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WOMEN IN TRANSITION: CHANGES IN GENDER WAGE DIFFERENTIALS IN EASTERN EUROPE AND THE FORMER SOVIET UNION

ELIZABETH BRAINERD*

Under state socialism, women fared relatively well in the labor market: female-male wage differentials were similar to those in the West, and female labor force participation rates were among the highest in the world. Have these women maintained their relative positions since the introduction of market reforms? The author investigates this question using household surveys from seven formerly socialist countries. The results indicate a consistent increase in female relative wages across Eastern Europe, and a substantial decline in female relative wages in Russia and Ukraine. Women in the latter countries have been penalized by the tremendous widening of the wage distribution in those countries. Increased wage inequality in Eastern Europe has also depressed female relative wages, but these losses have been more than offset by gains in rewards to observed skills and by an apparent decline in discrimination against women.

The socialist countries of Eastern Europe and the former Soviet Union were long committed—at least nominally—to gender equality in the labor market. Government policies such as relatively high minimum wages and generous maternity leave and day care benefits encouraged women to work, and female labor force

participation rates were high compared with those of other countries. While women remained over-represented in areas such as health and education, they fared at least as well as their counterparts in most developed and developing countries in terms of female-male wage differentials.

How have women in formerly socialist countries been affected by the introduction of market reforms? Given the profound economic changes in Eastern Europe and the former Soviet Union, it is

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The sources of the household surveys used in the paper are given in Appendix Table A1. The computer programs used to process the data and generate the results are available from the author on request.

likely that the labor market experiences of men and women have differed. Have women borne an equal share of the burden of economic restructuring, or shared an equal measure of the gains from the transition to a market economy? In other words, is the introduction of market reforms in formerly socialist countries a gender-neutral policy?

In this paper I attempt to answer these questions using recent household surveys and published data for a wide range of countries. Household surveys taken before and after the implementation of market reforms are used to estimate changes in the gender wage differential in the former Soviet republics of Ukraine and Russia, and in the East European countries of Bulgaria, Hungary, Poland, and the Czech and Slovak Republics. I include, as well, published survey-based information on changes in the gender wage gap in Estonia, Slovenia, and eastern Germany.

While several previous studies have examined the change in the gender wage differential in a single country in transition, few of the results are directly comparable across countries, because the studies define the gender wage differential and the sample being analyzed in different ways. Other studies examine the evolution of the gender wage gap in a country after the initial reform period, leaving unaddressed the issue of women's relative wages prior to the introduction of market reforms. This study contributes to the literature on the gender wage gap in transition by analyzing comparable surveys for each country before and after the initial period of reforms, using a consistent definition of the wage gap between men and women so that results across countries can be compared.

In addition, this study examines the change in the gender wage gap within one to two years of the introduction of market reforms in each country. With the analysis limited to this early period, we can be reasonably confident that the changes observed reflect the impact of the reforms that took effect quickly, such as wage and price decentralization, rather than the impact of policies that were implemented with vary-

ing speeds across countries, such as privatization and enterprise restructuring.

Finally, this paper decomposes the change in the gender wage gap in these countries into changes due to gender-specific factors, such as observed skills and discrimination, and changes due to the widening wage structure that occurred across the region. This approach clears the way for inferences regarding how, if at all, changing labor market institutions and returns to skills affected the gender earnings gap in formerly socialist countries.

It should be noted at the outset that while the female-male wage differential is one summary measure of women's labor market experience, this statistic in itself does not capture the full range of women's experiences in transitional countries. This paper focuses on changes in relative wages and briefly discusses labor force participation rates, but ignores other aspects of the changes in women's daily lives. A fuller treatment of the topic would examine changes in the female burden of non-market work, such as shopping and child care, which are clearly affected by the reforms, as well as the relative benefits of political liberalization. While these variables undoubtedly contribute to changes in the quality of women's lives, they are beyond the scope of this paper.¹

Labor Market Institutions and Female Labor Market Performance under Socialism

Labor market institutions in Eastern Europe and the Soviet Union shared many features and largely followed the Soviet model.² Central planners assigned wages

¹Fong and Paul (1992) and Paukert (1995) discuss some of these issues.

²The exception is the worker self-management system in Yugoslavia (see Orazem and Vodopivec [1995] for a description). Labor market institutions in socialist countries are described in Adam (1984), Boote and Somogyi (1991), Ham et al. (1995), Kirsch (1972), and Redor (1992). See Munich et al. (1999) for an analysis of the Communist wage grid used in Czechoslovakia.

by establishing an occupational wage scale within each industry, and wages were set as a multiple of the base wage (the wage of the lowest-grade occupation). Wage scales were compressed; for example, top managers typically earned at most five times as much as the average manual worker, whereas the same ratio reaches 20:1 or more in the United States (Kornai 1992:324). Workers also earned bonuses for plan fulfillment; this component of wages became increasingly important in many countries in the mid-1980s as enterprise managers gained flexibility in wage-setting.

Other labor market institutions included pervasive membership in official unions; these unions played little role in wage determination (with the exception of Poland in the 1980s) and largely acted as a "transmission belt" for Communist Party policies and ideology. Unemployment was not officially recognized, and in some countries being without a job brought criminal charges and imprisonment. Housing shortages—and an internal passport system in the Soviet Union—severely limited geographical mobility in most countries. These features of central planning resulted in similar labor market characteristics across countries, including open excess demand for labor (due to soft budget constraints faced by enterprises and the emphasis on plan fulfillment rather than cost minimization); narrow wage differentials between occupations, with a bias favoring manual workers; and relatively low levels and slow growth of wages.

The Economic Status of Women under Socialism

Female labor force participation began to grow rapidly in all of these countries soon after the introduction of central planning (in the late 1940s in Eastern Europe and the early 1930s in the Soviet Union). Female labor was needed to fuel the intense industrialization drives that most of these countries initiated, and authorities encouraged women to enter the labor force with an explicit guarantee of the right to

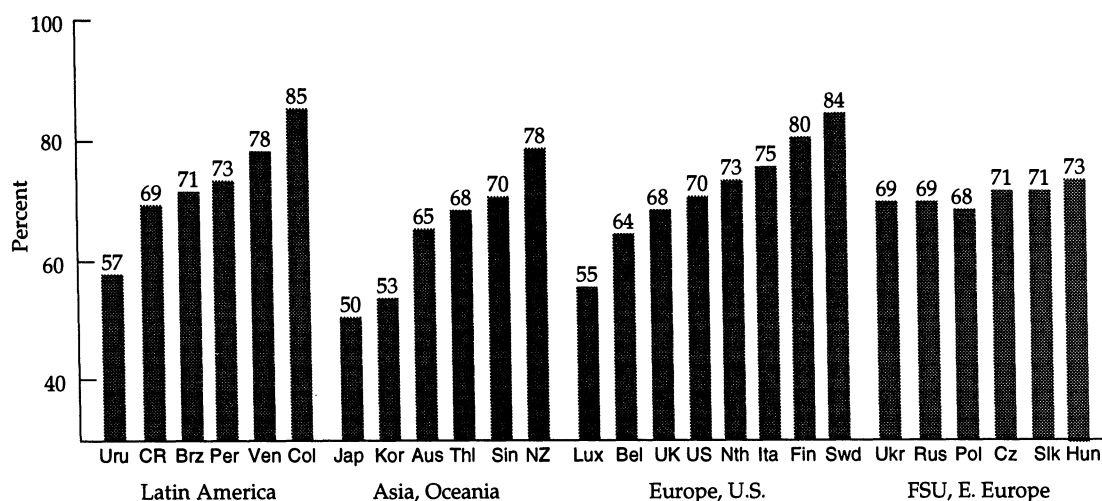
equal pay for equal work.³ Generous maternity benefits⁴ and extensive provision of day care centers also encouraged women to work, and relatively low average wages often compelled women to work to supplement family income. As a result, female labor force participation rates in Eastern Europe and the Soviet Union reached extremely high levels by international standards, on the order of 80% of the female working-age population in many countries. Since women also continued to do the bulk of the housework (70–80% according to time-use surveys [Fong and Paul 1992:17]), most women bore a double burden of market and non-market work, made yet more difficult by the lack of services and modern appliances in most of these countries.

At least by international standards, however, the socialist countries succeeded in achieving relatively equal labor market outcomes for men and women. This is illustrated in Figure 1, which presents the mean female-male wage ratio for Eastern Europe and the former Soviet Union in 1989, as well as that of selected developing and developed countries in the same year. By this measure, women in socialist countries did at least as well as women in most other countries. For example, the ratio of average female to male weekly wages in the United States was 70% in 1987, compared with 69% in the Russian republic in 1989 (for monthly wages).⁵ This measure is some-

³In the Soviet Union, for example, this right was written into the 1922 Soviet Labor Code and the 1936 Constitution (McAuley 1981:15).

⁴In most countries women were entitled to take up to three years of maternity leave per child, with the right to return to a suitable job with the same employer. Families also received non-means-tested maternity benefits and child care allowances. These policies continue to apply in most countries, although in some cases with reduced benefits (Fong 1996:21–23). Generous maternity benefits may also reduce participation rates if women accept the benefits and remain out of the labor force for a long time.

⁵Since the wage data reported here are not adjusted for hours worked, female relative wage rates are likely to be understated if women work fewer hours on average than men.

Figure 1. Female/Male Wage Ratios in Various Countries, 1989.^a

^aColombia: 1988; Italy: 1986; Sweden: 1992; Poland: 1985; Hungary: 1988. All wage ratios are calculated using monthly wages, except those for Colombia, the United Kingdom, the United States, New Zealand, and Australia, which use weekly wages.

Sources: Australian Bureau of Statistics (1990:172); Dept. of Statistics (N.Z.), Table 12.14; Statistical Yearbook of Finland (1990:380); U.S. Bureau of the Census (1991, Table 678); Psacharopoulos and Tzannatos (1991:5); ILO (1992:798, 800-802); ILO (1994:704-5); ILO (1996:678-79); Central Statistical Office (U.K.) (1992:1241); Central Bureau of Statistics (Neth.) (1992:122); Atkinson and Micklewright (1992, Tables CSE4, HE2, PE3, UE6); Statistika centralbyran (Statistics Sweden) (1998, Table 224); Luxembourg Income Study (Italy).

what deceiving, however, since the wage distributions in the centrally planned economies were relatively compressed, which benefited workers with below-average wages. A complementary measure of female labor market performance that is less sensitive to this problem is given by the mean (or median) position of women in the male wage distribution.⁶ This is an indicator of relative female progress that reflects both measured labor market skills and discrimination, and is less affected by the spread of the wage distribution than is the gender wage gap. If wages are interpreted as a measure of skill, then a man and a woman with the same percentile ranking

in the male wage distribution are arguably viewed as comparable workers by employers. A higher mean female ranking is associated with improvements in women's measured and unmeasured skills, as well as with declining discrimination against women.

By this measure, women in Eastern Europe fared poorly compared with some of their western counterparts. For example, the mean woman ranked at roughly the 17th percentile of the male wage distribution in the Czech Republic in 1984, compared with the 33rd percentile in the United States in 1988 (Blau and Kahn 1997:13).⁷ The mean woman in Russia, on the other hand, ranked at the 37th percentile, a high

⁶This measure is calculated by assigning each woman a percentile ranking in the male wage distribution, and finding the mean (or median) of these rankings.

⁷Note that the U.S. percentile is adjusted for hours worked. Since women work fewer hours on average than men, adjusting for hours worked will positively affect the estimated female percentile.

ranking compared with the United States and European countries.

As in many countries, the occupational and industrial distribution of female employment in Eastern Europe and the Soviet Union was skewed toward areas such as health and education, retail trade, and semi-skilled professional occupations. While wages were lower in the "low priority" health and education sectors, women often chose these professions because they had shorter and more flexible working hours. Because part-time employment was almost unknown in these countries, this was the only means by which women could reduce their total working time (Chapman 1991:186; Fong and Paul 1992:23). Women did, however, make inroads into some traditionally "male" preserves, increasing their relative numbers among doctors and some manual workers. They were also fairly highly represented in manufacturing; in Russia, for example, women comprised 48% of employment in manufacturing in 1990 (Goskomstat 1998:54). Overall, it appears that occupational segregation in Eastern Europe was lower, on average, than in the advanced industrialized nations (Blau and Ferber 1992:309).

Market Reforms and Changing Labor Market Institutions in the Early 1990s

The market reform experiences in these countries have been diverse, rendering generalizations difficult. Typical reforms in most countries have included wage and price liberalization, trade liberalization, privatization of state-owned enterprises, and tax and legal reforms.⁸ Across countries, the reforms have differed less in their elements than in the speed with which they have been implemented. Most East European countries initiated major reforms in 1990 or 1991 and have since made substantial progress in creating the institutions necessary for a market economy. Russian

reforms have been much more erratic and resulted in near hyper-inflation in 1992 before achieving a partial stabilization in 1994; however, Russia has privatized its state-owned enterprises more rapidly than most other countries. Ukraine has been among the more reluctant reformers, delaying major reforms until late 1994 amid paralyzing political battles between the Communist-dominated parliament and reformist government. In most countries the first years of reforms were followed by substantial declines in measured GDP and real wages, as well as high rates of inflation and increasing unemployment. Russia and Ukraine suffered much greater declines in GDP and much higher inflation rates than did the East European countries surveyed here, although the declines in GDP are overstated due to measurement problems (see EBRD [1995] and Fischer et al. [1996] for a discussion).

Labor market institutions have also changed dramatically and become much more diverse across countries.⁹ The centralized wage-setting system has been abandoned and replaced with new arrangements ranging from decentralized plant-level negotiations to collective bargaining, with the former Soviet Union inclined toward the former and Eastern Europe favoring the latter. Most countries introduced some form of tax-based incomes policy early in the transition to restrain wage growth, but many had abandoned these policies by 1994 or 1995.

Wage-setting appears to be most decentralized in Russia, where wages are primarily set through informal plant-level negotiations with little union influence, outside

⁸The EBRD's *Transition Report 1995* summarizes and evaluates the early reform experiences of formerly socialist countries.

⁹The following overview of changes in labor market institutions focuses on the early transition period and draws from numerous sources, including Bogetić and Fox (1993); Boote and Somogyi (1991); Bristow (1996); EBRD (1995); Flanagan (1995); Freeman (1994); Ham et al. (1995); Jackman (1994); OECD (1995a, 1995b); Orazem and Vodopivec (1995); Thirkell et al. (1998); and Vaughan-Whitehead (1998). See Flanagan (1998a) for an overview of industrial relations in Eastern Europe during transition.

of a few sectors like mining. Government influence on wage-setting has been minimal except for that introduced through a relatively modest excess wage tax imposed on public and private sector enterprises.¹⁰ Wage-setting is also decentralized in Ukraine, although that country still nominally continues to use the centralized tariff wage system: employers appear to routinely ignore the wage scales, and wages are instead set informally at the enterprise level. Ukraine levies an excess wage tax as well, but reports suggest that enforcement is weak.

Wage determination is somewhat more centralized in Eastern Europe, although again the institutional arrangements—and their effectiveness—vary widely across countries. Most countries, with the exception of Poland, have established tripartite commissions and collective bargaining arrangements of some sort, and national-level negotiations have largely focused on the form and duration of the tax-based incomes policies introduced in the early phases of the reforms.

A relatively decentralized wage-setting system has evolved in Bulgaria, apparently by default rather than intention. In 1991 a tripartite national agreement established both a floor and a ceiling on nominal wage increases in state enterprises, but the agreement disintegrated by the end of the year. A similar agreement reached in 1992 was not enforced. As a result, wages have effectively been set through enterprise-level collective bargaining in Bulgaria.

Tripartite wage bargaining also met with limited success in Czechoslovakia (prior to the dissolution in 1993). In 1992—the year under study for the two republics—the parties failed to reach an agreement, so wage determination was subject only to an excess wage tax that had been imposed in 1991.¹¹

Although Poland's draconian (500%) excess wage tax has since been abandoned, it continued to be in effect in 1992 (the year of the Polish Budget Survey used here) and was the primary vehicle for regulating wage growth in that country. In Slovenia wages are now largely set by tripartite collective bargaining; an excess wage tax was in effect through 1992 but apparently met with limited success.

The role of unions varies widely across countries and across industries within countries. In many cases newly formed independent unions are competing with the successor unions to the former official trade unions for worker representation. While unions have generally gained influence relative to their former status, as yet there is no statistical evidence of union wage effects in any of these countries.¹²

Some countries have maintained relatively high minimum wages while others have allowed inflation to erode the minimum wage to extremely low levels (Figure 2). Ukraine and Russia previously maintained the minimum wage at about 30% of the average wage, but by 1995 had allowed it to erode to remarkably low levels: 8.6% of the average wage in Russia, and less than 1% of the average wage in Ukraine. The minimum wage is much higher in Eastern Europe, ranging from 27% of the average wage in the Czech Republic in 1995 to 42% in Poland. Changes in the real value of the minimum wage will affect women's wages more than men's, because women have lower wages on average.

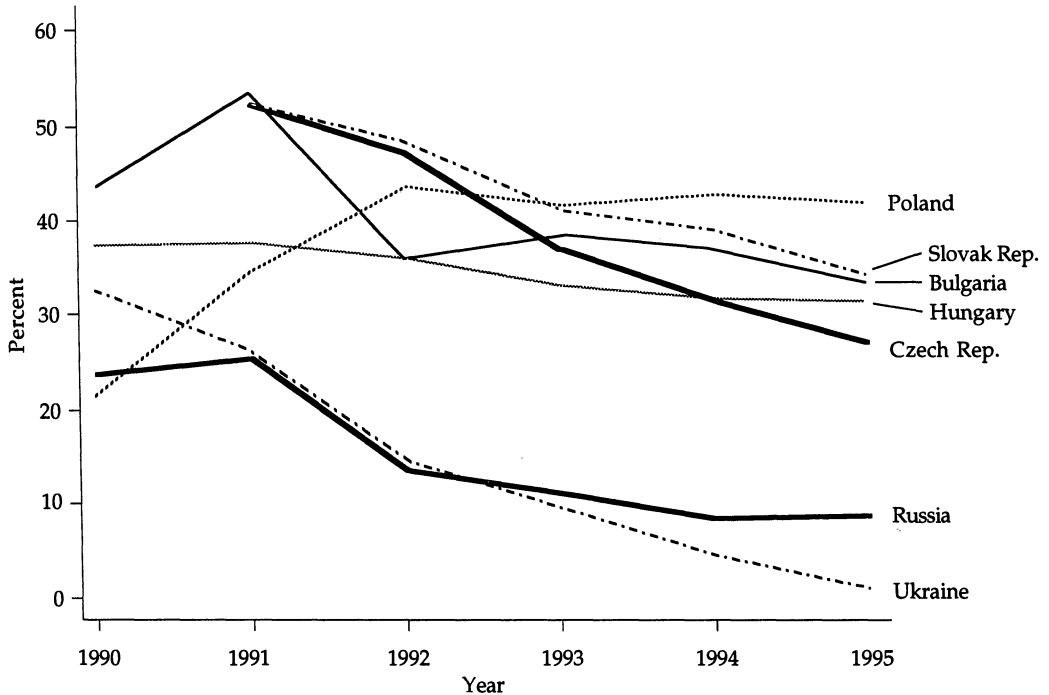
How might the changing labor market institutions affect women? As discussed in Blau and Kahn (1992, 1995, 1997), the factors that influence the gender wage gap can be divided conceptually into two areas: those related to changes in the overall wage structure (the market rewards to observed

¹⁰The excess wage tax imposed a penalty of 12–25% on the excess of the average wage of an enterprise over six times the minimum wage in 1994.

¹¹The Czech Republic concluded a tripartite agreement in 1993, however.

¹²The coefficient on a dummy variable for union status in log wage regressions is statistically insignificant in Bulgaria (Jones and Ilayperuma 1994), the Czech Republic (Flanagan 1995), and Poland (Belka et al. 1994).

Figure 2. Ratio of the Minimum Wage to the Average Wage, in Percent.



Sources: Vaughan-Whitehead (1998:33); Goskomstat of Russia (1996:86-87, 91-92); *Russian Economic Trends* (1994:47).

and unobserved skills, as well as rents), and changes in gender-specific factors such as discrimination and relative levels of labor market skills. The dramatic changes in labor market institutions in formerly socialist countries are likely to have an impact on both factors. The expected widening of the wage structure following wage decentralization will penalize women relative to men, since prior to the reforms women disproportionately occupied the lower part of the wage distribution. On the other hand, it is likely that market valuations of skills will change, and such changes may favor women relative to men. For example, since women in these countries are generally more highly educated than men, an increase in the return to education will increase female wages relative to male wages (everything else equal).

Women's relative wages will also be affected by changes in gender discrimina-

tion, although it is unclear *a priori* whether discrimination will increase or decrease. The breakdown of state control over enterprises may enable employers to discriminate against women more openly; employers may feel justified in doing so if they now face hard budget constraints and view women—with their mandatory maternity and child care benefits—as high-cost labor.¹³ On the other hand, market forces may result in less gender discrimination if discrimination becomes too costly for en-

¹³Discrimination may also adversely affect women through access to credit: if men have better access to capital than women do, they will be in a better position to exploit profit-making opportunities in the economy. While this will likely affect the income distribution, it may also affect the wage distribution by influencing men's and women's non-wage opportunities.

terprise managers facing hard budget constraints and increasing competition from internal and external sources, due to monopolization and trade liberalization.

Changes in labor force participation rates are also difficult to predict. Declining real wages for women should reduce female labor force participation, since women will substitute toward home production as the opportunity cost of home production falls. The widening of the wage structure may also enable families at the upper end of the wage distribution to have single-earner families, so female labor force participation may drop. On the other hand, the "added worker effect" could induce women who were out of the labor force to re-enter it if their spouses become unemployed or suffer a real wage decline.

Previous Literature

The previous literature on the gender wage gap in transition economies falls into two categories: studies of changes in the overall wage structure that briefly describe changes in gender wage differentials, and studies that focus exclusively on the gender wage gap in a country (or countries) in transition. The former category includes Brainerd (1998) for Russia; Jones and Ilayperuma (1994) for Bulgaria; Krueger and Pischke (1995) for eastern Germany; and Orazem and Vodopivec (1995) for Slovenia. One can also infer changes in the gender wage differential from results presented in Večerník (1995) and Flanagan (1998b) for the Czech Republic, and in Rutkowski (1996) for Poland, although the issue is not discussed explicitly in these papers. All of these studies of the East European countries show a narrowing of the gender wage differential after the introduction of market reforms, which is consistent with the results presented below.

To date, most of the studies that focus exclusively on the gender wage gap have examined Russia. Newell and Reilly (1996) analyzed the gender wage gap in Russia using the first round of the Russian Longitudinal Monitoring Survey (RLMS), a na-

tionally representative survey that began in 1992. Reilly (1999) extended the analysis through 1996, while Ogloblin (1999) examined the 1994–96 period, also using the RLMS. The level of the gender wage gap reported in these studies for the mid-1990s is similar to that found in this study for Russia using a different data set. The primary drawback of the RLMS is that the survey began in autumn 1992, many months after the wage and price liberalization of January 1992, so that one cannot use it to assess changes in the gender wage gap in Russia before and after these reforms.

Two other studies to date have examined changes in the gender wage gap in transition economies before and after the introduction of market reforms: Hunt (1997) for eastern Germany and Orazem and Vodopivec (1999) for Estonia and Slovenia.¹⁴ The former study analyzes the change in the gender wage differential in eastern Germany over the 1990–94 period. Like Krueger and Pischke (1995), Hunt documented a remarkable narrowing of the gender wage differential in that country, but she attributed a substantial portion of that narrowing—approximately 40%—to less skilled women exiting the labor force. Orazem and Vodopivec (1999) expanded on their 1995 analysis of the gender wage gap in Slovenia, and compared it with the changes in the gender wage gap that occurred in Estonia in the early years of reform in that country. They concluded that in both countries the improvement in women's relative wages was likely due to demand shifts that favored women, an improvement in women's unmeasured skills, and rising returns to skill that disproportionately benefited women. Some of the results from this paper and from Hunt (1997) are included in the tables below for comparative purposes. Finally, Newell and Reilly (2000) provide an overview of the evolution of the gender wage gap in eleven

¹⁴There is a growing literature on the gender wage gap in China; see Maurer-Fazio and Hughes (1999) for an analysis and an overview of this literature.

Table 1. Dates of Major Reforms and Household Surveys: Russia, Ukraine, and Eastern Europe, 1988–94.

<i>Country</i>	<i>Date of Major Reforms</i>	<i>Pre-Reform Data</i>	<i>Post-Reform Data</i>
Former Soviet Union			
Russia	Jan. 1992	April 1991, N = 1,695	Mar.–May 1994, N = 4,827
Ukraine	Oct. 1994	Mar.–Apr. 1991, N = 435	Dec. 1994, N = 2,700
Eastern Europe			
Bulgaria	Feb. 1991	na	1992, N = 2,245
Hungary	1988–89	1986, N = 3,965	1991, N = 1,727
Poland	Jan. 1990	1986, N = 10,017	1992, N = 4,524
Czech Rep.	Jan. 1991	1984, N = 4,201	1992, N = 17,381
Slovak Rep.	Jan. 1991	1984, N = 2,281	1992, N = 15,971

Notes: The dates indicated are the dates the wage information refers to rather than the survey date; the number of observations listed is the number actually used in the empirical work in this paper rather than the full sample size.

countries of Eastern Europe and the former Soviet Union (including several of the Central Asian republics) in the 1990s, with the emphasis on analyzing the changes in the post-reform period.

Data

In the past the analysis of gender wage differentials (and the wage structure in general) in Eastern Europe and the Soviet Union has been hampered by the lack of reliable micro-level data. While micro data from the 1980s remain limited, a surprising amount of recent household survey information from these countries has become available to researchers, enabling comparisons of this type.

Table 1 lists the household surveys that are used in the empirical work discussed below. The dates indicated are the dates the wage information refers to rather than the survey date; the number of observations listed is the number actually used in the empirical work rather than the full sample size. The table also indicates the year(s) in which the country implemented its major reforms, particularly price and wage liberalization.

Agricultural and self-employed workers are included in the analysis. Means of the demographic variables in the data sets are given in Table 2; more detailed informa-

tion on these surveys is provided in Appendix Table A1. Published data from household surveys conducted in Estonia (1989, N = 6,408 and 1994, N = 5,809), Slovenia (1987, N = 26,706 and 1991, N = 24,966), and in eastern Germany (1990, N = 2,061 and 1994, N = 1,428) are also included.¹⁵

The samples analyzed here exclude men and women of retirement age, which in all countries except Poland is age 60 for men and age 55 for women.¹⁶ The samples from Poland comprise men age 18 to 64 and women age 18 to 59, reflecting the higher retirement age in that country. The published results for Estonia and Slovenia ap-

¹⁵The Slovenian and Estonian results are from Orazem and Vodopivec (1995 and 1999, respectively); the eastern German results are from Hunt (1997). An important disadvantage of the Slovenian data sets is that they exclude information on wages earned by workers in the private sector. While this will have only a limited effect on the pre-reform wage structure due to the small size of the private sector prior to the reforms, it may bias the post-transition results, because female relative wages are higher in the state sector than in the private sector in most countries. The 1989 Estonian results should also be interpreted with caution because they are based on retrospective data collected in 1995.

¹⁶In the Czech and Slovak Republics, the female retirement age is between 53 and 57 and depends on the number of children raised. The empirical work here uses 55 as the retirement age.

Table 2. Means of Demographic Variables.

Group	% Female		Years of Education		Average Age		% Married	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Ukraine	49.0	49.1						
Men			11.2	12.0	38.3	37.8	76.1	74.3
Women			11.4	12.1	36.3	35.7	74.2	69.2
Russia	47.6	55.4						
Men			11.4	11.9	37.8	37.7	80.9	75.8
Women			11.8	12.2	36.7	37.2	71.5	67.9
Bulgaria	na	47.7						
Men			na	10.8	na	40.5	na	83.4
Women			na	11.0	na	39.8	na	81.2
Hungary	49.9	46.6						
Men			10.5	11.2	37.9	38.1	75.0	75.1
Women			10.5	11.5	35.5	37.5	76.3	67.1
Poland	44.9	46.4						
Men			10.9	11.2	38.2	39.4	na	na
Women			11.1	11.7	37.4	39.1	na	na
Czech Rep.	53.3	46.7						
Men			11.6	11.5	36.1	38.3	74.6	74.5
Women			11.1	11.1	34.6	38.0	75.8	74.1
Slovak Rep.	52.0	45.7						
Men			11.5	11.5	34.4	36.9	72.8	75.6
Women			11.3	11.4	32.9	36.7	71.3	72.0

parently do not limit the samples to any particular age group, so these results are not strictly comparable in this sense; the results for eastern Germany are based on individuals age 18–60. In addition, all samples have been trimmed of the top and bottom 1% of wage observations in order to eliminate implausibly high or low wages; the Estonian, Slovenian, and eastern German samples appear to be untrimmed.¹⁷

The wage concept used in this analysis is monthly wages, unadjusted for hours worked (few of the data sets include information on hours worked). If women work fewer hours on average than men, then female wages will be understated relative to male wages. The *change* in the gender wage differential, the key variable of interest, will be affected only if relative hours worked between the two sexes have changed. Given

rising unemployment and increasing use of shortened working hours in many transition economies, it is likely that relative hours worked have changed. The direction of the bias might be predicted, given the lack of data on hours worked, by comparing female and male unemployment rates. As discussed below, however, no consistent pattern has emerged in terms of female and male unemployment rates: in some countries the female unemployment rate is higher than the male unemployment rate, while in other countries the opposite is true. Thus, while the confounding effects of changes in relative hours worked should be kept in mind when interpreting the results, it is unclear how these trends have differentially affected women overall.

It should also be noted that the empirical results presented here focus on relative wages; the effect on women's welfare of declining labor force participation and rising unemployment is not taken into account in the measures used here. This could be a problem if, for example, low-wage women drop out of the labor force

¹⁷All results presented in the paper have also been calculated using untrimmed data sets; the results are similar and are available from the author on request.

Table 3. Female/Male Wage Ratios (%) and
Position of Women in the Male Wage Distribution.^a

Country	Fem./Male Wage Ratio, at Means		Fem./Male Wage Ratio, at Medians		Position of Mean Female in Male Wage Distribution		Position of Median Female in Male Wage Distribution	
	Pre- Reform	Post- Reform	Pre- Reform	Post- Reform	Pre- Reform	Post- Reform	Pre- Reform	Post- Reform
Ukraine	76.4	59.7	77.1	50.0	33.2	35.4	26.6	28.7
Russian Fed.	80.3	67.9	83.3	65.8	37.3	35.6	30.6	31.1
Bulgaria	na	78.4	na	90.0	na	39.2	na	34.5
Hungary	73.1	75.1	72.7	75.7	25.7	33.9	17.6	27.2
Poland	71.8	81.2	73.4	83.2	25.4	36.0	17.9	31.5
Czech Rep.	68.5	72.1	66.7	71.5	16.8	27.1	10.0	19.0
Slovak Rep.	70.5	77.3	71.4	77.0	19.2	31.1	12.6	22.6
Eastern Germany ^b	74	84	na	na	21 ^c	33 ^c	na	na
Estonia ^d	64	74	na	na	20 ^e	29 ^e	na	na
Slovenia ^f	88.0	90.0	na	na	na	na	35.0	40.0

^aCalculated by assigning each woman a percentile in the male wage distribution, and finding the mean or median of those rankings.

^bSource: Hunt (1997), p. 1 and Table 2.

^cCalculated after controlling for age, education, and tenure.

^dSource: Orazem and Vodopivec (1999:13).

^eCalculated after controlling for education, experience and its square, ethnicity, and industry of employment.

^fSource: Orazem and Vodopivec (1995:216).

disproportionately during the transition; this would misleadingly give the appearance of rising female relative wages. While a detailed analysis of this issue is beyond the scope of this paper, the evidence on changes in female labor force participation rates discussed below suggests that declining participation is unlikely to account for a large proportion of the change in female relative wages in most countries.

Empirical Results

Given the similar economic structure and labor market institutions of these countries before the transition, and the common elements of the recent economic reforms (although the reforms have been implemented at greatly varying paces), one might expect the change in women's economic status over this period to be broadly similar across the countries surveyed here. The surprising finding, however, is the opposite: while women's wages have unambiguously improved relative to men's wages in all of the East European countries analyzed

here, women in Russia and Ukraine have fared much worse in terms of relative wages since market reforms were introduced.

The changes in the mean and median female/male wage ratios over time are given in Table 3.¹⁸ Women's relative wages have increased in all of the East European countries, with the most dramatic increases occurring in Poland (where the mean female/male wage ratio increased from 72% in

¹⁸Note that female relative wages in Russia appear to have improved dramatically between 1989 (Figure 1) and 1991 (Table 3). While the 1991 figures may be anomalous, two other 1991 surveys confirm the results: a VTsIOM survey taken in October 1991 (N = 2,229) has mean and median gender wage ratios that are nearly identical to those reported here, and the General Social Survey (of European Russia only) taken in May 1991 (N = 982) has mean and median gender wage ratios of 74.8% and 77.3%, respectively. Relative improvements in female wages were likely due to Gorbachev's reforms, which, among other things, increased relative wages in female-dominated industries and occupations (see Chapman 1991 for a discussion).

1986 to 81% in 1992) and the Slovak Republic (from 71% to 77%). The absolute levels of the female/male wage ratios in most East European countries, in fact, now appear to be nearly comparable to those observed in the Scandinavian countries, which boast relatively high female wages. In contrast, female relative wages have fallen dramatically in Russia and Ukraine, with women earning on average 68% of male wages in the former and only 60% of male wages in the latter.¹⁹ It is difficult to know whether women are doing poorly in all countries of the former Soviet Union or only in Russia and Ukraine, since survey data for other former Soviet republics are limited. One (retrospective) household survey conducted in Estonia indicates that the female-male wage differential narrowed substantially between 1989 and 1994 (Table 3), which is unsurprising because Estonia is in some ways more similar to an East European country than to Russia. Estonia, like most of the East European countries surveyed here, undertook rapid and effective reforms in 1992, and largely avoided the macroeconomic instability that plagued Russia and Ukraine in the early 1990s.

Returning to Table 3, the last column in each panel presents the mean and median female positions in the male wage distribution. As noted above, this is a summary measure of female labor market progress that reflects measured and unmeasured

labor market skills as well as discrimination. A woman at a given percentile in the male wage distribution is perceived by employers to have skills comparable to the skills of a man at that percentile in the distribution. An improvement in women's actual labor market skills, or a decline in discrimination, will move the mean female ranking up in the male wage distribution. Assuming that the position of the mean woman is in the bottom half of the wage distribution, an increase in overall wage dispersion will penalize women relative to men. Thus, a relatively high mean female percentile can be associated with relatively low female wages if wage inequality is high; this has been shown to be the case in the United States (Blau and Kahn 1995). Comparing the change in the female/male wage ratio over time with the change in the mean (or median) female percentile will give a first indication of the role played by changes in the overall wage structure in explaining changing relative wages.

As indicated in Table 3, the mean and median female percentiles in both Russia and Ukraine changed little over the period, suggesting that the decline in the female/male wage ratio is due largely to changes in the overall wage structure in these two countries; gender-specific factors appear to explain little of the poor labor market outcomes of women in Russia and Ukraine. In contrast, the mean and median female percentiles in all of the East European countries rose substantially in the years following the introduction of market reforms. This suggests that women's labor market skills improved in these countries relative to men's skills, or that discrimination fell, or both.

Explaining Changes in Relative Wages: The Role of the Wage Structure and Labor Market Institutions

To shed some light on the role the overall wage structure has played in the changing gender gap, Table 4 summarizes the changes in male and female wage inequality in these countries after the introduction of market reforms; a comparison with the

¹⁹Using data from the Russian Longitudinal Monitoring Survey (RLMS) for 1994–96, Ogloblin (1999:609) calculated the female-male wage ratio for monthly wages at 66.8%, which is quite similar to that estimated here for Russia using a different data set. For Ukraine, however, Newell and Reilly (2000:19) reported a gender pay ratio for monthly wages of 77.7% in 1996, substantially higher than that reported in Table 3, which refers to late 1994. Since it is unlikely that the gender wage gap narrowed this dramatically between 1994 and 1996, the difference between the two estimates may be due to the small sample size of the survey used in the Newell and Reilly paper ($N = 996$), or it may be due to the urban bias of the survey used here, which was conducted in five cities in Ukraine (or a combination of the two).

changes in inequality that occurred in the United States and United Kingdom in the 1980s is also provided. The 90-10 log wage differential is given as a measure of overall wage dispersion; the 90-50 and 50-10 log wage differentials indicate whether changes in wage dispersion occurred predominantly in the upper or lower half of the wage distribution.

As expected, the wage structure widens in all countries over the period, but the changes differ between countries. The wage structure has widened substantially in the East European countries for both men and women, but has increased dramatically in the countries of the former Soviet Union. The level of wage inequality in the latter countries, as measured by the 90-10 log wage differential, appears to be greater than that currently observed in the United States, which has one of the most unequal wage distributions of any developed country. Wage inequality in Ukraine is remarkably high and is likely to be as great as that in some developing countries that have great extremes of wealth and poverty.

Russia and Ukraine are also noteworthy for the extreme widening of the lower half of the wage distribution, in contrast to the East European countries in which the increase in wage dispersion was either concentrated in the upper half of the wage distribution (Poland, Hungary) or was more symmetric (Czech and Slovak Republics). This difference across countries is likely related, at least in part, to the changes in the minimum wage discussed earlier and documented in Figure 2. The extraordinarily low levels of the minimum wage in Russia and Ukraine are likely responsible for the dramatic widening of the bottom part of the wage distribution in those countries, while the relatively high minimum wages in Eastern Europe prevented such a change. To the extent that more women than men earn the minimum wage, one would expect female wages to be more protected in the lower part of the wage distribution in Eastern Europe than in Ukraine and Russia. In addition, one would expect the overall increase in wage dispersion to

penalize women more in Russia and Ukraine than in Eastern Europe, given the changes documented in Table 4. As will be confirmed by further tests described below, the widening of the wage structure more than explains the deterioration of female relative wages in Ukraine and Russia. The widening of the wage structure also penalized women in Eastern Europe, but favorable changes in gender-specific factors more than offset this effect, resulting in a narrowing of the gender gap in these countries.

Why has the wage structure widened so much more dramatically in Russia and Ukraine than in Eastern Europe? While a detailed investigation is beyond the scope of this paper, this difference is likely to be due at least in part to the differing labor market institutions that have evolved in these countries. Although dismantling the centralized wage-setting system should allow the previously distorted wage structure to freely adjust to reflect relative scarcities and reward skills accordingly, most countries, as noted above, replaced centralized wage-setting with new institutions that had the potential to distort the wage structure in new ways. The imposition of tax-based incomes policies, the indexation of minimum wages, and the emergence of collective bargaining arrangements are all likely to narrow the wage structure. While the institutional arrangements across these countries are diverse and labor market policies have been implemented with varying degrees of effectiveness, it does appear that the countries with the most decentralized wage-setting systems—Russia and Ukraine—have experienced the greatest increases in wage inequality over the period. Countries with less unequal wage distributions are those with effective incomes policies, collective bargaining arrangements, and relatively high minimum wages.

Differing changes in wage inequality may also be related to the differing initial levels of macroeconomic disequilibrium across countries. Although it is difficult to provide statistical evidence on this hypothesis,

Table 4. Summary Measures of the Log Wage Distribution.

Description	Men			Women		
	90-10 ^a	90-50	50-10	90-10 ^a	90-50	50-10
Ukraine						
Pre-Reform	1.251	0.589	0.662	1.180	0.596	0.584
Post-Reform	2.427	1.105	1.204	2.526	1.322	1.322
Change	1.176	0.516	0.542	1.346	0.726	0.738
% Change	0.940	0.876	0.818	1.141	1.218	1.264
Russia						
Pre-Reform	0.968	0.511	0.457	0.979	0.533	0.446
Post-Reform	1.891	0.844	1.047	1.709	0.857	0.852
Change	0.923	0.333	0.590	0.730	0.324	0.406
% Change	0.954	0.652	1.291	0.746	0.608	0.910
Bulgaria						
Pre-Reform	na	na	na	na	na	na
Post-Reform	1.204	0.693	0.511	1.099	0.511	0.588
Hungary						
Pre-Reform	0.799	0.375	0.424	0.892	0.422	0.470
Post-Reform	1.297	0.717	0.580	1.229	0.668	0.561
Change	0.498	0.342	0.156	0.337	0.246	0.091
% Change	0.623	0.912	0.368	0.378	0.583	0.194
Poland						
Pre-Reform	0.908	0.447	0.461	0.861	0.398	0.464
Post-Reform	1.050	0.563	0.487	0.955	0.471	0.483
Change	0.142	0.116	0.026	0.094	0.073	0.019
% Change	0.156	0.260	0.056	0.109	0.183	0.041
Czech Rep.						
Pre-Reform	0.691	0.288	0.403	0.693	0.336	0.357
Post-Reform	0.988	0.449	0.539	0.984	0.456	0.528
Change	0.297	0.161	0.136	0.291	0.120	0.171
% Change	0.430	0.559	0.337	0.420	0.357	0.479
Slovak Rep.						
Pre-Reform	0.693	0.357	0.336	0.693	0.336	0.357
Post-Reform	0.971	0.452	0.519	0.934	0.454	0.480
Change	0.278	0.095	0.183	0.241	0.118	0.123
% Change	0.401	0.266	0.545	0.348	0.351	0.345
United States ^b						
1979	1.23	0.56	0.67	0.96	0.55	0.41
1990	1.40	0.69	0.71	1.27	0.67	0.61
Change	0.17	0.13	0.04	0.31	0.12	0.20
% Change	0.14	0.23	0.06	0.32	0.22	0.49
United Kingdom ^b						
1979	0.88	0.51	0.37	0.84	0.50	0.34
1990	1.16	0.67	0.49	1.11	0.64	0.47
Change	0.28	0.16	0.12	0.27	0.14	0.13
% Change	0.32	0.31	0.32	0.32	0.28	0.38

^aThe log wage at the 90th percentile of the wage distribution minus the log wage at the 10th percentile of the distribution. The 90-50 and 50-10 measures are calculated similarly.

^bSource: Katz et al. (1995:58). Hourly wages.

it does appear that wage inequality is higher in the countries of the former Soviet Union, which experienced well-known, dramatic shortages of consumer goods in the late 1980s. Greater initial disequilibrium will

result in greater labor market adjustments in response to price and wage liberalization, and will create more opportunities for workers to earn rents in the early years of transition.

Figure 3. Return to an Additional Year of Education.

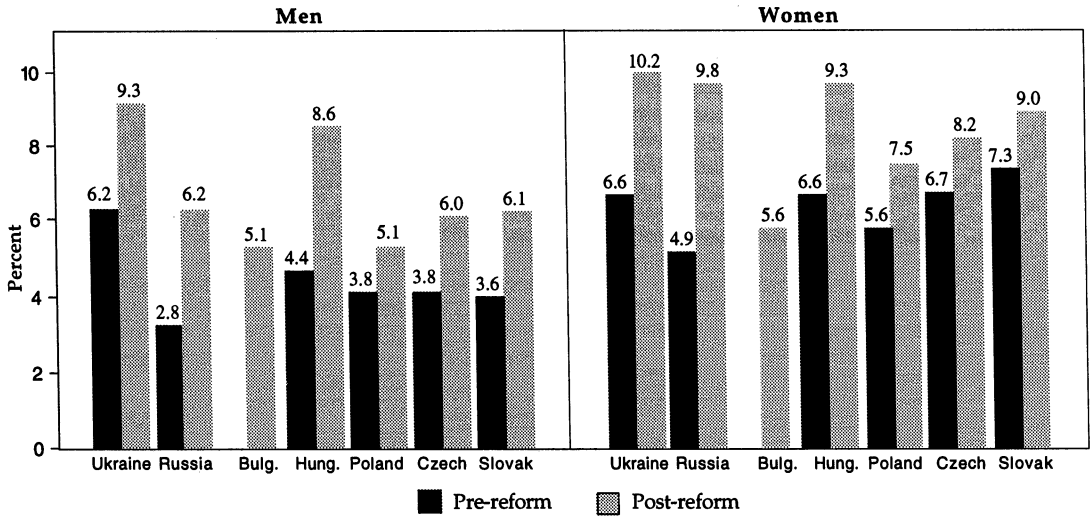
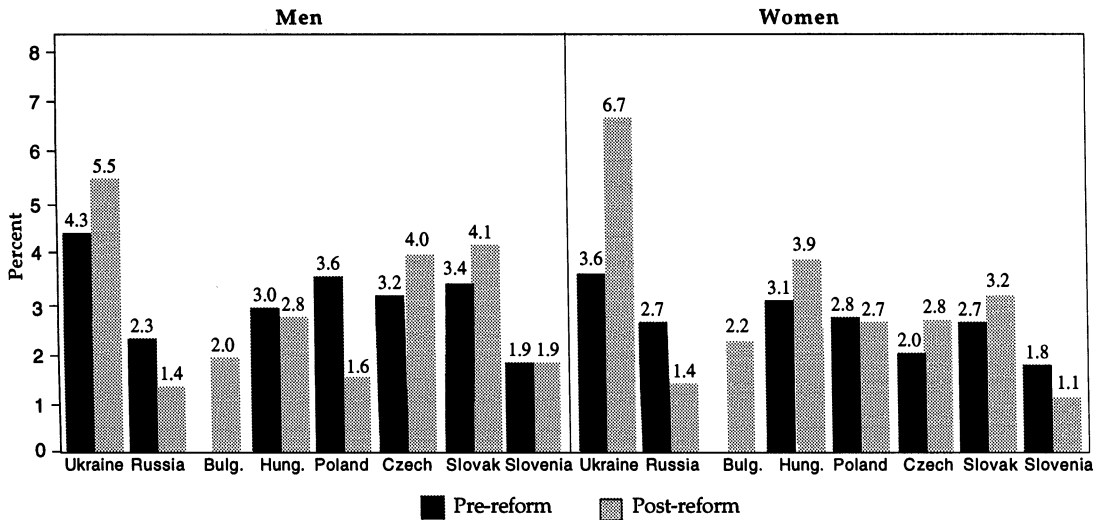


Figure 4. Return to First Year of (Potential) Experience.



Note: From regressions of log monthly wages on years of education, years of potential experience (age – years of education – 7), and its square.

A related component of the widening of the wage structure in these countries is the change in returns to labor market skills. Perhaps the improvement in female relative wages in Eastern Europe is due, for example, to an increase in the return to education for women relative to men in

those countries. The change in the return to education for men and women is shown in Figure 3.²⁰ The return to education for

²⁰Returns to education and experience are estimated from regressions of log monthly wages on years of education, years of potential experience (age –

both men and women has increased in all countries surveyed here, and women continue to earn higher returns to education than men. Since women are more highly educated than men on average, the increase in market returns to education should increase the female/male wage ratio. It is not the case, however, that the relative return to education for women has increased more in Eastern Europe than in Russia and Ukraine. Thus, differing changes in the returns to education are unlikely to explain the differing experiences between the two regions. Changes in returns to labor market experience have been mixed, falling in Russia and Poland and rising in other countries (Figure 4). Since women have close to the same levels of (potential) labor market experience as do men, this price change will likely explain little of the change in relative wages.

Decomposing the Change in the Female-Male Wage Differential

To further explore the reasons for the change in female-male relative wages, the change in the gender wage differential can be decomposed into changes due to gender-specific factors, such as observable skills and discrimination, and changes due to the widening of the wage structure. This technique was first developed by Juhn, Murphy, and Pierce (1991) and has since been used to examine changes in gender wage differentials in the United States (Blau and Kahn 1997) and to compare international differences in gender wage differentials (Blau and Kahn 1992, 1995). These studies highlight the potentially important role that wage inequality can play in explaining relative pay differences, as well as the traditional factors of discrimination and differences in observed and unobserved skills.

Following Blau and Kahn (1997), one can decompose the gender wage differential into these components by starting with a male wage equation for period t , written in the form

$$(1) \quad W_{Mt} = X_{Mt} \beta_t + \sigma_t \theta_{Mt},$$

where W_{Mt} is the log of monthly wages, X_{Mt} is a vector of explanatory variables, β_t is a vector of coefficients, σ_t is the standard deviation of the residual of the male wage equation, and θ_{Mt} is the standardized residual of the male wage regression, with mean 0 and variance 1 (that is, $\theta_{Mt} = e_{Mt}/\sigma_t$, where e_{Mt} is the residual from the male wage equation). Writing the wage equation in this way illustrates the two components that comprise the residual: the percentile the individual occupies in the residual distribution, θ_{Mt} , and the spread of the residual distribution itself, represented by σ_t . This conceptual distinction is exploited by the Juhn, Murphy, and Pierce (JMP) decomposition technique.

The male-female wage gap can then be written as

$$(2) \quad D_t \equiv W_{Mt} - W_{Ft} = (X_{Mt} - X_{Ft}) \beta_t + (\theta_{Mt} - \theta_{Ft}) \sigma_t,$$

where $\theta_{Ft} = (W_{Ft} - X_{Ft} \beta_t)/\sigma_t$, which reflects the wage a woman would receive if her skills were rewarded at the same rate at which men's skills are rewarded (deflated by the male standardized residual). Thus, the gender wage gap in a given period comprises an effect due to differences in observed skills between men and women, weighted by the return received by men to these skills, and an effect due to differences in the standardized residual, weighted by residual male inequality.

The change in the gender gap between two periods t and t' can then be written as

$$(3) \quad D_{t'} - D_t = [(X_{Mt'} - X_{Mt}) - (X_{Ft'} - X_{Ft})] \beta_{t'} + (X_{Mt} - X_{Ft}) (\beta_{t'} - \beta_t) + [(\theta_{Mt'} - \theta_{Ft'}) - (\theta_{Mt} - \theta_{Ft})] \sigma_{t'} + (\theta_{Mt} - \theta_{Ft}) (\sigma_{t'} - \sigma_t).$$

The first term is known as the "Observed X's" effect, which reflects changes in the gender wage differential that result from

years of education - 7), and its square. Full regression results are available from the author on request. See Newell and Reilly (1999) for an analysis of returns to education across countries in Eastern Europe and the former Soviet Union.

changes in male-female differences in observed labor market skills such as level of education and years of work experience. Given the relatively short time horizon under study, it is unlikely that changes in observed labor market qualifications will explain more than a small share of the changes in the gender wage gap.

The second term (the "Observed Prices" effect) captures the contribution of changes in the prices that the labor market attaches to observed skills of men. If the wage distribution in these countries was artificially compressed under socialism and rewards for observed skills increase as wage determination is decentralized, those with more skills will benefit disproportionately. In many East European countries, for example, women have higher levels of education than do men, and so will benefit more from increased returns to education. As noted above, however, since the pattern of changes in returns to education appears to be broadly similar across countries, this component is unlikely to explain the differing outcomes between Eastern Europe and the former Soviet republics.

The third term, which Blau and Kahn label the "Gap" effect, represents the contribution of changes in the relative position of women in the male residual wage distribution. Women will move up in this distribution if their unobserved labor market skills improve relative to men's, or if labor market discrimination against women declines.

The fourth term, the "Unobserved Prices" effect, measures the change in the gender gap attributable to the widening (or narrowing) of the distribution of male wage residuals, holding constant the gap in male-female unmeasured skills. In other words, this term reflects the contribution of the widening of the male residual distribution, holding constant the mean female ranking in the male residual distribution.

As noted in previous work by Blau and Kahn (1995, 1997), this decomposition technique is most valid when men and women are affected in similar ways by labor market institutions and other factors that influence the wage distribution. Based on the

information presented in Table 4, it seems clear that both the levels and changes in inequality are similar for men and women in the countries of Eastern Europe and the former Soviet Union. This suggests that institutional and market forces have affected men and women similarly in these countries and that it is appropriate to use this technique to analyze the changes in the gender wage differential in these countries.²¹

This decomposition was carried out for Ukraine, Russia, Hungary, Poland, and the Czech and Slovak Republics; the results, along with those for eastern Germany, Estonia, and Slovenia, are presented in Table 5. The same decomposition is presented for the United States (for 1979–88) for comparison. Positive numbers indicate factors that have decreased female wages relative to male wages over the period; negative numbers indicate factors that have improved female relative wages. Comparing across these countries highlights the substantial differences in the forces affecting Russia and Ukraine as compared with the East European countries.

In both Russia and Ukraine, the changes in returns to observed skills (column 2) and the small relative gains in the mean female rank in the male residual distribution (column 3) contributed to improve-

²¹Suen (1997) argued that the JMP decomposition may be misleading because the percentile rankings used in the "Gap" effect are not independent of the standard deviation of wage residuals used in the "Unobserved Prices" effect: as wage inequality rises, the mean percentile ranking of women will rise simply because wider distributions have thicker tails. Therefore, the "Gap" effect may reflect this mechanical relationship between the average percentile ranking and male wage inequality rather than, as most interpretations would have it, improvements in unmeasured skill or discrimination. While this is a valid concern, the results shown in Table 3 suggest that more is at work than this mechanical relationship: if this were the only factor operating, the female percentiles would have risen more in Russia and Ukraine than in the East European countries, because the rise in male wage inequality was greater in the former countries than in the latter.

Table 5. Decomposition of the Change in the Gender Wage Differential.

Country	Observed Change in Gender Gap (Log Wages) ^a	Of Which: Observed X's (1)	Observed Prices (2)	Gap (3)	Unobserved Prices (4)	Sum Gender- Specific (1+3)	Sum Wage Structure (2+4)	Explained (1+2)	Un- explained (3+4)
Ukraine	.274	-.011	-.013	-.052	.349	-.063	.336	-.024	.297
Russia	.150	.003	-.013	-.041	.198	-.038	.185	-.010	.157
Hungary	-.054	-.023	-.004	-.284	.257	-.307	.253	-.027	-.027
Poland	-.124	-.015	-.001	-.153	.045	-.168	.044	-.016	-.108
Czech Rep.	-.049	-.020	.010	-.256	.217	-.276	.227	-.010	-.039
Slovak Rep.	-.093	-.032	.008	-.250	.182	-.282	.190	-.024	-.068
Eastern Germany	-.115	-.035	.009	-.103	.013	-.138	.023	-.026	-.090
Estonia	-.140	.020	-.060	-.146	.046	-.126	-.014	-.040	-.100
Slovenia	-.030	-.012	-.014	-.100	.097	-.113	.083	-.026	-.003
U.S. (1979-88)	-.152	-.076	.042	-.146	.027	-.222	.069	-.034	-.119

^aThe change in the gender wage gap is calculated as $(\ln W_M - \ln W_F)^{\text{POST}} - (\ln W_M - \ln W_F)^{\text{PRE}}$, so a positive number indicates deteriorating relative wages for women over time, and a negative number indicates improving relative wages.

Note: From regressions of log wages on years of education, potential experience, and potential experience squared. For eastern Germany, controls are age, education, and tenure. For Estonia and Slovenia, controls are education, potential experience and potential experience squared, ethnicity, and industry of employment.

Sources: Eastern Germany: Hunt (1997, Table 2); Estonia: Orazem and Vodopivec (1999:39); Slovenia: Orazem and Vodopivec (1995:217); U.S.: Blau and Kahn (1997:15); others: author's calculations.

ments in female wages relative to male wages. However, these positive forces were more than offset by the adverse impact on women of the extreme widening of the wage distribution, reflected in column 4. Changes in the wage structure alone account for more than 100% of the deterioration in the female-male wage differential in these countries.²²

While the widening of the wage structure also worked against women in Eastern Europe, this was more than offset by women moving up in the residual male wage distribution (column 3). This remarkable improvement in the mean female percentile in the male residual distribution indicates

either that women are now subject to less discrimination in the labor market than previously, or that women's unobserved labor market skills have improved relative to men's; it could also be due to supply and demand shifts that have adversely affected men relative to women. Demand and supply indexes presented below, however, suggest that relative supply and demand shifts are unlikely to explain a large part of these changes. Improvements in observed labor market skills (column 1) also contributed to higher female relative wages in all of the East European countries, but the effects are small relative to the "Gap" effect.²³

The factors that contributed to the declining gender gap in the East European countries are remarkably similar to the fac-

²²For Russia, Hungary, and Poland—for which consistent data are available—this decomposition can also be done while controlling for industry of employment. As might be expected, the contributions of the "Observed X's" and "Observed Prices" effects increase, but these are still small relative to the contributions of the "Gap" effect and "Unobserved Prices" effect.

²³Results are similar using the opposite weights (pre-reform prices and post-reform quantities) to perform the decomposition, but the "Gap" effect and "Unobserved Prices" effect are smaller than those shown in Table 5.

tors that decreased the gender wage gap in the United States in recent years. As in these countries, women's wages in the United States improved relative to men's wages largely because of improvements in female observed and unobserved skills relative to male skills (the "gender-specific" factors). As in Eastern Europe, women's relative wage gains in the United States occurred despite their "swimming upstream" against a widening wage structure that adversely affected female wages relative to male wages. In the United States, the widening wage distribution reclaimed about one-third of the improvement in female relative wages (that is, the sum of the wage structure components divided by the sum of the gender-specific components); the increase in wage dispersion reclaimed as much as four-fifths of the improvement in women's relative wages in Eastern Europe, and led to declines in female relative wages in Russia and Ukraine.

Changes in Female Employment and Labor Force Participation

One factor that may explain changing gender wage differentials is differing shifts in the occupational and industrial distribution of employment between men and women. For example, since men comprise a larger share of employment in heavy industry, the expected shift in the industrial structure away from heavy industry should favor women relative to men. Similarly, changes in the relative labor supply of men and women will also affect the gender wage gap.

Although data on this issue are limited, it is possible to construct indexes to reflect changes in relative labor demand (by industry) and supply for Russia, Hungary, and Poland. The effect of between-sector demand shifts on relative labor demand can be measured using a fixed-coefficient "manpower requirements" index, which measures the percentage change in demand for a given group as the weighted average of percentage employment growth by industry (weights are the industrial employment distribution for the given group in the base

period). This index can be written as

$$(4) \quad \Delta D_k = \sum_j \lambda_{jk} (\Delta E_j / E_j),$$

where j indexes industry, E_j is total employment of all groups in industry j , $\lambda_{jk} = E_{jk} / (\sum_j E_{jk})$ is a base year, and E_{jk} is the employment of group k in industry j .²⁴ Changes in supply can be measured as

$$(5) \quad \Delta S_k = \ln E_{k1} - \ln E_{k0},$$

where E_{k1} represents the share of total employment in the post-reform year of group k , and E_{k0} is the share of employment of the group in the base (pre-reform) year. Changes in net supply are measured as

$$(6) \quad \Delta NS_k = \Delta S_k - \ln(1 + \Delta D_k).$$

The results of this calculation are shown in Table 6, along with those for the United States for the 1979–88 period. The direction of demand and supply shifts in all countries is consistent with the observed change in the gender wage gap: in Russia, where female relative wages fell, the net supply of women rose while that of men fell. In Hungary and Poland, in contrast, the net supply of women fell while that of men rose; this is consistent with the rising relative female wages observed in those countries. The magnitude of the shifts, however, is small, especially in comparison with those that occurred in the United States in the 1980s. This suggests that demand and supply shifts explain some, but not all, of the change in the gender wage gap in these countries. It should be noted, however, that because of data limitations these indexes do not account for occupation or within-industry demand shifts, which also likely explain some of the changes in the gender wage gap.

²⁴Katz and Murphy (1992) provided a formal justification for the use of this index, assuming that employment is based on efficiency units (value-weighted labor inputs). Since data for the latter are unavailable, employment is used here. Note that such demand indexes will tend to understate the demand shift favoring groups with rising relative wages.

It is also possible that differential changes in labor force participation rates between men and women account for some of the changes in the gender wage gap across countries. In particular, as documented in Hunt (1997) for eastern Germany, low-skilled women may be dropping out of the labor force disproportionately during transition, which would artificially increase female relative wages. While this appears to be a factor in explaining the narrowing gender wage gap in eastern Germany, it is unlikely to contribute significantly to the rising female relative wages in the countries surveyed here, because in many countries the decline in male labor force participation rates nearly matched the decline in female labor force participation rates. For example, in the Czech Republic the labor force participation rate for working age men declined from 87.8% to 83.6%, while the female labor force participation rate declined from 85.0% to 78.9%.²⁵ In several countries, including Ukraine, Russia, Bulgaria, and Poland, the decline in male labor force participation in the early years of transition exceeds that of female labor force participation. This again suggests that changes in the relative supply of female workers are unlikely to explain the changes in the gender gap in most of these countries.

A similar story is evident if one examines male and female unemployment rates across countries in the early 1990s. According to data published in ILO (1998:473–80) and using the ILO definition of unemployment, as of 1993–94 female unemployment rates were not uniformly higher than male unemployment rates across the region; in fact, there were no systematic patterns in unemployment by gender in these countries. Specifically, male and female unemploy-

Table 6. Measures of Demand and Supply Shifts of Men and Women.

Group	Supply	Demand ^a	Net Supply
Russia			
Men	-.0701	-.0179	-.0522
Women	.0659	.0189	.0470
Hungary			
Men	.0160	-.0106	.0266
Women	-.0177	.0104	-.0280
Poland			
Men	-.0150	-.0222	.0072
Women	.0177	.0258	-.0081
U.S. (1979–88) ^b			
Men	-.1123	-.0054	-.1069
Women	.1838	.0101	.1737

^aBased on 7 industry groups for Russia, 10 for Hungary, and 17 for Poland.

^bSource: Blau and Kahn (1997:22).

ment rates were roughly equal in four countries (Ukraine, Russia, Bulgaria, and the Slovak Republic); female unemployment rates exceeded male rates in two countries (Poland and the Czech Republic); and male rates were higher than female rates in two countries (Hungary and Slovenia).

In attempting to explain the differing outcomes between Eastern Europe and the former Soviet republics, a final factor to consider is the possible change in labor market discrimination against women that may have occurred during the transition. It is puzzling that gender discrimination seems to have persisted in Russia and Ukraine yet declined in Eastern Europe, as suggested by the “Gap” effect in Table 5. One hypothesis, although difficult to prove, is that persistent or declining labor market discrimination is related to the competitiveness of product markets in these countries. Product markets are more monopolized in the former Soviet republics, and the East European countries have a larger share of foreign trade in GDP than do Russia and Ukraine. Thus, it is likely that East European firms face more competition, both internal and external, than do their Russian and Ukrainian counterparts. Neoclassical theory predicts that, in competitive markets, employers who practice discrimi-

²⁵Labor force participation rates and unemployment rates are published in ILO (various years) and are provided in Brainerd (1997), an earlier version of this paper. See Paukert (1995) for a similar conclusion regarding Poland, Hungary, and the Czech and Slovak Republics.

nation (which is costly) will be forced out of business or forced to change their ways (Becker 1957). Thus, more competitive markets in Eastern Europe may have reduced discrimination against women in those countries.

Given the relatively small number of countries in this sample, it is difficult to assess this hypothesis empirically. Some suggestive evidence is provided by testing the correlation between the gender wage gap and the extent to which each country had liberalized its internal and external markets by 1994, as measured by de Melo et al.'s (1997) cumulative liberalization index. A higher value of this index reflects greater progress in economic liberalization, and is taken to indicate a greater degree of competition faced by firms.²⁶ Across these countries, there is a statistically significant positive relationship between the post-reform level of the gender wage ratio and the liberalization index, and between the change in the gender wage ratio and the liberalization index.²⁷ While these simple correlations cannot prove that competitive pressure on firms has narrowed the wage gap in some countries, the results are at least suggestive that gender discrimination has been eroded by the forces of competition in Eastern Europe, and that women in Russia and Ukraine may benefit from the continued de-monopolization and liberalization of those economies.

Conclusion

In retrospect it appears that the introduction of market reforms in formerly so-

cialist countries is not a gender-neutral policy, although these reforms have affected women in surprisingly different—and unpredictable—ways. Women have borne an unequal burden of the economic restructuring in Russia and Ukraine, but have gained substantially relative to men in the countries of Eastern Europe. The narrowing of gender wage differentials across all six of the East European countries surveyed here is remarkably consistent and suggests that, despite the difficulties of moving to a market economy, women have benefited relative to men in the labor market in that region. While some similar forces were operating in the former Soviet republics, the large magnitude of the increase in inequality in Russia and Ukraine, coupled with the lack of an effective minimum wage in those countries, prevented women from gaining in relative terms. Although female relative wages were also depressed by the increase in inequality in Eastern Europe, this was more than offset by improvements in gender-specific factors—in particular, it appears that women in Eastern Europe now face less labor market discrimination than they did previously.

Despite the emphasis on relative wages in this analysis, it should be recognized that the market reforms in Russia and Ukraine, as well as in the other countries, have benefited women in many ways outside of the labor market. In particular, the tremendous increase in the availability of goods and services in these countries since the introduction of market reforms has eliminated the once-legendary need to spend hours standing in line to obtain food to feed one's family. This has freed a significant amount of time in non-market work that was formerly required of women.

In addition, the changing economic status of women in these countries may have broader implications for economic growth. The shift in the wage distribution away from women in some countries and toward women in others will likely have consequences for the distribution of income within families. If, as has been shown in some countries (for example, Thomas 1990), women have a higher marginal pro-

²⁶The construction of the cumulative liberalization index is described in de Melo et al. (1997), from which it is taken. The index is normalized by reform duration, so that it reflects the number of "Poland-equivalent" reform years each country has undertaken.

²⁷The coefficient on the liberalization index is .052 (SE = .014, R^2 = .706, N = 8) with the gender wage ratio as the dependent variable, and .058 (SE = .011, R^2 = .858, N = 7) with the change in the gender wage ratio as the dependent variable.

pensity than do men to spend money on goods that benefit children, the resulting decline in investment in human resources in Russia and Ukraine may negatively affect

the long-run growth rates of these economies. Conversely, the re-allocation of wages toward women in Eastern Europe may serve to promote long-term growth there.

Appendix Table A1
Sample Sizes and Non-Response Rates^a

Country	Pre-Reform			Post-Reform				
	Survey	Source	Sample Size	Non-Response Rate	Survey	Source	Sample Size	Non-Response Rate
Ukraine	General Social Survey, Apr.–May 1991	ICPSR	Men: 222; Women: 213	6.9%	World Bank household survey (5 cities), Jan. 1995	Thomas Hoopengardner, World Bank	Men: 1,375; Women: 1,325	15.5%
Russian Fed.	VTsIOM, May 1991	All-Russian Center for Public Opinion Research (VTsIOM), Moscow	Men: 887; Women: 808	4.7%	VTsIOM, Apr.–June 1994 ^b	Interdisciplinary Academic Centre of the Social Sciences, Moscow	Men: 2,152; Women: 2,675	5.9%
Bulgaria	na	na	na	na	Social Stratification in Eastern Europe after 1989 (1993)	http://archiv.soc.cas.cz/SSEE	Men: 1,175; Women: 1,070	18.2%
Hungary	Táiki I 1986	Táiki Social Research Informatics Center, Budapest	Men: 1,988; Women: 1,977	1.0%	Táiki Hungarian Household Panel 1992 (first wave)	Luxembourg Income Study http://www.lis.ceps.lu	Men: 922; Women: 805	3.5%
Poland	Household Budget Survey 1986	Luxembourg Income Study	Men: 5,523; Women: 4,494	9.2%	Household Budget Survey 1992	Luxembourg Income Study	Men: 2,426; Women: 2,098	26.8%
Czech Rep.	1984 Class and Social Structure Survey	Sociological Data Archive, Institute of Sociology, Prague	Men: 1,960; Women: 2,241	na	Microcensus 1993	Luxembourg Income Study	Men: 9,257; Women: 8,124	6.5%
Slovak Rep.	1984 Class and Social Structure Survey	Sociological Data Archive, Institute of Sociology, Prague	Men: 1,095; Women: 1,186	na	Microcensus 1993	Luxembourg Income Study	Men: 8,668; Women: 7,303	4.9%
Eastern Germany ^c	German Socio-Economic Panel 1990	German Institute for Economic Research	Men: 1,014; Women: 1,047	na	German Socio-Economic Panel 1994	German Institute for Economic Research	Men: 757; Women: 671	na
Estonia ^d	Estonian Labor Force Survey 1995	na	Men: 3,118; Women: 3,290	na	Estonian Labor Force Survey 1995	na	Men: 2,987; Women: 2,822	na
Slovenia ^e	Slovenian Pension and Invalid Fund 1987	na	Men: 15,884; Women: 10,822	na	Slovenian Pension and Invalid Fund 1987	na	Men: 14,590; Women: 10,376	na

^aSample sizes are for the employed, working age population after elimination of observations with missing variables. The age range is 18-59 for men and 18-54 for women, except for Poland, for which the sample comprises men age 18-65 and women age 18-59, due to the higher retirement age in that country. Dates given are the dates the surveys were conducted. The non-response rate refers to non-response to the wage question.

^bRussian wages for May and June 1994 have been deflated into April 1994 wages using the regional consumer price indexes for those months.

^cFrom Hunt (1997).

^dFrom Orazem and Vodopivec (1999).

^eFrom Orazem and Vodopivec (1995).

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