Closing Gender Wage Gaps in Ukraine:
Composition, Returns and the Minimum Wage

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ABSTRACT:

As Ukraine considers meeting the relatively stringent European Union standards of gender wage equality, we analyze the evolution of Ukraine's gender gaps throughout the wage distribution and assess the relative importance of two explanations: changes in the composition of the labor market and changes in returns to productive characteristics, both of which can be affected by minimum wage legislation. We find the mean gender gap is large (about 40%) and unvarying from 1986 (late communism) to 1991 (start of transition) and 1997 ("end" of transition), but that it falls to 34% by 2003 (after four years of growth), when it is nevertheless twice the mean gap for the advanced EU countries. We show that the decline in Ukraine's mean gender gap is explained by a shrinking of the gap in the bottom half of the distribution but not in the top half, where the gaps are large and persistent across the four points in time. Using the Machado and Mata (2005) decomposition method, we demonstrate that gender gaps at the top are due primarily to differences in men's and women's returns rather than differences in their composition. The decline in the gaps in the lower half of the distribution is explained by a massive decline in men's wages, driven entirely by a worsening of their returns. Women's wages in the lower half of the distribution remain more stable over time; the relative effects of changes in returns and composition differed over percentiles. We also ask to what extent minimum wage legislation played a role in closing the gap; we show that the rising minimum wage in 1997-2003 impacted women's wages more than men's and was an important factor in explaining why women's wages did not fall as much as men's wages. Although Ukraine has not yet enacted changes in its labor code, changes in its minimum wage policy are a step toward meeting the EU directive of gender equality for the lower part of the distribution; nevertheless large unwarranted pay differentials continue to exist in the remainder of the distribution.

1. **Introduction**

Together with Turkey, Ukraine is the last large European country yet to become a member of the European Union (EU). Since EU countries have a commitment to gender equality in the labor market, if it is to join the EU, Ukraine will need to pursue policies for gender equality in line with those of Western Europe.[1] Interestingly, recent studies of the EU have shown that gaps persist throughout the wage distribution (e.g., Arulampalam et al., 2007; de la Rica et al., 2005; Albrecht et al., 2003). This raises three interesting questions: How far off is Ukraine from the European benchmarks of gender wage equality? How much have the gender gaps at the top and bottom of the wage distribution changed since Soviet times, with the USSR's egalitarian ideals? Are the gaps moving in the "right" direction and if so, what is driving them?

This paper seeks to answer these questions as we present the first estimates and analysis of the gender wage gaps across the distribution of wages in any transition economy. We do so for four points in time: in 1986 (during Communism); in 1991(the beginning of transition); in 1997 (arguably the end of transition, when the economy was stabilized and poised for growth) and in 2003 (after the economy experienced a period of rapid growth in a fairly market oriented environment). We analyze the estimated gaps within each of these four years as well as their changes over time. First we examine the extent to which gender wage differentials in any year are based on different returns for men and women for a unit of the same productive characteristic (often referred to as discrimination) v. differences in the composition of men and women's labor force characteristics (in terms of individual productive characteristics or allocation across jobs). Next we ask about the relative role of changes in the labor force composition or changes in returns to productive characteristics in explaining changes in the gaps over time. We note that the returns (also referred to as prices) can be affected by institutions including formal policies (such as the EU Directives of equal pay and equal access to jobs or minimum wage legislation) and informal institutions (such as discrimination) as well

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[1]In September 2008, at an EU-Ukraine summit, Ukraine and the EU agreed to sign a future "Association Agreement" in 2009/2010. This agreement is said to "acknowledge Ukraine's European aspirations." There has been deliberation on creating a new agency or ministry focused on gender rights as well as on drafting a new law on equal opportunity. For example, the law on "Equal Rights for Women and Men and Realization of Equal Opportunities," which passed its first Parliamentary hearing in January 2005, aims to ensure the equal rights and opportunities of both genders, particularly in the areas of education, professional training, employment, entrepreneurship, and the social sector.

as market forces. We ask which of these two factors (returns or composition) is more important in explaining the evolution of the gender gap over the transition period (1986-1997) as well as the more recent growth period (1997-2003). Finally, we delve further into the analysis of the change in prices to examine more closely whether changes in minimum wage legislation had an effect on the evolution of the gender gap through its effect on wages.

We estimate quantile regressions and counterfactual kernel density functions with the Machado and Mata (2005) – henceforth MM -- decomposition method using household data from the 2003 Ukrainian Longitudinal Monitoring Survey (ULMS) and find that: a) the gaps in the upper half of the distribution are much larger than the gaps in the lower half in all four points in time; b) the mean gap is large and constant (between 38%-41%) in the first three points in time, but it falls in 2003 (to 34%); these gaps are more than twice the average for eight EU countries in 1995-2001; c) the decline in the mean is explained by a shrinking of the gap in the bottom half of the distribution and not in the top half, where the gaps are large and persistent across all points in time; the gap in the bottom part of the distribution in 2003 is similar to the average for the eight EU countries but the gap at the top is three times as large; d) the wage gaps are due primarily and doggedly to differences in men's and women's prices rather than differences in their composition; e) the decline in the gaps in the lower half of the distribution arises because of relatively large declines in men's wages, driven entirely by a worsening in their prices; and women's wages, prices and composition changed relatively little over time.

Although Ukraine has not taken steps to comply with EU Directives of equal treatment for men and women in the labor market by enacting changes in its labor code, it has increased minimum wages dramatically (doubling them over the 1998-2003 period). Given women tend to have lower wages, minimum wages can impact women's wages more than men's wages. Hence, we evaluate to what extent minimum wage policy affected the relative prices of men's and women's labor. Our analysis shows that this policy is an important reason the gap at the bottom of the overall distribution fell from 1997 to 2003. Increases in the minimum wage over this period maintained a wage floor for women and had little to no effect on men's wages.

The paper is structured as follows: Ukraine's transition experience is described in Section 2; a brief review of the literature is presented in Section 3; an explanation of the data source is found in Section 4; estimates of the raw wage gaps are described and analyzed with counterfactuals in Section 5; the impact of the minimum wage on the gender gap is evaluated in Section 6; conclusions follow in Section 7.

2. Elements of Ukraine's Transition and Labor Market Policies

We have selected the four points in time – 1986, 1991, 1997 and 2003 – in order to capture the evolution of gender gaps as Ukraine transitioned from a socialist (1986) to a market economy (2003). Here we briefly outline important institutional reforms and macroeconomic indicators about this period to elucidate why these dates are selected for the analysis. We also highlight features of the labor code that will need to be reformed if Ukraine wishes to obtain membership in the EU.

Although Gorbachev took the first steps in liberalizing the centrally planned economy with *perestroika* in 1985, true transformation only began after Ukraine's independence from the USSR in August 1991. Hence this year marks the beginning of the transition to markets and the start of reforms. (See Table 1 for the key policy changes and the timing of reforms.) Many reforms were gradual, e.g., price liberalization began in 1992 but was not completed until 1995. The privatization process was initiated in 1992 with medium and large enterprises privatized through buyouts by managers and employees, and by 2003 the privatization process was nearly complete with only the largest enterprises remaining to be privatized (Elborgh-Woytek and Lewis, 2002).

Ukraine, as most of the countries of the Commonwealth of Independent States, suffered a severe recession at the end of socialism and as it transitioned to a market economy. GDP declined almost every year between 1986 and 1998. In 1991, Ukraine's economy was shrinking at a rate of 10 percent; the trough was hit in 1994 when GDP growth was -20 percent. From 1997 to 1999 the economy stabilized and during 2000-2003 it experienced strong growth. According to Ukraine's National Bank, inflation was over 390 percent in 1991 and rose to 2,000 percent in 1992 and over 10,000 percent in 1993, before it fell to 500 percent in 1994. In

1997 inflation was tamed to below 5 percent and remained stabilized at this rate through 2003. Another indication of the tumultuous macroeconomic environment is the fact that there were three currencies in use during our period of study: *Roubles* were used at the time of our first two observations (December 1986 and December 1991); in January of 1992, *karbovanets* were introduced, and then in 1996 the currency used to this day – *hryvnia* – was introduced.

Policies to liberalize the labor market lagged behind other reforms during this period. The government did fully liberalize wage setting by 2003.[2] However, despite interest in achieving membership in the EU, Ukraine has not taken steps to revise its Labor Code to be in compliance with the *Acquis Communautaire* (Community Law). In order to enter the EU, stage I measures require that the country complies with the contents of Directives 75/117/EEC and 76/202/EEC, which contain provisions on (i) equal pay and (ii) equal treatment for men and women in access to jobs, promotion, training and working conditions. As of 2003 (the last year of our analysis), Ukraine's labor code contained a significant amount of legislation which treated women differently. Chapter XII, specifically on women's labor, included provisions prohibiting employment of women in certain occupations and in night work[3] and generous leaves of absence for pregnancy, childbirth and child-caring (e.g., 70 days prior to giving birth). Women were given the opportunity to take a leave-of-absence from work for child-caring until their child was three years old, during which they were eligible for state pension benefits. The labor code also forbade pregnant women and women with children under the age of three from night work, over-time work, and work on weekends. Constraints were also imposed on over-time work and out-of-town business trips for women with young or disabled children (ILO, 2009). Although meant to protect women, these laws harm their access to various job opportunities.

Ukraine is in the process of changing its labor code to meet the EU standards. A new code, still under consideration as of early 2009, includes Article 4 on the "prohibition of

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[2] The exception being that throughout the period the Ukrainian government required compliance with a minimum wage, which will be described in more detail in Section 6.

[3] Prohibitions include strenuous occupations, occupations with harmful or dangerous conditions, and underground work. Women are also not allowed to lift or carry objects with a weight exceeding a certain limit. A list of dangerous and harmful occupations, as well as the weight limits for objects, is provided by the Ministry of Health. The list of the sectors of economy and occupations where night work is allowed is provided by the Cabinet of Ministers of Ukraine.

discrimination in the area of labor," which among other forms of discrimination prohibits discrimination based on sex. Gender discrimination is also specifically prohibited in Ukraine's Constitution under Article 24, which guarantees freedom from all forms of discrimination, including on the basis of sex (Minnesota Advocates for Human Rights, 2005). However, according to Human Rights Watch (2003), gender discrimination in hiring was still a problem in 2002-2003. For example, vacancy announcements, especially for high-level and high-paid positions, often specified male candidates. They point out that the state employment centers had gender-specific listings among their posted vacancies (not uncommon in the countries of the former Soviet bloc during the 1990s). Such discriminatory practices would suggest that there may have been discrimination in wage setting as well. Hence, in order to comply with the EU guidelines on equal opportunities, the Ukrainian government will need to significantly revise its Labor Code, as did the eight countries of the former communist bloc which entered the EU in 2004. Such revisions will need to include the introduction of the principle of equal compensation for jobs of the same value (and ensuring the enforcement of this principle) and the prohibition of discrimination in advertisements of jobs.

3. Cursory Review of the Literature and Our Contribution

There is a large body of research dealing with the extent to which the gap between men's and women's wages has grown in the transition countries as the market-based economies replaced the planned economies, although no paper has examined Ukrainian gender wage gaps. This literature was motivated by an interest in whether or not the market-based system would create wider gender differentials than the (egalitarian) socialist system or perhaps smaller differentials, if competition from markets was effective. The evidence generated by this research is inconclusive. At one end, Pastore and Verashchagina (2007) and Brainerd (2000) show the mean gender gap increased substantially in Belarus, Russia and Ukraine from communism to transition. On the other hand, Orazem and Vodopivec (1995) find that the gender gap fell (three log points) in Slovenia during early transition and Brainerd (2000) finds that it fell in the Central and East European countries.[4] In their study of sixteen transition

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[4] She finds the gender gap grew by 0.27 log points in Ukraine and by 0.15 log points in Russia, whereas it declined between 0.03 and 0.14 points in the Czech Republic, Hungary, Poland, Slovakia and Slovenia.

economies, Newell and Reilly (2001) conclude that the average gender gap did not exhibit an upward tendency over the 1990s.

Numerous studies have tried to find explanations for these changes in the mean gender gaps over time. While they focus on specific factors associated with the transition that may have affected these gaps either through changes in returns or changes in composition, none has yet examined the relative importance of these two overarching explanations. For example, Joliffe's (2002) analysis of Bulgaria, or Joliffe and Campos' (2005) analysis of Hungary focused on changes in the level of discrimination. The role of relative changes in returns to human capital has been examined by Münich, Svejnar and Terrell (2005b) and Liu et al. (2000), among others. With the enormous structural changes in these economies, it is natural to focus on changes in the composition of the labor force. The effect of changes in occupational segmentation can be found in Jurajda's 2003 study of the Czech Republic and Ogloblin's 1999 study of Russia. Hunt (2002) shows that in East Germany, the 10-point decrease in the gender wage gap was driven largely by decreases in employment among low-skilled women relative to men. Orazem and Vodopivec (1995) indicate that the improvement in women's relative wages was due in part from the fact that women were in economic activities (sectors) that benefited from transition. Others have examined the relative impact of specific factors of the transition process, such as privatization, on men's and women's wages (Brainerd, 2002 and Münich, Svejnar and Terrell, 2005a, 2005b).

We also contribute to the literature with estimates of the effect of minimum wage legislation on the gender gap in a transition economy. Blau and Kahn (2003) provide tests for the impact of the relative level of the minimum wage on the gender gap across 22 countries, including seven transition economies from 1985-1994 (before their transition to markets was complete). They find a negative correlation between the gender gap and the "bite" of minimum wages, measured as the minimum wage as a share of the average wage.[5] We replicate their

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[5] They also find that the effect of collective bargaining agreements is significantly negative and that the effect of minimum wages become smaller and not significant when controlling for collective bargaining coverage. They recognize that it may be difficult to disentangle the effects of minimum wages and collective bargaining since the level of the minimum may be influenced by the strength of unions in influencing the political process. In Ukraine, the strength of unions in this period has been relatively weak. During Soviet times, trade unions existed under the leadership of Central Party of the Communist Party. After1991, trade unions became independent from the state,

mean test using data over seven years in Ukraine and also carry out a microeconomic analysis of the relative impact of minimum wages on men's and women's wages at different points across the distribution.

Finally, all of the studies using data from transition economies have examined only the average gender gap; none has measured and explained gender wage gaps across the distribution and their changes over time, as we do. We note however, that several recent empirical studies of countries in the EU have plotted actual and counterfactual distributions of the wage gap using the Machado and Mata (2005) methodology (see e.g., Albrecht et al., 2003; Arulampalam et al., 2007; and de la Rica, 2005). They show the existence of large gaps in the top quartile of the distribution (which they call a "glass ceiling") in many of these countries. Arulampalam et al. (2007) and de la Rica (2005) also find large gaps at the bottom of the distribution for some countries, calling this phenomenon "sticky floors." Arulampalam et al. (2007) note that the gaps across the entire distribution have not changed over time in the eleven EU countries they examine. Since these economies were more stable and experienced less structural change than the transition economies over this period, we would not expect the same outcome in Ukraine.

4. Data

We use data from the Ukrainian Longitudinal Monitoring Survey (ULMS), the first nationally representative longitudinal survey of households, administered from April 11 until June 30, 2003. It contains demographic information on 4,056 households and 8,621 individuals as well as retrospective data on the characteristics of the jobs held by each member of the household in 1986, 1991, and each year during 1997-2003.[6] We use the information on both the workers' demographic characteristics and the characteristics of their main job in the reference week of each year. We use wage data from the ULMS question on the "net contractual monthly salary" for a main job.[7] Since we limit our analysis to changes in the wage

and have increasingly played a greater role in collective bargaining. However, their influence on the political process, and the setting of the minimum wage, appears to have been minimal.
[6] While there were subsequent waves of the ULMS collected after 2003, there was considerable attrition in these waves. Moreover, as noted earlier, 2003 marked the end of Ukraine's first period of economic growth since Independence.
[7] Net contractual salary does not include taxes but perhaps more important for the environment in this period is that it also does not include wage arrears. We do not exclude much information by concentrating on the main job since only approximately 2 percent of the 1986 and 2003 samples reported having a second job.

gap calculated within each year, we avoid conversion problems arising from the three currencies.

For the first part of our analysis, we create four cross sections (1986, 1991, 1997 and 2003) of individuals ages 15-56 who reported a monthly salary and were working full time (between 30 and 80 hours per week). We restrict the sample to full-time work (40+ hours/week) in the three later samples to be comparable with the 1986 sample since there was virtually no part-time work in 1986.[8]

Because the 1986, 1991 and 1997 data are obtained retrospectively, we must consider how representative these cross-sections are, especially in terms of the demographic structure given the problem of survival bias. Survival bias means we are unlikely to see older people in the earlier year, e.g., since the oldest individuals surveyed in 2003 are 72 years old, they would have been 56 years old in 1986. Hence we take two measures: 1) We trim the 2003 data to individuals 56 years of age; and 2) We follow Gorodnichenko and Peter (2004) and re-weight the retrospective data using new weights created from combining the 2003 sample weights with the information on the age and gender structure from the Statistical Yearbooks of the USSR, since weights are not available in the ULMS for the earlier periods.

A second concern that arises with retrospective data is the degree to which there is recall error; it can be argued that people may have had difficulty remembering their wages and employment status 11 and 16 years earlier. However, we expect the recall error to be relatively small for two reasons. Since wages set in the communist grid were clearly defined and did not change much over time, we expect them to be more easily remembered.[9] Moreover, 1986 was the year of the Chernobyl nuclear explosion and 1991 was the year of Independence, events which most Ukrainians remember vividly, and we believe that respondents are less likely to have recall lapse when they have an important event as a reference point. However we suspect that the wage data in 1991 may be a bit noisier than in the other points in time since inflation

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[8] We also include individuals working 30 hours/week if they report that this is considered full-time work at their job since this is the case for several professional occupations. We do not include individuals who reported working more than 80 hours per week, due to potential misreporting.

[9] We also note that since we use the self-reported wage as a dependent variable rather than as a regressor, we avoid the usual problem of "errors in variables" with respect to the right hand side variables.

was relatively high at this time (350%) and quite a few changes were made in Ukraine's institutions when it gained independence from the Soviet Union in August 1991.

To get a sense of the characteristics of individuals in our analytical sample, we compile summary statistics in appendix Table A1. We show in the columns in panel (a) the characteristics of the entire sample of men and women aged 15-56 in 1986, 1991, 1997 and 2003 and in panel (b) the characteristics of the analytical sample of full-time workers with no missing data. Columns in panels (c) and (d) report the characteristics of the individuals with missing wage data and who were working less than full-time in each year, respectively. As can be seen from the comparison of columns in panel (b) with columns in panels (c) and (d), the individuals excluded from the sample because of missing data or part-time work have similar characteristics to those of the full-time workers with no missing data, hence discarding them does not bias our sample on the basis of observable characteristics of age, education, etc. As mentioned previously, due to many events taking place in 1991, there is a higher percentage of individuals with missing data in this year.

Appendix Table A1 also shows large shifts in the labor force status of the working age population. In columns (e) and (f) we report the share of men (women) ages 15-56 that were unemployed or out of the labor force, respectively. The unemployment rates rose from 1 percent to 14 percent for men and from 0.5 percent to 11 percent for women over the period.[10] The share of the working age population out of the labor force, which was similar for men and women in 1986 (16-18 percent), grew substantially in 2003 and was much higher for women (37 percent) than for men (23 percent). The characteristics of the men and women who are unemployed or out of the labor force in each year are very different from the characteristics of both the working men and women and total population of men and women in the 15-56 year old age group. In general, the non-employed tend to be younger (15-19), less educated, and more likely to be unmarried.

In explaining changes in the gaps over time, we will look at differences in the composition of the men's and women's labor force as an explanatory factor. We report in Table 2 the percentage point difference in the demographic and job characteristics of men and

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[10] Our 2003 unemployment rates are very similar to the ILO estimates of overall unemployment in Ukraine.

women working full time within each of the four years. The relative decline of the share of young women (15-19) compared to men is noteworthy. Although working women always tend to be more educated than working men, after the start of transition the share of women with a secondary professional or higher education rose dramatically relative to men. As for the economic activity of their job, women are far more likely to be working in the education, health and social services sector, especially after the transition started. On the other hand, men moved more into jobs in manufacturing and utilities after 1991.

5. The Observed (Raw) Gender Gaps and Counterfactuals

5.1 Estimation of the Observed Gender Gaps

To begin our analysis, we first run OLS and quantile regressions on our pooled male and female data separately for 1986, 1991, 1997 and 2003 with no controls to estimate the raw gender gap at different points in the distribution. Using quantile regression, we can estimate the θth quantile of a random variable y (in our case, the log wage) conditional on covariates, where the θth quantile of the distribution of y_i given X_i is:[11]

$$Q_\theta(y_i \mid X_i) = X_i\beta_\theta(\theta) \qquad\qquad (1)$$

When we estimate the raw gender gap X_i is only a male dummy variable.

These estimates, presented in Table 3, reveal three notable findings. First, the mean (OLS) gap is relatively high in each year (ranging from 0.34 to 0.41) compared to Blau and Kahn's (2003) estimates of mean raw gaps in 21 countries that range from 0.14 (for Slovenia) to 0.48 (for Switzerland) and average at 0.28.[12] More important for the prospects of EU membership, the Ukrainian gaps in every year and at all points of the distribution are, with two exceptions, at least twice the corresponding average gaps for eight EU countries. (See the second panel of Table 3, calculated from Arulampalam et al., 2007). Except for the gaps at the 10th and 25th percentiles in 2003, the gaps in the Ukraine are as large as or larger than the gaps for Britain, which has the largest gaps throughout distribution among EU countries. Second, the observed mean gap in Ukraine did not change from 1986 to 1991 (when it was 0.40 and

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[11] See Koenker and Bassett (1978) and Buchinsky (1998) for a discussion of the quantile regression technique.
[12] Blau and Kahn (2003) corrected the raw gaps for differences in hours worked. In calculating the average, we excluded the log wage gap for Japan because it was such an outlier at 0.895.

0.41, respectively), during the period of communism and when there had not been much reform with *perestroika*. What is surprising is that it did not fall significantly during the first six years of transition as it was 0.38 (with a standard deviation of 0.02) in 1997. However it did decline significantly to 0.34 (with a standard deviation of .02) in 2003.[13] Third, the median gap rises over time from 0.41 in 1986 to 0.47 in 2003. The difference in the pattern of changes in mean and median gaps seems to be driven by changes in the 10th and 25th percentiles of the distribution as the gaps at the upper half of the distribution are less variable.

In Figure 1 we plot the gender log wage gaps at each percentile for each of the four years.[14] It becomes obvious that the fall in the mean gap in 2003 relative to the other years is the result of a decline in the gaps in the lower half of the distribution in 2003. What is striking is how similar the gaps are in 1986, 1991 and 1997 (albeit with some noise), especially in the bottom of the distribution. The general pattern is one of smaller gaps in the lower half of the distribution and larger gaps in the upper half. However, there is no evidence of a "glass ceiling," defined as a steep increase in the gaps at the top quarter or ten percent, as Albrecht et al. (2003) found in Sweden in 1992 and 1998. Figure 1 demonstrates for all four years a tendency for the gaps to rise from the 10th percentile to the 50th percentile and then to flatten off until the 90th percentile. Hence, the slopes in the distribution of gaps are considerably flatter in 1986, 1991 and 1997 than in 2003. The data for Europe and the U.S. (e.g., Albrecht et al., 2003; Arulampalam et al., 2007) tend to present flatter slopes in the gaps across the wage distribution, similar to those for Ukraine in the earlier years. For example, in Belgium the average 1995-2001 gap ranges from 7% to 10% in the 10th to the 75th percentile and rises to 15% in the 90th percentile. However, in Finland the gap is between 10% and 11% from the 10th to the 50th percentiles and rises to 24-27% in the 7th and 90th percentile. (See Arulampalam et al., 2007.)

We encounter several puzzles in the observed gaps which we study in the remainder of the paper: (1) Why are the mean gaps so large, especially in the first three years relative to

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[13] This falling trend is similar to Jolliffe and Campos' (2005) results for Hungary during the first years of its transition; although they found a greater decline in the observed gap over a shorter period: 0.31 in 1996 and 0.19 in 1998.

[14] The graph actually represents a three percentile moving average in order to smooth the plots.

2003 – are they explained more by differences in men's and women's returns (βs) or by differences in their composition (Xs)? (2) Why did the gaps at the bottom of the distribution fall in 2003?[15] Is this explained more by relative improvements of women's returns or their composition? (3) What explains the persistence of gender gaps in the upper half of the distribution from communism to markets? Has there been no change in relative gender prices or is it that the composition of the male and female workforce did not change in that part of the distribution?

5.2 Counterfactual Analysis

To answer these questions, we partition the observed gender gap in earnings into returns and composition components and construct counterfactuals at two different levels -- one within each year and one over time -- using the MM method. The MM method is similar to the standard Oaxaca-Blinder (OB) technique using OLS regression coefficients, however, whereas the OB method is only able to characterize the mean of the distribution, the MM method can characterize the full distribution using conditional quantile regression techniques. The impacts of changes in composition or returns on the distribution of wages are simulated under the partial equilibrium assumption that aggregate quantities of skills in the labor market do not affect skill prices.[16]

We begin by estimating equation (1) separately for men and women for each year of the four years, where X_i is now a vector of the following covariates: age (years), age^2, nationality (Ukrainian, Russian, other), education (highest level completed) and economic activity of the enterprise (ISIC at the one digit level). [17] The estimated parameters can be used to simulate the conditional distribution of y_i given X_i via an application of the probability integral

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[15] We would have expected the gaps at the bottom of the distribution to be smaller during the communist period (when there were expressed goals of gender equity and protection of the vulnerable) than during the transition to the market period (when there less protection of vulnerable groups, the government is weaker and gender equity is not yet an expressed policy goal).

[16] As Autor, Katz and Kearney (2005) point out, using evidence from DiNardo, Fortin and Lemieux (1996) for the U.S., this assumption is likely to be far from innocuous.

[17] As in most data sets, we do not have actual experience in the workplace and hence use age groups as a proxy instead. The education variable is coded as the highest level completed, which allows returns to vary by type of attainment. The education levels are defined as: less than High School, High School (through grade 11), Vocational (Technical Education), Secondary Professional (two additional years after High School), University and higher (Bachelor/Specialist/Masters/PhD). See appendix Table A1 for the means of these variables and appendix Tables A2 and A3 for the coefficients from quantile regressions for men and women, respectively.

transformation theorem: If x is a random variable with a cumulative distribution function F(x), then $F^{-1}(x) \sim U(0,1)$. Hence, for a given X_i and a random $\theta \sim U(0,1)$, $X_i\beta_\theta$ has the same distribution as y. Thus if $\theta_1, \theta_2,....\theta_n$ are drawn from a uniform (0,1) distribution, the corresponding n estimates of the conditional quantiles of wages at x_i constitute a random sample from the conditional distribution of wages given x_i. In other words, using MM, we can create a random sample from our 1986, 1991, 1997 and 2003 samples while maintaining the conditional relationship between the log wages and the covariates. With our Xs and βs generated for men and women in each year, we compute the predicted counterfactual wages , y_i $= X_i\beta(\theta),$ and construct counterfactual gaps (e.g. $\beta^M X^M - \beta^M X^F$, $\beta^M X^M - \beta^F X^M$, etc.).[18] We compare the observed gap to the counterfactual gap to learn whether the 'experiment' would lower or raise the gap.

5.3 Explaining the gender gaps within each year

Is it differences in men's and women's returns (βs) or differences in their characteristics (*Xs)* which drives the gender gaps in a given year? In Table 4 we present two counterfactual gaps at six points in the wage distribution for each of the four years (1986, 1991, 1997 and 2003). Counterfactual 1 assumes that in a given year women have men's βs, whereas Counterfactual 2 assumes that women have men's Xs.[19] The ratios of the counterfactual gaps to the observed gaps (in italics) indicate that the gender gaps would have been only 5% to 50% of the observed gap (across percentiles and years) if women had men's βs and between 85% and 127% of the observed gap if women had men's *Xs*. Hence differences in returns are far more important in explaining the gap. Moreover, whereas Counterfactual 1 lowers the gap at the bottom half of the distribution to about 10-20% of the observed gap in 1986, 1991 and 1997, it only lowers it to 35%-53% of the observed gap in 2003. Hence, in this part of the distribution, having men's βs would not help women as much in 2003 as in earlier years. Finally, when

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[18]Specifically, the counterfactual distributions are created with the following steps: We randomly draw 5000 numbers from a standard uniform distribution, U(0,1) as the quantiles we estimate. Using the male and female data for each year and sector, we estimate 5000 quantile regression coefficients $\beta(\theta_i)$ for i= 1, …, 5000*,* for men and women, i.e., $\beta^M(\theta)$ and $\beta^F(\theta)$. We generate random samples of the male and female 1986, 1991, 1997 and 2003 covariates (*Xs*) by making 5000 draws of men and women with replacement from each year.

[19] The counterfactuals are not the same as the decomposition technique used later in this paper and hence the two ratios of each counterfactual to the observed gap will not add up to one.

women are made to have the same composition as men (i.e., given men's *X*s), the gap becomes somewhat smaller in all cases except in the bottom (10th) percentile of the distribution in 1991, 1997 and 2003, when it actually increases. Hence having men's *X*s in the later years would make women worse off. It would thus appear that changes in the composition and returns for women are improving over time in the bottom half of the distribution, which helps explain the fall in the gap at the bottom in 2003 compared to earlier years (Puzzle 1).

Nevertheless, the main finding in Table 4 is that in each year both counterfactuals reduce the gender gaps across the distribution, but that the gaps would be much smaller if women were "paid as men" and only a little smaller if women's labor force characteristics "looked like men's" at each percentile.

5.4 Explaining the Change in the Gaps from 1986 to 1997 and from 1997 to 2003

To evaluate the contributions of changing labor market prices and changing composition of the labor force over time, we use both the OB-OLS and MM-quantile decomposition techniques. We compare changes over two periods: a) during the tumultuous transition to markets (1986 to 1997) [20] and b) during a period of greater stability and growth (1997 to 2003) in order to see if the roles of composition or prices changed in these two regimes, with special interest in changes in the bottom of the distribution.

Note that the change in the observed gender gap over time, using 1997-2003 as the example, can be summarized as:

$$(\beta_{03}^M X_{03}^M - \beta_{03}^F X_{03}^F) - (\beta_{97}^M X_{97}^M - \beta_{97}^F X_{97}^F) \tag{2}$$

where X represents the value of the characteristics at a point in the distribution, and the letters M and F, represent male and female, respectively. This change in the gap can be rewritten as the difference in changes in men's and women's wages over time:

$$(\beta_{03}^M X_{03}^M - \beta_{97}^M X_{97}^M) - (\beta_{03}^F X_{03}^F - \beta_{97}^F X_{97}^F) \tag{3}$$

Using standard decomposition techniques, equation (3) may be expressed as:

$$[X_{03}^M (\beta_{03}^M - \beta_{97}^M) + \beta_{97}^M (X_{03}^M - X_{97}^M)] - [X_{03}^F (\beta_{03}^F - \beta_{97}^F) + \beta_{97}^F (X_{03}^F - X_{97}^F)] \tag{4}$$

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[20] We use 1986 as the starting point, rather than the 1991, because as we noted earlier, in 1991 the data is noisier – more missing data – due to the changes in currency and regime in that year.

such that the change in the gender gap is decomposed into the following four components: the share due to changes in men's βs + share due to changes men's Xs – share due to changes in women's βs – share due to changes in women's Xs (weighted by X_{03} or $β_{97}$). However, as is well known, these four components can also be derived with the opposite weights (X_{97} and $β_{03}$). We solve the well-known "numeraire problem" in a standard fashion, i.e., by averaging the two expressions for each share.[21]

Table 5 contains the change in the raw gender gaps, change in men's and women's wages and decompositions for the 1986 – 1997 period in Panel A and the same for 1997 – 2003 in Panel B. The OLS column indicates that the mean gap fell by 1.6% from 1986 to 1997 and by 4.5% from 1997 to 2003. In both periods this decline is driven by the greater decline in men's wages than women's wages (which actually rose by a 0.5% in the second period). Moreover, in both periods the worsening of men's returns explains all (about 180%) of the decline in their mean wages, since the change in men's composition drove mean wages up over this period. For the average woman, changes in returns and composition contributed equally to the very small change in their wages. As seen in the third sub-panel for each period, the worsening of men's returns essentially explains the entire decline in the gaps within each period; improvements in men's Xs and the worsening of women's βs put some upward pressure on the change in the gaps in each period, while improvements in women's Xs also made a small contribution to the decline in the gaps.

The changes in the gaps at the mean (median and upper deciles) in each period are miniscule compared with the changes in the gaps at the bottom (10th and 25th percentiles) of the distribution. As can be seen from Table 5, the gaps in the bottom fell by about 3-4% from 1986 to 1997 and by a whopping 14-18% from 1997 to 2003. Did the roles of returns and composition change in this part of the distribution from the earlier to the later period?

Starting with the 10th percentile (first column of Table 5) we find that men's wages fell in both periods, but the decline was far greater (almost double) in the 1997-2003 period. In both periods it is the massive change in men's returns that is explaining the decline in their wages; changes in their composition were ameliorating the effect of returns somewhat (but only

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[21] See Appendix 1 for a complete derivation of the decomposition and the final expressions we use.

accounting for 25-33% of the negative impact of returns). For women we see that their wages fell slightly in the first period and rose slightly in the second (the combined effect being no change). In both periods the change in the composition improved women's wages; however, changes in returns went from a negative force in the 1986-1997 period to a positive force in the 1997-2003 period.

When we examine the relative role of each of the four components in the decomposition (in the third sub-panel of each period), we see that the change in men's βs are the most important factor explaining the fall in the gap in each period. The role of women's βs is second in importance, but switching from contributing to increasing the gap in the first period to decreasing the gap in the second period. Hence returns improved for women in the 10th percentile over time. Whereas changes in men's Xs played an important role in increasing the wage gap in the first period, they played a relatively unimportant role and tended to reduce the wage gap in the second period. Hence men's composition worsened in this percentile from one period to the next and it appears the same happened for women.

A close inspection of the changes in the 25th percentile indicate that again the greater fall in the gap in the 1997-2003 period compared with the 1986-1997 period is due to the massive decline in men's wages in the second period, as there was no change in their wages in the first period and women's wages changed relatively little (with gains in the first period being washed out by declines in the second period). Again, it is the decline in men's returns that explain the entire fall in the wage gap in each of these periods, with the role of women's returns being second in importance. We also see that the effects of women's returns and women and men's composition changes from one period to the next.

Hence we conclude from the analysis in Table 5 that the greater decline in the gap at the bottom of the distribution (10th and 25th percentile) in 1997-2003 compared to 1986-1997 is brought about by the more massive decline in men's wages as women's wages did not change much by comparison. The decomposition indicates that the lion's share of the decline in the gap in both periods is explained by the huge decline in men's returns; the portion of the decline in the gap explained by changes in women's returns and composition are smaller and their effects differed from one period to the next.

6. **Can minimum wage legislation help explain the decline in the gender gap at the bottom from 1997 to 2003?**

Next, we ask to what extent has minimum wage legislation -- one of the potentially most powerful policy tools -- contributed to the closing of the gender gaps between 1997 and 2003. Evidence consistent with this hypothesis would need to show that minimum wages increases over the period prevented women's wages from falling more than those of men.

We begin by demonstrating in Table 6 the remarkable evolution of minimum wages in Ukraine over the 1986-2003 period. The first two columns provide the nominal and real (monthly) values of the minimum wage in effect at the time of our wage data. Given minimum wages were set in three different currencies, we also show the change in the relative level over time by indicating its share of the average (total and men's and women's) wage in each year (second panel) and its point in the men's and women's distributions (third panel). It is clear that during the communist period the minimum wage was at a relatively high level (46% of the average in 1986 and 36% in 1991).[22] However, due to hyperinflation and lack of government intervention, the value of the minimum wage eroded to 8% of the average wage in 1997. From then to 2003, the minimum wage was increased rapidly, doubling in real terms from 1997 to 1998 and doubling again from 1998 to 2003 (when it rose at an annual rate between 9% and 23%).[23] Hence, whereas the minimum wage was at a point lower than the 1st percentile of the men's and women's wage distribution in 1997, it rose to the 19th and 35th percentiles, respectively, in 2003.

A simple test of whether or not higher minimum wage levels over time are correlated with lower average gender gaps in each year is presented in Figure 2. There is a negative correlation (-0.07) between the level of the minimum wage as a share of the average wage and the mean gender wage gap in each year, albeit with only seven data points. However, whereas Figure 2 shows a negative correlation, it does not indicate the mechanism by which the minimum wage might be closing the gap.

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[22] It is not clear that the minimum wages prior to the wage decree of 1992 should be treated in the same manner as minimum wages after this decree. Under communism minimum wages had a different meaning given that the entire wage structure was determined centrally by a wage grid.

[23] As seen in Table A4, the government raised the minimum wage frequently and continued to raise the minimum wage after 2003, with three increases in 2005 alone.

One way to test whether the minimum wage is more binding for women than for men is to construct kernel density estimates of their wages in 1986, 1991, 1997 and 2003 and look for spikes at the minimum wage level in each of their distributions. Figure 3 shows that minimum wages were clearly not binding for men in three of the four years; a small spike is visible only in 2003. However, for women they are binding in three of the four years, and especially in 2003, when it appears the women's wage distribution collapses on the minimum wage. Moreover, the density of women's wages at the spike around the minimum wage rises from about 0.8 in 1986 to about 0.9 in 1991 to 1.3 in 2003; the density at the minimum wage for men in 2003 is much lower. The year that minimum wages were not at all effective is 1997, when they were set within the first percentile of men's and women's wages. Finally, the data in the last two columns of Table 6 also show that the share of women earning within five percent of the minimum wage is far higher than the corresponding share of men in every year. Hence, there is some evidence that minimum wages are affecting women's wages more than men's wages.

We next test whether minimum wage increases have a greater impact on women's wages than men's wages by using the annual panel data on individuals available for the 1997-2003 period (when there was one currency in effect and inflation had subsided). We estimate the following wage equation (used by Neumark, Schweitzer and Wascher, 2004) separately for full-time working men and women:

$$\frac{W_{i,t=1} - W_{i,t=0}}{W_{i,t=0}} = \alpha_o + \sum_{j=1}^{5}\gamma_j\left(\frac{MW_{t=1} - MW_{t=0}}{MW_{t=0}}\right)(R_j) + \sum_{j=1}^{4}\delta_j(R_j) + \sum_{j=1}^{5}\pi_j\left(\frac{W_{i,t}}{MW_{t=0}}\right)(R_j)$$
$$+ \lambda X_{i,t=0} + \sigma I + \eta GDP + \mu_{Ift},$$

(5)

where the dependent variable is the percent change in the individual's nominal monthly wage from one year to the next (i.e., $W_{i,t=1}$ and $W_{i,t=0}$). The first term on the right is the percent change in the nominal minimum wage (MW) interacted with six dummies (R_j), which mark the distance between the individual's wage and the minimum wage at $t=0$.[24] The second term is

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[24] R1=1 if the individual's wage is <90% of the MW; R2=1 if the individual's wage is 91% - 110% of the MW; R3=1 if w=111-200% of the MW; R4=1 if w=201-300% of the MW; R5=1 if w=301-400% of the MW; R6=1 if w>400% of the MW.

the set of *Rj* dummies (minus one), which control for any changes in wages across the distribution of wages that may not be due to minimum wages. The third term is the interaction between the *Rj* dummies and the individual's wage relative to the minimum wage, which controls for differential wage growth within the *Rj* cells. The vector X_i includes a set of human capital variables (age and education) in the initial period. A set of dummy variables for the industry (*I*) of the person's job in the initial period control for inter-industry wage differentials. Finally, we include the GDP at *t=0* in order to control for overall demand factors which may affect wages.

The γ coefficients indicate the extent to which a percent increase in the minimum wage from one year to the next impacts the change in the individual's wage over the same time frame at different points across the wage distribution (defined by the *Rj* dummies). We see from the estimated coefficients in the first column of Table 7 that women's wages are significantly affected by minimum wages throughout the distribution; the magnitude of the coefficient is largest for women whose wages are either within five percent of the minimum wage or below 90 percent of the minimum wage. On the other hand, the γ coefficients estimated for the male sample are generally not significantly different from zero. The only significant coefficient is for men earning within five percent of the minimum wage. Hence, we conclude that minimum wage increases are boosting women's wages more than men's wages, especially at the bottom of the wage distribution.[25]

7. Conclusion

We analyze the gender wage gap across the distribution in Ukraine, as the country moves toward possible European Union membership, and uncover several interesting patterns: the raw mean gender gap remains at about 0.40 during communism from 1986 to 1991, falls two percentage points during the transition to 0.38 in 1997 and declines substantially to 0.34 in 2003, as the economy begins to grow. The decline in the mean gap is driven by a decrease in the gaps in the lower part of the distribution. The gaps in the upper part persist in all four years

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[25] Given the significant wage effects on women, we also carried out an analysis of the impact of the minimum wage on employment of women using a specification similar to equation (5) but where the dependent variable is equal to 0 if she remains employed and 1 if she becomes unemployed or leaves the labor force. We did not find any significant employment effects.

and are substantially larger than the gaps in the lower half of the distribution in all four years. A comparison with estimates for eight advanced EU countries indicates that Ukraine's gaps are relatively high throughout the distribution, and especially in the upper half of the distribution.

Using Machado and Mata (2005) counterfactual methods, we find that differences in men's and women's returns explain the lion's share of the difference in wages at every point in the distribution. The most important factor explaining the decline in the mean gap over time is the large decline in men's wages, which is driven by a worsening of men's returns. Women's mean wages are fairly stable over these three points in time. The decomposition analysis indicates that among the four components, it is a decline in men's returns that is the most important explanatory factor. Changes in women's returns were second in importance, but their effect differed for the 10th and the 25th percentile.

The 4.5% fall in the mean gap from 1997 to 2003 is driven by a large fall in the gap at the bottom of the distribution -- driven primarily by sizable declines in men's wages and relatively little change in women's wages. What may have kept women's wages from falling as much as men's wages, especially at the bottom of the distribution? Women were disadvantaged by the labor code in effect during this period and there is evidence of discrimination in hiring practices. On the other hand, the government did increase the minimum wage significantly during 1997-2003 and we provide evidence that this policy affected the wages of women more than the wages of men, since few men had very low wages.

The gender wage gap will be an important measure of gender equality in Ukraine as it begins its bid to join the EU. Our findings suggest that the Ukrainian government take note of the persistence of discrimination in the rewards to women's work, especially at the top half of the distribution, and of the impact that policies and institutions such as the minimum wage can have on women's wages at the bottom of the distribution. Judicious use of minimum wage policy in the future may advance the goal of closing the gender gap at the bottom but other policy instruments and changes in incentives are necessary at the top of the distribution.

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Appendix 1: Decomposition of Change in Gender Gap over Time

Observed 2003 gender wage gap – Observed 1997 gender wage gap:

(Men's 2003 Wage – Women's 2003 Wage)–(Men's 1997 Wage – Women's 1997 Wage) (A1)

$$= (\beta_{03}^M X_{03}^M - \beta_{03}^F X_{03}^F) - (\beta_{97}^M X_{97}^M - \beta_{97}^F X_{97}^F) \tag{A2}$$

where X represents the mean value of the characteristics at a point in the distribution, and the letters M and F, represent male and female, respectively.

Rewrite the change in the gap as Men's and Women's changes over time:

$$(\beta_{03}^M X_{03}^M - \beta_{97}^M X_{97}^M) - (\beta_{03}^F X_{03}^F - \beta_{97}^F X_{97}^F) \tag{A3}$$

Using the Oaxaca-Blinder decomposition method for both men and women, this can be rewritten as:

$$[(\beta_{03}^M X_{03}^M - \beta_{97}^M X_{97}^M) + (\beta_{97}^M X_{03}^M - \beta_{97}^M X_{97}^M)] - [(\beta_{03}^F X_{03}^F) - (\beta_{97}^F X_{03}^M) + (\beta_{97}^F X_{03}^F - \beta_{97}^F X_{97}^F)] \tag{A4}$$

$$= [X_{03}^M (\beta_{03}^M - \beta_{97}^M) + \beta_{97}^M (X_{03}^M - X_{97}^M)] - [X_{03}^F (\beta_{03}^F - \beta_{97}^F) + \beta_{97}^F (X_{03}^F - X_{97}^F)]$$

= diff due to men's βs + diff due to men's Xs – [diff due to women's βs + diff due to women's Xs]

The decomposition can also be rewritten as:

$$[(\beta_{03}^M X_{03}^M - \beta_{03}^M X_{97}^M) + (\beta_{03}^M X_{97}^M - \beta_{97}^M X_{97}^M)] - [(\beta_{03}^F X_{03}^F) - (\beta_{03}^F X_{97}^F) + (\beta_{03}^F X_{97}^F - \beta_{97}^F X_{97}^F)]$$
$$= [\beta_{03}^M (X_{03}^M - X_{97}^M) + X_{97}^M (\beta_{03}^M - \beta_{07}^M)] - [\beta_{03}^F (X_{03}^F - X_{97}^F) + X_{97}^F (\beta_{03}^F - \beta_{97}^F)]$$

= diff due to men's Xs + diff due to men's βs – [diff due to women's Xs + diff due to women's βs]

To overcome the numeraire problem, we follow the usual procedure of averaging the two:

Averaging the difference due to men's βs in the two decompositions:
$$[X_{03}^M (\beta_{03}^M - \beta_{97}^M) + X_{97}^M (\beta_{03}^M - \beta_{97}^M)]/2 = [\beta_{03}^M X_{03}^M - \beta_{97}^M X_{03}^M + \beta_{03}^M X_{97}^M - \beta_{97}^M X_{97}^M]/2$$

Averaging the differences due to men's Xs in the two decompositions:
$$(\beta_{97}^M X_{03}^M - \beta_{97}^M X_{97}^M + \beta_{03}^M X_{03}^M - \beta_{03}^M X_{97}^M)/2$$

Averaging the differences due to women's βs in the two decompositions:
$$(-\beta_{03}^F X_{03}^F + \beta_{97}^F X_{03}^M - \beta_{03}^F X_{97}^F + \beta_{97}^F X_{97}^F)/2$$

Averaging the differences due to women's Xs in the two decompositions:
$$(-\beta_{97}^F X_{03}^F + \beta_{97}^F X_{97}^F - \beta_{03}^F X_{03}^F + \beta_{03}^F X_{97}^F)/2$$

Table 1: Policy Timeline

1985	Beginning of *perestroika*.
1986	Wage reforms introduced in goods sectors.
1990	Ukrainian Council of Ministers formulates a "Program for Transition to a Market Economy" (Nov.)
1991	Independence from the USSR (Aug.)
	Nationalization of all USSR property in Ukraine (Sept.)
	Employment Act passes (legitimizes unemployment)
	Creation of State Employment Service, Employment Fund
	Decentralization of wage system. Centralized wage grid still used as a benchmark to ensure wage differentials.
1992	Initial price liberalization (Jan.)
	Small- and large-scale privatization begins
	Karbovanets (interim currency) introduced
	Reintroduction of centralized of wage regulation with centralized wage grid
	"Wage Decree" establishes a minimum wage to be determined by prices of 70 goods needed for 'subsistence.'
1993	Income-tax law adopted.
	Law on Collective Contracts and Agreements establishes legal grounds for collective bargaining.
	General Wage Agreement sets wage coefficients for different categories of workers and sectors based on the minimum wage.
1995	Most prices liberalized
	Voucher privatization begins
	Most export quotas and licenses abolished
	New Law on Wages adopted, strengthening the role of bargaining in setting wages.
1996	New currency (Hryvnia) introduced
	Constitution adopted, including Article 24, which prohibits gender discrimination.
1999	New "Subsistence Minimum" law sets a new official minimum consumption basket[1]
2000	Significant reforms introduced in areas of government decision-making, budget, tax, land, and energy sector.[2]
2004	Draft of new Labor Code passed second Parliamentary hearing.
2005	Draft law "Equal Rights for Women and Men and Realization of Equal Opportunities" passed first Parliamentary hearing.

Sources: Aslund (2002), Chapman (1991), EBRD (1999), and ILO (1995,1998).

[1]This method was later suspended. Now, the Cabinet of the Minister decides the minimum wage, which must be approved by Parliament.

[2]Binding at all levels of contractual regulation of wages, as agreed by the Cabinet of Ministers and 12 trade union associations. See Aslund (2002) for discussion of these reforms.

Table 2: Percentage Point Differences in Men's and Women's Labor Force Composition in Each Year

	Men-Women			
	'86	**'91**	**'97**	**'03**
Age				
15-19	-1.3	-2.1	-0.2	1.4
20-29	8.3	4.9	4.0	7.8
30-39	0.7	1.0	-0.7	-1.3
40-49	-6.1	-1.5	-3.1	-6.5
50-56	-3.1	-2.3	0.0	-1.5
Education Levels				
Less than High School	-2.4	-2.5	1.2	2.2
High School	1.1	-0.5	2.9	4.2
Vocational	13.3	10.4	11.9	11.3
Secondary Professional	-8.6	-8.1	-11.8	-11.4
Higher Education	-1.3	0.0	-4.2	-6.3
Nationality				
Ukrainian	0.6	1.0	1.1	-0.5
Russian	-0.9	-0.7	-1.1	-0.8
Other (Including Belorussian, Jewish)	0.4	-0.3	0.1	1.4
Activity of Enterprise				
%Agriculture, Hunting & Forestry	4.8	2.6	5.0	3.3
%Manufacturing & Mining	8.2	6.1	10.5	11.6
%Elec, Gas, Water & Construction	4.9	6.1	8.1	10.2
%Transport, Communic. & Financial [2]	-1.6	2.1	-2.6	1.4
%Public Admin. & Defense	2.4	1.6	2.3	1.6
%Education, Health & Social Work	-17.3	-17.0	-23.4	-25.4
%Other	-1.4	-1.4	0.2	-2.8

[1] Includes Wholesale/Retail Trade, Repair of Motor Vehicles/Motorcycles; Hotels & Restaurants; Transport, Storage & Communication; Financial Intermediation, Real Estate, Renting & Business Activities.

[2] Includes Other Community, Social and Personal Service Activities.

Note: Using sample weights.

Table 3: Observed Log Wage Gender Gaps in Ukraine and the EU

Ukraine	10	25	50	75	90	Mean
1986	0.288	0.368	0.405	0.446	0.464	0.397
	(0.022)	*(0.019)*	*(0.000)*	*(0.000)*	*(0.060)*	*(0.015)*
1991	0.223	0.405	0.439	0.511	0.470	0.411
	(0.000)	*(0.000)*	*(0.000)*	*(0.000)*	*(0.038)*	*(0.021)*
1997	0.248	0.336	0.431	0.511	0.470	0.381
	(0.034)	*(0.000)*	*(0.000)*	*(0.024)*	*(0.036)*	*(0.022)*
2003	0.069	0.192	0.470	0.504	0.442	0.336
	(0.033)	*(0.013)*	*(0.033)*	*(0.003)*	*(0.048)*	*(0.022)*

Note: Boostrapped standard errors in parentheses.

1995-2001 Avg., Selected EU Cointries	10	25	50	75	90	Mean
Britain	0.238	0.248	0.234	0.248	0.252	0.246
France	0.136	0.127	0.113	0.122	0.139	0.142
Italy	0.089	0.072	0.054	0.037	0.028	0.063
Avg. for 8 EU Co.[1]	**0.167**	**0.153**	**0.146**	**0.156**	**0.174**	**0.166**

[1]Authors' calculations based on Table 1 in Aralampulam et al. (2007). The eight countries are: Austria, Belgium, Britain, Denmark, Finland, France, Germany, Ireleand, Italy, Netherland and Spain.

Table 4: Within Year Counterfactual Gaps

	10	25	50	75	90	Mean
1986						
Gap with Counterfactual 1 ($\beta^M X^M - \beta^M X^F$)	0.074	0.078	0.042	0.051	0.046	0.059
Gap with Counterfactual 2 ($\beta^M X^M - \beta^F X^M$)	0.251	0.321	0.348	0.346	0.344	0.336
Counterfactual 1/observed	*0.256*	*0.213*	*0.105*	*0.113*	*0.100*	*0.148*
Counterfactual 2/observed	*0.874*	*0.872*	*0.859*	*0.775*	*0.740*	*0.846*
1991						
Gap with Counterfactual 1 ($\beta^M X^M - \beta^M X^F$)	0.047	0.042	0.065	0.057	0.078	0.058
Gap with Counterfactual 2 ($\beta^M X^M - \beta^F X^M$)	0.254	0.304	0.342	0.348	0.391	0.343
Counterfactual 1/observed	*0.213*	*0.104*	*0.148*	*0.111*	*0.166*	*0.141*
Counterfactual 2/observed	*1.139*	*0.750*	*0.780*	*0.682*	*0.831*	*0.834*
1997						
Gap with Counterfactual 1 ($\beta^M X^M - \beta^M X^F$)	0.048	0.072	0.084	0.105	0.134	0.088
Gap with Counterfactual 2 ($\beta^M X^M - \beta^F X^M$)	0.256	0.296	0.366	0.385	0.359	0.341
Counterfactual 1/observed	*0.194*	*0.213*	*0.196*	*0.206*	*0.284*	*0.230*
Counterfactual 2/observed	*1.029*	*0.881*	*0.849*	*0.754*	*0.764*	*0.897*
2003						
Gap with Counterfactual 1 ($\beta^M X^M - \beta^M X^F$)	0.030	0.101	0.167	0.122	0.083	0.100
Gap with Counterfactual 2 ($\beta^M X^M - \beta^F X^M$)	0.088	0.170	0.346	0.363	0.343	0.266
Counterfactual 1/observed	*0.437*	*0.526*	*0.355*	*0.242*	*0.188*	*0.299*
Counterfactual 2/observed	*1.274*	*0.882*	*0.737*	*0.720*	*0.776*	*0.791*

Observed gaps are estimated from a quantile or OLS regression with no controls and using sample weights. Standard errors are in parentheses.
The counterfactuals are estimated using the Machado-Mata approach, with separate quantile regressions and separate random samples generated from covariates for men and women in each sector.

Counterfactual 1 assumes women have men's βs

Counterfactual 2 assumes women have men's Xs

Table 5: Decomposition of the Change in Wage Gaps from 1986 to 1997 and 1997 to 2003

Panel A: 1997 - 1986	10	25	50	75	90	Mean
Change in Gender Gap	**-0.039**	**-0.031**	**0.025**	**0.065**	**0.006**	**-0.016**
Change in Men's Wages	**-0.074**	**0.000**	**0.031**	**0.108**	**0.059**	**-0.020**
share due to change in men's βs	1.395	0.995	0.288	0.634	0.713	1.778
share due to change in men's Xs	-0.395	-0.994	0.712	0.366	0.287	-0.778
Change in Women's Wages	**-0.035**	**0.031**	**0.006**	**0.044**	**0.054**	**-0.003**
share due to change in women's βs	1.027	0.441	0.587	0.526	1.043	3.420
share due to change in women's Xs	-0.027	0.559	0.413	0.474	-0.043	-2.420
Share of Change in Gap Explained by:						
change in Men's βs	2.638	0.996	0.355	1.063	7.432	2.140
change in Men's Xs	-0.748	-0.994	0.878	0.613	2.991	-0.936
change in Women's βs	-0.915	0.440	-0.137	-0.355	-9.828	-0.698
change in Women's Xs	0.024	0.559	-0.096	-0.321	0.405	0.494
sum of shares:	1.000	1.000	1.000	1.000	1.000	1.000

Panel B: 2003-1997	10	25	50	75	90	Mean
Change in Gender Gap	**-0.179**	**-0.144**	**0.039**	**-0.007**	**-0.028**	**-0.045**
Change in Men's Wages	**-0.136**	**-0.185**	**-0.071**	**-0.031**	**0.018**	**-0.040**
share due to change in men's βs	1.267	1.103	1.077	0.561	1.744	1.847
share due to change in men's Xs	-0.267	-0.103	-0.077	0.439	-0.744	-0.847
Change in Women's Wages	**0.043**	**-0.041**	**-0.111**	**-0.024**	**0.046**	**0.005**
share due to change in women's βs	0.328	1.146	0.790	0.901	0.592	-2.077
share due to change in women's Xs	0.672	-0.146	0.210	0.099	0.408	3.077
Share of Change in Gap Explained by:						
change in Men's βs	0.660	1.230	-1.534	-2.149	0.025	1.254
change in Men's Xs	0.098	0.052	-0.288	6.757	-0.670	-0.368
change in Women's βs	0.342	-0.177	2.812	-5.324	-0.099	-0.226
change in Women's Xs	-0.100	-0.106	0.010	1.716	1.744	0.340
sum of shares	1.000	1.000	1.000	1.000	1.000	1.000

Table 6: Evolution of the Minimum Wage (MW); Location of the MW in the Distribution of Wages; and the Share of Workers Earning the MW

Year	Monthly Minimum Wage (December Values)		MW/Mean Wage			Location of MW: Percentile		Share whose wage is 95%-105% of MW	
	Real[1]	Nominal	Total	Men	Women	Men	Women	Men	Women
1986	n.a.	80 Roubles	0.46	0.36	0.58	3	12	2.96	11.65
1991	n.a	185 Karb (80 Roubles)	0.36	0.29	0.45	3	8	1.92	7.64
1997	0.383	15 UAH	0.08	0.07	0.10	<1	<1	0.00	0.14
1998	1.271	55 UAH	0.27	0.22	0.34	3	3	0.54	1.53
1999	1.394	74 UAH	0.33	0.27	0.41	3	4	1.14	3.32
2000	1.548	90 UAH	0.48	0.39	0.60	3	5	2.88	9.89
2001	1.733	118 UAH	0.44	0.36	0.55	6	10	3.04	6.53
2002	2.149	165 UAH	0.55	0.46	0.68	15	31	7.64	16.07
2003	2.290	185 UAH	0.59	0.49	0.71	19	35	11.38	22.40

[1]In 1997 constant prices.

Source: Minimum wages were taken from Ukrainian Minimum Wages Decrees; calculations based on ULMS, 2003.

Table 7: Wage Effect of Minimum Wages throughout the Distribution of Wages

Depen. Var.: Δ wage	Women	Men
R1 x Δ MW	0.684***	1.108
	(0.193)	(1.862)
R2 x Δ MW	1.062***	0.878*
	(0.248)	(0.484)
R3 x Δ MW	0.278**	-0.013
	(0.112)	(0.035)
R4 x Δ MW	0.097**	0.363
	(0.047)	(0.227)
R5 x Δ MW	0.191***	0.005
	(0.065)	(0.032)
R6 x Δ MW	0.018**	0.026
	(0.009)	(0.018)
R1	-1.474***	-2.650*
	(0.546)	(1.466)
R2	-1.470***	-2.636*
	(0.449)	(1.382)
R3	-1.496***	-2.572*
	(0.454)	(1.386)
R4	-1.367***	-2.690**
	(0.490)	(1.356)
R5	-1.547***	-2.748**
	(0.448)	(1.395)
Observations	5932	5092
R-squared	0.16	0.07

See Eqn. (5) in text for full specification. OLS estimates on wage earners (excludes self-employed) in 1997-2003. All regressions control for age (5 dummies), education (4 dummies), industry (7 dummies) annual GDP and a set of Rj dummies interacted with the individual's wage relative to the minimum wage.
Robust standard errors in parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%

KEY:

R1 = 1 if W < 90% of MW

R2 = 1 if W = 91-110% of MW

R3 = 1 if W = 111-200% of MW

R4 = 1 if W = 201-300% of MW

R5 = 1 if W = 301-400% of MW

R6 = 1 if W = 400%+ of MW

Figure 1: Gender gaps Across the Distribution for 1986, 1991, 1997 and 2003
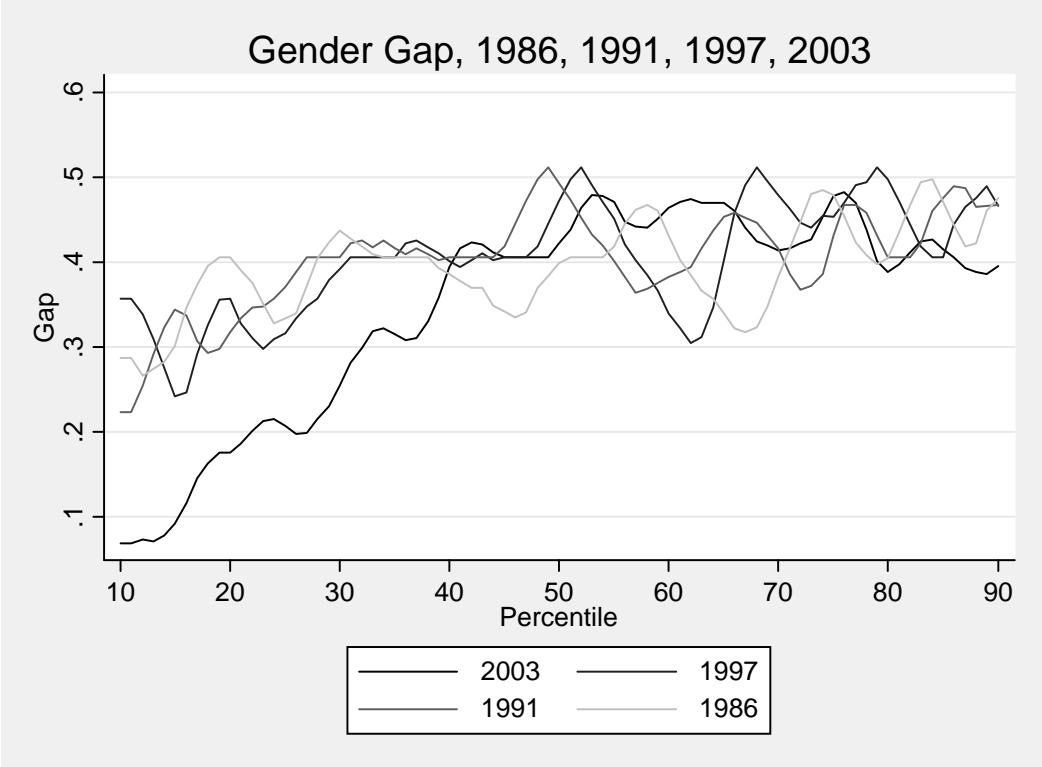
Note: Moving average over three percentiles

Figure 2: Correlation between the Mean Log Gender Gap and MW/W
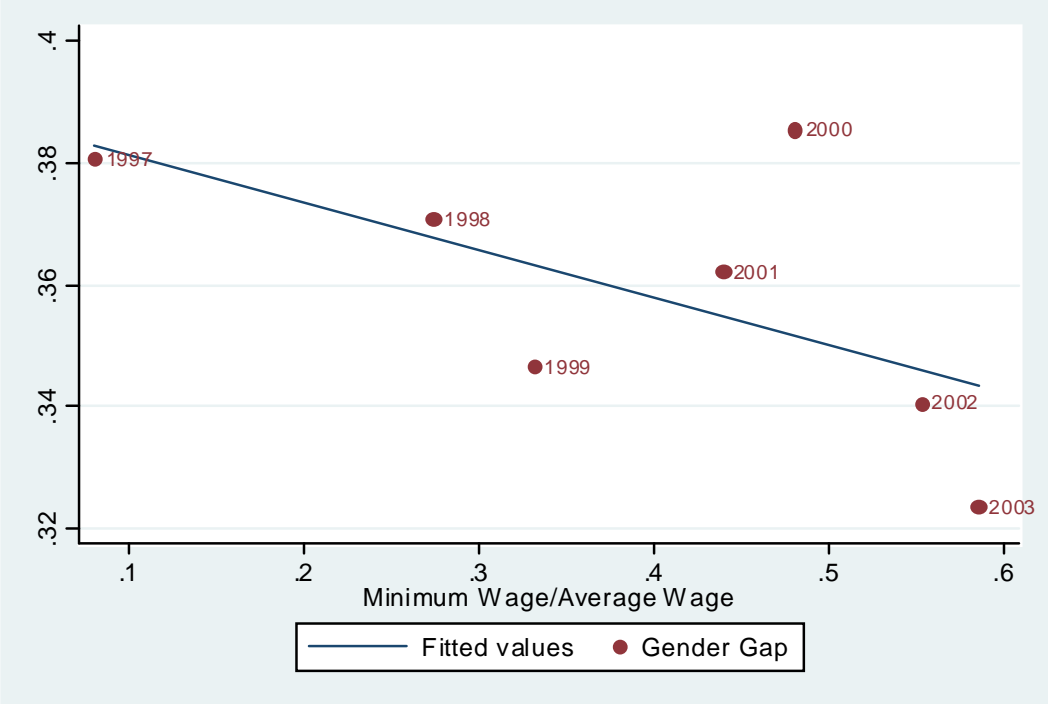
Table A1: Sample Selection (Using Sample Weights)

	Total Sample, 15-56 (a)				Analytical Sample Employed FT[1] (b)				Missing Wage/Empl. Info (c)			Employed PT (d)			Unemployed (Job-Seeking) (e)			Out of LF (f)		
	86	*91*	*97*	*03*	*86*	*91*	*97*	*03*	*86*	*91*	*03*	*86*	*91*	*03*	*86*	*91*	*03*	*86*	*91*	*03*
MEN																				
Observations	2451	2600	2640	2843	1684	1450	1113	1355	337	675	307	26	29	110	22	56	410	382	390	661
% Total Sample, age 15-56	100%	100%	100%	100%	69%	56%	42%	48%	14%	26%	11%	1%	1%	4%	1%	2%	14%	16%	15%	23%
Age																				
15-19	17.6	15.1	14.2	16.1	2.2	3.1	2.8	2.9	5.1	3.4	4.0	0.0	0.0	9.6	56.5	40.2	10.2	71.0	64.7	52.4
20-29	32.9	25.4	24.2	24.2	36.2	27.1	26.7	27.4	34.8	27.0	27.4	45.5	20.1	18.9	29.8	21.6	30.0	21.4	18.7	13.8
30-39	24.3	26.4	25.7	20.9	31.3	31.3	30.4	24.7	27.6	32.0	26.3	40.7	43.1	21.3	10.4	23.2	24.7	1.0	3.7	8.4
40-49	14.8	19.0	24.3	23.7	18.6	22.6	27.7	28.4	19.4	22.8	27.7	13.8	32.9	31.1	3.3	11.5	24.3	1.0	3.3	11.2
50-56	10.3	14.1	11.6	15.1	11.7	16.0	12.5	16.5	13.2	14.8	14.7	0.0	4.0	19.2	0.0	3.5	10.9	5.6	9.5	14.3
Education Levels																				
Less than High School	20.4	16.7	12.8	15.0	12.7	9.6	6.0	4.8	17.1	11.2	7.7	5.9	0.0	7.5	35.2	31.9	9.0	45.9	44.4	43.4
High School	27.4	25.6	26.5	24.3	26.9	25.1	25.1	22.7	24.2	25.1	26.2	38.0	37.2	20.4	22.1	33.0	25.7	30.6	26.3	26.5
Vocational	26.8	28.7	29.9	30.3	29.4	31.0	32.7	33.4	28.4	32.2	30.3	32.1	39.5	37.4	37.8	20.3	41.3	17.0	17.4	16.4
Secondary Professional	14.9	17.0	18.1	17.4	18.0	19.6	21.1	21.9	16.4	17.9	18.3	14.2	13.1	16.3	2.3	11.1	16.1	5.4	9.2	8.8
Higher Education	10.5	11.9	12.8	13.1	13.1	14.6	15.3	17.2	13.8	13.7	17.4	9.8	10.1	18.4	2.6	3.7	8.0	1.2	2.8	4.9
Nationality																				
Ukrainian	78.5	77.7	77.4	79.2	78.2	78.7	78.4	77.9	78.2	76.2	79.2	97.5	89.3	83.0	78.6	68.3	79.2	78.5	77.2	81.4
Russian	18.1	18.5	18.1	16.7	18.3	18.0	17.5	17.5	17.5	18.5	16.4	2.5	7.2	11.4	13.5	18.3	18.3	19.0	20.4	14.9
Other (Including Belorussian, Jewish)	3.5	3.9	4.5	4.1	3.6	3.3	4.2	4.6	4.3	5.3	4.4	0.0	3.5	5.5	8.0	13.4	2.4	2.6	2.5	3.7
WOMEN																				
Observations	3458	3606	3488	3682	2263	1871	1327	1494	521	882	178	47	45	225	17	54	415	610	754	1370
% Total Sample, age 15-56	100%	100%	100%	100%	65%	52%	38%	41%	15%	24%	5%	2%	1%	6%	0.7%	1%	15%	25%	21%	37%
Age																				
15-19	13.4	14.3	11.9	13.1	3.5	5.1	3.0	1.5	3.6	5.1	3.0	2.5	6.0	3.1	30.6	34.3	8.2	51.0	41.5	31.0
20-29	26.9	23.0	23.1	22.7	27.9	22.2	22.7	19.6	26.5	22.7	19.6	25.4	12.2	18.0	48.4	32.6	31.5	24.0	25.0	24.5
30-39	26.4	26.3	25.0	20.9	30.6	30.2	31.1	26.0	31.4	34.6	26.6	51.8	38.1	27.2	6.8	9.1	12.5	8.8	9.1	12.5
40-49	19.9	19.4	26.5	26.6	24.7	24.1	30.8	34.9	20.7	23.2	38.8	17.6	37.6	34.6	14.2	5.2	25.5	5.1	5.8	14.6
50-56	13.4	17.0	13.5	16.8	13.4	18.4	12.4	18.0	17.8	14.4	12.1	2.8	6.1	17.1	0.0	0.0	11.8	11.1	18.6	17.4
Education Levels																				
Less than High School	22.8	18.1	12.9	12.2	17.2	12.1	4.8	2.6	21.4	12.2	7.0	14.6	8.9	4.9	28.0	14.2	7.4	41.1	37.3	26.7
High School	26.6	26.1	25.0	24.7	25.8	25.4	22.1	18.5	23.3	24.7	25.0	17.0	0.4	19.1	24.1	27.0	25.7	31.9	28.6	32.2
Vocational	15.6	18.3	20.1	20.6	16.1	20.1	20.7	22.1	16.5	18.7	23.2	24.8	15.3	19.5	38.9	22.1	26.2	12.1	13.9	17.0
Secondary Professional	22.9	24.7	27.1	26.7	26.5	27.8	32.9	33.3	24.0	28.0	25.8	27.9	35.5	27.0	6.5	25.8	29.7	11.1	14.3	18.3
Higher Education	12.2	12.9	14.9	15.8	14.3	14.6	19.5	23.5	14.7	16.4	19.1	15.7	9.6	29.6	2.6	11.0	11.1	3.9	6.0	5.9
Nationality																				
Ukrainian	77.8	77.6	77.6	78.5	77.6	77.7	77.3	78.5	80.1	77.7	79.5	69.3	81.2	80.5	56.4	74.9	74.4	77.3	77.2	79.2
Russian	19.0	18.8	18.4	17.6	19.2	18.7	18.6	18.4	16.8	18.4	17.1	30.7	12.2	16.3	43.6	18.4	20.3	18.9	19.5	16.1
Other (Including Belorussian, Jewish)	3.3	3.6	3.9	4.0	3.2	3.5	4.1	3.2	3.1	3.9	3.4	0.0	6.7	3.2	0.0	6.7	5.3	3.8	3.2	4.7

[1] For 1986, FT means they did not report working 'always' or 'sometimes' part-time; For 2003, FT means reporting between 40 and 80 hours/week, or 30-40 hours/week if it is considered FT at that job.

Table A2: OLS & Quantile Regressions: Men

	1986							1997							2003						
	OLS	10	25	50	75	90	95	OLS	10	25	50	75	90	95	OLS	10	25	50	75	90	95
Nationality (Ukrainian																					
Russian	0.089**	0.011	0.094**	0.076*	0.091*	0.150*	0.085	0.052	-0.044	-0.013	0.121**	0.082	0.146	0.087	0.046	-0.019	-0.015	0.085	0.092	0.132	0.018
	(0.029)	(0.067)	(0.030)	(0.035)	(0.035)	(0.067)	(0.109)	(0.042)	(0.073)	(0.056)	(0.044)	(0.044)	(0.089)	(0.103)	(0.040)	(0.074)	(0.058)	(0.045)	(0.065)	(0.075)	(0.079)
Other (inc. Byelorussian, Jewish)	-0.066	-0.009	-0.070	-0.116	-0.181**	-0.213	-0.052	0.044	-0.140	-0.098	0.117	0.012	0.096	0.026	0.115	-0.022	-0.075	0.131	0.123	0.525**	0.437**
	(0.061)	(0.139)	(0.065)	(0.072)	(0.069)	(0.130)	(0.197)	(0.081)	(0.137)	(0.115)	(0.085)	(0.085)	(0.148)	(0.150)	(0.073)	(0.127)	(0.106)	(0.086)	(0.113)	(0.149)	(0.139)
Education (Less than HS																					
High School	0.045	-0.013	0.093*	0.079	-0.008	0.069	0.069	-0.075	0.046	-0.081	0.040	-0.141	-0.237	-0.252	0.009	0.151	0.009	0.043	0.053	0.095	-0.273
	(0.042)	(0.094)	(0.040)	(0.049)	(0.050)	(0.094)	(0.165)	(0.073)	(0.123)	(0.098)	(0.078)	(0.078)	(0.167)	(0.195)	(0.077)	(0.137)	(0.110)	(0.086)	(0.121)	(0.156)	(0.145)
Vocational	0.112**	0.060	0.101**	0.174**	0.089	0.149	0.255	-0.088	-0.026	-0.075	0.055	-0.155*	-0.220	-0.347	0.042	0.180	0.040	0.112	0.068	0.128	-0.221
	(0.041)	(0.090)	(0.038)	(0.048)	(0.048)	(0.093)	(0.163)	(0.072)	(0.119)	(0.096)	(0.077)	(0.076)	(0.160)	(0.183)	(0.075)	(0.131)	(0.106)	(0.084)	(0.116)	(0.152)	(0.138)
Secondary Professional	0.191**	0.189	0.225**	0.251**	0.172**	0.128	0.209	0.049	0.259*	0.049	0.125	-0.098	-0.035	-0.177	0.183*	0.286*	0.186	0.261**	0.205	0.262	-0.015
	(0.044)	(0.097)	(0.041)	(0.052)	(0.052)	(0.099)	(0.166)	(0.075)	(0.125)	(0.101)	(0.080)	(0.079)	(0.165)	(0.190)	(0.078)	(0.135)	(0.110)	(0.088)	(0.122)	(0.158)	(0.147)
Higher Ed (Bach, Spec, Masters, PhD)	0.239**	0.273**	0.350**	0.294**	0.139*	0.192	0.236	0.160*	0.380**	0.155	0.237**	0.031	0.132	0.072	0.394**	0.442**	0.387**	0.464**	0.460**	0.557**	0.221
	(0.048)	(0.106)	(0.045)	(0.055)	(0.057)	(0.103)	(0.171)	(0.080)	(0.132)	(0.106)	(0.084)	(0.083)	(0.182)	(0.204)	(0.081)	(0.140)	(0.114)	(0.090)	(0.125)	(0.160)	(0.150)
Age	0.029**	0.015	0.014	0.033**	0.043**	0.024	0.039	0.038**	0.046*	0.042**	0.018	0.024*	0.031	0.047	0.036**	0.017	0.015	0.042**	0.049**	0.039	0.050*
	(0.009)	(0.019)	(0.009)	(0.011)	(0.010)	(0.021)	(0.035)	(0.011)	(0.020)	(0.016)	(0.012)	(0.012)	(0.026)	(0.026)	(0.011)	(0.021)	(0.016)	(0.012)	(0.018)	(0.020)	(0.022)
Age2	-0.000**	-0.000	-0.000	-0.000**	-0.001**	-0.000	-0.000	-0.000**	-0.001*	-0.001*	-0.000	-0.000	-0.000	-0.001	-0.000**	-0.000	-0.000	-0.001**	-0.001**	-0.000	-0.001*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Activity of Enterprise (Agriculture is omitted)																					
Manufacturing & Mining	0.395**	0.367**	0.407**	0.430**	0.466**	0.403**	0.354*	0.520**	0.382**	0.560**	0.555**	0.519**	0.625**	0.611**	0.740**	0.886**	0.725**	0.813**	0.582**	0.550**	0.313*
	(0.032)	(0.074)	(0.033)	(0.039)	(0.041)	(0.082)	(0.155)	(0.050)	(0.081)	(0.067)	(0.052)	(0.051)	(0.104)	(0.118)	(0.054)	(0.097)	(0.078)	(0.059)	(0.088)	(0.105)	(0.122)
Electricity, Gas, Water & Construction	0.250**	0.367**	0.235**	0.255**	0.172**	0.212*	0.195	0.475**	0.435**	0.468**	0.467**	0.491**	0.492**	0.425**	0.649**	0.857**	0.547**	0.721**	0.554**	0.592**	0.253
	(0.044)	(0.095)	(0.045)	(0.053)	(0.055)	(0.107)	(0.195)	(0.060)	(0.099)	(0.081)	(0.063)	(0.063)	(0.129)	(0.141)	(0.062)	(0.114)	(0.090)	(0.069)	(0.099)	(0.118)	(0.132)
Transport, Communic. & Financial[1]	0.173**	0.284**	0.210**	0.243**	0.123**	0.063	-0.053	0.417**	0.358**	0.395**	0.482**	0.476**	0.475**	0.392**	0.654**	0.752**	0.598**	0.745**	0.545**	0.503**	0.249
	(0.038)	(0.087)	(0.040)	(0.047)	(0.047)	(0.091)	(0.167)	(0.055)	(0.091)	(0.074)	(0.058)	(0.057)	(0.121)	(0.123)	(0.057)	(0.099)	(0.082)	(0.063)	(0.093)	(0.112)	(0.130)
Public Administration & Defense	0.294**	0.400**	0.308**	0.314**	0.294**	0.238	0.073	0.415**	0.429**	0.468**	0.505**	0.453**	0.395*	0.308*	0.688**	0.956**	0.615**	0.735**	0.543**	0.460**	0.072
	(0.053)	(0.119)	(0.057)	(0.068)	(0.070)	(0.136)	(0.220)	(0.075)	(0.137)	(0.106)	(0.080)	(0.077)	(0.161)	(0.137)	(0.080)	(0.146)	(0.118)	(0.091)	(0.128)	(0.153)	(0.161)
Education, Health, & Social Work	-0.131*	-0.059	-0.131*	-0.128	-0.070	-0.184	-0.256	0.017	0.085	0.057	0.061	-0.073	-0.209	-0.148	0.113	0.534**	0.221*	0.091	-0.049	-0.223	-0.483**
	(0.054)	(0.136)	(0.056)	(0.066)	(0.068)	(0.115)	(0.171)	(0.073)	(0.128)	(0.101)	(0.078)	(0.075)	(0.154)	(0.185)	(0.073)	(0.144)	(0.107)	(0.082)	(0.120)	(0.139)	(0.159)
Other[2]	0.042	0.149	0.067	0.081	-0.012	-0.079	-0.231	0.343**	0.183	0.236*	0.371**	0.336**	0.545**	0.627**	0.357**	0.615**	0.354**	0.416**	0.221	0.163	-0.150
	(0.055)	(0.123)	(0.059)	(0.069)	(0.070)	(0.117)	(0.211)	(0.072)	(0.122)	(0.097)	(0.077)	(0.076)	(0.073)	(0.148)	(0.077)	(0.132)	(0.106)	(0.084)	(0.118)	(0.135)	(0.151)
Constant	-0.649**	-0.857*	-0.699**	-0.841**	-0.597**	-0.017	-0.109	-0.825**	-1.615**	-1.184**	-0.699**	-0.211	0.025	0.066	-1.159**	-1.779**	-1.063**	-1.384**	-0.935**	-0.565	0.051
	(0.150)	(0.351)	(0.195)	(0.184)	(0.184)	(0.391)		(0.198)	(0.343)	(0.287)	(0.210)	(0.209)	(0.450)	(0.435)	(0.202)	(0.395)	(0.297)	(0.228)	(0.327)	(0.351)	(0.391)
N =	1666	1666	1666	1666	1666	1666	1666	1098	1098	1098	1098	1098	1098	1098	1340	1340	1340	1340	1340	1340	1340
R-Squared =	0.17							0.15							0.23						

* significant at 5%; ** significant at 1%.

[1] Includes Wholesale/Retail Trade, Repair of Motor Vehicles/Motorcycles; Hotels & Restaurants; Transport, Storage & Communication; Financial Intermediation, Real Estate, Renting & Business Activities.

Table A3: OLS & Quantile Regressions: Women

	1986							1997							2003						
	OLS	10	25	50	75	90	95	OLS	10	25	50	75	90	95	OLS	10	25	50	75	90	95
Nationality (Ukrainian																					
Russian	0.027	0.072**	0.051**	0.025	-0.001	-0.045	-0.091	0.025	0.002	0.018	0.035	0.018	0.046	0.017	0.130**	0.054	0.075**	0.113**	0.146**	0.141*	0.063
	(0.023)	(0.025)	(0.012)	(0.019)	(0.026)	(0.039)	(0.064)	(0.036)	(0.060)	(0.042)	(0.037)	(0.038)	(0.060)	(0.105)	(0.034)	(0.045)	(0.025)	(0.032)	(0.036)	(0.064)	(0.096)
Other (inc. Byelorussian, Jewish)	0.015	-0.002	0.000	-0.003	-0.064	0.084	0.134	-0.083	-0.024	-0.179*	-0.105	-0.064	-0.001	-0.000	0.001	0.165	0.105*	0.038	0.102	-0.077	-0.108
	(0.050)	(0.050)	(0.024)	(0.041)	(0.058)	(0.080)	(0.148)	(0.070)	(0.086)	(0.084)	(0.074)	(0.070)	(0.103)	(0.191)	(0.053)	(0.081)	(0.052)	(0.067)	(0.077)	(0.124)	(0.167)
Education (Less than HS																					
High School	0.078**	0.109**	0.022	0.109**	0.088**	0.017	0.014	0.122	-0.015	0.011	0.092	0.155*	0.160	0.268	0.188**	0.050	0.120*	0.227**	0.125	0.239	0.220
	(0.030)	(0.030)	(0.014)	(0.025)	(0.033)	(0.049)	(0.082)	(0.070)	(0.103)	(0.074)	(0.069)	(0.072)	(0.105)	(0.186)	(0.086)	(0.104)	(0.060)	(0.080)	(0.089)	(0.142)	(0.139)
Vocational	0.133**	0.133**	0.093**	0.188**	0.128**	0.064	0.111	0.207**	0.167	0.187	0.213**	0.248**	0.278*	0.335	0.201*	-0.002	0.121*	0.246**	0.134	0.277*	0.269
	(0.034)	(0.034)	(0.017)	(0.029)	(0.039)	(0.056)	(0.093)	(0.072)	(0.106)	(0.076)	(0.071)	(0.074)	(0.112)	(0.201)	(0.085)	(0.104)	(0.059)	(0.079)	(0.088)	(0.141)	(0.138)
Secondary Professional	0.133**	0.174**	0.132**	0.213**	0.096**	0.080	0.083	0.267**	0.196	0.179*	0.263**	0.259**	0.396**	0.510**	0.281**	0.096	0.153**	0.316**	0.222*	0.403**	0.375**
	(0.030)	(0.032)	(0.015)	(0.025)	(0.033)	(0.051)	(0.087)	(0.070)	(0.101)	(0.074)	(0.068)	(0.071)	(0.107)	(0.192)	(0.084)	(0.100)	(0.058)	(0.078)	(0.087)	(0.140)	(0.129)
Higher Ed (Bach, Spec, Masters, PhD)	0.394**	0.398**	0.415**	0.473**	0.481**	0.447**	0.374**	0.523**	0.433**	0.416**	0.489**	0.535**	0.667**	0.854**	0.523**	0.241*	0.376**	0.614**	0.533**	0.723**	0.794**
	(0.035)	(0.038)	(0.017)	(0.029)	(0.038)	(0.057)	(0.095)	(0.073)	(0.107)	(0.078)	(0.072)	(0.074)	(0.109)	(0.197)	(0.085)	(0.102)	(0.059)	(0.079)	(0.089)	(0.141)	(0.136)
Age	0.009	0.002	0.005	0.015*	0.010	-0.001	-0.018	0.008	0.010	-0.002	0.005	0.013	0.018	0.007	0.012	0.030*	0.007	0.007	0.004	0.004	-0.006
	(0.007)	(0.008)	(0.003)	(0.006)	(0.008)	(0.011)	(0.019)	(0.010)	(0.016)	(0.011)	(0.011)	(0.011)	(0.018)	(0.031)	(0.010)	(0.012)	(0.007)	(0.010)	(0.011)	(0.018)	(0.026)
Age2	-0.000	-0.000	-0.000	-0.000*	-0.000	0.000	0.000	-0.000	-0.000	0.000	-0.000	-0.000	-0.000	0.000	-0.000	-0.000*	-0.000	-0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Activity of Enterprise (Agriculture is omitted)																					
Manufacturing & Mining	0.246**	0.181**	0.208**	0.277**	0.208**	0.270**	0.344**	0.355**	0.498**	0.312**	0.301**	0.390**	0.261**	0.185	0.362**	0.831**	0.360**	0.269**	0.440**	0.187	-0.059
	(0.030)	(0.033)	(0.015)	(0.025)	(0.034)	(0.051)	(0.084)	(0.054)	(0.078)	(0.062)	(0.054)	(0.054)	(0.081)	(0.156)	(0.050)	(0.043)	(0.053)	(0.061)	(0.108)	(0.157)
Electricity, Gas, Water & Construction	0.239**	0.188**	0.233**	0.202**	0.209**	0.248**	0.321**	0.199*	0.289**	0.132	0.035	0.384**	0.059	0.205	0.444**	1.023**	0.411**	0.382**	0.474**	0.237	-0.053
	(0.048)	(0.051)	(0.024)	(0.040)	(0.054)	(0.075)	(0.106)	(0.079)	(0.111)	(0.089)	(0.078)	(0.075)	(0.117)	(0.204)	(0.082)	(0.099)	(0.059)	(0.076)	(0.084)	(0.136)	(0.168)
Transport, Communic. & Financial[1]	0.033	0.001	-0.004	0.068*	-0.011	-0.024	0.013	0.241**	0.236**	0.174**	0.151**	0.311**	0.242**	0.316*	0.274**	0.665**	0.230**	0.156**	0.393**	0.185	-0.080
	(0.033)	(0.037)	(0.017)	(0.028)	(0.038)	(0.056)	(0.090)	(0.053)	(0.077)	(0.063)	(0.054)	(0.054)	(0.081)	(0.156)	(0.056)	(0.070)	(0.043)	(0.053)	(0.061)	(0.108)	(0.158)
Public Administration & Defense	-0.015	-0.024	-0.050	-0.000	-0.111	-0.149	-0.009	0.276**	0.288**	0.302**	0.161*	0.334**	0.134	0.093	0.253**	0.828**	0.301**	0.104	0.299**	0.052	-0.343
	(0.054)	(0.055)	(0.027)	(0.046)	(0.060)	(0.085)	(0.131)	(0.080)	(0.114)	(0.091)	(0.081)	(0.086)	(0.124)	(0.237)	(0.081)	(0.100)	(0.059)	(0.076)	(0.091)	(0.169)	(0.229)
Education, Health, & Social Work	-0.112**	-0.036	-0.116**	-0.124**	-0.215**	-0.270**	-0.182**	0.064	0.336**	0.134*	0.003	0.012	-0.264**	-0.436**	-0.013	0.746**	0.174**	-0.071	-0.099	-0.472**	-0.753**
	(0.032)	(0.037)	(0.017)	(0.027)	(0.036)	(0.052)	(0.088)	(0.052)	(0.078)	(0.061)	(0.053)	(0.052)	(0.075)	(0.148)	(0.054)	(0.065)	(0.041)	(0.051)	(0.059)	(0.105)	(0.156)
Other[2]	0.014	0.038	-0.046*	-0.023	-0.042	0.064	0.253	0.104	0.073	0.111	0.037	0.151*	0.018	-0.064	0.166*	0.795**	0.225**	0.061	0.158*	-0.088	-0.220
	(0.043)	(0.049)	(0.023)	(0.036)	(0.049)	(0.076)	(0.129)	(0.069)	(0.098)	(0.078)	(0.069)	(0.070)	(0.101)	(0.207)	(0.065)	(0.083)	(0.049)	(0.063)	(0.072)	(0.127)	(0.185)
Constant	-0.578**	-0.875**	-0.702**	-0.771**	-0.261	0.177	0.529	-0.834**	-1.408**	-0.804**	-0.671**	-0.671**	-0.459	-0.143	-0.938**	-2.106**	-1.041**	-0.815**	-0.496*	-0.132	0.513
	(0.118)	(0.137)	(0.062)	(0.105)	(0.141)	(0.199)	(0.327)	(0.185)	(0.204)	(0.192)	(0.197)	(0.321)	(0.578)		(0.202)	(0.261)	(0.151)	(0.192)	(0.221)	(0.353)	(0.520)
N =	2230	2230	2230	2230	2230	2230	2230	1310	1310	1310	1310	1310	1310	1310	1475	1475	1475	1475	1475	1475	1475
R-Squared =	0.15							0.13							0.19						

* significant at 5%; ** significant at 1%.

[1] Includes Wholesale/Retail Trade, Repair of Motor Vehicles/Motorcycles; Hotels & Restaurants; Transport, Storage & Communication; Financial Intermediation, Real Estate, Renting & Business Activities.
[2] Includes Other Community, Social and Personal Service Activities.
Note: Using sample weights.

Table A4: Minimum Wage Legislation 1991-2005

Minimum Wage	Dates
185 karb.	July 1, 1991 - Nov. 30, 1991
400 karb.	Dec. 1, 1991 - April 30, 1992
900 karb.	May 1, 1992 - Oct. 31, 1992
2,300 karb.	Nov. 1, 1992 - Dec. 31, 1992
4,600 karb.	Jan. 1, 1993 - May 31, 1993
6,900 karb.	June 1, 1993 - Aug. 31, 1993
20,000 karb.	Sept. 1, 1993 - Nov. 30, 1993
60,000 karb.	Dec. 1, 1993 - Feb. 29, 1996
1,500,000 karb.	March 1, 1996 - Sept. 1, 1996
15 UAH	Sept. 2, 1996 - Dec. 31, 1997
45 UAH	Jan. 1, 1998 - June 30, 1998
55 UAH	July 1, 1998 - Dec. 31, 1998
74 UAH	Jan. 1, 1999 - March 31, 2000
90 UAH	April 1, 2000 - June 30, 2000
118 UAH	July 1, 2000 - Dec. 31, 2001
140 UAH	Jan. 1, 2002 - June 30, 2002
165 UAH	July 1, 2002 - Dec. 31, 2002
185 UAH	Jan. 1, 2003 - Nov. 30, 2003
205 UAH	Dec. 1, 2004 - Oct. 31, 2004
237 UAH	Nov. 1, 2004 - Dec. 31, 2004
262 UAH	Jan. 1, 2005 - Aug. 30, 2005
332 UAH	Sept. 1, 2005 -

Source: Ukrainian Minimum Wage Decrees