

ESTIMATION OF EMPLOYMENT
EFFECTS OF WAGE
DISCRIMINATION: THE CASE OF
UKRAINE

by

Olena Kostyshyna

A thesis submitted in partial fulfillment of
the requirements for the degree of

Master of Arts

2001

Approved by _____

Chairperson of Supervisory Committee

Program Authorized
to Offer Degree _____

Date _____

Kiev-Mohyla Academy

Abstract

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Discrimination is present in the life of all contemporary societies, however, the extent of discrimination is dependent on the overall economic development of the country. The theory of Becker provides the conceptual basis for the model of estimation of employment effects of gender wage discrimination. The model is based on the assumption of imperfectly elastic supply of labor, therefore, the wage discrimination leads to the decreased employment. Using the data of Kiev International Institute of Sociology, it was estimated that discriminatory wage differential constitutes 2.24% of the mean offer males wage. The discriminatory differential in probability to be employed for women equals 0.02% and results in 2.4 thousand fewer women employed.

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ACKNOWLEDGEMENTS

I wish to thank my thesis advisor Dr. Charles Steele for his guidance during the process of thesis writing, valuable comments and suggestions. I am grateful to the visiting faculty member Dr. Ghaffar Mughal for his revision of the thesis and comments that allowed me to improve it. I thank Kiev International Institute of Sociology for providing me with the data that enabled me to perform the empirical part of this work. And I want to thank my colleagues Olena Stavrunova and Oleksandr Zholood for their timely advice.

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GLOSSARY

Offer wage is a wage that employer offers to a prospective employee.

Postdisplacement wage is a wage that individual can receive after displacement.

Predisplacement wage is a wage that individual receives before displacement.

Reservation wage is a wage at which individual is indifferent between working and not working.

INTRODUCTION.

The process of transformation brings numerous changes to all spheres of activity of the society. One of these is related to the changes in the social and economic position of different social groups. Labor market, political and poverty indicators provide evidence that women as a social group are adversely affected by economic reforms. Therefore, it is necessary to conduct thorough economic investigation of the position of women in the social, political, and economic structure of society.

Discrimination is present in all contemporary societies. However, the extent of it differs for different countries with the level of their economic development. The costs of discrimination are spread over the entire society resulting in the punishment in the form of deterred growth and persistent poverty. Economic development alone does not guarantee the promotion of equality. The important aspect of this problem is institutional arrangements in the country that contribute to the asserting equality. Ukrainian legislation states equal rights of men and women in the economic, political, social, and cultural spheres of life. However, the implementation of the law might be far from perfect.

Empirical studies provide evidence that women's wages are, on average, lower than men's wages all over the world. Most women earn about 50%-80% of

men's wages. For Japan and Republic of Korea, gender pay ratio constitutes 0.5. For developed countries wage disparity reaches 10 to 30% (International Labor Organization, 2001). For Ukraine, women's wages constitute 64 and 70% for low qualified and managerial positions respectively (World Bank, Kiev International Institute of Sociology, 1999). Often women are limited to certain jobs and positions because of persistence of gender-based division of labor and dominating stereotypes. In developed countries, 60% of economically active women concentrate in service sector, only 10-20% of management and administrative positions are occupied by women (international Labor Organization, 2001). In the Soviet Union, some sectors were traditionally occupied predominantly by women, e.g. education, medicine, and light industry. Most of these spheres are being devastated by the serious economic problem of wage arrears (Earle, Sabirianova, 1999). This reduces women's access to the resources and earning possibilities, and in turn affects the ability of women to influence the resource allocation and investment decisions (World Bank, 2000). One of the aspects that might contribute to income inequality is invisible and unpaid household work of women that, if were counted, would increase their level of economic activity and value of the world's GDP (International Labor Organization, 2001). Participation of women in the total labor force has been at the level of 50% until recently when it fell to 48% in 1998. This can be attributed to the transition process and cannot be viewed as an irreversible trend (World Bank, 2001). The representation of women in parliaments is 10%

on average in the world. However, in Eastern Europe women representation has fallen from 25 to 7 percent since the beginning of transition (World Bank, 2000, p.6). The important finding of the impact of promoting equality is that the increased participation of women in the life of society is associated with the cleaner government and business conditions: the higher the influence of women, the lower the corruption rate (World Bank, 2000, p.12). However, the position of women in the labor market of Ukraine has deteriorated during the transition: unemployment, hidden unemployment, forced part-time employment, unpaid leaves, and higher risk of being fired are among the main factors that affected women's position.

This paper aims at evaluation of gender discrimination in wages and estimation of the effect of wage discrimination on women's employment in Ukraine. Discriminatory wage gap and loss of employment by women will be estimated using the econometric model developed in the article by Baldwin and Johnson (1992). For this purpose, data from the survey conducted by Kiev International Institute of Sociology in 1996 will be used.

The first chapter reviews theories of discrimination and some important aspects concerning the explanation of gender wage gap. The second chapter presents the theoretical formulation of interdependence between discrimination, wage level, and level of employment that constitutes the conceptual framework of the econometric model to be estimated. In addition, the second chapter describes

the position of women during transition and the specific conditions they encounter in Ukraine. The third chapter includes model specification and results of its estimation.

Chapter 1

LITERATURE REVIEW.

In this chapter, the notion of discrimination, its sources, and forms are discussed, followed by a brief review of theories of discrimination, concentrating on the specific factors that cause gender wage gap.

Discrimination in the labor market can be defined as the different treatment of the same productive characteristics and efforts because of the demographic groups the individuals belong to. Discrimination can take forms of unequal remuneration and employment segregation. The first form is called wage discrimination and it occurs if individuals with identical education, experience and background receive different wages at the same jobs because of their gender, ethnicity, or race. The occupational segregation means that women are precluded from being employed at certain jobs or levels.

Wages depend on the worker's productive characteristics. So if men and women possess different productive qualities, their wages must naturally be different. Thus, in case of different levels of wages for men and women having the same characteristics (education, experience) and being employed at the same jobs, we might suspect the existence of discrimination on the basis of gender (Ehrenberg, Smith, 1993).

Discrimination is induced by different factors, and the existence of discrimination affects the choices of people related to the education, profession, working schedules.

Therefore, it is important to identify the reasons for the existence of discrimination. So far three sources of labor market discrimination have been identified, and corresponding theories and models have been built for each of the potential sources. Ehrenberg and Smith (1993) identify personal prejudice, statistical prejudgment and monopoly power as the sources of labor market discrimination.

These three can be characterized in the following way. Personal prejudice means that employers might feel disutility for having employees of certain gender or race. Statistical prejudgment means that employers attribute to the group of employees of certain gender or race qualities they think this group possesses. Monopoly power theories deny the assumption of the competitiveness of labor markets and propose the existence of profitability of discrimination for those who discriminate.

Barret (1982) suggests grouping the potential explanations of discrimination into two groups. The first group includes the “resurgence of genetic, biological, and anthropological analysis”. This means that heredity is to blame for the discrimination, meaning that different sexes have different genetic inclinations

and abilities and therefore should follow their natural roles, which prescribes a woman to be "a nurturant, passive housewife and mother". The theory of genetic determination of gender roles calls into question the idea of freedom of choice of different or similar roles by men and women.

The other set of explanatory theories, according to Barret, includes Becker's view (1997) and human capital explanations. In this case, the explanations involve the existence of a vicious circle of mutual dependencies of labor market and household roles. According to Becker, the potential market wages is the opportunity cost of the labor time devoted to the household work. Historically, the level of women's wages has been lower, therefore, women have a comparative advantage in performing the household responsibilities. However, as women spend more time and effort at household work, they have less to devote to the labor market. This results in their willingness to take work with lower wages, but with more flexible working hours, thus they occupy traditionally female positions that require less human capital accumulation. This, in its turn, leads to the accumulation of less human capital that later does not allow them to occupy better-paid and more qualified positions. This argument can be summarized as follows: rationality of family members in making their choices about employment and its type reduces women's opportunity set as it relates to their participation in the labor market, because low or non-participation in the labor market further intensifies the initial non-marketability of their skills.

However, Barret casts some doubts on this view, since the evidence shows that even with increased labor force participation of women continue to perform housework “traditionally” assigned to their gender.

Human capital theory assumes “that the spouses start out equally likely to perform certain economic functions (apart from their human capital endowments)”. But the “societal expectations attached to gender roles condition behavior, so that, *ceteris paribus*, women and men are more apt to perform traditional gender specific functions than the reverse” (Barret, 1982, p.162). Barret stresses the importance of the societal expectations about the traditional role of women as homemakers and the commitment to perform this role in forming the outcome in the labor market. And Becker explains women’s failure in the labor market by their choice to disproportionately perform unpaid household work.

Human capital is strongly dependent on the investments in it. The amounts and character of these investments depend on the nature of employment. Women’s intermittent participation in the labor force results in the unwillingness of employers to invest in their training because during the periods of absence in the labor force human capital deteriorates and the duration of the period of usage of the acquired skills is shorter and payback is therefore lower (Fuchs, 1989). Also women themselves have “fewer incentives to invest in education and training that improve earnings and job skills” because of the expected withdrawal from the labor market after having children (Becker, 1993, p.394). “The beliefs of

employers, teachers, and other influential groups that minority members are less productive can be self-fulfilling, for these beliefs many cause minorities to underinvest in education, training, and work skills". (Becker, 1993, p.388) Maxwell and D'Amico (1986) also point to the fact that women tend to invest in general purpose, as opposed to firm-specific, human capital because of the intermittent character of their employment. This causes the following result: men tend to earn higher wages than women due to their continual participation in the labor force and heavy investments in firm-specific skills.

Firm-specific human capital may be important in determining wages. Wages are determined, among other factors, by occupation and industry where individual is employed. "Occupational internal labor markets" exist within a firm where certain occupations pay higher wages, however, skills acquired at these occupations are firm specific and, therefore, this decreases interfirm mobility at comparable wages. Similar institutions exist "along industrial lines with increased wages available for workers in large firms" (Maxwell, D'Amico, 1986, p.373). Women are deterred from occupying high-wage positions within a firm (so-called "glass-ceiling" problem) and from being hired in high paying sectors. This suggests discrimination is a two-facet problem: women are discriminated in the process of hiring and women, like men, end up in occupations and industries "in which predisplacement wage cannot be obtained elsewhere" (*Ibid.*, 1986).

People choose to work when their reservation wage is lower than an offered wage. Human capital and labor market institutions influence reservation wage, thereby affecting employment. The continuing unemployment puts downward pressure on reservation wage, and when “it becomes equivalent to market wage, employment occurs”. (Maxwell, D’Amico, 1986, p.374) However, it might happen so that reservation wage will reach the level of “shadow wage” received for “being employed in homemaking”, and this means that the decision not to reenter labor force might follow. Maxwell and D’Amico assert that it is frequently for women, their post-displacement market wages are lower than their “home productivity” as women specialize in the household production activity. This means that women are more likely than men to withdraw from the labor market in case of displacement.

Extensive empirical research of the problem provides ample evidence about and explanations of gender wage gap. Different approaches give different results about the size of impact of discrimination on wages. This can mainly be attributed to the composition of the list of control variables: “education, age, race, training, labor market experience, seniority with the particular employer, marital status, health, hours of work, city size, region, quality of schooling, absenteeism, and number of children” (Gunderson, 1989). Usually the greater the number of the control variables included in the estimation model, “the smaller the

productivity-adjusted wage gap relative to the unadjusted wage gap” (Gunderson, 1989, p.51).

Factors originating from outside the labor market (household responsibilities, type of education, career interruptions) are extremely important when considering the overall wage gap, thereby suggesting little effectiveness of the labor policy directed solely at the labor market (Fuchs, 1989). Segregation, marital status, and work experience are substantially responsible for the wage gap. Women’s education, while of the same level as men’s, is often of a type that does not give them skills rewarded in the labor market. Fuchs (1989) points to the significant impact socializing and societal expectations play in the process of bringing up, investing in the certain skills, and choosing education and its type, behavioral roles. However, recently the technological advances and increasing role of education is erasing the segregation patterns, i.e. limited access to certain occupations and positions, and contributed to the decline of gender wage gap (Fuchs, 1989).

This chapter showed that different factors contribute to the existence of discrimination. Human capital theory explains gender discrimination based on the accumulation and quality of human capital. Investment in different types of education, in general as opposed to firm-specific skills, intermittent participation in the labor force and consequent lower work experience, underinvestment in, and, deterioration of human capital, societal expectations about gender roles are

the main sources of gender discrimination. However, recently gender wage gap and segregation have tended to become less severe.

The next chapter will concentrate on the theoretical formulation of discrimination based on prejudice, its influence on gender wage gap and on women's employment.

Chapter 2

DISCRIMINATION AND ITS INFLUENCE ON WAGES AND EMPLOYMENT

This chapter discusses the theory of influence of discrimination on gender wage gap and women's employment. This theory provides the conceptual basis for the model used to estimate the employment effect of wage discrimination.

Wage discrimination and its effect on employment.

Gary Becker based his theory of discrimination on the assumption that people maximize their utility of action/ nonaction, they weigh the costs and benefits to decide on each step in their life - purchase, employment, marriage, children, discrimination - so that the outcome is of maximum utility for her/him. So, employers that have taste for discrimination maximize their profits and utility of behaving according to their tastes when they make decision about hiring their employees from the groups they discriminate against

Analyzing the case of prejudice discrimination, Ehrenberg and Smith (1993) start with the assumption that both men and women have the same marginal revenue productivity. The discriminating employers, who must maximize their profits as well because of their acting in the market, behave as if women had less productivity. But this devaluation of the women's productivity is entirely

subjective, and is positively correlated with the strength of the discriminating feelings of the employer.

Equilibrium in the labor market is attained in the point where marginal revenue productivity is equal to the wage level: $MRP = \text{wage}$. This will be the case for the groups that are not discriminated, i.e. men. As the marginal revenue productivity of women is “devalued”, the equation will be:

$$MRP - d = \text{wage of women},$$

where d is the value of devaluation or disutility from having workers from a group against which employer discriminates.

The assumed equality of marginal revenue productivities brings:

$$\text{Wage of men} = \text{Wage of women} + d$$

The cost of hiring woman to the employer is the wage paid and disutility of having woman at the working place (Baldwin, Johnson, 1992). So “employer hires men rather than women until the wage offer required to hire a man is equal the cost of hiring woman” (*Ibid.*, 1992, p.446).

This model has two implications. The first of the implication concerns the possible losses from the discriminating character of hiring behavior.

Figure 1 shows that a profit-maximizing employer hires quantity N_1 for a wage W_w , market wage, whereas the discriminating employer has higher costs of hiring women $W_w + d$ and therefore he hires quantity N_0 . Value d plays a role similar to

that of a tax. The result is that wage discrimination decreases the employment of the discriminated group. The area under the marginal revenue curve is the total revenue, therefore the discriminating employer earns less of it. However, the discriminating employer compensates for his money losses by gains in utility.

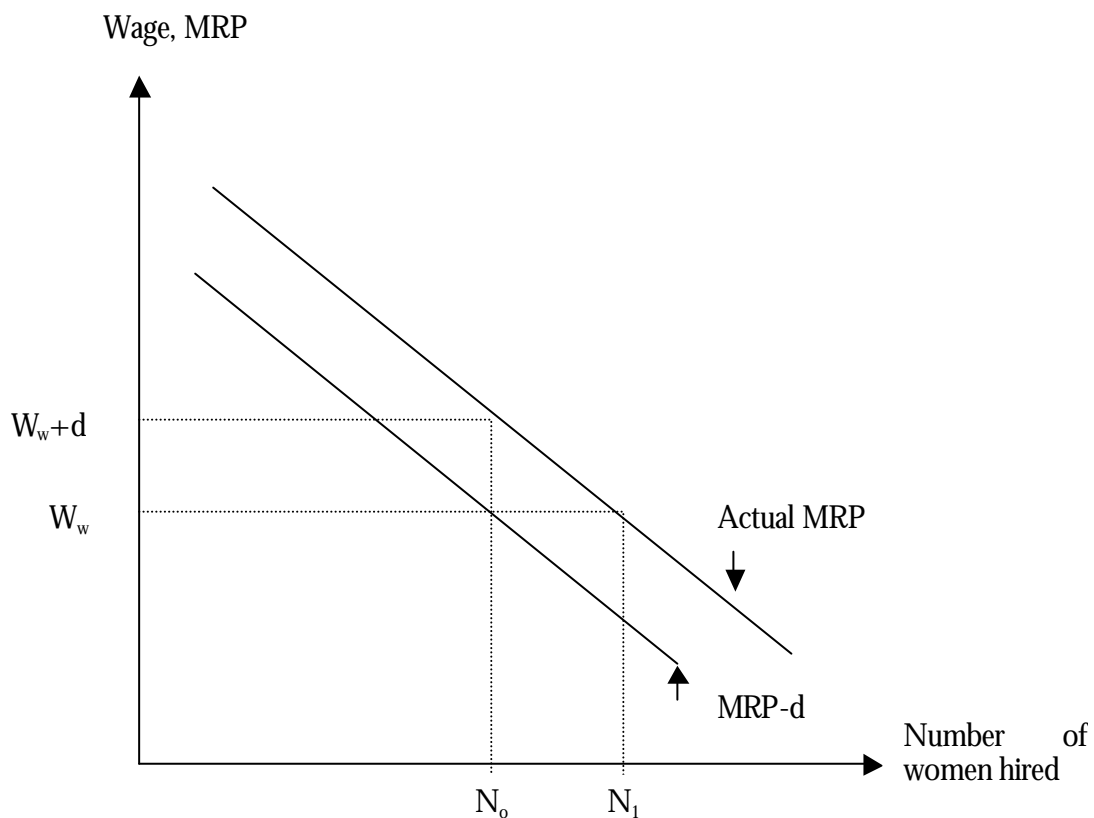


Figure 1. Equilibrium employment of women or minorities in the discriminatory firms.

Source: Ehrenberg, Smith. 1993. *Modern labor economics*. P.415

The second implication of this model involves the size of the gap. Figure 2 shows the relationship between quantity of females employed and female to male wage differential. The horizontal portion of the market demand for women's labor curve up to the point A corresponds to the non-discriminating labor demand, the downward portion of the demand curve means that the labor that is left above the quantity employed by the non-discriminating employers will have to be hired by the discriminating employers. This shape of the demand curve has several consequences relating the wage gap.

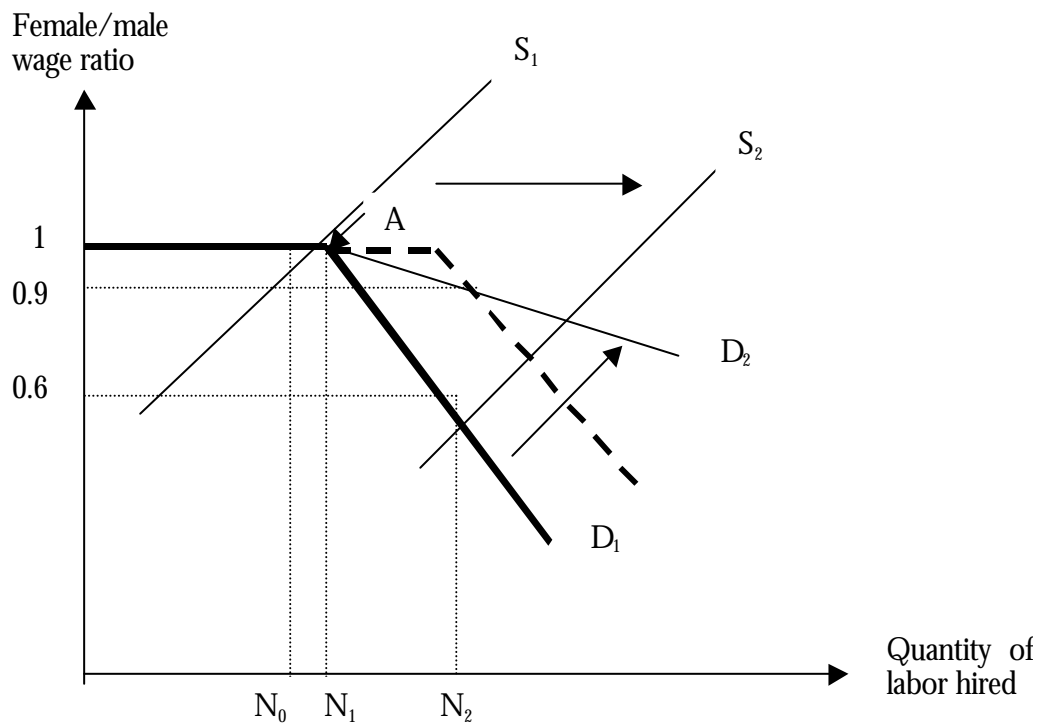


Figure 2. Market demand for women or minority labor as a function of relative wages and effects of changes in supply and demand on the relative changes.

Source: Ehrenberg, Smith. 1993. *Modern labor economics*. P.416.

As can be seen from figure 2, the size of the gap depends on the changes in supply and demand sides. As more women decide to join the labor market, the supply curve shifts to the right causing the discriminatory differential to become bigger, as the possibility to be hired by non-discriminating employers will vanish together with increase in supply of women or minority labor. The demand side of the labor market can change in the following ways: more employers can become non-discriminatory and discriminatory views can become less severe. Both of these changes cause the wage gap to shrink.

As the supply of the minority labor increases, the wage gap becomes wider, as it can be seen from the graph after the supply curve shift to the right from S_1 to S_2 . The demand for labor can change in two ways. First, the number of non-discriminating employers can increase, thereby the horizontal portion of the demand curve becomes longer (dashed line), so with the unchanging discrimination habits and number of supply, the wage gap shrinks. The other case is the changing tastes for discrimination- the alleviation of discrimination- so that the downward sloping portion of the labor demand curve becomes flatter and thereby makes the wage gap smaller (D_1 shifts to D_2). The changes in character of discriminatory behavior bring changes in the size of wage gap and also changes in the employment of discriminatory group. The decline in discrimination severity

(larger quantity of nondiscriminatory employers and alleviated discrimination) leads to the increased employment and smaller gender wage gap.

Summing up this part of the chapter, we can say that gender pay gap depends on the supply of and demand for women's labor. Discriminatory tastes of employers cause lower number of women employed. Wage gap depends on the number of discriminatory employers and the severity of discrimination (demand conditions) and women's decision to supply labor.

Changes in women's position in the labor market during transition.

Now it would be interesting to detect changes in supply of and demand for women's labor during transition in Ukraine. The reform process in the countries of the former Soviet Union started later than in the countries of the Central and Eastern Europe and has been proceeding much slower. The beginning of the transition witnessed significant output reduction in all of these countries, implying a decrease in labor demand in the contracting sectors and raised the problem of absorbing free labor. Real wages fell and wage inequality rose. The discussion of changes will be structured in the following way. First, the situation prior to transition is to be described. Then the discussion of changes in employment and unemployment, wages and specific factors influencing women's position will follow.

Prior to transition, the labor markets were heavily regulated. Wages were centrally set. Central wage planning was aimed at the reduction of wage inequality across workers. However, the participation of both man and woman was needed in order to maintain basic living standard for a family. The soft budget constraints caused excess labor demand and hoarding. Enterprises had little incentive to fire workers, and central planning limited mobility of workers across both sectors and regions. Fully paid maternity leaves, well-developed child-care and health-care policies, women's labor protection were the factors that stimulated women's participation in the labor force (Newell, Reilly, 2001). It is an established fact that women's labor force participation rates were significantly higher for the socialist countries. The unweighted average participation rates for women were 44.8% and 72.9 % for western and eastern countries respectively in 1970 and 65.2% and 80.0% in 1992 (Saget, 1999). Nevertheless, Newell and Reilly (2001) point to the similarity of labor market outcomes for women in western and eastern countries in terms of segregation. The senior positions were rarely occupied by women for two reasons. First, women have less time to pursue career because of double burden of household duties. Second, "fundamental revolution of gender relations in the West that brought a shift in household division of labor did not happen in the socialist countries" (Newell, Reilly, 2001, p.0). The labor market of pre-transition period had weaknesses: low productivity, low relation of wages to productivity, concentration of employment in industry and agriculture. Lack of connection between wages and skills led to the investment in specific and narrow

skills. Regulated wages were characterized by low dispersion of wages by skill and by region. This caused skill mismatches: high-skilled workers could make decision to move to jobs that required lower qualification but paid higher wages. This narrow specialization adversely affected the opportunities of people to find jobs during transition (World Bank, 1994). Thus, in conclusion of discussion of pre-transition period, it can be stated that women in the socialist countries participated in the labor market more actively, and centrally set wages aimed at equality in earnings. However, segregation problem is common for both socialist and capitalist countries.

Now it would be interesting to explore the issue of changes in employment and unemployment. The decline in output was the highest in the agriculture and manufacturing, male-dominated industries, while industries employing predominantly women declined less or expanded a little (e.g., services), for instance, in Estonia and Slovenia. In 1999 in Ukraine, employment increased in the following sectors: in trade (67% of employed are women), catering (81,2%), material and technical delivery and sale (41.1%), provision (40.5%) by 4.2%, in utilities (60%) and services (74.2%) by 5%, in health care (81.5%), physical training (39.3%) and social work (86.6%) by 0.9% (Pratsya Ukrainy 1999, 2000). Increase in employment was disproportionately filled by women. Therefore, in general the relative employment of women increased but not due to the increased share of women within sectors, rather due to “the changes in the composition of

relative output demand that favored female sectors” (Orazem, Vodopivec, 1995, p.21). In addition, women’s labor was characterized by higher education, so the increased returns to education during transition benefited women in these countries. However, “there is no evidence that diminishing discrimination against women is responsible for women’s relative wage gain” (Orazem, Vodopivec, 1995, p.22).

In Ukraine, 80% of women are economically active, i.e. have a paid job or actively seeking for one (International Labor Organization, 2001). Women workers are concentrated in industry (24.3% of all employed in economy), agricultural sector (15.2%), education (15.3%), health protection (12.8%), and the rest of the branches employ 32.4% of working women. However, industry and agriculture are not predominantly female sectors, women constitute up to 40% of employed in these industries (Kostrysya, International Labor Organization, 2001). The decline in employment was heavily concentrated in the industrial sector (mining, manufacturing, and electricity), where the number of wage employees fell by about 19.9% from 7.1 million in 1990 to 5.9 million in 1993” (Fallon, Hoopengardner, Libanova, 1999, p.85). “Within industry, employment fell most in light industry and in engineering activity” (Fallon, Hoopengardner, Libanova, 1999, p.85). “During recent years, women’s employment has been falling despite their higher quality of education and professional training” (Hansen, Nanivska, 1999, p.150) Participation of men and women in tertiary education constituted 46

and 48% respectively for men and women in 1985, 36 and 47% of age group in 1998 (World Bank, 2001). The transition process decreases competitiveness of women's labor: rates of hired women-workers are lower than those of men. Women are concentrated in the spheres of self-employment, and sectors with arrears problems. Women are exposed to higher risk of being laid-off. They constitute 59.8% of laid-off in industry (43.1% of the employed), 62% from science and scientific services (48.8%), 59.7% from managerial staff (55.6%), 62% from transport and communication (43.5%). Sociological studies suggest women are more affected by the problem of underemployment in forms of reduced working hours and unpaid leaves (Kostritsya, International Labor Organization, 2001).

Unemployment rate has been steadily growing since 1991 from 0.02% to 7.3% (Hansen, Nanivska, 1999, p.149). "The registered unemployment statistics suggests that women have been disproportionately hit by unemployment, accounting for 61.3% of all registered stock of unemployed in early 2000. The registered unemployment rate for women and men was correspondingly 5.69 and 3.39. But according to the Labor Force Survey that rate of unemployment for men is actually slightly higher than for women (e.g., it was on average 12.7 and 12.3% correspondingly for men and women of working age in 1999" (Kupets, Lehmann, 2001, p.4). The higher proportion of women in the registered employment can be attributed to the fact that "women approach employment

offices more often for help, since they are more likely to accept low salary jobs and are less inclined to be employed in the non-formal sector and shadow economy” (Hansen, Naniivska, 1999, p.150). Thus, transformational changes resulted in development of some industries (e.g., services) that are female-dominated, thereby proposing increase in relative employment of women. However, other female-dominated sectors are devastated by arrears problem, unpaid leaves, decrease in hours worked, and this deteriorates women’s relative income position.

The most serious consequence of the transformational recession has been a severe decline in the real average wages. This important factor influences individual’s decision to supply labor and enterprises’ decisions to hire labor. ”The main effects [of changes in real wages] were twofold: household demand for goods declined, with adverse effects on employers’ demand for labor; and households increased their supply of labor and effort” (World Bank, 1994, p.140). During transition real wages dropped by 63% between 1990 and 1993” (Fallon, Hoopengardner, Libanova, 1999, p.82). The evidence of the increasing inequality is that “7.5% of population have incomes lower than UAH 30...More than 50% of population have an income which is below subsistence level (UAH 73.7 per month)” (Hansen, Naniivska, 1999, p.144). Blau and Khan (1994) propose that increasing wage inequality is associated with the increased gender wage differentials in the western countries. Reilly (1999) found that despite increased

wage dispersion, gender pay gap exhibited some degree of stability and somewhat declined over the period 1992-1996 in Russia. When adjusted for human capital, the gender pay gap rose by 2% and 4% for monthly and hourly wages respectively. Estimates of gender pay gap obtained by Newell and Reilly for Ukraine are 18.6 and 24.4% for unadjusted and adjusted for human capital achievements gaps respectively. “For all transitional countries, most of the average gender pay gap is attributed to treatment effects rather than differences in endowments” (Newell, Reilly, 2001, p.10). The surprising finding in this article is that transition process was neutral to the average pay position of women relative to men despite the fact that wage inequality rose. So “the relative position of women has not deteriorated” (Newell, Reilly, 2001, p.14). However, this stability of gender pay gap cannot be used as an appropriate indicator of unchanging position of women in the labor market. It can be caused by the decreased participation of the less-educated women in the labor force. Drop in real wages, increased inequality are the factors that influence the income position of women and their supply decisions. Increased inequality did not lead to increase in the gender pay gap according to Newell and Reilly. Decreased real wages might reach the level of home productivity and, therefore, lead to termination of employment by women.

Changes in the social policies influence women’s decision to work. Women in transition countries face special problems of protection from negative market

outcomes and lack of efficient law enforcement mechanisms, problems with social services (arrears in social and maternity benefits are 80% of total amount of these benefits) that were previously provided by the state but became more scarce during reform period (International Labor Organization, 2001). Now supplementary guarantees of employment are provided to women with children under the age of 6, single mothers with children under the age of 14 or disabled children, and persons of pre-retirement age (53 years). This takes a form of 5% quota of total job places at the enterprises reserved by local administrations. "Because women are considered higher risk and more expensive labor, finding employment for men is the priority. Women might, for instance, take maternity leave and stay at home during the first years after child is born, a period during which it is against the law to fire them. Women are also often under pressure to return to traditional roles: staying home and taking care of the family. Under these circumstances, a woman's chances of being considered as serious contender for a job are rather slim. Further, men are more likely to benefit from retraining or education opportunities" (Nedolast, 1999, p.32). Informal sector activities are more difficult to start for women as they have difficulties obtaining micro-credits. The poverty indices are higher for women. However, this can be explained by the correlation between age and poverty, and women have higher life expectancy (Fallon, Hoopengardner, Libanova, 1999). The quantity of preschool educational institutions steadily declined during the period from 1990 to 1998 from 24.5 to 17.2 thousand. The number of children in these institutions decreased from 2428

to 1055 thousand during the same period. In addition, enrollment of children in the preschool institutions as a share of children of corresponding age declined from 57% to 39% during the same period (Dity, zhinky ta sim'ya 2000, 1999). These changes might provide partial evidence of women's decisions as for bringing up children at home and using the possibility of longer maternity leave adopted at the beginning of reforms. These changes also affect women's labor supply decisions. "There is a tendency in the transition countries of Central Europe to re-emphasize women's traditional role in the family as a way of alleviating the pressure on the labor market". This view is reinforced by the declining formal employment opportunities and unchanging role of women in family during communist period (Ulshoefer, International Labor Organization, 2001). Thus, supply-side factors might have brought the overall decrease in women's participation in the market activities. These include the individual decisions to withdraw from the labor market or changes in social policies (e.g., improved pension system in Slovenia).

Recession in the country caused decrease in demand for all inputs including labor. However, some predominately female sectors (e.g., services) contracted less or even expanded a little, thereby increasing relative female employment. Nevertheless, many of these spheres (e.g., education, and health care) are devastated by wage arrears that deteriorate women's pay position. However, women could gain from their higher level of education because of the

development of sectors requiring higher education. Empirical study of Newell and Reilly found stability of gender pay gap during transition in Russia. The decrease of women's participation in the labor force can be explained by contraction of their supply of labor force. Drop in real wages caused by recession might make market wage lower than their home productivity (as women tend to specialize in household duties), intermittent participation in the labor force and longer maternity leaves adopted in the beginning of transition (during which human capital deteriorates) contributed to this trend. However, because of low level of wages both men and women have to work to keep some level of living standards of family, therefore, women's labor force participation stays high.

The next chapter will continue with the explanation of the model that will be used to estimate the gender wage gap and influence of wage gap (discriminatory wages) on employment of women.

Chapter 3

EMPIRICAL PART

As was shown in the previous chapter, discrimination in the labor market leads to lower level of employment of the discriminated group. This chapter is devoted to the estimation of the employment effect of wage discrimination. The hypothesis to be checked can be formulated in the following way: discrimination in wages reduces employment of women in Ukraine. The model used for this purpose is based on the article by Baldwin and Johnson “Estimating the Employment effects of Wage Discrimination”. Now the paper will continue with the discussion of the model and its econometric specification.

The aim of the calculations is to estimate the wage differential caused by discrimination and the attendant loss of women’s employment because of discriminatory wages. Gap caused by discrimination will be calculated by estimating wage equation with demographic, human capital and occupational characteristics as independent variables correcting for sample selection bias, then applying assumption that nondiscriminatory wages lie halfway between discriminatory male and female wages. Employment effect is obtained applying the difference in the nondiscriminatory (corrected for the wage gap caused by

discrimination) and discriminatory probabilities to be employed (estimated from probit (selection) equation) to the corresponding population of working women.

Conceptual basis of the model.

The model is based on the assumption that labor supply is not perfectly inelastic, therefore, wage discrimination leads to the withdrawal from the labor market of discriminated individuals. The conceptual background of this model is the theory of discrimination developed by Gary Becker (1971). Employers maximize their profits and utility from not-having female employees. Therefore, they hire women when the offer wage of men and offer wage of women plus cost of disutility are equal.

The standard neoclassical framework of wages explanation is employed here. During transition, numerous changes occurred in the labor market including the increasing unemployment that resulted from excess supply of labor. Acquired before transition skills were highly specialized and narrow. And with the disruption in economy, market demanded new types of skills. Empirical part is based on the survey conducted in 1996. The political reforms were under way since 1991, price liberalization occurred in 1994-1995. Thus, we might describe the process of formation and acquisition of skills at this time as that of kind that was significantly influenced by the market requirements. Therefore, this can serve as justification for usage of neoclassical framework.

The aim of this paper is to explain wage differentials. However, “the wages are observed only for those people who actually work, but for economic purposes we are interested in (potential) wages not conditional upon this selection...Because sample of workers may not be a random sample of the population (of potential workers)...this problem is often referred to as sample selection problem” (Verbeek, 2000, p.207). Sample selection models include a second equation – selection equation – which determines whether an observation makes it into the sample. The Heckman two-step estimation procedure, second-best alternative to maximum likelihood, is used to correct for sample selection bias. The sample selection model consists of a linear wage equation and of a binary choice equation that describes whether a person is working or not (Kennedy, 1998).

The individual i works if his/her reservation wage W_i^r is lower than offer wage W_i^o . Offer wage W_i^o depends on the individual's endowments H_i that determine productivity. Reservation wage W_i^r depends on non-wage income V_i and personal characteristics Z_i .

$$W_i^o = \hat{a}_0 + \hat{a}_1 H_i + \hat{a}_i^o,$$

$$W_i^r = \hat{a}_0 + \hat{a}_1 V_i + \hat{a}_2 Z_i + \hat{a}_i^r,$$

W_i^o is offer wage, W_i^r is reservation wage, H_i is endowments of individual (education, health), V_i is non-wage income, Z_i is personal characteristics (age, marital status, number of children). \hat{a}_1 , \hat{a}_2 are vectors, the number of elements in

them equals the number of endowment and personal characteristics correspondingly.

So individual i works if $J_i^* = W_i^{o*} - W_i^r > \hat{a}_i^r - \hat{a}_i^o$, where W_i^{o*} is nondiscriminatory offer wage. The probability that individual works is probability (i works) = $\Pr(J_i^* > \hat{a}_i) = \Pr(J_i^*/\hat{\sigma} > \hat{a}_i/\hat{\sigma}) = \Phi(J_i^*/\hat{\sigma})$, where $\hat{a}_i = \hat{a}_i^r - \hat{a}_i^o$, and $\hat{\sigma}$ is the variance of the difference in errors.

Selection equation is a standard probit model with dependent variable alternatives working or not working. The distributional assumption on the unobserved errors μ_i and error from probit equation is the bivariate normal distribution with expectations zero. For the probit model, the normalization restriction is imposed.

On the first stage of the Heckman procedure, the expected value of the error term is estimated. This variable is called Heckman's lambda (inverse Mill's ratio) $\lambda_i = \phi(J_i/\hat{\sigma})/\Phi(J_i/\hat{\sigma})$. The second stage includes estimation of wage equation with Heckman's lambda as an extra explanatory variable to correct selection bias.

This Heckman's selection bias procedure controls for between-group differences in tastes for work. However, this interpretation is only correct when equally productive women and men are on average offered the same wages. "If offer wages are discriminatory, then part of the male-female difference in the selectivity bias variable results from discrimination" (Baldwin, Johnson, 1992, p.447).

Estimation procedure.

The following estimation procedure is used to correct male-female differences in offer wages for the effects of employer discrimination.

First, the selection equation is estimated in the form of a probit model that relates probability of obtaining work to personal characteristics. The discriminatory probability of obtaining work is supposed to be higher for men than for women. On this stage, we obtain estimates of average offer wage-reservation wage differentials \bar{J}_j / σ_j and associated probabilities of employment Π_j ($j=M, F$). Also Heckman's lambda is estimated to be used in the second step to correct for selection bias.

Second, using the selection bias correction variable we estimate linear equation for wages: $W_j^o = \beta_0^j + \beta_1^j H_j$

We exclude some variables used in probit equation that influence the reservation wage (marital status, number of children) but do not influence the wage itself. Also we include variables that directly influence the wage (occupation, sector of employment, etc.). Using this equation, we can calculate average offer wages for men and women W_f^o , \bar{W}_m^o (we do not include Heckman's lambda here).

Third, mean non-discriminatory offer wages (\bar{W}_j^0)* are estimated based on the assumption that nondiscriminatory offer wages lie between mean women's and mean men's offer wages (this explains coefficient 0.5) :

$$(\bar{W}_j^0)^* = 0.5(\hat{a}^M + \hat{a}^F) \bar{H}_j$$

Discriminatory difference (\bar{W}_j^0)* - (\bar{W}_j^0) in offer wages is positive for women and negative for men.

Fourth, the non-discriminatory probabilities of employment Π_j^* are to be calculated. This is done using the following procedure. Hours worked are assumed to be proportional to the offer wage- reservation wage differential $\psi_i = J_i/\sigma$. Therefore, the regression of hours worked on estimated ($\psi_i + \lambda_i$) is estimated, the estimate of coefficient σ_j/v_j are obtained, where v_j is the factor of proportionality. This factor of proportionality can be derived by dividing the coefficient of job experience in the wage offer equation by the coefficient of job experience from the regression of hours worked on all variables from the wage offer equation. Thereby it is possible to calculate the value of σ_j .

The next step is to calculate non-discriminatory probabilities to be employed:

$$\pi_j^* = \Phi(\bar{J}_j/\sigma_j + (\bar{W}_j^{0*} - \bar{W}_j^0)/\sigma_j)$$

Then the discriminatory differential in the probabilities of employment ξ is to be obtained and consequently the employment losses (or gains) resulting from discrimination are to be calculated as:

$$\xi = \Delta\pi + \Delta\pi^* = (\pi_M - \pi_M^*) + (\pi_F^* - \pi_F)$$

Data and variables.

The data for the estimation of the employment effects of wage discrimination are taken from the survey of individuals performed by Kiev International Institute of Sociology in 1996 that provided the characteristics of 2314 men and 3089 women. This survey was conducted in June-July 1996 and included observations from all administrative regions of Ukraine. For our analysis, we use 1700 observations for women and 1534 observations for men having dropped the observations for pensioners, students at schools and universities and concentrating on those individuals who work for wages, as we want to explain wage discrimination.

The first step of the estimation of employment effects is the estimation of probit employment functions separately for men and women. The dependent variable in this regression is binary, and it equals one if the individual worked in the surveyed period, zero - otherwise. The independent variables include those that influence both the offer and reservation wages (age, age squared, education, and health) and

those that influence the reservation wage (marital status, number of children, additional incomes). The health variable used is the evaluation of individuals of their health, in the regression it equals one if health was assessed to be bad, and variable health equals zero otherwise. The education variable equals the years of education individual have. The number of children is included into the probit regression of women due to the peculiarity of the questionnaire where only women were asked about the number of children they have. The additional income variable includes social support payments received by individuals, non-wage income from unregistered activity, and interest payments on capital, etc.

Table 1. Definition of Variables in Probit Equation.

Dependent variable	=1 if individual works, =0 otherwise
Independent variables:	
Social payments	Include public assistance for the indigent and disabled
Unregistered income	Equals income from unregistered activity
Interest payments	Include interest payments, other income on capital
Age	Equals age of individual
Age squared	Equals age squared
Marital status (married)	=1 if individual works, =0 otherwise
Years of education	Equals years of education
Health	=1 if individual has poor health, =0 otherwise
Births	Equals number of births

In this regression, a positive (negative) sign means that the variable increases (decreases) the probability of being employed. Additional income, age squared, and poor health are expected to have negative sign in the probit equation. Years of education and age are expected to have positive sign. Also it would be good to control for the spouses earnings, however, it is not available in the data.

The next equation to be estimated is wage equation. The dependent variable is the wage per hour received by individuals in the month prior to survey. The independent variables include the human capital measures (education, health, and tenure), job characteristics (capital intensive industries, occupation), and other factors influencing wages (permanent or temporary job). Tenure is the specific experience (measured in months) at the currently occupied job. In addition, the square of the experience is included to represent the diminishing returns to on-the-job experience. Age is used as a proxy for general experience that is the experience with employers other than present employer. The capital-intensive variable equals one for industry, construction, and transportation, and zero otherwise. Occupation characteristics include dummies for laborer, occupation that does not require university level degree, and occupation that requires university level degree and farming. Dummy equals one if individual is employed in the respective category. The base category is other occupations. The dummy variable is constructed for permanent jobs, the base category is one-shot deal jobs and temporary jobs. There is also a dummy for public sector workers. Handicap variable equals one if individual has some physical impairment. The control for job characteristics limits estimates to discrimination within industry type and type of employment, and occupation, thus lowering discriminatory differential. The expected signs on tenure, years of education, age, capital intensive industry are positive, while on handicap, tenure squared are negative.

Table 2. Definition of Variables in Wage Equation.

<i>Dependent variable</i>	Hourly wages
<i>Independent variables</i>	
Age	Equals age of individual
Tenure	Equals specific experience with current employer
Tenure squared	Equals tenure squared
Years of education	Equals years of education
Permanent job	=1 if individual is employed at permanent job, =0 otherwise

Laborer	=1 if individual is laborer, =0 otherwise
Jobs without high education required	=1 if individual occupies job not requiring to hold higher education, =0 otherwise
Jobs with high education required	=1 if individual occupies job requiring to hold higher education, =0 otherwise
Military	=1 if individual is employed in military service, =0 otherwise
Art	=1 if individual is employed in the sphere of culture, =0 otherwise
Farmer Subordinates	=1 if individual works in agriculture, =0 otherwise Equals number of subordinated individual has
Capital-intensive industries	=1 if individual is employed in industry, construction, and transportation, =0 otherwise
Public sector	=1 if individual works in public sector, =0 otherwise
Health	=1 if individual has poor health, =0 otherwise
Handicapped	=1 if individual has physical handicap, =0 otherwise

Results.

Now the results of regressions estimation will be discussed. Almost all probit coefficients are significant with signs that conform to our a priori expectations (table 3). Also most coefficients of the wage equation have expected signs (table 4).

Table 3. Estimation Results of Probit Functions.

	Females (N=1700)	Males (N=1534)
Intercept	-3.0712* (0.3655)	-1.6535* (0.4344)
Social payments	0.0002 (0.00002)	0.0003* (0.0001)
Unregistered income	$5.7 \cdot 10^{-6}$ ($9.3 \cdot 10^{-6}$)	-0.00002*** (0.00001)

Interest payments	-0.00008 (0.00003)	0.00001 (0.00003)
Age	0.1430* (0.0197)	0.0661* (0.0236)
Age squared	-0.0013* (0.000193)	-0.0006* (0.0003)
Marital status (married)	-0.4591* (0.077125)	0.4384* (0.1002)
Years of education	0.0510* (0.0155)	0.0653* (0.0184)
Health	-0.2433* (0.0953)	-0.0556 (0.1315)
Births	-0.0106*** (0.0066)	-
Log likelihood	-927.14	-645.87
Pseudo R ²	0.1312	0.0915

(Standard errors are in parenthesis)

* Significant at 0.01 level ** Significant at 0.05 level *** Significant at 0.11 level

The values of coefficients in probit equations for men and women are different, and for some variables are several times different. Unregistered income lowers the probability of being employed for men, whereas it has positive sign for women, however, it is not significant for women. Income from capital reduces probability of being employed for women, and it is significant. For men, the sign of this variable is positive, but insignificant. Social payments variable has positive effect on probability of being employed for both men and women, however, it is insignificant for women. Thus, it might be that different forms of additional income are important for men and women in their opportunity of being employed. The coefficient of age variable for women is about twice as big as that for men. Absolute value of age squared variable is twice as big for women as for

men. “Diminishing effect” of age is larger for women, i.e. older age lowers probability of being employed more significantly for women than for men, this might result from lower retirement age of women. Marital status has opposite influence on employment probabilities: positive for men and negative for women. This can be explained by the so-called interaction effect. Being married for men may be perceived to increase their productivity; however, for women, being married may generate the opposite perception, as they tend to perform household work or stay at home with ill children. Years of education have comparable (almost equal) positive effect on employment probability of men and women. Poor health is more important in its negative influence for women, as the coefficient of this variable is about five times higher for women than for men. This might be explained by the nature of this variable, as it represents the subjective evaluation of health by the individual. In addition, women are known to be more attentive to their health than men. This might be revealed in the increasing difference in life expectancy of men and women. Thus, the perception of one’s health as being poor lowers an individual’s ability, willingness and chances of being employed. Number of births has a negative effect on probability of being employed for women for obvious reason.

Now, it would be interesting to consider the results of estimation of the wage equation. Age has a negative and almost equal impact on wages for both men and women. Age was used as a proxy for general work experience, i.e. total experience

with current employer and all employers other than the current employer. The negative coefficient might be explained in the following way. The recent transition process has stimulated emergence of new jobs. These new jobs are the ones that bring higher wages, as they were created in response to the needs of the market. Having higher age might mean that a person does not possess characteristics that are valued at the market or faces more difficulties acquiring them. Therefore, older people stay at their former jobs (e.g., state enterprises), even if it pays lower wages. The skill mismatch following the collapse of the soviet system is expected to have adversely affected the older workers. Tenure, i.e. specific experience with the current employer, has a positive impact on wages, however, it is tenfold higher for women. Permanent job dummy is positive for men and negative for women. As for dummies for occupations, we observe comparable ladder for both men and women. The values of coefficients can be ranked in an ascending order in the following way. For women: culture, agriculture, laborer, jobs not requiring higher education, public sector, military, and jobs requiring higher education. For men: agriculture, public sector, laborer, jobs requiring higher education required, jobs not requiring higher education, military, and culture. The differences in the values of coefficients can be attributed to the existence of glass ceiling within sectors. This factor can cause the difference in this ranking of coefficients and ultimately in the wages of men and women. Dummy for poor health is negative for both men and women reducing hourly wages. Handicapped variable reduces men's wages twice as much as

women's wages. The character of handicaps may vary by gender and cause this difference..

Table 4. Least Squares Estimates for Wage Equation.

	Females(N=1700)	Males(N=1534)
Intercept	85.56 (40.78)	-55.46 (40.06)
Age	-0.7507** (0.4476)	-0.7169** (0.3773)
Tenure	0.0739 (0.0361)	0.0091 (0.0443)
Tenure squared	-0.00008 (0.00004)	-0.00003 (0.00005)
Years of education	0.4867 (1.5009)	1.5507 (1.7274)
Permanent job	-0.5611 (12.8847)	9.2172 (15.6504)
Laborer	-17.2366 (9.5383)	3.4885 (12.3302)
Jobs without high education required	-16.4071** (7.0319)	18.0538*** (10.2989)
Jobs with high education required	8.0026 (7.0261)	10.0669 (11.3585)
Military	2.0041 (41.6281)	20.4268 (22.2515)
Art	-38.4134 (30.1329)	58.8487 (46.9394)
Farmer	-31.4571 (12.2224)	-14.6485 (15.0250)
Subordinates	0.2143* (0.1097)	0.1486* (0.0632)
Capital-intensive industries	8.2771** (5.5730)	13.3124** (6.4097)
Public sector	-8.4729 (6.7253)	-14.6250 (12.3632)
Health	-7.1383 (6.5226)	-4.3956 (9.0524)
Handicapped	-12.3413 (27.1296)	-25.4106 (23.4896)

Lambda	-30.0813*** (19.7896)	-49.2345*** (29.0111)
Adj. R ²	0.0478	0.033
F-value	3.80	3.10

(Standard errors are in parenthesis).

* Significant at 0.01 level ** Significant at 0.05 level *** Significant at 0.11 level

The results of the decomposition of the wage equations are presented in Table 5. As it can be seen, the discriminatory wage differential is 1.39 thousand coupons per hour, this constitutes 2.24% of the mean offer wage to men. This percentage is significantly lower than that estimated in the article by Baldwin and Johnson for the case of the USA where it is equal to 36.5%.

Table 5. Wage and Employment Effects of Discrimination Against Women.

Effects	Numbers
Wage effects	
Wage differential ($\bar{W}_M - \bar{W}_F$)	8.78 ¹
Offer wage differential: $D_0 = \bar{W}_M - \bar{W}_F - [(c \bar{\lambda}_M) - (c \bar{\lambda}_F)]$ $D_0 / \bar{W}_M^o * 100$	1.53 ¹ 2.46%
Wage difference due to endowments: $D_E = 0.5 (\beta_M + \beta_F) (\bar{X}_M - \bar{X}_F)$	0.14 ¹
Wage difference due to discrimination:	

$D = D_0 - D_E$	1.39*
$(D / \overline{W_M^o}) * 100$	2.24%
Employment Effects:	
$\pi_M * 100$	85.31%
$\pi_F * 100$	70.29%
$\pi_M^* * 100$	82.89%
$\pi_F^* * 100$	70.31%
Loss of Jobs to Women	0.02% * 12.25mln = 2.45 thous.
$(\pi_F^* - \pi_E) * N_W$	

¹ measured in thousand of coupons, the currency in use at the time

$$\overline{W_M^o} = 62.16 \quad \overline{W_F^o} = 60.63 \quad \overline{W_M} = 53.07 \quad \overline{W_F} = 44.29$$

$$\overline{W_M^{o*}} = 61.01 \quad \overline{W_F^{o*}} = 60.78$$

The elasticities of labor supply of males and females influence the effect of wage discrimination on employment. The uncompensated wage elasticities can be calculated as following:

$$\eta = \frac{\% \Delta L_j}{\% \Delta W_j}, \text{ where}$$

$$\% \Delta L_j = \frac{(L_j^* - L_j)}{(L_j^* + L_j)}$$

$$\% \Delta W_j = \frac{(\overline{W}_j^* - \overline{W}_j)}{(\overline{W}_j^* + \overline{W}_j)}$$

The uncompensated wage elasticities from the results of this work are 1.545 and 0.115 for men and women respectively. “These elasticities refer to the participation decisions not to choices of hours of work” (Baldwin, Johnson, 1992, p.451). The surprising result is that the elasticity of women turns out to be lower than for men that is not consistent with the theoretical expectations that the participation of discriminated (lower wage) group is more elastic than that of the nondiscriminated (higher wage) group. However, this finding can reflect the fact that in Ukraine women are more likely to accept and stay at lower paid jobs as they are less mobile between jobs, less prone to work in non-formal sector or shadow economy, but nevertheless, women’s participation in labor market activities is indispensable for survival of family.

Estimates of observed probabilities of employment and nondiscriminatory probabilities of employment are shown in Table 5. The difference between nondiscriminatory and discriminatory probabilities to be employed equals 0.02% and results in 2.45 thousand fewer women working, and difference of 2.42% gives 308.5 thousand men additionally employed. The lower and upper bounds for discriminatory differential in probability of employment are -0.1% and 2.5% for women and 0.46% and 4.53% for men. These values were calculated using the estimates of coefficients of wage equation and confidence intervals of means

of independent variables (excluding selection bias correction variable) in wage equation. The lower value of discriminatory differential is negative for women that means that women do not lose jobs but gain as their nondiscriminatory probability to be employed is lower than discriminatory probability. Considering this, we might make a proposition about insignificant extent of gender wage discrimination in Ukraine and its small effect on women's employment. This finding is quite unexpected as women are considered to be disproportionately hit by the transition, however, women are found to have gained after transition in such countries as Estonia and Slovenia. Data limitations do not allow conducting dynamic analysis of changes of women's position in the Ukrainian labor market.

CONCLUSIONS.

In this paper the discriminatory effect of gender wage discrimination was estimated. Discrimination results from personal prejudice, statistical prejudice, or monopoly power. Discrimination may take the forms of wage discrimination and segregation.

The method used to estimate the employment effect is based on the assumption of imperfectly elastic labor supply curve. This means that lower wages lead to the reduction of employment by the workers from the discriminated group. The wage differential was estimated to be 2.46% of the average offer male wages. The result of empirical analysis is that gender wage discrimination reduces employment of women by 0.02%, or by 2.45 thousand out of 12.25 million of women in the labor force, and men gain in employment 2.42%, or 308.5 thousand men are additionally employed. The complete withdrawal from work – employment reduction – results in the losses of income by both non-working women and working women because of the lower wages paid. However, the effect on the working hours was not calculated in this work. The total effect of gender wage discrimination can be corrected taking into consideration the effect on working hours. The consideration of lower and upper bounds of discriminatory differential of probability to be employed for women that equal -0.1% and 2.5% correspondingly bring us to the conclusion about insignificant

extent of gender wage discrimination in Ukraine. This finding might be attributed to the long history of equal participation of men and women in the market jobs before transition. However, it might be a problem of including as control variables dummies for sector of employment, occupation that might include the segregation outcome. Thus, for further research, it would be interesting to explore the other form of discrimination, segregation.

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