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ABSTRACT

Gender Pay Gap in Poland

by Michal Grajek *

The gender pay gap under central planning and its changes in the course of transition have only lately attracted the attention of researchers. Only few papers focused on comparison between two economic regimes, pre and post reform, having reported narrowing gap for all East European countries. This paper adds more detailed study of timing of the gap changes to existing evidence. This in turn allows to identify which mechanisms of transition were responsible for these changes. It investigates the earnings gap between females and males in Poland over the years 1987-1996, i.e. in the last years of central planning and during the period of transition to market economy. The JMP decomposition, which accounts for changes in overall wage dispersion over time beyond Oaxaca's standard decomposition, is applied on large set of HBS data and reveals some interesting results. The year of giving away the power by the communists (1989) turned out to be far more important in terms of improving relative position of women than the actual year of launching the reform package (1990) and all the following years of transition. Females had gained substantially due to the structural shift in the very first years of the new economic system and the improvements have slowed down or even reversed in the next years, probably due to the "statistical" discrimination.

Keywords: Earnings Differentials, Discrimination, Gender, Decomposition, Transition economy, Planned economy, Poland

JEL Classification: J71

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ZUSAMMENFASSUNG

Geschlechterspezifische Einkommensunterschiede in Polen

Die Entwicklung geschlechterspezifischer Einkommensunterschiede während des Übergangs von der zentralistischen Planwirtschaft zur Marktwirtschaft wird erst seit kurzem in der Forschung thematisiert. Die wenigen Arbeiten, die Einkommensdifferenzen zwischen den beiden Wirtschaftsystemen – vor und nach der Reform – untersuchen, weisen auf einen abnehmenden Abstand in allen mittel- und osteuropäischen Ländern hin. Der vorliegende Beitrag ergänzt die Forschung nicht nur um eine detaillierte Analyse des Anpassungsverlaufs der Einkommenslücke, sondern identifiziert auch die Ursachen dieser Entwicklung. Die Untersuchung, die anhand von haushaltsbezogenen Einkommensunterschieden zwischen Frauen und Männern in Polen erfolgt, berücksichtigt die letzten Jahre der zentralen Planwirtschaft und die Übergangszeit (1987-1996). Die Juhn-Murphy-Pierce-Zerlegung (JMP-Zerlegung), die im Gegensatz zur Oaxaca-Methode explizit Änderungen in der allgemeinen Einkommensverteilung berücksichtigt, wurde auf die umfangreichen Haushaltsdaten angewendet. Die Ergebnisse zeigen, daß es 1989, dem Jahr der Beendigung der kommunistischen Führung, zu einer wesentlich stärkeren Verbesserung der relativen Einkommensposition der Frauen kam, als im folgenden Jahr, in welchem die Wirtschaftsreformen tatsächlich verabschiedet wurden. Insgesamt profitierten Frauen erheblich vom Strukturwandel der ersten Jahre nach der politischen Wende. Dieser Aufholprozeß verlangsamte sich später, wahrscheinlich durch einen statistischen Diskriminierungseffekt.

Introduction

Interest in the issue of earnings gap and gender discrimination on labor markets has undeniably increased during the last decades. Politicians started treating the problem of discrimination as an important element in election campaigns; economists and sociologists created a new branch of scientific theories and have undertaken many attempts to investigate the problem empirically. The forerunner of the researches dealing with the problem of discrimination were naturally the United States, which on the one hand are deeply diversified from the ethnic point of view, and on the other are a democratic country, in which groups unsatisfied with their status have the possibility to exert political pressure on authorities. There the problem of discrimination was strengthened, as it comprised not only women but also colored people. "In view of the importance of discrimination, it may seem surprising that economists have neglected its study". This statement from Becker (1957) has already become obsolete for the most developed countries of the world. However, it still seems to hold for Poland[1]. Scientists and market researchers concentrate rather on different issues, most of all unemployment. It does not mean however, that this problem is absent on the Polish labor market. The fact that the issue of male-female wages differentials in Poland has not yet been openly brought up and, as a result, has neither become a subject of researches nor a goal of economic policy, means only a delay in an unavoidable process, which the Polish society will also be subjected to.

Another motivation for inquiring polish male-females earnings data might be a hope for deeper understanding of the phenomenon of discrimination. In the centrally planned economy wages were assigned according to occupational wage scale within each industry. The enterprises operating under no competitive pressure were left with little impact on wage rates and wage differentials. The liberalization of the wage setting system, prices and trade during the transition toward market economy has changed this picture dramatically. The enterprises have gained some control over wages on the one hand, and have faced rising competition on the other. These peculiar changes in labor market institutions and competitive environment challenge the existing theory of discrimination. One might expect gradual driving out of discrimination according to Becker's (1957) classical model and the "overcrowding" model of Bergmann (1974). On the other hand, discrimination should survive or even strengthen according to the "statistical discrimination" models (e.g. Aigner and Cain, 1977).

[1] Exceptions are Kot, Podolec and Ulman (1999), Brainerd (2000) and Grajek (2000)

This paper aims to refine the previous findings concerning the gender pay gap, using Household Budget Survey (HBS) data collected by the Polish Central Statistical Office over the years 1987 to 1996. This large dataset allows one to study in detail the trend of gender earnings differentials shaped under centrally planed regime and during the economic transition. With the help of decomposition analysis of the male-female pay gap the main forces driving the gap are revealed. The paper adds also to the influential study of Brainerd (2000) an analysis of further transition years (1995,1996), showing that after an initial narrowing, a rising gender gap may be experienced by transition countries other than these of the former Soviet Union. The issue of gender discrimination will be placed in the discussion as becoming more and more important in the course of the transition.

The data used will be described in the following section of the paper (Chapter 2). Next, labor market institutional background under socialism (Chapter 3) and reforms toward market economy (Chapter 4) will be discussed shortly. Chapter 5 will present the decomposition technique used in the paper and Chapter 6 - the empirical results and a discussion of them. The final chapter will conclude.

Data

The analysis of this paper relies on the data from the Household Budget Survey (HBS) conducted by a rotational method by the Central Statistical Office (Glowny Urzad Statystyczny, GUS) over the years 1987-1990, 1992, 1995 and 1996. The data come from three rounds of the rotational panel, the first round being 1987-1990, the second 1991-1994 and the third 1995-1998. The sample coverage is representative and quite large; it amounts for about 35 thousand households, which corresponds to about 100 thousand individuals each year. Within a given round, 2/3 of the sample size rotates each year, which gives about 3500 individuals (1/27 of the coverage each year) who are present in the sample over all four years of a given round. The full data set from the 1987-1990 round, 1/3 of the 1992 data set (from the 1991-1994 round) and again a full set over the years 1995 and 1996 (from the 1995-1998 round) are available for the analysis.

For the purpose of the paper the sub-sample of the wage employed is utilized. The size of the sub-sample and means of demographic variables important for the analysis are given in Table 1. The survey (HBS) uses the concept of net monthly earnings consistently over the analyzed period. In this way the potential problem with introducing the personal income tax system in 1992 is resolved. Since this year the wages were shifted up by the amount of tax that each employee was supposed to pay, the earnings data remain consistent. The advantage

Table 1. Sample size and means of demographic variables.

Group[a]	Sample		Education (%)				Means	
	Size	%	University	Secondary	Vocational	Primary	Years of Schooling[b]	Years of Potential Experience[c]
1987								
Men	14968	55,66	8,01	21,86	45,30	24,83	10,49	20,66
Women	11925	44,34	10,15	42,71	22,66	24,49	11,06	19,15
Total	26893	100,00	8,96	31,10	35,26	24,68	10,74	19,99
1988								
Men	14397	54,79	7,65	21,50	46,94	23,90	10,48	21,21
Women	11881	45,21	9,87	42,13	24,08	23,92	11,04	19,62
Total	26278	100,00	8,66	30,83	36,60	23,91	10,73	20,49
1989								
Men	13739	54,44	7,27	21,04	47,58	24,11	10,44	21,72
Women	11496	45,56	9,89	42,27	24,58	23,26	11,06	20,15
Total	25235	100,00	8,46	30,71	37,10	23,72	10,72	21,01
1990								
Men	12738	54,18	7,80	24,32	48,00	19,88	10,67	21,46
Women	10773	45,82	10,33	45,64	24,11	19,92	11,35	20,18
Total	23511	100,00	8,96	34,09	37,05	19,90	10,98	20,88
1992								
Men	3708[d]	52,57	10,41	26,32	47,68	15,59	10,96	21,34
Women	3346[d]	47,43	13,45	48,63	22,21	15,72	11,70	20,40
Total	7054[d]	100,00	11,85	36,90	35,60	15,65	11,31	20,89
1995								
Men	13572	52,27	11,18	27,31	49,20	12,31	11,10	20,29
Women	12391	47,73	13,77	49,07	25,06	12,11	11,80	19,89
Total	25963	100,00	12,41	37,70	37,68	12,21	11,44	20,10
1996								
Men	13385	51,85	11,45	28,52	48,47	11,56	11,17	20,25
Women	12430	48,15	14,84	48,66	25,01	11,50	11,88	19,75
Total	25815	100,00	13,08	38,22	37,18	11,53	11,51	20,01

[a]Up to 1992 the sample consists of public sector employees only, later private sector employees are also present.
[b]Calculated on the basis of the highest completed education level.
[c]Calculated as age minus potential years of schooling minus 6.
[d]The coverage in the year 1992 constitutes ca. 1/3 of the usual one.
Source: selected sample of wage employed from HBS data, GUS; author's calculations.

of the data is also that it covers employees from firms of any size. In contrast, other GUS data such as the Earnings Distribution as of September and the Survey of Economic Activity of the Population (BAEL), which come from a sample survey of employers, omit employees of small firms (i.e. employing less than six workers).

The HBS data however is not free from disadvantages, the most important being the reliability of the reported earnings in the 1990's. Under the centrally planned regime, in the 1980's, earnings data reported by respondents were verified with that reported by employers. This was no longer the case in the 1990's, hence the opportunity to under-report one's earnings. It seems reasonable to assume that top earners have greater propensity to do so than

the middle ones. Since there are more men than women in this group, the male-female wage gap after the 1989 is likely to be underestimated.

Another problem in HBS is the coverage of the private sector of the economy. The employees in that sector are omitted in the sample over the period 1987-1992. This might be observed through the size of the sample reported in Table 1. The size of the private sector was negligible in 1987 (3,6% of employment, as reported in Rutkowski, 1996), but had increased gradually, pushing the size of the sample constituted by public sector employees down. In the years 1995 and 1996 the sample returned to its "original" size, because the private sector workers had been incorporated. This gap in coverage does not pose a serious problem for the analysis however. Comparing earnings functions' estimates based on HBS (without private sector) and Labor Force Survey data (with private sector) Rutkowski (1996) reports: "both surveys give similar parameter estimates for the overlap year (1992)". Also in Grajek (2000), decomposition of the gender pay gap with and without private sector over the years 1995 and 1996 reveals only slight increase of explained difference (by ca. 2,5 log % points) in favor of women when private sector is present and no change in unexplained difference.

Institutional Background and Position of Female Labor under Socialism

Labor market institutions in socialist Poland mirrored these of other east block countries and to an extent might be considered together as a Soviet block model. A fine description of the institutions in context of male-female differentials may be found in Brainerd (2000) and Ogloblin (1999). Neither of these however, pays special attention to the peculiarities of the Polish example.

The most important feature of the wage setting policy in countries of the Soviet block was that it regulated basic wages by means of (characteristic for each industry) wage rate scales (for more details see Adam, 1984). The spread between the lowest wage rate (set for the lowest grade) and the highest one in given industry was supposed to reflect the difference in skills required for performing jobs of different complexity. Moreover, the difference between wage rates scales reflected different importance attached to different industries by planners. According to principles of Marxist political economy, the production of means of productions (heavy industry) was superior to the production of consumer goods (light industry), which in turn was superior to the so-called "non-productive sphere" (education, healthcare, trade etc.). Additionally, the wage rate scales reflected the ideological importance of the working class, i.e. blue-collar workers as opposed to white-collar workers. This wage setting policy lead to lower wages inequality in countries of the Soviet bloc than in these of

Western Europe and the United States, as illustrated in Table 2. Take 1987 as a good reference year for Poland[2]; the wages at the 90th percentile of the male distribution are about 92 log % points higher than the wages at the 10th percentile. The corresponding figures in the year 1990 are 116 log % points for the UK and 140% for the United States.

Table 2. Measures of the Log Wages Distribution (log % points) in Poland, UK and USA.

	Men			Women		
Year	90-10[a]	90-50	50-10	90-10	90-50	50-10
Poland[b]						
1987	91,93	49,23	42,71	85,36	40,40	44,97
1988	88,64	46,77	41,87	85,46	39,00	46,46
1989	93,82	46,17	47,64	86,70	41,35	45,35
1990	94,56	50,34	44,22	91,65	47,35	44,30
1992	106,55	58,39	48,17	94,91	49,45	45,46
1995	116,82	62,98	53,84	101,24	57,95	43,29
1996	119,26	65,13	54,13	103,61	57,74	45,87
UK[c]						
1990	116	67	49	111	64	47
USA[c]						
1990	140	69	71	127	67	61

[a]The log wage at the 90th percentile of the wage distribution minus the log wage at the 10th percentile of the distribution; similarly 90-50 and 50-10.
Source: selected sample of wage employed from HBS data, GUS; author's calculations.
[c]*Source:* Katz et al. (1995) cited by Brainerd (2000).

Trade unions in the centrally planned economies played a different role than those in market economies. Their primary task was basically to gain support for the government's wage policy and more generally to mobilize workers to fulfill economic goals set by the central planners. In the Polish context however, this was true only for the official trade unions (OPZZ) controlled by the communist party (PZPR) and not for independent unions associated within Solidarity. In fact, strong egalitarian pressure exerted by Solidarity in the early 1980's resulted in a sharp fall of earnings inequality. Workers unrest and egalitarian demands caused significant reduction in earnings differentials again in 1988 (see Table 2), even though Solidarity had been delegalized since December 1981.

Another important feature of the Soviet-type economy was an excess demand for labor driven by economic plans targeting rapid industrialization and extensive growth of the economy. Enterprises faced no particular necessity for labor economizing since they did not

[2] Rutkowski (1996) in the discussion of the wages dispersion in Poland considers the year 1987 as "the last normal year preceding the incipient fall of the communist economy, a year representing the situation prevailing in the middle 1980s".

benefit from labor savings; instead they had to focus on plan fulfillment. These regulations do not surprise when you take into account the commitment to full employment from the very beginning of central planning (Adam, 1984). Unemployment was not recognized in official statistics and the official unemployment rates were first published in 1990 reaching 6.1% by the end of the year. Under socialism, the ideological principle of integration into the social sphere of production ruled.

That principle considered also women. Female labor was needed to satisfy the excess demand for labor, as described above, and official policies encouraged women to enter the labor force in many ways. First of all, women were given the same educational opportunities as men, which resulted in higher average educational attainment of females compared to males. For example, in the academic year 1988/89, the proportion of women in the overall number of university students was 51,4%. This might also be observed in the sample considered in this paper. In Table 1, the average of female years of schooling is higher than male by ca. half a year consistently over the period 1987-1996. The advantage of females in the share of workers with a university degree rises from ca. 2 to 2,5-3 % points over that period. Secondly, generous maternity benefits and well-developed day care center provision have to be mentioned. The prolonged maternity leave program introduced in 1968 can serve as an example. Women had been entitled to take a four years maternity leave for each child (since 1981 with an allowance, Adam, 1984) Thirdly, perhaps most important, low average real earnings silently, but very efficiently, encouraged women to supply household income in order to maintain decent living standards. And finally, the principle of equal pay for equal work regardless of gender was guaranteed and emphasized, explicitly in the Labor Code and implicitly in the same wage rate scales for both males and females.

These policies and attitudes resulted in Soviet block countries in extremely high by international standards participation rates of women in the labor force. 1980's saw in Poland female participation rate slightly above 70% compared with around 80% for males. It does not mean however, that women achieved labor market outcomes relatively equal to men. In spite of proclaimed gender equality women as labor force experienced specific treatment by the authorities, which resembled occupational segregation and promotional discrimination recognized in Western economies. The difference was that these attitudes were institutionalized through official policies under socialism. In the Polish Labor Code women were particularly protected because their physical constitution did not allow them to perform certain jobs (Romer, 1993). In this way women were "encouraged" to enter the "non-productive sphere" and light industries and also inclined toward white-collar occupations.

Since these industries and occupations were recognized as inferior by Marxist ideology, they were remunerated accordingly. Promotional patterns were influenced in a similar, perhaps more subtle way, "encouraging" women not to pursue their professional careers too far.

An obvious consequence of the above described policies and attitudes was the sustaining gender wage gap, in fact, similar in terms of female-male wage ratio to that observed in Western economies. The ratio in socialist Poland (Table 3, 1987, 1988) at the level of roughly 72% fits in the middle of the 1989 European and US figures (the range being from 68% in the UK to 75% in Italy, excluding the unusually low case of Benelux and the unusually high case of Scandinavian countries, as reported by Brainerd, 2000).

Table 3. Female-Male Relative Performance.

			Oaxaca Decomposition at the Mean	
Year	Wage Ratio (%) at Means	Position of Mean Female in Male Wage Distribution[a]	Overall Difference (log % points)	Unexplained Difference (log % points)
1987	70,82	25,03	34,50	35,09
1988	72,33	25,78	32,39	32,68
1989	79,68	33,14	22,72	24,15
1990	82,18	35,84	19,62	22,29
1992	80,74	35,90	21,40	24,30
1995	78,01	34,71	24,84	30,46
1996	78,43	34,90	24,30	30,29

[a]Calculated by assigning each woman a percentile in the male wage distribution and finding a mean of those rankings.
Source: selected sample of wage employed from HBS data, GUS; author's calculations.

The female-male wage ratio is however a misleading indicator of relative male-female labor market performance, because of its sensitivity to overall wages dispersion in the economy. If one squeezed overall wages distribution, as it was the case in centrally planed economies (Table 2), an average man would loose relatively to an average woman, because women tend to be in the lower tail of the distribution more often than men. The average female percentile in male wage distribution is less sensitive to this problem expressing the average position of women in male wage hierarchy. By this measure, women in 1987 Poland with an average position of ca. 25th percentile (Table 3) did significantly worse than in 1985-86 US (32nd percentile) and all other developed countries reported in Blau and Kahn (2000).

Overall, it appears that male-female occupational differences were greater in pre-reform Poland (and other East European countries, as positions of mean female in male wage distributions in Brainerd, 2000 illustrate) than in Western industrialized countries, which was

offset by smaller wage inequalities in the former, yielding similar average female-male wage ratios.

Market Reforms

Major reforms, which the Polish economy went through on its way toward market economy, were implemented on 1 January 1990 in the form of an initial reform package, known also as Balcerowicz Plan. The reform package affected employment and wages in many ways, most important in rising pressure on enterprises from both the supply and the demand side, final abandoning of the direct control of enterprises by authorities and fundamental institutional restructuring (e.g. layoffs regulations, new wage setting system).

The reform package included removing restrictions on foreign trade and setting up private firms. Price liberalization began already in 1989, when the last communist government freed food prices. The proportion of controlled prices was further decreased from 50% to 10% (Berg, Blanchard, 1994). This led to increasing domestic and foreign competition creating demand side pressure on enterprises. On the supply side, budget subsidies to state enterprises were reduced from 6.2% of GDP in 1989 to 1.4% in 1992 (Rutkowski, 1994), which was meant to remove the soft budget constraint and induce economizing on costs. This policy had already been attempted in 1989, but 1990 was a clear breakthrough (Berg, Blanchard, 1994).

Relaxing constraints on wage and employment decisions together with subsidies withdrawal aimed at final abandoning of the direct control of enterprises by the state. In fact, substantial economic freedom (self-financing, self-governing) was granted to them already in 1982, but the government retained much of the control through informal channels (Rutkowski, 1994). The turn of nominal into actual freedom might explain the dramatic change in male wages inequality that occurred in 1989. As given in Table 2, top earners were remunerated ca. 94 log % points higher than bottom ones in 1989, which corresponds to ca. 89 log % points a year before. This change was mostly driven by a rise of inequality at the lower tail of the distribution. Since the female-dominated “non-productive sphere” continued to be financed by the state budget according to wage rate scales, the change in women wages distribution was not that dramatic.

Institutional restructuring included, among other things, a new regulation concerning lay-offs, which actually made it possible to dismiss workers for other than disciplinary reasons. Unemployment, a new experience for Poland, was first recognized in 1990. Attempts to establish new structures of collective bargaining were largely unsuccessful (Socha,

Sztanderska, 1991), therefore an excess wage tax (ranging from 100% to 500% depending on the level of overstepping the allowed limit) remained the primary tool for regulating wage growth until 1992. On the other hand rising minimum wage (from around 20% in 1990 and 35% in 1991 to slightly above 40% from 1992 on, Brainerd, 2000) aimed to protect the poorest from growing wage inequality.

The privatization program implemented in the Privatization Act was approved by the Parliament in February 1991. The aim of the program was to achieve within 5 years an ownership structure similar to that of Western Europe. Yet, despite the priority attached to privatization, its tempo had been slow from the very beginning (Wellisz et. al., 1991). According to the BHS data used in this paper, over 60% of the employees still worked in the public sector in 1996.

Gender Pay Gap Decomposition

A very convenient tool for studying the gender pay gap in context of this paper is the JMP decomposition developed by Juhn, Murphy and Pierce (1991). First of all, it looks at the change in pay differentials over time, what is crucial to the analysis here as opposed to detailed explanation of the gap by means of various productivity characteristics, work history and occupational variables. This rich array of variables is simply not available in HBS data studied here. Secondly, JMP decomposition catches the impact of overall wage inequality rise on the pay gap. Since the rise on overall wage inequality is an obvious consequence of the transition from the centrally planned to market economy, this must be taken into account in investigating the gender gap. The presentation of the JMP decomposition below follows roughly Blau and Kahn (1997).

The starting point is the wage equation for male worker i in a period t written in the form:

$$W_{it} = X_{it}\beta_t + \sigma_t\theta_{it}, \tag{1}$$

where W_{it} is the log of wages, X_{it} is a vector of productivity characteristics, and θ_{it} is the standardized residual (with mean 0 and variance 1) of the i-th male worker. Further, β_t is a vector of coefficients and σ_t is the standard deviation of the residuals from the male wage regression. This way of writing the wage equation distinguishes the impact of one's position in residual distribution θ_{it} and of the spread (σ_t) of the distribution itself on one's wage.
Now, the male-female wage gap can be written as:

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

where M and F subscripts refer to male and female averages and $\theta_{Ft} = (W_{Ft} - X_{Ft}\beta_t)/\sigma_t$. This decomposition is actually equivalent to one of the two variants of the standard technique introduced by Oaxaca (1973). The first term on the RHS is the part of the wage differential explained by observed characteristics, while the second term constitutes unexplained (residual) difference, which can be attributed to unobserved characteristics and discrimination. Again, the spread (σ_t) of the males residual distribution arises explicitly in the notation.

The change in the gender gap between two periods *t'* and *t* can be then decomposed into four parts:

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

The first term on the RHS is known in the literature as "Observed X's" effect. It accounts for changes in relative male-female observed characteristics (labor market skills). Since it is unlikely, that over a short period there is a big difference in acquiring skills between male and female employees or that the new labor market entrants differ substantially in this respect, large "Observed X's" effect would suggest asymmetric perturbations to labor market participation of males and females.

The second term, known as "Observed Prices" effect, reflects the change in remuneration of observed skills (represented by male skills returns) by the labor market. Increasing returns to skills are likely in the course of transition to market economy due to abandoning of the artificially squeezed central wage setting system. Since women tend to be better educated on average and the measure of work experience available in this study is only the potential experience (see Table 4 for variable definitions), the increase is likely to be beneficial for women.

The third, "Gap" effect, captures the change in unexplained gender wage difference corrected for the change in unexplained wages dispersion (represented by standard deviation of the male residuals distribution). The idea behind it is to catch the changing relative performance of women due to changes in relative unobserved skills (ability to command people, willingness to work overtime, to accept stress etc.) and discrimination rather than changes in the dispersion of that distribution.

The fourth term, "Unobserved Prices" effect, captures the part of the change in gender pay gap due to change of the dispersion of the male wage residual distribution. This term is meant to illustrate the effect of rising returns to unobserved skills (analogous to the observed

skills) during transition. If women acquire less unobserved skills on average or are discriminated (segregated) against, this rise will work against them.

Discussion of the Empirical Results

The decomposition technique described above was applied to the selected sample of the HBS data at the mean. The wage regressions, as in (1), were estimated by OLS separately for each year. The dependent variable was the logarithm of after-tax monthly earnings (including wages, bonuses and benefits). The earnings have not been corrected for the number of hours worked. This might bias upward the unexplained male-female wage gap, since women are more likely to work part-time. The bias does not seem severe however, because part-time work is rather uncommon in Poland. The definitions of explanatory variables and the results of the wage regressions are given in the Appendix, in Table A1 and Table A2 respectively. With the help of the estimates of these regressions standard Oaxaca decomposition as in (2) was calculated and the last columns of Table 3 present the results. Table 4 presents the JMP decomposition[3] carried out as in (3).

Table 4. Decomposition of the Change in the Gender Wage Gap
(log % points; base year = 1987).

	Overall	Of Which:				Sum:			
Year	Change in Gender Gap	Observed X's (1)	Observed Prices (2)	Gap (3)	Unobserved Prices (4)	Gender Specific (1)+(3)	Wage Structure (2)+(4)	Explained (1)+(2)	Un-explained (3)+(4)
1988	-2,1[a]	0,2	0,1	-1,9	-0,5	-1,7	-0,4	0,3	-2,4
1989	-11,8	-0,5	-0,3	-14,1	3,2	-14,6	2,8	-0,8	-10,9
1990	-14,9	-0,6	-1,5	-13,9	1,1	-14,6	-0,3	-2,1	-12,8
1992	-13,1	-1,0	-1,3	-16,4	5,7	-17,5	4,4	-2,3	-10,8
1995	-9,7	-1,8	-3,4	-12,1	7,5	-13,9	4,1	-5,1	-4,6
1996	-10,2	-1,6	-3,8	-11,4	6,6	-13,0	2,8	-5,4	-4,8

[a]Negative numbers indicate a decrease of the gap subject to the base year, i.e. improving relative wages of women.
Source: selected sample of wage employed from HBS data, GUS; author's calculations.

A first look at the relative female-male performance figures reveals 1989 as the most spectacular in change. All measures presented in Table 3 increase that year dramatically in favor of women. Overall difference (the gender gap) falls by almost 10 log % points (which correspond to the 12,4 log % points fall over the period 1986-1992 reported in Brainerd, 2000), of which over 8 points correspond to unexplained difference fall. Position of mean female in male wage distribution also went up by 7,5 percentiles. In context of this measure

[3] Altogether four variants of the decomposition might be calculated using different weights; the variant used in the paper was chosen for consistency with Brainerd (2000).

80% of the change over the nine years period studied here occurred just in 1989. This is why this year calls for special attention.

It is important to note, that actual market reforms had begun one year after, but 1989 was the year of the first democratic parliamentary elections, which resulted in forming the first non-communist government. The relative women wage improvement might be explained by the earnings dispersion measures (Table 2). As mentioned before, men at the lower tail of the wages distribution suffered substantial loss compared to women. The likely reason for that was freeing of state owned enterprises' (SOEs') managers from informal government control. Hyperinflation reaching 251,1% in 1989, an experience without precedence in post-war Poland, and associated wages indexation problems may have also harmed SOEs' employees more, because of unclear wage setting procedures. Altogether, the first wave of changes influenced males and females in different proportions. Males, constituting the majority of employment in SOEs, were more exposed to labor economizing and had lost relative to females over-represented in the "budgetary sphere".

Further improvements (after 1898) of women position in men's wage distribution were far less spectacular. 1990 saw the next upward movement by ca. 2,5 percentiles and since then the measure had stabilized around 35^{th} percentile. On the other hand, female-male wage ratio decreased by a 4 % points over 1990-1996. The discrepancy between these two measures comes from the fact, that the latter is more sensitive to overall wage inequality as indicated before.

Let us now turn to the JMP decomposition of the gender wage gap (Table 6) and see what we can learn from it. The decomposition over 1987-1992 corresponds quite well to that reported in Brainerd (2000) over 1986-1992. Again it is clear that 1989 is a breakthrough. The 14,1 log % points improvement of relative women position is basically due to the "Gap" effect, which means radical change in unexplained factors, actually working against rising wages inequality. The relative loss of males in the first wave of changes described above is responsible for that to a great extent. Rise in observed prices encounters only for slight (0,3 log % points) improvement of women's position over the 1987-1989 period, and so does the observed skills improvement, the latter being an evidence for no significant asymmetric perturbations in male-female relative labor market participation (Hunt, 1997, attributed approx. 40%. of the narrowing of the gap in Eastern Germany to less skilled women exiting the labor force). Also Brainerd (2000) reports no significant changes of net supply of male and female workers over 1986-1992 in Poland. Altogether, unexplained factors are to a great

extent responsible for the first wave of relative improvement for women (10,9 log % points vs. 0,8 log % point due to explained factors).

This picture changes gradually and although the overall change remains similar for 1987-1996 period (10,2 log % points improvement), explained and unexplained factors have now almost equal shares in it. The magnitude of the "Observed X's" effect is relatively small and rises slowly over the whole period. Since statistical evidences do not support the idea of the less skilled women dropping out of the labor market in Poland, it is likely that new cohorts take advantage of better education and thanks to improvements in relative observed skills equipment shorten the distance to men. The effect doubles since the private sector had been incorporated to the sample (1995 and 1996), which is in line with the presented reasoning, because the private sector attracts well-educated members of the new cohorts more.

Rising returns to education benefit women and help them to catch up with men as the "Observed Prices" effect shows. Again, incorporation of the private sector is noticeable in this effect. These two gradually rising effects result in gaining importance of explained factors in the gender pay gap change.

Interestingly, the "Gap" effect that drives the improving relative performance of women till 1992 turns against them later on. It would be rather difficult to find the reason for the fall in relative females unobserved skills. One explanation might be that after the initial abandoning of distortions resulting from the principles of Marxist political economy (what relatively benefited women as working outside heavy industry more often), another market force had taken the leading position, namely statistical discrimination. Since it is likely, that women on average have less unobserved skills, it may pay off to discourage them to promotions in favor of men and pay them lower wages accordingly.

Rising prices for unobserved skills (an element of overall rise of earnings inequality) had further harmed women as the "Unobserved Prices" effect shows. In sum, due to unexplained factors the gender gap increased by 6,1 log % points over the years 1989-1996, but the initial (1987-1989) fall of 10,9 log % points had not been offset.

Conclusions

A detailed examination of the gender pay gap in Poland over 1987-1996 revealed some interesting results. First of all, the year of giving away the power by the communists (1989) turned out to be far more important in context of male-female earnings differentials than the actual year of launching the reforms package (1990). The gain of substantial real economic freedom (self-financing, self-governing) by SOEs' managers might explain that phenomenon inducing the relative erosion in male wages at the lower tale of the distribution. Altogether, the first wave of changes affected males and females in a different degree. Abandoning of distortions resulting from the principles of Marxist political economy relatively benefited women as working outside heavy industry more often. These changes are best illustrated by position of mean female in male wage distribution, which from the level of 25^{th} percentile in 1987 jumped to around 33^{rd} in 1989 and increased further to almost 36^{th} percentile in 1992. Since then the position of mean female in male wage distribution had stabilized and even reported slight decrease (by 1 percentile). It turns out to be driven by two offsetting effects. On the one hand, rising relative observed skills equipment and returns to them had pushed women up the male wages distribution. On the other , possible strengthening of discrimination practices, as statistical discrimination models would predict, had balanced the former effect.

Appendix

Table A1. Variable Definitions.

	Education Dummies
Univ	University/college
Sec	Secondary/high school
Voc	Ordinary vocational school
Omitted category	Primary/elementary school (also incomplete)
	Experience Variables
Exp	Potential experience calculated as age - years of schooling - 6
Exp2	Square of Exp/100
	Ownership Dummy[a]
Priv	Employed in private sector
Omitted category	Employed in public sector
	Regional Dummies
Large[b]	Lives in town larger than 500 000 inhabitants
Medium[b]	Lives in town larger than 100 000 but smaller than 500 000 inhabitants
Small	Lives in town larger than 20 000 but smaller than 100 000 inhabitants
Omitted category	Lives in town smaller than 20 000 inhabitants or in the countryside

[a]Only in 1995 and 1996; before only public sector employees are there in the sample.
[b]Before 1995 Large and Medium categories are indistinguishable; appropriate variable is the sum of the two.

Table A2. Male Log Earnings Regression Results (t-statistics in parentheses).

	Year						
Variable	1987	1988	1989	1990	1992	1995	1996
Univ	0,276[a]	0,289	0,315	0,428	0,433	0,599	0,635
	(21,9)	(22,5)	(21,3)	(29,7)	(15,2)	(37,7)	(40,3)
Sec	0,145	0,150	0,130	0,169	0,168	0,246	0,266
	(15,9)	(16,3)	(12,4)	(16,3)	(7,4)	(18,7)	(20,3)
Voc	0,121	0,127	0,079	0,091	0,103	0,118	0,119
	(15,5)	(16,0)	(8,9)	(9,9)	(5,0)	(9,8)	(9,8)
Exp	0,035	0,032	0,032	0,025	0,018	0,036	0,033
	(33,7)	(30,0)	(27,2)	(20,8)	(6,8)	(25,8)	(24,4)
Exp2	-0,061	-0,053	-0,054	-0,038	-0,021	-0,068	-0,061
	(-27,5)	(-24,1)	(-22,2)	(-15,2)	(-3,6)	(-21,0)	(-19,0)
Priv	-	-	-	-	-	-0,068	-0,060
	-	-	-	-	-	(-8,8)	(-8,0)
Large						0,151	0,190
	0,162[b]	0,141	0,099	0,136	0,162	(12,3)	(16,6)
Medium						0,205	0,182
	(22,4)	(19,4)	(12,1)	(17,0)	(10,0)	(21,0)	(19,4)
Small	0,124	0,102	0,088	0,109	0,104	0,130	0,119
	(15,0)	(12,3)	(9,1)	(12,2)	(6,1)	(13,6)	(12,3)
Constant	9,775	10,383	11,723	13,330	14,305	5,558	5,809
	(762,3)	(784,3)	(787,4)	(883,4)	(426,0)	(312,4)	(330,4)
Adj. R^2	0,163	0,147	0,115	0,158	0,138	0,228	0,242
Sample N	14968	14397	13739	12738	3708	13572	13385

[a]All variables estimates are significant at 1% level.
[b]For the years 1987-1992 the categories Medium and Large are indistinguishable.
Source: selected sample of wage employed from HBS data, GUS; author's calculations.

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