	OLS_Private	OLS_Private
	No correction	Corrected	No correction	Corrected
age	-0.005	0.0216	0.0447	0.1008***
age2	0.0002	-0.0002	-0.0004	-0.0012***
married	-0.007	-0.0327	-0.0399	0.0373
educ02	-0.0286	-0.0228	0.0691	-0.1159**
educ03	0.1537**	0.1828	0.3305***	0.1692**
educ03_central	-0.0229	-0.0193	-0.1602*	-0.1957***
educ03_coastal	0.0023	-0.0015	-0.0795	-0.2239***
educ03_mountains	-0.1403*	-0.1208	-0.1538	-0.2946***
exper	0.0157	0.0055	-0.0215	-0.0490***
expersq	-0.0004	-0.0002	0.0002	0.0008***
managers	0.4993***	0.4958***	0.1567	0.4843***
profession~s	0.3803***	0.3711***	0.4384***	0.4722***
technicians	0.3292***	0.3198***	0.3391***	0.2991***
clerical	0.1632***	0.1531**	0.2584**	0.1359**
service	-0.0254	-0.027	0.1239*	-0.1611***
skilled_agri	0.4478*	0.4600**	-0.0383	-0.1583*
craft	0.2042	0.1846	0.0232	0.1254***
operators	0.1824	0.1685	-0.0079	0.2592***
armedforces	0.3349*	0.3314*	(omitted)	0.0593
urban01	0.0555**	0.0866	-0.1079**	-0.0175
coastal	-0.0977	-0.1061	-0.1720***	0.009
central	-0.0492	-0.0666	-0.1498***	-0.009
mountains	0.005	-0.0621	0.0162	0.0227
english01	0.1518***	0.1527***	0.0950**	0.1092***
$\lambda_p$		0.3306		0.0832
$\lambda_s$		-0.2067		0.0383
cons	8.6365***	8.1907***	8.2422***	7.6314***
N	622	622	496	1320
R <sup>2</sup>	0.4902	0.4929	0.4584	0.2348
adjusted R <sup>2</sup>	0.4697	0.4707	0.432	0.2195

legend: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

Similar to the regression results for men, the employment and sector selection terms are not statistically significant. The results are similar between the models with and without correction terms for the same sector, but they differ in significance and magnitude between sectors. In the public sector models, profession and English knowledge are the most important variables. Managers, skilled agriculture workforce and technicians have significantly higher wages compared to those in elementary occupations. English speakers also have higher wages compared to those that do not speak English.

In the private sector regressions, the significance of the variables is higher. Age is significant and has a positive effect until 42 years. Surprisingly, women with secondary education earn less than their counterparts with primary education, whilst those with tertiary education have significantly higher returns to education. The return to education depends on the regional variables and the differences with Tirana are significant. Compared to Tirana, the return to tertiary education is 2.65 percent lower in the central region, 5.47 percent lower in the coastal area and 12.54 percent lower in the mountain areas. Experience has a U-shaped relation with wages. Again, professions seem to be the most important determinant of wages. Professionals, technicians, clerical and support workers, service and sales workers, crafts and trade related professionals as well as plant and machine operators earn significantly higher wages compared to elementary occupations. Those who speak English are also predicted to have a higher wage than those who do not, *ceteris paribus*.

**Table 20.** Results of Oaxaca decomposition for women

<b>ldailywage</b>	<b>Observed Coef.</b>	<b>Bootstrap Std. Err.</b>	<b>z</b>	<b>P&gt;z</b>	<b>Normal-based [95% Conf. Interval]</b>	
<b>Differential</b>						
Private sector	8.975	0.020	444.480	0.000	8.936	9.015
Public sector	9.280	0.013	718.160	0.000	9.255	9.306
Difference	-0.305	0.025	-12.440	0.000	-0.353	-0.257
Adjusted	0.044	0.309	0.140	0.887	-0.562	0.650
<b>Decomposition</b>						
Endowments	-0.217	0.056	-3.870	0.000	-0.327	-0.107
Coefficients	0.335	0.268	1.250	0.212	-0.191	0.861
Interaction	-0.074	0.080	-0.930	0.352	-0.230	0.082

The decomposition results in Table 20 indicate that there is a higher gap in the case of women. The unadjusted wage gap between the private and the public sector is about -0.31 and the adjusted for selectivity is -.044. If women employed in the public sector would have had the characteristics of the private sector ones, their wages would have been considerably lower. If the coefficients of the public sector employees would be applied to the characteristics of their private sector counterparts then the wages of the latter would increase. The effect of the interaction term is also negative. The effect of the unexplained terms is not individually significant.

### Counterfactual decomposition of differences in distributions

Tables 21 and 22 present the decomposition of wage gap for men and women by deciles, respectively. The results indicate that for men, the observed difference narrows until it reaches its lowest level in the upper part of the wage distribution and the implications of this result are similar to those for Kosovo. For women, the observed difference is persistent and very similar in the first six deciles and significantly decreases in the last three. At the highest decile, women and men working in the public sector have the same wages compared to their counterparts working in the private sector.

**Table 21.** Men's wage decomposition by deciles

Quantile	Differences between the observable distributions		Effects of characteristics			Effects of coefficients		
	Quantile effect	Pointwise Std. Err.	Quantile effect	Pointwise Std. Err.	z	Quantile effect	Pointwise Std. Err.	z
0.1	-0.284	0.033	-0.084	0.054	-1.562	-0.200	0.061	-3.296
0.2	-0.254	0.025	-0.173	0.034	-5.044	-0.081	0.041	-1.974
0.3	-0.212	0.025	-0.164	0.030	-5.482	-0.048	0.033	-1.470
0.4	-0.179	0.023	-0.157	0.032	-4.960	-0.022	0.032	-0.665
0.5	-0.159	0.017	-0.171	0.033	-5.121	0.011	0.034	0.335
0.6	-0.126	0.020	-0.163	0.033	-4.863	0.037	0.035	1.057
0.7	-0.085	0.021	-0.137	0.035	-3.884	0.052	0.035	1.468
0.8	-0.068	0.022	-0.122	0.035	-3.487	0.053	0.036	1.491
0.9	-0.045	0.028	-0.089	0.040	-2.230	0.044	0.045	0.961
No. of obs. in the reference group					1320			
No. of obs. in the counterfactual group					697			

Except for the lowest wage decile for men, differences are attributed to better characteristics in the private sector. Again, the effects of the characteristics are statistically significant at the 5 per

cent level. This result is consistent for the two genders and across deciles, with the private sector being disadvantaged thus confirming the results of the previous decomposition. However, decile decomposition indicated that the effects of different returns are also significant for the lower part of the wage distribution. There are significantly different returns to characteristics of the employees between the private and the public sector at 5 percent for men in the first and second decile, and for women in the first three deciles.

**Table 22.** Women’s wage decomposition by deciles

Quantile	Differences between the observable distributions		Effects of characteristics			Effects of coefficients		
	Quantile effect	Pointwise Std. Err.	Quantile effect	Pointwise Std. Err.	z	Quantile effect	Pointwise Std. Err.	z
0.1	-0.397	0.037	-0.196	0.078	-2.508	-0.200	0.072	-2.794
0.2	-0.421	0.029	-0.281	0.062	-4.544	-0.140	0.054	-2.585
0.3	-0.416	0.026	-0.309	0.056	-5.529	-0.107	0.049	-2.173
0.4	-0.422	0.201	-0.343	0.055	-6.284	-0.079	0.050	-1.572
0.5	-0.410	0.030	-0.353	0.059	-5.948	-0.057	0.052	-1.091
0.6	-0.349	0.028	-0.306	0.054	-5.621	-0.043	0.049	-0.886
0.7	-0.273	0.031	-0.233	0.055	-4.252	-0.041	0.049	-0.836
0.8	-0.160	0.033	-0.166	0.053	-3.124	0.006	0.049	0.124
0.9	-0.021	0.038	-0.094	0.047	-1.976	0.072	0.048	1.497
No. of obs. in the reference group					496			
No. of obs. in the counterfactual group					622			

## 6. Conclusions

This paper estimates the public-private wage differential in Kosovo and Albania. In order to correct for potential sample selection bias, a double sample selection model is utilized to control for both, selection from the participation decision and the sector choice, the results of which are compared with separate OLS regressions. The estimations are performed only for men in Kosovo sample given the model estimated for women using two-stage Heckman technique is not identified. Sample selection from the labour force participation decision for men is an issue hence wage regressions cannot be estimated separately. Both stages of the model are identified and the coefficients have the expected signs, except children ratio.

The results for wage equations for Kosovo suggest that education matters. The result is in line with human capital theory and wages increase with increased education level. In general, there are no significant differences in earnings across regions and urban or rural areas. The returns to

tertiary education do not differ across regions except for public sector in Peja and Gjakova, and in line with expectations they are lower than in Prishtina. As expected, returns to medium and professional occupations are higher compared to low skilled occupations. Results also highlight the importance of age yet only for private sector employees, and the effect is inverted U-shaped.

The results of Oaxaca decomposition suggest that there is a wage gap in favour of public sector employees in Kosovo and higher wages can be explained by differences in the observed characteristics. It is also found that the wages of men employed in public sector would be lower if they would have the characteristics of their private counterparts or if they would be subject to the returns of private sector employees. This may affect the distribution of skills among public and private sectors and thereby the overall labor market efficiency.

The results across quantiles for Kosovo indicate that on average public sector employees earn less than private sector employees and the gap varies along the wage distribution. At the low tail of the distribution the portion of the public sector wage gap is accounted by differences in returns to characteristics (where no advantage in terms of individual characteristics is observed) whereas at the mid and high wage levels, due to better endowments of men employed in the private sector.

The empirical evidence for Albania is based on separate estimations for men and women assuming that they have different wage structures. For men, the participation into employment and sector choice decisions are not correlated. Employment regression results regarding men indicate that age, dependency ratio, being married, number of children aged 0 – 5 and 6 – 14 years, education level, potential experience, living in the urban, coastal, central or mountain are statistically significant determinants of employment. In the sector choice equation, the presence of other household members that work in the public sector, level of education and location variables are also significant factors. Age, education, potential experience, urban/rural, knowledge of English and professional groups are the significant determinants of wages. The return to education depends on the regional variables and the differences with Tirana are significant.

With regard to women, there is a significant correlation between the participation (employment) and the sector choice equations. In the employment model age, experience, secondary and

tertiary education, being married and the presence of children and the location variables are significant. The probability of being employed in the public sector is determined by education, age, experience, presence of other household members that work in the public sector and location variables are significant and have the expected signs.

In the wage equations by sector the results are similar. In the public sector models, profession and English knowledge are the most important determinants. English speakers, managers, skilled agriculture workforce and technicians have significantly higher wages compared with employees in elementary occupations. In the private sector, professionals, technicians, clerical and support workers, service and sales workers, crafts and trade related professionals as well as plant and machine operators earn significantly more than elementary occupation workers.

Results of the Oaxaca decomposition for the subsample of men indicate that most of the difference is due to the characteristics of the employees, with the private sector being the disadvantaged group. The wage gap is higher in the case of women, and the Oaxaca decomposition results indicate that the gap may be explained by the differences in characteristics of the employees in the two sectors and the returns to characteristics are statistically equal for both groups. These results suggest that private sector is being disadvantaged in terms of exploring opportunities, given that the most productive employees are working in the public sector.

The wage differential fluctuates at the lower deciles and significantly decreases at the higher tail for both genders. Exploring the wage differential along its distribution, the quantile regression decomposition results support the previous finding and indicate also that for both women and men, the wage differential is attributable to better characteristics of the employees of the public sector in every decile. However, this result is also complemented by different returns to characteristics in the lowest quantiles. The differences in returns are insignificant in the higher deciles for both men and women.

An implication deriving from the results is that for both countries private sector productivity and services could have been better if the public sector would not be employing the most qualified individuals. Moreover, the differences in returns to characteristics for low wages may indicate that the private sector is not strictly implementing the minimal wage requirement.

## Appendixes

### Appendix A

**Table A.1.** Kosovan Labour Market Indicators during the 2003-2009 and 2012-2013 period (%)

Year ↓	Indicator →	LF Participation Rate	Employment Rate	Unemployment Rate	Inactivity Rates
2003	All	50.3	25.3	25	81.4
	Women	29.5	8.3	21.2	69
2004	All	45.9	27.9	18.3	84.1
	Women	25.2	9.9	15.4	71.4
2005	All	48.7	28.9	41.4	78.3
	Women	29.7	11.9	61.6	67.5
2006	All	52.5	28.7	44.9	47.5
	Women	30.6	11.8	61.6	69.4
2007	All	46.5	26.2	43.6	82.6
	Women	28.3	12.7	55.2	70.2
2008	All	46	24.1	47.5	70.4
	Women	26.1	10.5	59.6	83
2009	All	47.7	26.1	45.4	69.2
	Women	28.7	12.5	56.4	81.3
2012	All	36.9	25.5	30.9	63.1
	Women	17.8	10.7	40	82.2
2013	All	40.5	28.4	30	59.5
	Women	21.1	12.9	38.8	78.9

Source: Labour Force Surveys 2003-2009 and 2012-2013

**Table A.2.** Total and woman\*employment rates (%) across sectors during 2003-2009 and 2012-2013<sup>38</sup>

Year Sector → ↓	2003	2004	2005	2006	2007	2008	2009	2012	2013
Agriculture	17.3 (8.8)	24.7 (22.0)	18.8 (20.5)	2.3 (19.6)	14.6 (19.3)	8.0 (3.2)	6.2 (2.6)	4.6 (5.3)	5.9 (7.6)
Mining	1.4 (0.8)	1.1 (0.2)	1.6 (0.1)	3.2 (0.6)	1.0 (0.2)	1.5 (0.9)	1.1 (0.6)	1.2 (0.3)	1.3 (0.4)
Manufacturing	10.5 (7.6)	8.6 (7.3)	9.6 (5.8)	30.8 (5.1)	10.4 (3.3)	8.7 (3.9)	9.9 (5.2)	14.3 (7.9)	12.6 (6.1)
Electricity	3.5 (1.0)	4.3 (2.0)	3.2 (1.1)	3.9 (1.0)	2.7 (0.7)	5.2 (1.6)	4.5 (1.3)	2.3 (0.9)	1.7 (0.7)
Construction	11.3 (0.8)	8.0 (1.5)	7.9 (0.6)	19.8 (0.3)	6.6 (0.3)	8.6 (0.6)	7.9 (0.7)	9.5 (0.4)	11.4 (0.9)
Trade	13.9 (13.4)	13.9 (13.1)	13.8 (12.8)	15.0 (16.4)	16.9 (15.1)	17.1 (15.9)	17.4 (16.3)	13.4 (14.1)	12.8 (12.8)
Hotels	3.0 (1.1)	3.3 (0.7)	3.5 (2.3)	4.3 (0.7)	3.9 (1.0)	4.5 (2.1)	4.6 (1.8)	4.8 (3.1)	5.3 (3.1)
Transport	4.4 (1.6)	4.7 (2.0)	4.2 (2.4)	3.2 (1.5)	4.5 (1.8)	5.6 (4.3)	5.8 (4.2)	3.5 (2.2)	3.2 (1.0)
Finance	0.9 (2.0)	1.1 (0.8)	1.1 (1.5)	0.2 (2.4)	1.1 (1.5)	1.8 (3.1)	2.2 (3.6)	2.2 (2.9)	2.2 (2.2)
Business	0.8 (1.4)	2.2 (1.5)	2.4 (1.5)	3.1 (2.4)	1.4 (1.2)	2.6 (3.3)	2.9 (2.8)	/	/
Public Administration	9.4 (10.8)	6.7 (8.2)	8.2 (7.5)	3.4 (6.9)	9.6 (9.2)	9.7 (10.0)	9.8 (10.5)	5.0 (5.3)	4.9 (4.7)
Education	12.0 (22.9)	10.6 (18.0)	10.8 (19.4)	2.3 (18.5)	12.1 (20.2)	13.6 (24.4)	13.4 (23.7)	12.0 (21.3)	11.1 (19.9)
Health	5.1 (19.1)	4.6 (13.8)	5.2 (15.2)	1.1 (16.1)	7.0 (16.5)	6.5 (18.4)	7.0 (18.1)	7.5 (17.2)	8.1 (19.0)
Other	6.5 (8.7)	6.4 (8.7)	9.7 (9.5)	7.5 (8.5)	8.3 (9.7)	6.7 (8.3)	7.5 (8.7)	3.9 (6.4)	3.6 (4.6)

Source: Labour Force Surveys 2003-2009, and 2012-2013

\* Woman employment rates in brackets

<sup>38</sup> Labour Force Study reports for years 2012 and 2013, due to a methodology change, have presented more sectors and the respective employment rates compared to the previous years. Hence, in order to keep consistency, we have presented only the employment rates for which we have data also for the previous years. The additional sectors for years 2012 and 2013 not reported in the table account for 20.8 % and 21.2 %, respectively.

**Table A.3** Albanian Labour market indicators by gender for 2007 - 2015

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015
<b>Labour force participation rate</b>									
<b>Overall</b>	58.0	53.3	55.1	55.2	60.3	57.3	52.4	53.7	55.7
<b>Man</b>	66.9	61.7	64.9	64.0	67.9	65.5	61.7	63.5	64.3
<b>Woman</b>	49.5	45.7	46.2	46.9	52.9	49.2	44.0	44.4	47.2
<b>Employment rate</b>									
<b>Overall</b>	50.3	46.3	47.5	47.5	51.9	49.6	44.1	44.3	46.2
<b>Man</b>	57.3	54.0	57.0	55.9	58.6	55.9	50.7	51.4	53.3
<b>Woman</b>	43.4	39.4	38.9	39.5	45.3	43.5	38.0	37.6	39.2
<b>Unemployment rate</b>									
<b>Overall</b>	13.4	13.1	<b>13.8</b>	14.0	14.0	13.4	15.9	17.5	17.1
<b>Man</b>	14.3	12.5	12.2	12.6	13.6	14.6	17.8	19.2	17.1
<b>Woman</b>	12.2	13.7	15.8	15.9	14.4	11.7	13.5	15.2	17.1

**Table A.4** Employment by sector in Albania for 2000 - 2015

Year	Total Employed	Public sector	Non-agricultural private sector	Agricultural private sector	Public sector (%)
<b>2000</b>	1,068,190	191,166	116,024	761,000	17.9%
<b>2001</b>	920,569	188,965	205,267	526,337	20.5%
<b>2002</b>	920,144	186,065	207,742	526,337	20.2%
<b>2003</b>	926,225	181,417	211,169	533,639	19.6%
<b>2004</b>	931,217	176,065	213,000	542,152	18.9%
<b>2005</b>	932,102	175,015	214,935	542,152	18.8%
<b>2006</b>	935,058	169,000	224,058	542,000	18.1%
<b>2007</b>	939,000	167,100	229,900	542,000	17.8%
<b>2008</b>	901,708	166,543	238,975	496,190	18.5%
<b>2009</b>	910,325	166,430	237,231	506,664	18.3%
<b>2010</b>	904,364	166,338	241,836	496,190	18.4%
<b>2011</b>	947,799	165,100	256,288	526,412	17.4%
<b>2012</b>	959,350	164,400	268,690	526,260	17.1%
<b>2013</b>	916,916	163,900	290,763	462,253	17.9%
<b>2014</b>	925,339	163,885	318,571	442,883	17.7%
<b>2015</b>	972,621	164,020	360,230	448,371	16.9%

## Appendix B

**Table B1.1.** Descriptive Statistics for both sectors for Kosovo

Variables	Total Sample				
	Obs	Mean	Std.deviation	Min	Max
Monthly wage/income	1964	285.79	135.88	30	2000
lmonthlywage	1964	5.56	0.45	3.40	7.60
Children ratio	8584	0.22	0.184	0	0.857
Age	8584	34.80	13.95	15	64
Tenure	8649	20.92	14.76	0	58
Mother's yrs of educ	7525	4.32	5.32	0	16
Father's yrs of educ	7936	8.07	5.77	0	16
Otherpublic	8649	0.39	0.69	0	4

**Table B1.2.** Descriptive Statistics between Public and Private Sector for Kosovo

Variables	Public Sector			Private Sector		
	Obs	Mean	Std.deviation	Obs	Mean	Std.deviation
Monthly wage	671	316.65	105.39	1012	287.75	152.15
lmonthlywage	671	5.70	0.34	1012	5.56	0.44
Age	671	43.23	11.46	1012	37.47	11.59
Tenure	671	24.57	12.14	1012	21.13	12.39
Mother's yrs of education	589	7.04	6.18	900	5.13	5.55
Father's yrs of education	626	11.21	5.11	949	8.97	5.43
Child's ratio	671	0.19	0.18	1012	0.219	0.19
Otherpublic	671	1.51	0.69	1012	0.259	0.56

**Table B1.3.** Proportion of binary variables and according to sector for Kosovo

Variable	Public	Private
Age21-30	20.1	31.7
Age31-50	48.9	48.9
Married	78.9	72.1
Primary	14.3	34.4
Secondary	48.1	50.2
Tertiary	37.5	15.4
Urban	65.4	60.9
Ferizaj	14.0	0.9
Gjakove	13.9	10.9
Gjilan	13.6	12.9
Mitrovice	14.2	14.7
Peje	0.9	17.5
Prizren	10.1	16.6
Prishtine	24.6	17.7
Lowskilled	0.74	17.9
Mediumskilled	34.3	65.6
Professionals	57.1	13.0
Remittancs	4.5	0.6

**Table B1.4.** Comparison and tests of proportions of categorical variables between public and private sector employees according to gender in Kosovo

Variable	Public Sector	Private Sector	Prob>Chi2
Primary			
- men	0.16	0.34	0.000
- women	0.11	0.38	0.000
Secondary			
- men	0.46	0.52	0.079
- women	0.51	0.42	0.074
Tertiary			
- men	0.37	0.15	0.000
- women	0.38	0.20	0.000
Married			
- men	0.86	0.76	0.000
- women	0.66	0.51	0.003
Low skilled			
- man	0.09	0.17	0.000
- woman	0.05	0.23	0.000
Medium skilled			
- men	0.42	0.68	0.000
- women	0.21	0.51	0.000
Professionals			
- men	0.47	0.13	0.000
- women	0.74	0.15	0.000

**Table B1.5:** T-test for comparison of means between public and private sector employees according to gender for Kosovo

Variable	t	df	Significance	Mean diff	St.error	95% confidence intervals	
Income							
- men	-4.3525	1285	0.0000	-34.824	8.00	-50.52	-19.12
- women	-2.2907	394	0.0225	-31.900	13.92	-59.28	-4.52
Age							
- men	-9.4419	1285	0.000	-6.44	0.68	-7.77	-5.09
- women	-5.3944	394	0.000	-6.31	1.17	-8.60	-4.01
Consumption							
- men	-5.2812	1285	0.000	-191.52	36.26	-262.67	-120.38
- women	-2.5853	394	0.010	-250.29	96.81	-440.63	-59.95
Tenure							
- men	-5.9096	1285	0.000	-4.26	0.72	-5.67	-2.84
- women	-2.9659	394	0.003	-3.79	1.28	-6.31	-1.28
Childratio							
- men	2.0378	1285	0.042	0.003	0.01	0.0009	0.05
- women	-0.2067	394	-0.004	0.018	-0.04	0.03	

**Table B1.6.** Description of variables used in estimations for Kosovo

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Name of the variable	Explanation
Employed	=1 if the person is employed, 0 otherwise
Public	=1 if the person is employed in public sector, 0 if in private sector
Inwage	= Natural logarithm of hourly wage
age21_30	=1 if the person is 21-30 years old, 0 otherwise
age31_50	=1 if the person is 31-50 years old, 0 otherwise
tenure	= potential experience
married	=1 if the person is married, 0 otherwise
primary	=1 if primary education, 0 otherwise
secondary	=1 if secondary education, 0 otherwise
tertiary	=1 if tertiary education, 0 otherwise
professionals	=1 if in ISCO classified in the category of professionals, 0 otherwise
Mediumskilled	=1 if in ISCO classified as a medium skilled profession, 0 otherwise
Lowskilled	=1 if in ISCO classified in the group of low skilled profession, 0 otherwise
Ferizaj	=1 if lives in the region of Ferizaj, 0 otherwise
Gjakove	= if lives in the region of Ferizaj, 0 otherwise
Gjilan	= if lives in the region of Ferizaj, 0 otherwise
Mitrovice	= if lives in the region of Ferizaj, 0 otherwise
Peje	= if lives in the region of Ferizaj, 0 otherwise
Prizren	= if lives in the region of Ferizaj, 0 otherwise
Prishtine	= if lives in the region of Ferizaj, 0 otherwise
urban01	=1 if lives in urban area, 0 otherwise
public	=1 if works in the public sector, 0 if works in private
othmemberpublic	=1 if at least one other member of the household works in the public sector, 0 otherwise
childratio	= (number of children in total adult members)*100
Remittances	=1 if household received remittances, 0 otherwise

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**Table B1.7.** Description of variables used in estimations for Albania

<b>Name of the variable</b>	<b>Explanation</b>
wage	daily wage
ln(wage)	natural logarithm of hourly wage
public	=1 if works in the public sector, 0 if works in private
participation	=1 if employed, 0 otherwise
age	age in years
age2	age squared
age21_30	=1 if the person is 21-30 years old, 0 otherwise
age31_50	=1 if the person is 31-50 years old, 0 otherwise
exper	potential experience
expersq	squared potential experience
married	=1 if the person is married, 0 otherwise
educ01	=1 if primary education, 0 otherwise
educ02	=1 if secondary education, 0 otherwise
educ03	=1 if tertiary education, 0 otherwise
managers	=1 if the person is a manager, 0 otherwise
professionals	=1 if in ISCO 08 classified in the category of professionals, 0 otherwise
technicians	=1 if in ISCO 08 classified as a technician, 0 otherwise
clerical	=1 if in ISCO classified in the group of clerical support workers, 0 otherwise
service	=1 if in ISCO 08 classified in the group of services and sales workers, 0 otherwise
skilled_agri	=1 if in ISCO 08 classified in skilled agricultural, forestry and fishery workers, 0 otherwise
craft	=1 if in ISCO 08 classified in craft and related trades workers' category, 0 otherwise
operators	=1 if in ISCO 08 classified in the category of plant and machine operators and assemblers, 0 otherwise
elem_occ	=1 if in ISCO 08 classified in the category of elementary occupation, 0 otherwise
central	=1 if lives in the central area of the country, 0 otherwise
coastal	=1 if lives in the coastal area of the country, 0 otherwise
mountains	=1 if lives in the mountain area of the country, 0 otherwise
tirana	=1 if lives in Tirana, 0 otherwise
urban01	=1 if lives in urban area, 0 otherwise
gender01	=1 if a man, 0 if woman
english01	=1 if speaks english, 0 otherwise
public	=1 if works in the public sector, 0 if works in private
othmemberpublic	=1 if at least one other member of the household works in the public sector, 0 otherwise

**Table B1.8.** T-tests of mean equality by sector for men and women in Albania

**TEST OF EQUALITY OF MEAN AGE BY SECTOR FOR MEN**

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
private	1326	40.08069	.3311128	12.05723	39.43113	40.73026
public s	702	46.62963	.4199345	11.12628	45.80515	47.45411
combined	2028	42.34763	.2697367	12.14714	41.81864	42.87662
diff		-6.548936	.5481385	-7.62391	-5.473962	
diff = mean(private) - mean(public s) t = -11.9476						
Ho: diff = 0 degrees of freedom = 2026						
Ha: diff < 0 Ha: diff != 0 Ha: diff > 0						
Pr(T < t) = 0.0000 Pr(T > t) = 0.0000 Pr(T > t) = 1.0000						

**TEST OF EQUALITY OF MEAN EXPERIENCE BY SECTOR FOR MEN**

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
private	1326	27.76018	.3323065	12.1007	27.10828	28.41209
public s	702	35.31197	.4187738	11.09553	34.48976	36.13417
combined	2028	30.37426	.2730545	12.29655	29.83876	30.90976
diff		-7.551785	.5490327	-8.628512	-6.475057	
diff = mean(private) - mean(public s) t = -13.7547						
Ho: diff = 0 degrees of freedom = 2026						
Ha: diff < 0 Ha: diff != 0 Ha: diff > 0						
Pr(T < t) = 0.0000 Pr(T > t) = 0.0000 Pr(T > t) = 1.0000						

**TEST OF EQUALITY OF MEAN AGE BY SECTOR FOR WOMEN**

Variable	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
private	500	38.528	.4721783	10.55823	37.6003	39.4557
public s	623	43.20546	.4036886	10.07605	42.4127	43.99822
combined	1123	41.12289	.3147744	10.54846	40.50527	41.7405
diff		-4.677457	.6180491	-5.890121	-3.464794	
diff = mean(private) - mean(public s) t = -7.5681						
Ho: diff = 0 degrees of freedom = 1121						
Ha: diff < 0 Ha: diff != 0 Ha: diff > 0						
Pr(T < t) = 0.0000 Pr(T > t) = 0.0000 Pr(T > t) = 1.0000						

**TEST OF EQUALITY OF MEAN AGE BY SECTOR FOR WOMEN**

```

Variable      Obs      Mean      Std. Err.   Std. Dev.   [95% Conf. Interval]
private      500      25.928     .4853832    10.8535     24.97435     26.88165
public s     623      31.33066   .4171016    10.41084     30.51156     32.14976
combined     1123     28.9252    .3264687    10.94036     28.28464     29.56576

diff          -5.402658   .637064    -6.65263    -4.152686

diff = mean(private) - mean(public s) t =  -8.4806
Ho: diff = 0                                degrees of freedom = 1121

Ha: diff < 0                                Ha: diff != 0    Ha: diff > 0
Pr(T < t) = 0.0000                          Pr(T > t) = 0.0000    Pr(T > t) = 1.0000

```

**Table B1.9.** Chi-square tests of equality of proportions of binary variables for characteristics of men

Variable	Code	private sector	public sector	Total	Pearson Chi-Square Value	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
educ01	0	810	643	1453	210.322	.000	.000
	1	516	59	575			
educ02	0	1210	631	1841	1.023	.312	.333
	1	116	71	187			
educ03	0	1109	286	1395	393.341	.000	.000
	1	217	416	633			
managers	0	1314	672	1986	25.680	.000	.000
	1	12	30	42			
professionals	0	1237	489	1726	202.221	.000	.000
	1	89	213	302			
technicians	0	1257	557	1814	116.104	.000	.000
	1	69	145	214			
clerical	0	1283	689	1972	3.307	.069	.086
	1	43	13	56			
service	0	1111	603	1714	1.564	.211	.221
	1	215	99	314			
skilled_agri	0	1272	696	1968	16.552	.000	.000
	1	54	6	60			
craft	0	909	637	1546	124.726	.000	.000
	1	417	65	482			
operators	0	1131	647	1778	20.051	.000	.000
	1	195	55	250			
elem_occ	0	1107	671	1778	62.178	.000	.000
	1	219	31	250			
urban01	0	465	205	670	7.138	.008	.009
	1	861	497	1358			
central	0	811	433	1244	.052	.819	.848
	1	515	269	784			
coastal	0	872	518	1390	13.717	.000	.000
	1	454	184	638			
mountains	0	1197	562	1759	41.626	.000	.000
	1	129	140	269			

english01	0	1023	453	1476	36.898	.000	.000
	1	303	249	552			
othmemberpublic	0	1311	472	1783	432.407	.000	.000
	1	15	230	245			
<b>Total</b>		<b>1326</b>	<b>702</b>	<b>2028</b>			

**Table B1.10.** Chi-square tests of equality of proportions of binary variables for characteristics of women

	Code	Private sector	Public sector	Total	Value	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
educ01	0	370	592	962	99.832	.000	.000
	1	130	31	161			
educ02	0	457	566	1023	.103	.748	.833
	1	43	57	100			
educ03	0	334	151	485	204.799	.000	.000
	1	166	472	638			
managers	0	497	609	1106	5.048	.025	.027
	1	3	14	17			
professionals	0	412	234	646	228.252	.000	.000
	1	88	389	477			
technicians	0	465	543	1008	10.296	.001	.001
	1	35	80	115			
clerical	0	478	599	1077	.212	.645	.653
	1	22	24	46			
service	0	387	588	975	69.912	.000	.000
	1	113	35	148			
skilled_agri	0	490	621	1111	7.397	.007	.008
	1	10	2	12			
craft	0	400	616	1016	114.657	.000	.000
	1	100	7	107			
operators	0	429	619	1048	81.809	.000	.000
	1	71	4	75			
elem_occ	0	445	562	1007	.437	.508	.554
	1	55	61	116			
urban01	0	76	105	181	.561	.454	.464
	1	424	518	942			
central	0	314	375	689	.795	.372	.388
	1	186	248	434			
coastal	0	338	466	804	7.069	.008	.009
	1	162	157	319			
mountains	0	483	507	990	61.540	.000	.000
	1	17	116	133			
english01	0	314	361	675	2.726	.099	.111
	1	186	262	448			
othmemberpublic	0	492	394	886	205.918	.000	.000
	1	8	229	237			
<b>Total</b>		<b>500</b>	<b>623</b>	<b>1123</b>			

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