**When Do Gender Wage Differences Emerge?**

**A Study of Azerbaijan’s Labor Market**

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**Abstract[[5]](#footnote-5)#**

Building on recent analyses that find a sizeable overall gender wage gap in Azerbaijan’s workforce, this paper uses a unique database on young people in their early years in the labor market to understand how gender wage gaps evolve over time. New labor market entrants begin with little or no gender differences in earnings, but a wage gap gradually emerges over time closer to the childbearing years, also after controlling for sample selection bias. When decomposing the gap at different deciles of the wage distribution, it appears that most of it is at the lower and upper end.

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# Introduction

The recently published Europe and Central Asia (ECA) Regional Report on Gender (World Bank 2011) provides summary data on unconditional gender wage gaps across countries, with values ranging from a low 10 percent (Slovenia) to 50 percent (Georgia). Azerbaijan’s gender wage gap (36 percent) is at the higher end of this distribution.

It is not clear whether there are large disparities between the wages of Azerbaijan’s men and women throughout their careers. One possibility, which the empirical literature has started exploring systematically only in the last few years using data for a handful of industrial countries, is that gender wage gaps *evolve* over time and that the first few years in the labor market, as young people transition from school to work, are an important determinant of the emergence of overall gender wage gaps (Manning and Swaffield, 2008; Bertrand, Goldin and Katz, 2010; Del Bono and Vuri, 2011). One possibility is that young men and women earn equal wages at the beginning of their career, but the childbearing years—in the absence of suitable leave policies, child care, and other supporting mechanisms—gradually place women at a disadvantage. Because this is a fledgling literature (see, for instance, Pastore, 2010; and Pastore, Sattar and Tiongson, 2013), little is known about this possibility, particularly in developing countries and economies in transition such as Azerbaijan.

Youth unemployment has become one of the most pressing socio-economic problems in the country. Youth unemployment rate among males is 11.3% in 2016 and female youth unemployment rate is 15.1% (ILOSTAT, 2017). For a country with over 37% of the population under 25 years of age (CIA Factbook, 2017), this is a significant number and a serious setback. As youth is more likely to be unemployed and lack work experience, particularly young women, there is dearth of studies on understanding the gendered wage gap for this age group (15-29) in the labor market. Given the rich historical Islamic cultural and Soviet and post-Soviet labor market institutions, Azerbaijan provides convincing case study to explore the decision to work and/or family formation. Heyat (2007, p. 407-408) concludes that “while Islam and nationalism are potent forces directing Azeri society, it is consumerist individualism, oriented towards Europe and the West generally that has had a growing impact on the identities of Azeri men and women, particularly in the capital, Baku. The paradoxical attraction to a western model of society is especially significant for young people, most of whom no longer compare and contrast themselves with Russians as the most significant ‘other’”. This paper aims to contribute to the literature on gender wage gaps in early career by studying wage differences among young people in Azerbaijan.

The analysis is based on an *ad hoc* nationally representative School-to-Work Transition survey carried out in the country in August 2005 on a large sample of young people aged 15 to 29. The age of individuals in the sample allows us to observe the entire process of transition from school to work and to adulthood, including the phase when the young person is going to establish a family and have children. According to official statistics, the average age of first marriage for women is 23 years, while a remarkable share of about 13% of the entire female population experience early marriage, namely when they are between 15 and 19 years of age. This allows us to study the asymmetric impact of marrying and maternal decisions by gender on labor supply and other labor market outcomes, such as wages.

The outline of the paper is as follows. Section one discusses a survey of the literature on the evolution of the gender wage gap in the early entrance in the labor market. Section two describes the data used in the econometric analysis and the methods used. Section three presents the results. Section four discusses the results while drawing some implications for national and international policy makers. Section five provides concluding remarks.

# 1. Survey of the Literature

In this section we discuss the main findings of the literature on both advanced economies and developing countries, though the latter is more limited. These studies have focused on the evolution of the gender wage gap over the life-cycle, by asking such questions as: When does the gender wage gap emerge? Does one exist at labor market entry or does it emerge over time?

In his enlightening overview of the literature on the gender wage gap, Polachek (2014) note that two main factors explain most part of the gender wage gap: age and marital status. In the USA, the gender wage gap is only 2.8% among single men and women, but it equals 22.6% among married men and women. In addition, it is only less than 5% for individuals aged 16-24, and goes up by age to about 25% for the over 45 years. Why is this the case? Does it suggest that discrimination is neither the only nor even the main explanation of the gender wage gap? Is it indirect confirmation that the policy of gender equality is not succeeding in making equal the chances of men and women? This evidence suggests that the interruptions due to giving birth and the reduced work effort of women due to child rearing causes a reduced work effort and accumulation of work experience of women as compared to men when they marry and have children. Maternity pushes women to self-segregate themselves into jobs which are less innovative and less skill driven but are consequently paid less. Mincer and Polachek (1974) and Polachek (1985) are the pioneering studies establishing for the first time a close link of the gender pay gap to family issues.

Manning and Swaffield (2008) have started a new wave of this literature, by addressing in a systematic way the issue of the exact time when the gender wage gap emerges using UK data. Confirming the previous findings by Mincer and Polachek (1974), they find no gender gap at labor market entry but a gap of 25 log points emerges after 10 years. They attribute the gap to a number of factors, such as human capital differences, maternity leave, psychological factors and, to a lesser extent, the lower degree of job mobility, which prevents women from finding higher-paying jobs. Although lower, a gap also emerges ten years from the beginning of the career of women without any children.

Del Bono and Vuri (2011) also find that the gender wage gap appears not immediately but a few years after workers first join the labor market. Compared to Manning and Swaffield (2008), however, they find a greater impact of returns to job mobility on the gender wage gap. They use administrative social security data containing detailed information on job moves of men and women during the first ten years of labor market entry[[6]](#footnote-6).

Bertrand et al. (2010) look at a particular sample, namely a sample of graduates from an MBA of a major American university. As such, the sample presents little heterogeneity and allows the comparison of men and women with very similar skill levels and motivation. The results of the analysis of this sample also suggest that a conditional gender wage gap emerges only after some time, after maternity and the ensuing childcare activities which apparently involve women more than men.

Such findings are echoed in a recent literature on developing countries. Pastore (2010a) finds that the gender wage gap, which is not statistically significant among young teenagers in Mongolia, becomes statistically relevant and sizeable among the adults and the prime-aged group. The paper uses a data set similar to the one used in this paper and is hence particularly interesting for comparative purposes, although cultural, economic and political differences between Mongolia and Azerbaijan are quite important, despite both having been in the Soviet (and more recently, Russian) sphere of influence.

Pastore, Sattar and Tiongson (2013) use the same data for Kosovo, a country with documented experiences of gender discrimination and gender-based violence. Nonetheless, the authors find that there is no gender wage gap in the sample, though the sample includes only individuals under 25 years of age, when most men and women have still not experienced maternity in the country. In fact, the typical age for child birth in Kosovo is about 27.

Background: Azerbaijan

Azerbaijan has gained independence in 1991 and since then it has started its transition to a market economy. In the context of post-Soviet society, this market economy can be described as male-dominated and the situation of women has considerably deteriorated during the transition (Sabi, 1999; Najafizadeh, 2003).

The economy of Azerbaijan is largely dependent on the Caspian oil and is, therefore, highly dependent on the evolution of oil prices. The mining sector represents the most important contributor to the country’s GDP, with a share increasing from 31.7% to 61.8% during the period 2000-2007 (Hasanov, 2013). However, the oil industry is capital intensive, and only employs 1% of the total workforce (Guliyev, 2015). It is located in close proximity to Europe, between Russia, Iran and Turkey.

Azerbaijan is a small country with a majority Muslim population (≈97%, the rest are Christians and other) of slightly under 10 million located in the Caucasus. Despite the fact that the country is male-dominated, women hold high positions in public life and politics. Currently, a woman, Mehriban Alieva. serves as the vice-president and first lady of Azerbaijan. At the same time, a significant percentage of women still work in vulnerable jobs (low-wage and low-status) and remain as contributing family workers (i.e., agriculture and manual farm labor). Women’s representation in managerial and high level decision making jobs remain minimal and declining. For example, firms with female top managers decreased from 4.7% in 2009 to 2.4% in 2013. The percentage of firms with female participation in ownership was recorded at 4.5% in 2013, down from 10.8 in 2009. Azerbaijan ranks 78 (HDR, 2016) out of 188 countries, which puts Azerbaijan in the high human development category. However, the country is ranked 86 out of 144 countries (World Economic Forum, 2017) on their progress towards equality. In Azerbaijan, most women are engaged in service, agricultural, and educational sectors and they mainly hold such positions as teachers and doctors, while males are mainly engaged in mining and construction sectors of the economy.

Azerbaijan’s customs and traditions relate to its Muslim, Iranian, Turkish and Soviet past. The position and identity of women at home, at work, and in public life, in particular, were influenced by historical religious and cultural transitional factors. In her book, Heyat (2002) discusses the role of women in Azeri society; she analyzes how cultural factors have affected female patterns of employment. For example, they have shaped community expectations of “modern” women and their domestic roles and relations. The 2007 Azerbaijan Human Development Report concludes that “The Azerbaijani family is significantly inclined toward patriarchy in terms of expectations from men and women, stereotypes about male and female gender roles, gender-biased divisions of labour, and attitudes to male and female employment. Deeply rooted cultural norms provide a basis for justifying traditional gender roles and facilitating their internalization by both sides” (UNDP, 2007, p.86). According to the 2016 EBRD’s Life in Transition report, Azerbaijani respondents (91 percent) have the highest figure among the transition countries and both male and female respondents favor a traditional family arrangement where the man works and the women takes care of the house and children. The same survey shows that support for the market economy has substantially decreased (40 pp) among Azerbaijani respondents since the last survey, from 56 percent in 2010 to 16 percent in 2016. This indicator is the lowest in the transition region.

Age is one of the most important factors in the study of the evidence on women’s empowerment. Habibov et al. (2017) find that women’s age is the most robust predictor of women’s participation in making household decisions, in that older age is associated with greater decision-making power in the Azeri family. According to the 2006 Azerbaijani Demographic and Health Survey findings, the median age at first marriage for women aged 25-49 is 21.9 years old and the median age at first birth is 23.5 years old. Thousands of young people enter the workforce each year after they usually complete secondary education. Many seek university admission first and depending on the university admission outcomes, and if negative, males start looking for jobs while females either get married or stop looking for jobs. This situation is reflected in the unemployment figures shown by the State Statistical Committee of Azerbaijan and in general, unemployment is high among the youth aged 15-29 and even higher for female youth. Pregnant women and women with a child under the age of one-and-a-half, have right for 36 hours per week.[[7]](#footnote-7) However, not all women can demand their rights, especially in private sector. Therefore, firstly, legislative interventions into flexible working options should guarantee these rights to all women despite workplace, as well as may change 36 hours to 30 hours per week and increase child age up to 2 years. Also, the birth grant in the country is too low (93 AZN in 2016). Parents are entitled to a child care benefit for children of up to 3 years of age. For small children (up to 1.5 years of age), the benefit is 40 manat, and for children from 1.5 to 3 years, the benefit is 25 manat. So, as one can see the amount of the benefit is much lower than the minimum wage. Therefore, all these benefits must be increased taking into account the real growth.

Young women are usually perceived as a failure once they have passed the marriageable age of 21 to 23 years (Klaveren et al., 2010). The share of married by age 25 is 46% for females, and 15% for males (WEF, 2017). Poverty rate was about 29 percent in 2005 (Afandi & Pellenyi, 2007). The authors also found that working in agricultural sector implies a greater risk of being poor in Azerbaijan, yet this sector is the largest employer. This could be a symptom of huge oil revenues, low labor productivity and low wages in agriculture and measurement issues.

# 2. Methodology and Data

## 2.1. Data

The econometric analysis is based on the ILO’s School-to-Work Transition (SWT) survey collected in Azerbaijan on a sample of young workers aged 15 to 29 in 2005 representative of the national population. As the name suggests, the survey collects information on the labor market experiences of young workers at the beginning of their career shortly after leaving school and entering the labor force. The data is at the individual level[[8]](#footnote-8) with a sample size of 4,972. The survey includes three age groups: “teenage workers” (aged 15-19 years), “young adults” (20-24 years), and for lack of a better-term, the “prime-age workers” (25-29 years). The sample size is large for this segment of the labor force which is generally under-represented in typical labor force surveys. The data thus provide an unusual opportunity to analyze the labor market performance of men and women in this stage of their careers.

Between 2004 and 2006, the ILO conducted SWT surveys in 8 countries (Azerbaijan, China, Egypt, Kosovo, Mongolia, Nepal, and Syria). and subsequently made the micro data publicly available.[[9]](#footnote-9) Although as a result of the lag in the public release of the data the data are now a few years old, the general paucity of data on earnings or wages in Azerbaijan and other countries, especially among young workers, means that SWT data provide a rare opportunity to assess the emergence of gender wage differentials.

## 2.2. Variables

The natural logarithm of the average total monthly labor income (in thousands of Manats[[10]](#footnote-10)) is the dependent variable of our Mincerian earnings equations.[[11]](#footnote-11) The weekly hours worked are used as an independent variable, rather than as the denominator of monthly wages, in order to control for gender differences in the number of hours worked. In addition, hourly wage rates are not widely used in Azerbaijan, especially among young people. The survey provides two types of information regarding the hours worked: the normal contractual hours and the actual hours during the reference week. Estimates are often presented with both types of hours of work. Table A1 and Table A2 in the Appendix report descriptive statistics for young workers in wage employment and non-employment, respectively.

Based on characteristics of the Azerbaijan educational system[[12]](#footnote-12), the years of education have been computed as follows: The uneducated are assigned 0 years of education. The respondents holding a primary school diploma are considered to have had 4 years of education (from age 6 to 10 years). Those holding a diploma of general (low secondary) education are assigned 5 more years of education after primary education (from age 11 to 15 years). Those holding vocational diplomas are attributed 3 more years of education after primary education (from age 11 to 13 years). Those with a general high secondary education degree are assigned 2 more years of education after general education (from 16 to 17 years). Those with a specialized secondary education degree are assigned 3 more years of education after general education (from age 16 to 18 years). Those holding tertiary education diplomas (university or in 2 cases also graduate courses) are assigned 4 more years of education after general high secondary education (from age 19 to 22 years). Those holding a master’s degree (in 2 cases only) are assigned 2 more years of education after tertiary education (from age 23 to 24 years).

Actual work experience was computed by imposing two main corrections to potential work experience. The latter has been computed in the usual way as the difference between current age of the respondent, years of education completed, and the age when primary education starts, which, in the case of Azerbaijan is 6 years. The first correction subtracts the time that the respondents declare to have spent to find his/her current job. Question 57 in the survey asks for how long the individual has been seeking a job, answers are constrained within given intervals of time; the average value within the interval has been transformed into fractions of a year and subtracted from the person’s age. A second correction is applied only to women with children, as suggested in Munich et al. (2005) and Pastore and Verashchagina (2011). A year per child is subtracted from the mother’s age to calculate work experience. In a few cases, the implied total number of years of potential work experience turned out to be negative; we set these equal to zero.

The other variables used in the estimates are self-explanatory.

Any data source has both advantages and disadvantages. The advantages of the SWT survey are many and they include the following: the availability of a relatively large number of observations for young people rarely available in labor surveys; the availability of information on household characteristics which can be used as instruments in two-step procedures able to control for endogeneity and sample selection bias; very detailed information on demographic and individual characteristics, including aspects of young people’s labor market attitudes, such as aspirations and life goals, job satisfaction, job search methods and the like. Nevertheless, some other important variables, typically used as controls in Mincerian earnings equations, are missing in the SWT survey, thus constraining our ability to explore wage differences more fully. This is the case, for instance with respect to the following variables: the ownership of firms; the sector of employment; the location of respondents, and, except for the distinction between rural and urban residential areas, information on whether they moved to their current place of residence or not.

# 3. Results

## 3.1. Descriptive Statistics

### 3.1.1. Demographic factors

Figure 1 reports the age distribution of first marriage by gender for the entire sample and for employed and non-employed women respectively. The average age at first marriage is different for men and women: 20.3 years for women and 22.6 years for men. It is also different from the official statistics reported in the introduction simply because the data set we use includes only the youngest age segment. Early marriages, namely marriages under the age of 19 years, are much more common among women than men in our sample: in fact, 41.2% of the women who marry do so early, while the comparable figure for men is about a fourth (10.3%). In the case of women, this is a very high share by international standards and several international organizations, including UNICEF point out that this is an important driver of gender differences in the labor market as well as of child health and well-being.

Figure 1 also highlights the bigger-than-average share of first marriages among the non-employed women (42.9%) and the bigger share among employed men (12.5%). This confirms the finding typical of this literature according to which marriage affects positively the labor supply decisions of men and negatively those of women.

**[Figure 1 about here]**

We should also note that the overall share who marry is 22.2% for women and 15.6% for men. Women (7.4%) are also more likely to be engaged than men (5.3%) in this sample. The shares of women and men who have children are 19.6% and 12.6%, respectively. As the ensuing analysis will show, decisions regarding marrying and having children have important consequences for labor supply.

Figure 2 shows that education is another important factor of labor supply but more so for men than for women. The labor supply of men with vocational education is already extremely high at this young age, over 60%. Over 50% of men with high secondary education or above are also employed, which compares with about 20% or less for men with general education or below. In the case of women the educational gap is not as striking as in the case of men although education is an important factor. The overall labor supply of women with high secondary education fluctuates between 30% and 40%. The shares of employed women with general education or below is less than 15%.

**[Figure 2 about here]**

Figure 3 reports the shares of young people who participate in the labor market by age group and gender. The figure clearly shows the widening of the gender gap in labor supply decisions over the years of age. The gap is about 5% among the teenagers, about 20% among the young adults and about 40% among the oldest age group in the sample. It suggests that the school-to-work transition path is dramatically different for men and women.

**[Figure 3 about here]**

To explore more in-depth the previous point, Figure 4 looks at the evolution of labor supply shares of men and women over the years in the sample. The green lower line measures the gender gap in labor supply. The figure shows that the gap is strikingly small for individuals up to the age of 19 and, then, it starts increasing dramatically for the individuals aged 20 years and more. The gender gap in labor supply is steadily above 20% for those aged 20 years of age or more. There is a close correspondence between the negative gender gap in the labor supply of women and the positive gap in the cumulative shares of age-at-first marriage by gender. In other words, the larger is the gap in the share of married women, the larger is the share of men working.

**[Figure 4 about here]**

### 3.1.2. Work differences

Figure 5 reports the kernel density distribution of men and women by contractual (Panel a) and actual (Panel b) weekly hours of work. Panel (a) shows that the average weekly hours of work of a large share of employed men and women is the same, namely, 40 hours. Nonetheless, many men tend to work more hours per week, as much as 60 hours or more.

**[Figure 5 about here]**

Figure 6 reports the hours worked by men and women along their age distributions. On the left-side vertical axis, we measure the hours worked per week, while on the right-side vertical axis we measure the gender gap in weekly hours worked. Interestingly, the gender gap in weekly hours is always in favor of women up to the age of 21 years, and is persistently in favor of men thereafter. It is notable that the gap in favor of women is much higher in absolute terms than that in favor of men.

**[Figure 6 about here]**

The Tables A2 and A3 in the Appendix provide descriptive statistics by gender for the entire sample and for each age group, whereas Table A4 does the same for the sample of employed young people. Women have lower log wages than men. The educational level of women is slightly higher in secondary general education, but lower in terms of general education and tertiary education.

The actual work experience of women (about 1.6 years) is much lower than that of men (about 7.1 years). Note that, as explained in the data section, this measure takes into account also the number of children of men and women, subtracting some years to potential work experience to take into account maternity factors. This is the first evidence of the dramatic gender differences emerging in the labor market as a consequence of the commitment of women to reproductive activities in the country.

The migration status is very similar by gender. About 54.7% of young people found their jobs through friends and relatives while only 3.9% found theirs through Public Employment Service (PES) offices. The second most important channel is direct hiring (17.8%, which could be also associated with family and friends), followed by other (14.3%). Other methods are all smaller than PES.

Job search channels differ by gender to some extent. Women tend to find employment more frequently through direct contacts with prospective employers (37.2% of the employed); and men tend to use more frequently the public employment service (5.3%), the networks of family and friends (61.1%) and others (7.7%).

Women typically prefer formal working contracts suggesting risk aversion, since they provide maternity leave benefits.

For similar reasons, men tend to work more in jobs in which taxes are not paid or where the worker does not know whether taxes are paid. Men are also more likely to moonlight than women, though this is still not a common phenomenon in this young age group. Men are more likely to report dissatisfaction with their jobs than women.

More than 50% of the employed report that they participate in on-the-job training programs, more commonly among women (63.1%) than men (47.7%). Most of this training is of the apprenticeship type (86%), but men are slightly more likely to be trained in new technologies than women.

Men are more likely to be union members. They are also more frequently employed in small-sized firms (between 1 and 9 employees), whereas women tend to be more frequently employed in medium-sized firms (between 10 and 19 employees). The share of men and women in large-sized firms is more or less the same, at about 11%which might depend on their tendency to apply more frequently gender neutral recruitment policies.

In the SWT database, unfortunately, there is no definition of firm’s ownership. Respondents are requested to declare their firm’s name which may help indicate whether they work in the private sector. These represent 24% of the sample. In addition to the firms’ name, respondents are requested to say whether they are: self-employed (11.9%) or “working for family income” (55.8%), which we take to mean that they are employed by a family business.

## 3.2. The gender wage gap

Figure 7 reports kernel density estimates of monthly (panel a) and hourly (panel b) wage distributions by gender. The figures show gender differences along the entire wage distribution. Most of the difference in monthly wages is in the tendency of men to have higher wages at the modal value of the distribution. The higher hourly wages of men are also due to a higher share of young men who have higher than modal hourly wages.

**[Figure 7 about here]**

Table 1 reports the coefficient of the gender dummy in standard Mincerian earnings equations starting from the basic version to the version augmented by weekly hours of work, educational categories, and actual work experience (as defined in the data section) and in the extended version including a number of other various characteristics relative to the individual, the family and the job. Gender wage gaps are reported for the different age groups available in the data for both the monthly and the hourly wage. The middle panel gives estimates where we control for the actual, rather than the usual hours of work.

According to the variables included in the estimates in panel (a), the gender gap in monthly wages fluctuates between about 7.7% and 16.5%. The unconditional gender gap in monthly wages suggest that without controlling for any individual characteristics, women tend to earn about 10% less than men. Adding hours of work is slightly reducing the gap. Adding education increases the gap: since employed women have slightly higher educational level, this suggests that they are paid less for the same educational characteristics, which will be tested using the Oaxaca and Blinder decomposition in the next sections. When we consider also the actual work experience, the gap doubles as women, particularly married women, have much less actual work experience than men. The other characteristics, such as the degree of job security, which is generally associated with higher wages, reduce the gap slightly.

However, the key finding reported in the table is that the gap is statistically insignificant among the teenagers but statistically significant among older age groups. In the augmented version, the gap rises to 22.4% among the young adults and about 15.2% among the oldest age group. In the extended specification it reaches about 20% among the young adults and slightly less, about 12.8%, among the oldest age group available in the data.

The results are quite similar when we look at the gender wage gap in terms of monthly wages where we control not for the usual hours of work, but for the actual hours of work, as we do in panel (b). In this case, a gender gap emerges, although not highly statistically significant, also among the teenagers, because we consider here the much smaller actual number of hours worked by women.

**[Table 1 about here]**

The above findings suggest the existence of strong variability of wages by years of age. Figure 9 provides measures of the gender wage gap from different equations that we ran for individuals belonging to a particular age group using monthly wages. Panel (a) reports the unconditional estimates only, while panel (b) also reports conditional estimates based on basic earnings equations. The unconditional estimates confirm the impression that there is a gender gap not statistically different from zero for the youngest segment, while the gap has a clear tendency to rise over the years, with the exception of the individuals aged 26 and 27. The trend estimated by OLS and reported in the figure suggests of an increase of the gender gap by about 1.3% per year of age.

 **[Figure 8 about here]**

## 3.3. Earnings equations

Table 2 presents the results of extended earnings equations estimated by OLS for different age groups and by gender. As already noted above, there is no conditional gender wage gap among the teenagers, though the gap is quite high among the young adults, about 18%, and the prime-aged, about 26%. This is quite a large gap, considering the relatively low wages of young workers in Azerbaijan.

The coefficient of the weekly hours is statistically significant especially for men and among the young adults and the prime-age workers, a finding that Pastore, Sattar and Tiongson (2013) report relative to Kosovo, using the same types of data.

The returns to education are not particularly strong, especially for women and the youngest age group. Holding tertiary education is associated with a wage premium of about 20%, which implies quite a low annual rate of return, for a low income country, where returns to education are expected to be generally high also because of the low average educational level (Psacharopoulos, 1994).

The return to work experience is less than 1% higher wages per year of work experience. Considering the low average work experience, the squared term is not included.

We find a wage premium for self-employment of 30% on average

Holding other things constant, migration is associated with a wage premium when individuals migrate for educational reasons and associated with a wage penalty when individuals move to find a job.

Being hired through their own educational institution brings a wage penalty, while being hired through job fairs, public employment services and public job advertisements is correlated with a wage premium. Job security does not come without a cost in Azerbaijan. Holding a contract implies always lower wages, especially if the contract is of unlimited duration and seasonal in nature. Moonlighting is associated with higher wages in the worker’s main occupation.

Ceteris paribus, training brings with it a wage penalty rather than a wage premium.

Union membership is associated with a wage penalty, of about 15%.

The size of firms is associated with a wage penalty of about 20% in the case of jobs provided in very small firms and a wage premium of about 12% in the case of jobs provided by firms with more than 20 employees. Meanwhile, wages in rural areas are about 12.6% lower than in urban areas, ceteris paribus.

**[Table 2 about here]**

The Oaxaca and Blinder decomposition is the analytical tool typically used to disentangle the roles played by differences in characteristics and differences in coefficients (namely the way such characteristics are rewarded in the market) in determining the gender gap. Table 3 reports the results of such decomposition for all the age groups considered. The table has three panels. Panel (a) reports the overall results of the analysis; panel (b) shows the role of each characteristics; and panel (c) reports the coefficients of such characteristics. The characteristics are summarized for several homogeneous groups. The variables included in each group are explained in the table’s accompanying footnotes. A positive coefficient can be read as increasing the gap, whereas a negative coefficient can be read as reducing the gap.

The conditional gap rises from about 6 log points among teenagers to over 10 log points among the older age groups. Among teenagers, neither the explained nor the unexplained component is statistically significant. In all other cases, the explained component reduces while the unexplained component increases the gap. This means that women have overall characteristics that are superior to men and therefore if they were paid for those characteristics at the same rate as men they would receive higher wages, on average. The point is that in the market the same characteristics may be paid at different rates by gender and men are, on average, paid more. This explains the gender gap, which therefore has a prevailing discrimination component.

Looking at panel (b), among the characteristics that increase the gap we find the number of weekly hours, which, as we know from previous discussion, is greater for men, and the greater share of self-employed and moonlighters among men. Among the factors that tend to reduce the gap, we have the better type of contract typically chosen by women, their tendency to work in larger firms and the higher training level. Other factors are not statistically different across gender. There are not remarkable differences by age. These differences are quite stable for the young adults and the prime-aged, but not for the teenagers. As noted above, for the latter group, when maternity factors are still not at play, differences are still irrelevant.

When we look at the unexplained component of the gap, we see that the return to a weekly hour of work is much greater for men than for women, especially among prime aged workers. Also human capital characteristics are paid much more to men than to women. The same type of contract is more rewarding to men than to women.

**[Table 3 about here]**

## 3.4. Machado and Mata (2005) decomposition

OLS earnings equations and the Oaxaca and Blinder decomposition suffer from a number of limitations which prevent us from fully understanding some important features of the wage distribution. One such limitation is that they look at the average value of the wage distribution, preventing us from exploring whether the wage gap varies at different quantiles of the wage distribution. The empirical literature provides compelling evidence of the different size of the gender wage gap at different quantiles of the wage distribution. In addition, they do not tell us anything about the impact of quantity and price differences at different deciles of the wage distribution.

To explore this issue in a more systematic way, we implement the Machado and Mata (2005) decomposition of the gap at each percentile of the wage distribution. The panels of Figure 9 show the decomposition for the entire sample (panel a) and then separately for each age group, including the teenagers (panel b), young adults (panel c) and prime-aged (panel d). The figures suggest the following conclusions:

a) there is little gender wage gap among teenagers;

b) most of the gap can be found among young adults and prime-aged young people;

c) the gap is particularly wide at the top and bottom end of the wage distribution, confirming yet again the sticky floor and glass ceiling. In other words, women tend to be paid less than their male counterparts both when they are employed in low-skill, low-productivity jobs and when they are employed in high skill, high productivity jobs; and

d) the gap at the bottom of the wage distribution rises to about almost 40% while at the top of the wage distribution, the gender gap is about 20%.

Overall, the Machado and Mata (2005) decomposition analysis confirms the impression that the main differences between men and women emerge when women reach the child-bearing years. We have noted that women tend first to adjust the number of hours worked per week and then subsequently also the decision itself whether to work or not. We now study labor supply decisions by gender and the impact of different variables on these decisions.

**[Figure 9 about here]**

## 3.5. Labor supply decisions

As noted in the previous sections, labor supply decisions diverge early in the careers of young people in Azerbaijan. Young men and women start having children at a slightly different age, which then affects their labor market outcomes. Early marriages, particularly among women, are quite common in the country and in our sample represent an important share.

In order to assess the importance of marital status and other demographic characteristics on the labor market experience of young people, we first estimate by Probit a labor supply equation and then decompose using the Fairlie (2005) decomposition technique the impact of different covariates on the gender gap in labor supply for different age groups, namely the teenagers, young adults, prime-aged, and for the entire sample. The results of this exercise are reported in Table 4. The regressors include a number of variables grouped into clusters such as age, education, marital status, children, early marriage, being parentless, number of siblings, household size, education of father, education of mother, worked while studying, living in rural areas. In the table’s accompanying footnote, we report all the variables included in each group.

The pseudo-R2 of the underlying Probit estimates ranges between the 0.10 of the prime-aged group to the 0.18 of the overall sample, which are in the usual range for this type of estimates[[13]](#footnote-13). The explained component of the gap, ranges from 8.9% in the case of the prime-aged workers to 24.9% of the entire sample.

Among the covariates, marital status contributes the most to the explained component of the gap. Surprisingly, the effects are mainly due to the positive impact of being married on male labor supply rather than to the negative impact of being married on female labor supply. Also the role of children is to some extent unexpected. Having more children reduces the reservation wage of young men pushing them to seek labor, but does not seem to affect the probability of mothers to participate in the labor market. When one disentangles the differences in labor supply of individuals associated with different marital statuses, it appears that the gender difference in good part come from a large share of women who do not participate in the labor market because they are housewives.

**[Table 4 about here]**

Overall, the decomposition of the factors affecting the labor supply of men and women in their early career suggests that labor supply decisions are dramatically different among women, likely due to the lack of services to support childbearing and childcare. In other words, the choices for women are stark: either start a family or continue working. In the following section we attempt to assess the impact of such labor supply decisions on wages and especially the conditional gender gap.

## 3.6. Sample selection correction

In order to assess the impact of selection into employment of men and women on the gender wage gap, we implement the sample selection procedure. The selection arises from the fact that the Mincerian earnings equations and, hence, also the gender wage gap are estimated only among the sub-sample of employed individuals, not for the entire sample. However, if, by chance, employed men and women are systematically different with respect to some unobservable characteristics from the sample of the non-employed, then the earnings equation may yield biased estimates of the coefficients, including the gender gap. The most obvious reason why the two samples might be different is that, in the case of the decision to participate in the labor market, both men and women may have higher skill levels than their counterparts who are not employed. If this is true and if the non-employed ever find a job, they would likely receive a lower-than-average wage, the consequence being a higher gender wage gap.

To estimate the impact on the gender wage gap of selection into employment, we use the Heckman procedure. It implies estimating two equations – either simultaneously by maximum likelihood or sequentially in a two-step procedure – of which the first equation, called the selection equation, is a labor supply equation, where the dependent variables is a dummy variable taking on a value of one if the individual earns an income and zero if not; the second equation, called the main equation, is the usual Mincerian earnings equation augmented of an additional term – the inverse Mills ratio – which measures the probability that an individual be employed rather than not. This term accounts for the impact of the unobservable factors that may cause some individuals to be employed and others to be non-employed. Once we control for such unobservable factors, the coefficient of each variable becomes unbiased, including the coefficient of the gender dummy.

Our expectation is that the new coefficient will be lower than the OLS coefficient or greater in absolute value, considering that it is negative. This expectation is based on what Nicase (2001) calls the reservation wage hypothesis: when non-employment is high and therefeore involuntary in nature, the most skilled individuals accept job offers more easily and hence the non-employed are least skilled. The gender wage gap is then larger in absolute value, once accounting for the less skilled non-employed. Instead, if unemployment is low, it can be voluntary and depend on the tendency of the most skilled to prefer waiting for a better job offer to come. In this case, controlling for the non-employed the gender gap would be lower in absolute value.

The success of this modeling strategy depends on the effectiveness of the instruments used to explain selection into employment. Because non-employment is due to two distinct phenomena in our sample, namely non-employment (unemployment and inactivity), on the one hand, and study, on the other hand, we imagine two sets of instruments. Set one includes early marriage and the number of children; set two includes family background variables, such as being parentless, having a larger number of siblings, having parents with a higher educational background. To work effectively, instrumental variables need to affect the selection equation – labor supply decisions – but not earnings, the dependent variable of the main equation.

Early marriage, namely marrying before the age of 20 is considered as an exogenous decision for women, because today only few women would marry at this young age. The number of children is expected to affect labor supply for they are likely to reduce the time available for productive activity, especially at this age. The second set of instrumental variables tend to affect the probability of working in different ways: the number of siblings and being parentless might reduce the reservation wage and increase hence the probability to work rather than study or being non-employed; the educational level of fathers and mothers might instead increase the reservation wage and increase the chance to continue studying rather than working among the youngest age segment or to seek for better job opportunities if prime-aged. In our estimates reported in Table 7, after considerable experimentation, we are left with being parentless as the only instrumental variable used in the estimates. Especially being fatherless is one important factor pushing youg people to work rather than not. Being motherless, is not statistically significant, except in few cases relative to the prime.aged; the negative sign hints probably to the lower time available for productive activities. Omitted estimates suggest that some of the instrumental variables used (early arriage, number of children, number of siblings) are never statistically significant determinants of the probability to be employed rather than not; while the other variables (education of parents) are not consistently estimated from one specification to the next.

The results of the Wald test do not always reject the hypothesis of absence of sample selection bias, suggesting that the coefficients estimated by OLS may be biased in some cases. Such cases include the young teenagers and young adults, especially women, and the prime-aged women. The *artrho*, the coefficient that measures the correlation between the error term of the main and selection equation, is expected to be positive if there is an unobserved factor affecting both the probability to be employed and the wage level, but, following Ermisch and Wright (1994), if it is negative we should not overinterpret this sign which could be due to some statistical properties of the estimated model.

What is the impact on the gender wage gap? Interestingly, the gender gap follows the values of the estimates without controls for sample selection bias. The coefficient is close to zero and not statistically significant among teenagers, while it is bigger in absolute value among older age groups, up to -15 for the young adults and -0.21 for the prime-aged, although in this latter case the coefficient is not statistically significant-.

Another interesting coefficient is the gender gap in employment chances. It is already at -0.27 among the teenagers and goes up to -0.38 and -0.66 among the older age groups. This suggests that with time passing the commitment of women to productive activities undergoes a dramatic reduction not only at the intensive, but, even more so, at the extensive margine.

**[Table 5 about here]**

# 4. Discussion and policy implications

The previous analysis has shown that the early stages of a woman’s labor market experience are critical. It is at this stage that women are to take important decisions regarding their family life and the labor market, generating lasting consequences for their work experience and earnings. In fact, maternity seems to generate a wage penalty years after entering the labor market. The gap between men and women emerges among young adults, namely in the early 20s, when the gap in labor supply goes up at 29 per cent. Also the gap in hours of work turns from positive for women, by up to 6 weekly hours on average, to positive for men, by up to 4.6 weekly hours. These differences affect wages immediately. The unconditional wage gap which is positive in favor of women for the teenagers who work, turns negative for the young adults and prime-age workers. In their late 20s, the gender wage gap approaches 35%, consistent with other studies of wage gaps among adults. In fact, of the 40% of women in our sample who marry in their early 20s, most make decisions about family life at that point.

Maternity affects the gender wage gap in part by apparently eroding women’s advantage in terms of readiness to work and speed in finding a job. This is also related to their tendency to work in sectors that provide more maternity benefits, such as large firms and jobs covered by formal work arrangements. In such protected sectors, women generally tend to earn more, but most of those who do not find these types of jobs remain non-employed (either unemployed or inactive). It would be important to increase the extent to which each job provides maternity benefits to reduce the tendency of young women to self-select themselves into a limited number of sectors, where they are not necessarily best placed to find a job.

Interestingly, the results of the procedure implemented to control for sample selection suggest that we observe selection into employment by skill and motivation in several cases. The gender wage gap is confirmed to increase with age, also controlling for sample selction bias. A dramatic gap, which is strongly increasing with age, in employment opportunities confirms the tendency of women to reduce their commitment to work not only at the intensive, but also at the extensive marine, with time passing.

Another important field of intervention is granting equal pay at work. In the case of Azerbaijan, the gender gap in earnings is mainly due to the way the market rewards the same characteristics differently for men and women. The results of the Oaxaca and Blinder decomposition analysis show that both their human capital and their hours of work are rewarded more in the case of men. Discrimination against women is confirmed by the size of the so-called sticky floor and glass ceiling effect based on the Machado and Mata decomposition analysis. Women are paid much less than men both at the bottom and at the top of the wage distribution.

# Concluding remarks

This paper is the first to explore the emergence of gender differences in the labor market in Azerbaijan. A further novelty of the paper is the focus on early career, made possible by the ILO’s SWT survey, a unique source of information both for the size of the sample and the wealth of information on young people’s individual and demographic characteristics and labor market activity.

We address the question of whether gender wage differences appear from the beginning of the careers of young men and women or whether they emerge later in their careers. The analysis suggests that at the point of entry into the labor market, differences between men and women are marginal. However, measurable differences emerge as workers begin making choices between family formation and work. The Oaxaca and Blinder decomposition analysis shows that women have better productivity-related characteristics than their male counterparts but are paid less for the same characteristics. This points to a sizeable unexplained component of the gap. This case is generally associated with the phenomenon referred to as “sticky floor and glass ceiling”, namely the tendency of men and women to be paid differently especially at the bottom and at the higher end of the earnings distribution, where differences in pay are more striking. This hypothesis is strongly confirmed by Machado and Mata decomposition analysis at each percentile of the earnings distribution.

After controlling for sample selection bias, the gender wage gap is confirmed as increasing with age. Also increasing with age is the gap in employment opportunities, which goes up from slightly more than 20% among the teenagers to up to 67% among the prime-aged.

The results, in addition to contributing to an important, fledgling literature, also has important policy implications for promoting gender equality. First, it is important to reduce the labor market disadvantage of women linked to maternity and try to increase their labor supply. To reduce the tendency of women to withdraw from the labor market it is important to provide more maternity services than are currently available.

In addition, the tendency of women to work in highly protected jobs, namely jobs in large sized firms and jobs with formal contracts, suggests that in other types of jobs and especially in the informal sector and in small firms, rights linked to maternity are not always granted. Implementing the current legislation throughout the entire productive sector might increase the labor supply of women, especially those who prefer not to work instead of working in non-protected sectors.

Third, equal-pay-at-work measures should be implemented to grant the same pay for the same productivity characteristics of men and women. This point is related to the previous one. The tendency of women to work in highly protected sectors might be also due to the tendency to get paid unequally in other sectors.

Fourth, efforts should be made to reduce the exclusion of women from highly paid jobs, which is apparent from the confirmation of the glass ceiling hypothesis when we implement the Machado and Mata decomposition analysis.

# References

Arulampalam, W., A. L. Booth and M.L. Bryan (2007). “[Is There a Glass Ceiling over Europe? Exploring the Gender Pay Gap across the Wage Distribution](http://ideas.repec.org/a/ilr/articl/v60y2007i2p163-186.html),” [*Industrial and Labor Relations Review*](http://ideas.repec.org/s/ilr/articl.html), 60(2): 163-186.

Bertrand M, Goldin C, Katz LF (2010) “Dynamics of the gender gap for young professionals in the corporate and financial sectors,” *American Economic Journal: Applied Economics* 2(28): 228–255.

Del Bono, E. and D. Vuri (2011) “[Job mobility and the gender wage gap in Italy](http://ideas.repec.org/a/eee/labeco/v18y2011i1p130-142.html),” *[Labour Economics](http://ideas.repec.org/s/eee/labeco.html)*, 18(1): 130-142.

Ermisch, J.F. and R.E. Wright (1994), “Interpretation of negative sample selection effects in wage offer equations”, *Applied Economics Letters*, 1(11): 187-189.

Fairlie, Robert W. (2005). “An extension of the Blinder-Oaxaca decomposition technique to logit and probit models,” Journal of Economic and Social Measurement 30: 305-316.

Juhn, C., Murphy, K.M. and B. Pierce (1993). “Wage Inequality and the Rise in Returns to Skill,” *The Journal of Political Economy*, 101(3): 410-442.

Kunze, A. 2003. “Gender Differences in Entry Wages and Early Career Wages,” *Annales d’économie et de statistique*, 71/72: 245-265.

Kunze, A. 2005. “The Evolution of the Gender Wage Gap,” in *Labour Economics*, 12(1): 73-97.

Machado J, Mata J (2005), “Counterfactual decompositions of changes in wage distributions using quantile regression,” *Journal of Applied Economics*, 20(4): 445–465

Manning A, Swaffield J (2008) “The Gender Gap in early-career wage growth,” *Economic Journal*, 118(530): 983–1024.

Mincer, Jacob and Solomon Polachek , "Family Investments in Human Capital: Earnings of Women," *Journal of Political Economy*, 82(2): S76-S108.

Munich, D., Svejnar, J. and Terrell, K. (2005). “Is women’s human capital valued more by markets than by planners?” *Journal of Comparative Economics*, 33(2): 278-299.

Nicaise I (2001) Human capital, reservation wages and job competition: Heckman’s lambda reinterpreted. *Applied Economics* 33(3): 309-15.

Pastore F (2010a) “The Gender Gap in Early Career in Mongolia,” *International Journal of Manpower* 31(2): 188–207.

Pastore F (2010b) [“Returns to Education of Young People in Mongolia,”](http://dx.doi.org/10.1080/14631371003740753) *Post-Communist Economies*, 22(2): 247-265.

Pastore F, Sattar S and Tiongson E (2013) “Gender Differences in Earnings and Labor Supply in Early Career: evidence from Kosovo’s School-to-Work Transition Survey,” *IZA Journal of Labor & Development* 2:5.

Pastore, Francesco and Alina Verashchagina (2011) [“When Does Transition Increase the Gender Wage Gap? An Application to Belarus”](http://onlinelibrary.wiley.com/doi/10.1111/j.1468-0351.2010.00407.x/abstract)  *The Economics of Transition*, 19(2): 333-369.

Polachek, S.W. (2014), “Equal Pay Legislation and the Gender Wage Gap”, *IZA World of Labor*, Vol. 16. doi: 10.15185/izawol.16

Psacharopoulos, G. 1994. “Returns to investment in education: a global update”, *World Development*, 22(9): 1325-1343.

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6. Kunze (2003; and 2005) is the only author who finds a gender wage gap from labor market entry on, but this is probably due to the specific sample of manual workers with education in vocational training. These workers are essentially employed in male-dominated professions, where men have a competitive advantage which apparently pays off in terms of earnings. [↑](#footnote-ref-6)
7. <http://www.mlspp.gov.az/en/pages/4/125> [↑](#footnote-ref-7)
8. The survey also includes a questionnaire administered to the employers of young people in the sample. The Employer and Managers Module of the survey includes detailed information about the characteristics of enterprises including their recruitment, hiring, and training practices. [↑](#footnote-ref-8)
9. For further information on the SWT survey, see the following website: <http://www.ilo.org/employment/areas/WCMS_159352/lang--en/index.htm>. [↑](#footnote-ref-9)
10. At the time of the survey, namely in August 2005, the exchange rate was: US$ 1 = AZM 4908, which means also a US$ / AZM exchange rate of 0.00024. Note that the exchange rate now reported is based on the old Manat, not the new one (AZN). [↑](#footnote-ref-10)
11. It is not clear from the wording of the questionnaire whether this is the gross wage or the wage net of taxes. In the other SWT surveys, wages referred to net monthly wage. [↑](#footnote-ref-11)
12. For a general description of the educational system of Azerbaijan, please see the following: <http://www.classbase.com/Countries/Azerbaijan/Education-System>. [↑](#footnote-ref-12)
13. We do not report these estimates, which are, however, available on request, because in the next section we report the results of the Heckman sample selection procedure, which includes also a labor supply equation as selection equation. [↑](#footnote-ref-13)