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## When Does Transition Increase the Gender Wage Gap? An Application to Belarus

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May 2007

# **When Does Transition Increase the Gender Wage Gap? An Application to Belarus**

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## ABSTRACT

### When Does Transition Increase the Gender Wage Gap? An Application to Belarus<sup>\*</sup>

This paper suggests an analytical framework to analyse the joint evolution of female participation and wages across countries in Central and Eastern Europe (CEE) and the Former Soviet Union (FSU), of which Belarus is a particular case. In CEE, female participation has reduced relatively more than wages, due to greater wage rigidity; in the FSU, wages have reduced more than participation, due to labour hoarding practices. In Belarus, only wages adjust, since (mainly state owned) firms tend to largely maintain their entire workforce. Underneath slow transition and remarkably stable female participation rates (at over 80%), the unconditional gender gap in log hourly wages has increased by a half, while that in log of net and total monthly wages has more than doubled over almost a decade (1996-2004). The Juhn, Murphy and Pierce (1991) decomposition suggests that the deterioration of women wages is caused by negative changes in observed characteristics (due to horizontal segregation) and in the remuneration for those characteristics. Instead, very bland changes in the residual wage distribution tended to reduce (not to increase) the gender wage gap: in fact, women have benefited both of changes in the degree of wage inequality and of gains in the mean female rank in the male residual distribution.

JEL Classification: J16, J22, J31, P20

Keywords: evolution of the gender wage gap, decomposition analysis, wage inequality, economic transition, Belarus

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## Introduction

Despite slow transition and remarkably stable participation rates the gender wage gap (GWG) has increased in Belarus, which might signal a general deterioration of the labour market position of women. Section 1 brings to the fore three main stylised facts that this paper aims to explain. First, the unconditional GWG has increased in relative terms by about two times in the case of the net (and total) monthly wage. Second, there has been increasing distance, especially in the last half decade, between the unconditional gender gap in terms of net monthly and in terms of hourly wages. This last has increased only by about a half. Third, the difference between unconditional and *ceteris paribus* GWG has progressively narrowed and almost disappeared in 2004.

What are the causes of such deterioration of women' position in the Belarusian labour market? This question is particularly interesting in consideration of the slowness of the transition process and the stability of female participation. Why are Belarusian women experiencing a reduction in their relative earnings, if the main sources of deterioration of female pay in transition countries, such as privatisation, market and trade liberalization, monetary stabilization, and the ensuing reduced job opportunities for women, are virtually absent? Section 2 attempts to answer these questions by developing a simple analytical framework, whereas female labour demand shrinks as a consequence of increasingly hard budget constraints for the state, firms and households, and the ensuing process of industrial restructuring. Moreover, services for childrearing become more costly in relative terms forcing women to substitute their effort in market work for that in non-market work<sup>1</sup>. A

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<sup>1</sup> A crucial point here is that although the absolute cost of childrearing has remained roughly the same, its relative cost has increased due to the increasing cost of living. According to art. 184-185 of the Belarusian Labour Code, "fully paid maternity leave cannot be for less than 146(160) calendar days". However, under special conditions, women can still apply for an extension of maternity leave for up to three years earning a state allowance. This refers to women who do not work or work part-time at their main place of job, not exceeding half of the monthly time-norm. In April 2007, a fixed monthly allowance of about US\$ 50 (65% of the minimum living budget) is given for a child for a period of up to three years. For a cross-country comparative analysis, see the United Nations (2006).

greater degree of wage rigidity translates this in reduced female employment, more than female wages in Central and Eastern European countries (CEECs). In Former Soviet Union (FSU) countries, labour hoarding practices tend to reduce female wages, more than female employment. In Belarus, in line with the so-called “social market economy” model prevailing in the country, (mainly state owned) firms tend to hoard all the available labour, and only wages adjust.

After surveying in Section 4 previous similar contributions relative to other transition countries, Section 5 presents the first available results for Belarus of the Juhn, Murphy and Pierce (1991; 1993; JMP from now on) decomposition allowing to disentangle changes in the GWG over time in terms of changes in observed quantities and prices, but also in terms of changes in the residual wage distribution (discussed in Section 3).

In spite of the remarkable stability of employment and participation levels of working age women, considerable changes have regarded the productivity characteristics by gender, whose overall impact on the GWG is difficult to predict a priori. The evidence provided in this paper suggests that several offsetting factors are at work. Sizeable *positive* shifts have regarded the educational level of (employed) women, but not less noticeable *negative* shifts have appeared in the industrial composition of employment by gender. As discussed in more detail in Section 5, on the one hand, women with university or technical secondary education have slowly, but continuously crowded out women with lower levels of education attainment. On the other hand, as also UNDP<sup>2</sup> document, a silent, but massive process of horizontal segregation has led an increasing number of women to move out of the highly valued so-called “material production”. The de-feminisation of employment regards also the Information, Communication and Computer services, a sector providing some of the best-paid jobs in the country. At the same time, there is a tendency of women to move towards low wage public service jobs concentrated in traditionally female dominated sectors, like Education and Health.

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<sup>2</sup> Note that the UNDP report relies on aggregated statistics. That is why some of the findings may slightly differ from those based on BHSIE and reported in this paper. See <http://un.by/en/gender/>

However, observation of unconditional shifts in employment shares by gender (probably due to sizeable job-to-job moves) does not allow us understanding whether they go in the direction of an increase or of a reduction in the average GWG, and what is the role of other possible sources of gender pay inequality<sup>3</sup>. The JMP (1991; and 1993) decomposition shows that the aforementioned offsetting factors – increasing relative female educational levels and horizontal segregation in the service sector – were overall unfavourable to women, contributing to the progressive increase in the GWG.

Another important factor is the way in which the market remunerates similar characteristics according to whether men or women possess them. This component is measured by changes in the differences in coefficients of observed characteristics. In the case of Belarus, a higher remuneration to men for the same characteristics as women contributes to increase the GWG, but this factor is also reducing over time. A tentative explanation of this process is that women have tended to reduce their work effort, instead of their labour supply, which they did in other transition countries, because of the prevalence of labour hoarding and of the traditional two-bread-winner household model. A weakening of this effect might be due, in turn, to the increasing tendency of men to move towards additional and occasional jobs, which provide important income integration for households distressed until recently by high inflation and increasing cost of living.

Overall, these findings are consistent with the conclusions of Pastore and Verashchagina (2006a, p. 352) based on an Oaxaca and Ransom (1994) type of decomposition analysis relative to the period from 1996 to 2001. They note that the unexplained component of the gap, the differences in coefficients, is more than offsetting the educational advantage of women.

In terms of the JMP methodology, changes in the overall degree of wage inequality play also a role and several previous papers have attempted to assess the impact of these changes

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<sup>3</sup> Indeed, if the process of tertiarisation is strong enough, female wages might increase (not reduce) as a consequence of their pooling in the service sector. According to Giddings (2002), Bulgarian women have greatly benefited in terms of lower GWG due to contraction of the manufacturing and expansion of the service industry.

for several CEECs and FSU republics (Reilly, 1999; Brainerd, 2000; Orazem and Vodopivec, 2000; Giddings, 2002; Hunt, 2002; Anderson and Pomfret, 2003). While in FSU Republics changes in the degree of wage inequality yield a sizeable increase in the wage differentials by gender, in Belarus, instead, they generated a very small impact, and tended to slightly reduce, not to increase the GWG. This should come as no surprise considering the remarkable stability of wage inequality in Belarus.

This paper innovates on the existing literature under many respects, the most important of which are as follows. First, it presents an analytical framework to explain changes in female participation *and* GWG across transition countries, with a special focus on differences between CEE and FSU countries. Second, it provides the first available evidence on several aspects of the Belarusian wage distribution for the year 2004 based on a new release of the Belarusian Household Survey of Income and Expenditure (BHSIE). It is worth mentioning that changes in the GWG were particularly important in recent years. Third, it implements the JMP decomposition of the GWG for Belarus.

## **1. The evidence on GWG**

The majority of previous studies reach the conclusion that the GWG did not change dramatically during transition in CEECs (see, for a survey, Paci and Reilly, 2004). In fact, as shown in Table 1, many authors note a reduction in the GWG in East Germany (Hunt, 2002), Hungary (Brainerd, 2000; and Jolliffe and Campos, 2005), Poland, the Czech and Slovak Republics (Brainerd, 2000), Estonia and Slovenia (Orazem and Vodopivec (2000), Bulgaria (Giddings, 2002). Nonetheless, according to Brainerd (2000), in FSU republics the evolution of the wage distribution was against women. In fact, in this last group of countries, labour market institutions, such as unions, employment protection legislation, and other national arrangements, such as wage policy, minimum wage and so on, were supposedly less binding,



therefore making the wage structure more dispersed and allowing for differences against women' wages to emerge. Advocating this hypothesis, Brainerd (2000) provides evidence of a dramatic increase in the GWG in Russia and Ukraine and explain it in terms of sizeable losses in the female rank in the male residual distribution. Anderson and Pomfret (2003) also document a notable increase in the GWG in the Kyrgyz Republic and explain it essentially in terms of increasing wage inequality<sup>4</sup>.

**[Table 1 about here]**

Moreover, the literature documents a remarkable reduction in the female participation rate especially in CEECs. There, the move to a market economy has caused women decisions to adjust through quantity changes (reduction in employment and activity rates), rather than through price changes (reduction in wages) (Brainerd, 2000; Giddings, 2002; Hunt, 2002; Paci and Reilly, 2004). In fact, the reduction in female labour supply has tended female wages to slightly increase through a mechanism of selection of the most motivated women in their job, which might contribute to explain stability of the GWG (Hunt, 2002). In FSU republics, instead, wages were easier to adjust than quantities, due to widespread labour hoarding practices.

Belarus can be considered a special case of the FSU. In Belarus, female participation rates have remained remarkably high, at levels that existed also in soviet times. According to own calculations based on the BHSIE, the participation rate of women in their working age (16-55) was always over 80% from 1996 to 2004. This is due to the particular type of transition process the country has experienced, a process that has been driven to a great extent by price liberalization, rather than by monetary stabilization or privatisation and restructuring. As a consequence, state owned enterprises, representing the vast majority of firms in the country<sup>5</sup>, still experience soft budget constraints and tend to keep low productivity workers on their job

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<sup>4</sup> In this context, Reilly (1999) is an exception: he finds, in fact, that the GWG did not change much also in Russia. For a more detailed survey of the contributions on evolution of GWG during transition see Section 4.

<sup>5</sup> The contribution of the private sector to GDP is low compared to the neighbouring countries, making up about 25% in the year 2003, including mixed forms of state and private property (EBRD).

rather than firing them. Also the unemployment rate has remained remarkably stable from 1996 to 2004, in between 5 and just above 7% of the working age population<sup>6</sup>.

Over the 1990s the GWG was smaller in Belarus than in other transition countries, but it has been increasing at a fast pace. Figure 1 provides measures of the unconditional and the conditional (sometimes called also adjusted or *ceteris paribus*) GWG for three points in time covering a period from 1996 to 2004, as estimated using the BHSIE. This has been the period after the downturn of the transition that Belarus has gone through<sup>7</sup>. The lines show that the unconditional GWG in log hourly wages increased by about 4%, from a very low of 8.6% to almost 13%. The increase in the gender gap in terms of net monthly wages<sup>8</sup> over the same years is double that, suggesting that the relative work effort of women has dramatically reduced, perhaps as a consequence of increasing hardship in the state support for female maternity decisions and the provision of childrearing services by the state and large (mainly state-owned) firms<sup>9</sup>.

**[Figure 1 about here]**

The analysis considers also total monthly wages, which in addition to net monthly wages includes monetary and in-kind payments related to the main job<sup>10</sup>. The gender gap in terms of the log of total monthly wages has more than doubled, which is more than the increase in net

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<sup>6</sup> The official unemployment rate is about half the figures provided in the text. This is probably due to the fact that: a) the unemployment rate is computed based on the employment register; b) and is divided by the total, rather than the active population of working age. The figures in the text are based instead on own calculation on the BHSIE.

<sup>7</sup> As noted in Pastore and Verashchagina (2006a), the transition in Belarus has reached its negative pick in the mid 1990s. Since then, EBRD data shows that the country's GDP has been growing at a steady rate, reaching about 10% in 2004-2005. Monetary stabilization has been achieved just recently with the level of inflation at the range of 7% in the year 2006, down from a high of 50% just in the beginning of the 2000s.

<sup>8</sup> It is not common practise to measure wages in hourly terms in Belarus. Therefore, although the hourly wage controls for work effort, it might be misleading as a measure of the disadvantage of women. Evidence on working hours of men and women based on the BHSIE is provided in Section 5.

<sup>9</sup> This is one way to capture the fact that it is important in the country to hold a job for other reasons than the wage itself, such as accessing social and health care, queuing for low price housing and so on.

<sup>10</sup> This is a slightly different concept compared to that used in Clark (2003) and Pastore and Verashchagina (2006b). These authors use a measure of total incomes including all sorts of incomes, among which state subsidies.

monthly wages, witnessing the reduced ability of women in attracting also this type of income.

Overall, women seem to experience a dramatic deterioration of their remunerations, although the difference from their male counterparts was and still remains lower than that experienced by their pairs in other FSU republics.

Another interesting finding that Figure 1 brings to the fore is the dramatic progressive reduction in the difference between the unconditional and the conditional GWG whatever the measure of pay adopted. Pastore and Verashchagina (2005; and 2006a, p. 352) already noted the difference between conditional and unconditional GWG and claimed that it is a consequence of the greater skills women possess in terms of human capital. The convergence observed in Figure 1 is suggestive of a progressive erosion of the female “relative advantage” in terms of productivity characteristics over recent years. Why this is the case will be explained in detail in section 5. In synthesis, it can be attributed to a slow down of the educational growth of women and to the progressive segregation of women in low pay, traditionally female jobs in the service sector.

Figure 2 investigates differences in the GWG at deciles of the hourly, net monthly and total monthly log wage distribution. The figure is supportive to the hypothesis of the existence of a sizeable “glass ceiling” effect found recently also in the case of Ukraine (Ganguli and Terrell, 2005). It consists of an increase in the GWG as one goes up the personal distribution of incomes: the higher is the level of jobs women hold, the greater is the difference with respect to men’ pay. Following, among others, Dolado and Llorens (2004), one can assume that those at the lower end of the personal distribution of incomes are the youngest segments. At this level, women obtain similar or even higher wages compared to men. However, with time passing, perhaps because of interruptions of their work experience due to maternity, women receive lower wages compared to men. This certainly prevents women from entering high paid jobs and might represent an incentive for highly educated women to choose low wage

occupations and sectors, where career progression is slower or less important. In other words, since women understand that they will never reach the top end of the wage distribution, they might find it convenient to trade off career opportunities in exchange for lower work effort. In turn, this need is particularly important for women in transition countries, since, as Malysheva and Verashchagina (2007) note, in all transition countries, women spend a very high amount of time, higher than in any mature market economy, not only in paid work, but also, and perhaps more importantly, in unpaid work in the household. The time women spend in unpaid work in the household in CEE and FSU countries is from 2 to 3 times higher than in mature market economies, reaching 25.6 weekly hours in the case of Russia and 28.2 hours in the case of Hungary.

**[Figure 2 about here]**

The existence of a glass ceiling effect is confirmed by observation of other measures of wages. Only two differences are noticeable. First, in the case of hourly wages, one may observe a slight reduction in the GWG at the highest deciles of the personal wage distribution. Second, whatever the measure of wages adopted, the advantage of women at the lowest end of the distribution seems to disappear in recent years and, more generally, the gender gap tends to flatten over time. This might suggest that in recent years there is some tendency to reduce differences in pay for similar characteristics or that the wage structure becomes flatter, a point that will be object of further discussion in Section 5. The data seems to reject, instead, the hypothesis of the existence of a “glass floor” or a “sticky floor”, which Ganguli and Terrell (2005) find in the case of Ukraine.

## **2. Labour market institutions, female labour supply and the GWG**

An interesting research question is whether liberalisation of the labour market increases or reduces the GWG. Becker (1957) suggested that market forces could punish discriminatory

wage-setting behaviour and thus reduce the GWG. In their recent meta-study of the cross-country determinants of the GWG, Weichselbaumer and Winter-Ebner (2007) conclude that increased competition and adoption of international conventions concerning equal treatment laws both reduce the GWG, while legislation which prevents women from performing strenuous or dangerous jobs tends to increase it.

This section argues that, in principle, the case of transition countries might also lead to the opposite conclusion and that a higher degree of labour market liberalization could also cause the GWG to increase, not to reduce. This is simply because of the specific nature of the transition process, which, among other things, has led to the abolishment of centrally determined wage grids and, therefore, from a predetermined and unnaturally compressed wage distribution to one featured by greater dispersion. In fact, the literature suggests that many factors are at work that need consideration and that their overall impact on the relative pay of women might differ across countries, also depending on the mix of labour market institutions:

- a) the drop in employment rates might reduce not only female participation, but also the GWG, since it might affect especially low wage female earners (Hunt, 2002).
- b) vice versa, labour hoarding practices, common in FSU countries, may prevent a fall in female employment and cause, instead, an increase in the GWG;
- c) the expansion of the service sector, typically female dominated, might increase female employment and reduce the GWG (Giddings, 2002);
- d) segregation in low paid jobs might increase the GWG (Jurajda, 2003; and 2005; Ogloblin, 1999);
- e) the increased dispersion of the overall wage distribution might increase the GWG (Brainerd, 2000);
- f) the existence of rigid labour market institutions might reduce the GWG, but also female participation (Brainerd, 2000);

- g) the introduction of Western-type anti-discrimination policies might reduce the GWG (Jurajda, 2005).

As shown in the previous Section, the factors now listed have produced at least three different outcomes as to the evolution over transition of female participation and wages: a) in CEECs, female participation has reduced more than the GWG has increased; b) in FSU countries, female participation has reduced less than the GWG has increased; c) in Belarus, participation has been stable, whereas the GWG has more than doubled. This section aims to provide an analytical framework able to explain such country differences. Note that the peculiarities of the Belarusian case are interesting not only per se, but also because they allow us deepening the general understanding of the way gender differences have emerged in the early 1990s and evolved during the entire process of economic transition from a planned to a market economy. In fact, the main assumption of this Section is that the same forces cause different outcomes on female participation and wages across countries according to specific country characteristics and institutions.

In all transition economies, women have been one of the weakest groups and one that had to pay the cost of increasingly hard budget constraints for the state, firms and households. As a consequence of monetary stabilisation, the state has progressively reduced its presence in the economy. It had also to reduce the expenditure in income support schemes for maternity and social policy for the provision of childcare facilities. Privatisation and market competition has had a similar impact on firms, especially the private or privatised ones. Firms have not only reduced their availability to give maternity leave provisions and provide kindergartens at the workplace as they used to do in the past. According to Stefanova Lauerová and Terrell (2007), they have also preferred to fire women rather than men and, to a greater extent, to hire men rather than women. Finally, having to pay for services that they used to receive for free, households have started to adapt their labour market participation and fertility decisions to the

increasing opportunity cost of maternity. This has meant reducing both the degree of participation and fertility.

In turn, hard budget constraints have emerged across countries as a consequence of different processes, on the one hand, and have been influenced by different trajectories, on the other hand. In CEECs, hard budget constraints have emerged because of deeper programs of monetary stabilisation, price and trade liberalisation, and privatisation of state owned enterprises. Nonetheless, CEECs have maintained more rigid labour market institutions, including a higher union density, high social security contributions, sometimes wage fixing mechanisms, binding minimum wage arrangements and passive income support schemes for non-employed workers that FSU republics had to a much less extent (Brainerd, 2000). In FSU republics, in fact, stabilisation, liberalisation and privatisation processes have progressed more slowly, while labour market institutions have been weaker. A possible explanation of why, in FSU republics, labour market institutions have been used to a less extent to absorb social problems is that for long time the state itself was taking the cost of social distress by maintaining higher than acceptable levels of employment (labour hoarding).

This might explain why structural change has affected women to a greater extent than men, although with different labour market outcomes across countries. Figure 3 attempts to provide a simple graphical representation of the way the same tensions caused by transition have affected female participation and the GWG in CEE and FSU countries. For simplicity sake, in this framework it is assumed that generally a homogeneous female labour is exchanged in competitive markets. Male employment and wages are considered constant. At least until recently, economic transition from a planned to a market economy has caused similar reductions in the demand for female labour due to a process of structural change. In CEECs, where labour market institutions have been more rigid, women have mainly reacted to increasingly hard budget constraints via reducing their employment and activity rates. The increasing cost of maternity has forced women to cope with it by reducing their work effort

and productivity. This case of rigid wages is depicted in Panel (a) with a straight horizontal line. Forced by existing labour market institutions not to reduce wages according to reduced demand, private firms have therefore decided to reduce the employment share of women. This yields only a slow increase in the GWG, but a stronger reduction in employment and inactivity. One additional factor to consider, which is difficult to represent in this analytical framework with homogeneous labour, is the tendency of employers to fire especially less motivated women. According, among others, to Hunt (2002), this process of selection has contributed to contain the reduction in women's wages and, hence, to hinder the increase in the GWG.

**[Figure 3 about here]**

In FSU republics, instead, especially state-owned firms have been forced to maintain high levels of employment, in line with the traditional state policy of providing employment and, therefore, a living wage for all<sup>11</sup>. This has pushed firms to reduce women wages instead. This case is represented in Panel (b) of Figure 3 with a similar leftward shift in labour demand and a more rigid labour supply. Women have been able to reduce their effort and productivity via a smaller reduction in labour supply, but in exchange for greater wage losses. This could explain the greater increase in the GWG of women in the FSU republics.

The case of Belarus can be seen as an extreme case of the FSU model of transition. In Belarus, the slow process of industrial restructuring has, in fact, hindered the tendency of firms to fire less motivated women. In fact, firms have been following the so-called model of "social market economy". Traditional soft budget constraints and no-risk of bankruptcy have generated sufficient incentives for women not to reduce labour supply. Consequently, women had to accept wage reductions. This might explain why in the face of remarkably stable participation rates of women, the GWG has more than doubled.

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<sup>11</sup> Kornai (1992, Ch. 10) provides an appealing explanation of why this was the case everywhere under communist regimes. As the Author puts it, the socialist system had a preference for labour intensive production processes with the double intent to extract the entire possible surplus from manpower and at the same time to maintain social and political control. In this type of system, working was almost a duty, rather than a right. This was true independent of gender.



To sum up, economic transition has increased the opportunity cost of childrearing, forcing women to substitute market for non-market work. This might have reduced women productivity and, therefore, also their relative labour demand. In the case of CEECs, where firms have been constrained by stronger wage setting mechanisms, female wages have remained stable, and reduced labour demand has mainly translated in lower participation. In the case of the FSU republics, widespread labour hoarding has pushed firms to reduce female wages, rather than employment. Belarus is a particular case of the FSU transition, where firms have obeyed to the so-called model of “market socialism”, by keeping the entire workforce. The consequence has been predominantly a wage reduction<sup>12</sup>.

### **3. Methodology and Data**

Pastore and Verashchagina (2006a) apply an Oaxaca and Ransom (1994) type of decomposition of the GWG in Belarus in 1996 and 2001. The main conclusions of that study were as follows: a) the GWG depends very much on differences in coefficients; b) which more than outweigh the relative advantage of women in terms of human capital. However, the Oaxaca and Ransom (1994) decomposition does not allow considering changes of the GWG over time and does not take into account the role of the residual wage distribution. This section aims to give a short discussion of the implications of the JMP (1991) methodology<sup>13</sup> adopted in this paper to disentangle the components of the change in the GWG experienced in Belarus from 1996 to 2004. As noted in the previous section, changes in the overall degree of wage inequality might be an important cause of increase in the GWG during transition, due to the increased degree of dispersion of the wage distribution compared to the communist period, and the JMP (1991) methodology provides a framework to assess whether this was the case

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<sup>12</sup> This translates in difficulty that Belarus experiences in terms of catching up with the level of real wages in neighbouring countries (Haiduk et al. 2005).

<sup>13</sup> For more detailed discussion of the JMP (1991) methodology, see also Blau and Kahn, (2006, pp. 47<sub>ff</sub>).

also in Belarus. More generally, this exercise should yield important indications as to whether the factors affecting the GWG are those predicted in the analytical framework laid down in Section 2, namely:

- a) the need for young women to acquire the highest degree of human capital to avoid the glass ceiling effect and to prevent firms from firing them;
- b) a continuous tendency of women to reduce their work effort over time;
- c) a tendency of firms to reduce female wages according to their reduced work effort;
- d) and the actual impact of the changes in the overall degree of dispersion of the wage distribution.

The JMP (1991) methodology has been used in a number of studies relative to mature market economies (see, among others, Blau and Kahn, 1997, 2006, for the USA; and Blau and Kahn, 1996, for international comparison), but also in several studies relative to transition countries, whose results are surveyed in the next Section. Consider the usual log wage regression:

$$w_{it} = X_{it}\beta_t + u_{it} = X_{it}\beta_t + \sigma_t\theta_{it} \quad (1)$$

where  $t$  stands for time (which, in this paper, are the years 1996, 2001 and 2004);  $X_{it}$  is a vector of the observable characteristics of individual  $i$  and  $\beta_t$  gives the coefficients on these characteristics;  $\sigma_t$  is the within-group standard deviation of wages in year  $t$ ;  $\theta_{it}$  is the standardized residual (with mean 0 and variance 1). Taking the male wage equation as a basis, the wage gap between men (m) and women (f) at point  $t$ , can be written as:

$$\Delta w_t = w_{mt} - w_{ft} = (\Delta \bar{X}_t)\beta_{mt} + \sigma_t\Delta \bar{\theta}_t \quad (2)$$

The change of the GWG over time can be further decomposed in the following way:

$$\Delta w_1 - \Delta w_0 = (\Delta \bar{X}_1 - \Delta \bar{X}_0)\beta_{m0} + \Delta \bar{X}_1(\beta_{m1} - \beta_{m0}) + \sigma_0(\Delta \bar{\theta}_1 - \Delta \bar{\theta}_0) + \Delta \bar{\theta}_1(\sigma_1 - \sigma_0) \quad (3)$$

1.  $(\Delta \bar{X}_1 - \Delta \bar{X}_0) \beta_{m0}$  represents changes in the GWG due to changes in observed characteristics of men and women evaluated at fixed male prices. In what follows, this component will be called “quantity effect of the predicted part of the GWG”;
2.  $\Delta \bar{X}_1 (\beta_{m1} - \beta_{m0})$  represents changes in the GWG due to changes in the returns for men to those observed characteristics. If this term turns out to be positive, than the considered characteristics pay more in 2001 (or in 2004, with  $t=1$ ) compared to 1996 (or 2001, with  $t=0$ ). In what follows, this component will be called “price effect of the predicted part of the GWG”;
3.  $\sigma_0 (\Delta \bar{\theta}_1 - \Delta \bar{\theta}_0)$  represents the change in the GWG due to changes in the relative position of men and women in the residual wage distribution.  $\Delta \bar{\theta}_t > 0$  means that in year  $t$  men on average are positioned higher than women in the residual distribution. Thus if the term under consideration appears to be positive than the average position of women is worse in 2001 (or in 2004, with  $t=1$ ) compared to 1996 (or 2001, with  $t=0$ ). In other words, if the term is positive (negative) there has been a relative gain or moving up (loss or moving down) in the mean female rank in the male residual wage distribution. In what follows, this component will be called “unobserved quantity effect of the residual part of the GWG”;
4.  $\Delta \bar{\theta}_1 (\sigma_1 - \sigma_0)$  represents the change in the GWG due to changes in the degree of the dispersion in the residual wage distribution; assuming that females on average earn less than males, the overall rise in inequality would increase the male-female wage differential. Provided that  $\Delta \bar{\theta}_1$  is negative (since women earn less than men on average), an increase in the residual inequality would increase the GWG even if women maintained the same relative position in the male residual wage distribution. In what follows, this component will be called “unobserved price effect of the residual part of the GWG”.

Note that the components 1 and 3 are gender-specific factors, while the components 2 and 4 depend on the structure of the labour market. Intuitively, if the market returns increase for given characteristics that men possess more than women, such as work experience and working in more productive sectors, then the GWG will widen even if the observed characteristics of women are the same. The opposite will happen if the market values more female specific characteristics, such as doing white collar compared to blue collar jobs (Blau and Kahn, 2006).

The empirical part of the paper is based on three waves of the Belarusian Household Survey of Income and Expenditure (BHSIE; 1996, 2001 and 2004). Pastore and Verashchagina (2005) used the hourly wage rate as a dependent variable. Nonetheless, there are two caveats to be taken when using this measure. First, hourly wage rates are not widely used in Belarus. Second, the calculation procedure may introduce some distortions, for example by excluding around 200 observations for those who do not report hours of work<sup>14</sup>. In order to control for these potential selection problems, the analysis is carried out also using net monthly wages and total monthly wages (including monetary and in-kind payments). Moreover, Section 1 has shown that the GWG in terms of monthly wages has increased much more sharply than that based on hourly wages. While this might mirror differences in the relative number of working hours across gender, a strong difference in monthly wages is important when wages are very low, like in the case of Belarus, and deserves particular consideration.

Moreover, to account for different behavioural models and have a homogeneous sample, the categories of respondents that by definition would perform differently, namely pensioners, students, self-employed, out of working age population workers, have been excluded from the sample. In other words, the sample includes only working age workers (16-55 for women and 16-60 for men) holding a paid job.

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<sup>14</sup> Additionally, since in some cases people declare unusually low wages and unusually high working hours, the variable has been truncated to exclude outliers, defined as those with wages higher or lower than the mean by 3-times the standard deviation of the distribution.

Finally, it is worth noting that this paper uses a non-traditional definition of work experience, as defined in Munich, Svejnar and Terrell (2005). This is obtained by deducting from a standard potential work experience ( $\text{age} - \text{years of education} - 6$ ) the number of children multiplied by three. This definition aims to account for the child leave as defined in the Labour Code of the Republic of Belarus, which is provided until the child is 3 years old. Nonetheless, this measure can understate the real values in case of overlapping of three-years periods taken for two children born one after another.

#### **4. Previous studies on the CIS Republics**

Previous applications of the JMP (1991) decomposition of changes in the GWG during transition reach different results according to the period, country and data considered. Table 1 summarises the findings of the few existing studies. For each study, the table provides information on the period, the change in the GWG occurred and the size of each of the four components of the change in the GWG as based on JMP (1991) and outlined in Section 3.

The findings of Anderson and Pomfret (2003) for the Kyrgyz Republic compare to those of Brainerd (2000), rather than of Reilly (1999). Above all, they find large increases in the GWG. In addition, they find very small changes in observed prices and quantities compared to those in the residual wage distribution. However, opposite to Brainerd (2000), the dramatic increase in the GWG was mainly due to an unobserved quantity effect, rather than unobserved price effect.

Brainerd (2000) uses a specific cross-country survey data bank covering two years in the early 1990s, when economic transition had already started but before there was any substantial GDP recovery. She finds that women dramatically worsened their position in terms of wages, with the GWG increasing by 15% in Russia and by about 30% in Ukraine. Most of the GWG changes occurred in Russia and Ukraine at that time were due to the extreme widening of the

wage distribution (unobserved prices), which more than offset the positive effects of changes in returns to observed skills (observed prices) and small relative gains in the mean female rank in the male residual distribution (unobserved quantities). She finds that changes in female characteristics were almost irrelevant.

The case of CEECs (Hungary, Poland, the Czech and the Slovak Republic) is radically different. First, She finds that the GWG reduced in all CEECs during early transition. Moreover, changes in the predicted gap were almost irrelevant. Changes in the residual wage distribution tend to increase the gap, suggesting that women were negatively affected by the widening of the wage distribution during transition (unobserved prices). Nonetheless, important gains in the mean female rank in the male residual distribution (unobserved quantities) outweighed this effect. Overall, changes in the residual wage distribution reduced the wage differential. Hunt (2002), Orazem and Vodopivec (2000) and Giddings (2002) find results for East Germany, Estonia, Slovenia and Hungary very similar to those of Brainerd (2000) relative to other CEECs.

Using the Longitudinal Monitoring Survey, Reilly (1999) finds instead that the GWG was stable in Russia. In fact, it slightly reduced by about 1%. Moreover, he finds that the changes in unobserved quantities and, more importantly, in unobserved prices were almost irrelevant. Changes in the residual distribution were much more sizeable than, for instance, changes in observed quantities and prices. However, moving in an opposite direction, they tended to offset each other. He maintains, therefore, that the widening wage structure occurred during transition was gender neutral also in Russia.

Overall, previous studies do not suggest a unanimous conclusion. Nonetheless, most studies agree in suggesting a different pattern for CEE and FSU countries. Brainerd (2000) and Anderson and Pomfret (2003) find a dramatic increase in the GWG and a strong impact of residual wage inequality on female wages in FSU countries. The only exception in the literature relative to FSU countries is Reilly (1999); in this study, both the Russian GWG and

the role of the residual wage distribution are negligible. All the studies relative to CEECs find a reduction, not an increase in the GWG. Moreover, changes in the residual wage distribution tend, overall, to reduce, not to increase the GWG. The general interpretation of these cross-country differences is that in CEECs labour market institutions were able to hinder the tendency of the wage distribution to explode, which was not the case in the FSU republics. In turn, this conclusion is in line with the analytical framework laid down in Section 2.

Worth noting is also that previous studies on FSU republics found only small differences between estimates based on monthly or on hourly wages, probably because of the small differences between male and female hours of work. As Malysheva and Verashchagina (2007) document, in fact, the share of part-time over total female employment was, and has continued to be, very low in most CIS countries.

## 5. Results

Table 2 reports the results of JMP (1991) decomposition for Belarus across three years (1996, 2001 and 2004). For every year, the table reports the total unconditional wage differential by gender (Column 1), and the decomposition between predicted gap (Column 2), which is the sum of differences in observed characteristics and prices for those observed characteristics, and the residual gap (Column 3), which is the component of the gap due to the residual wage distribution. For changes over time, the table reports not only changes in predicted and residual gap, but decomposes this change in the part that is due to observed quantity and price effects (under Column 2) and the part that is due to unobserved quantity and price effects (under Column 3)<sup>15</sup>. The analysis is based on mincerian OLS estimates of

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<sup>15</sup> Note that the specification of the Mincerian equation is slightly different in the year 2004 due to some small changes in the design of the questionnaire, especially in the composition of employment by type of employer. In particular, few observations related to people working in Joint and foreign enterprises, Leasing enterprises and Joint stock enterprises are pooled together in “other types of employers”. This makes the coefficients attained when implementing pair wise JMP decomposition for the changes between 1996-2001 and 2001-2004 slightly different for the same year 2001. In other words, the 2001 data have been made homogeneous

natural logs of hourly wages, net monthly wages and total monthly wages (including various forms of monetary and in-kind payments related to holding a job). The independent variables include educational levels, potential work experience and its squared value, as well as controls for marital status, firms' ownership, industry and regions<sup>16</sup>. Note that negative (positive) values of the figures in a cell of the table indicate factors that reduce (increase) the GWG.

Table 2 shows that in 1996 and in 2001 the GWG in hourly wages is the algebraic sum of two competing forces offsetting each other, namely the predicted and the residual gap. The residual component tends to increase the gap, whereas the predicted component tends to reduce it. In 2004, instead, these two forces go in the same direction of increasing the gap, since also the predicted components increase the gap. This change over time is the consequence of a continuous reduction of the impact of the residual component and of a continuous increase of the impact of the predicted component. Consequently, when one looks at the evolution over time, changes in the predicted component of the gap tend to increase it, whereas changes in the residual component of the gap tend to reduce it. It is interesting to note that the evolution of the overall degree of wage inequality goes in the direction of reducing, not of increasing the gap. This finding is different from what found in the studies relative to other FSU republics surveyed in the previous section, whereas the residual gap is always increasing the GWG. This point will be taken on later again.

**[Table 2 about here]**

Disentangling changes in the predicted gap in quantity and price effects, it appears that they are both positive, but the price effects (0.045) outweighs the quantity effects (0.013). In the case of the residual gap, both components are negative, but, instead, unobserved quantity effects (from  $-0.023$  in 1996-'01 to  $-0.037$  from 2001 to 2004) are much larger than unobserved price effects, which are in fact very low (always below  $-0.01$ ). This suggests that

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to the 1996 data for the decomposition relative to the first period and homogeneous to the 2004 data for the decomposition relative to the first period. The reason is that the JMP decomposition requires the same specification to be held for two years.

<sup>16</sup> For shortness' sake, the wage estimates are not reported, but are available on request from the authors.



women have benefited both of gains in the mean female rank in the male residual distribution and of changes in the degree of wage inequality, but the latter component is much smaller.

Notice also that the trends observed in the case of hourly wages hold also when one looks at other measures of pay, namely net monthly and total monthly wage, suggesting that the forces behind the increase in GWG are the same, although the increase in monthly wages is about two times larger than that in hourly wages. The only difference between hourly and monthly wages is that changes in the residual gap are much smaller in the latter case. This is particularly true for unobserved quantity effects, which in the case of total monthly wages are in some cases also positive. Unobserved price effects are slightly greater, suggesting the existence of gains in the mean female rank in the male residual distribution of monthly wages.

What is behind changes in the predicted and residual component of the gap? Changes in the productive characteristics of women compared to men (observed quantities) and changes in the way such characteristics are priced in the market (observed prices) are behind the predicted component of the gap. In both cases, the impact on the change in the GWG is positive and stable over time, suggesting not only that the productive ability of women is reducing, but also that such changes cause a reduction by state owned firms in the female remuneration for the same characteristics as men. The analytical framework discussed earlier and some additional evidence on the productive characteristics of women should provide an answer to the reason why this is the case.

As noted in Section 2, transition has caused an increasing opportunity cost of childrearing and household work for women. In turn, this has pushed women to reduce their effort in market work and, consequently, employers to reduce their demand for female labour. Nonetheless, in the case of Belarus, it is difficult both for firms and women to reduce employment: firms are forced by political constraints to hoard (also) female labour, whereas women are interested to maintain full time employment to integrate their spouses' low income and grasp all possible benefits from holding a state job. Therefore, women have had two

choices to adjust to their increasing effort in non-market activities: a) reducing their working hours; b) moving to sectors where it is more difficult for managers to monitor their work effort. Both factors might affect not only female productive characteristics, but also their remuneration by employers. In fact, if women tend to reduce their effort to cope with increasing effort in non-market work, it is obvious that they could pay some wage penalty for that.

The reduction in working hours might be behind both the reduced productivity of women and the reduced pay for female work or, in other words, behind the “positive” impact on the GWG of changes in observed quantities and prices noted above. What evidence is there available in favour of this hypothesis? Figure 4 provides Kernel density estimates of the distribution of weekly working hours and monthly wages by gender for the years under scrutiny. Apparently surprising is the fact that employed women have increased, not reduced the overall amount of time spent on the job. Female weekly hours of work have slightly increased from 38.3 in 1996 to 38.7 in 2001 and to 38.6 in 2004. In addition, the share of part-time labourers, which was already very low in 1996, has constantly further reduced over time so that it has almost disappeared in 2004<sup>17</sup>. However, this evidence cannot reject the hypothesis of a reduced commitment in market work of women *relative* to men. In fact, the same Figure 4 shows that the male work effort in terms of weekly hours has been even higher than that of women and after slightly reducing from 39.6 in 1996 to 39.4 in 2001, it has increased again to 39.7 in 2004. To sum up, women have increased their work effort, but in a context where also men spend a huge amount of time in market work.

**[Figure 4 about here]**

Note that gender differences in working hours might explain also the difference between the evolution of the GWG in log of hourly and of net monthly wages evidenced in Figure 1. Recall that one of the stylised facts brought to the fore in Section 1 is that the GWG in hourly

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<sup>17</sup> The low share of part-time female work might also be due to the provision of fully paid maternity leave for up to three years and the availability of childrearing services almost for free.

wages has increased by only a half compared to that in monthly wages. The simple explanation is that the number of weekly hours of work has increased also for women. Panel B of Figure 4 confirms this by comparing the distribution of monthly wages of men and women over time. The Figure provides also a different perspective of the glass ceiling effect discussed in Section 2: in fact, the female distribution is much below that of men for higher income levels.

Nonetheless, working hours are only one possible indicator of work effort. For instance, women could maintain the same hours of work, but reduce the effort and quality of their work. The interpretation is as follows. The low wages of spouses, together with the availability of benefits linked to holding a job in the state sector, impose a two-bread winner family model. This forces women to work, and, as previous discussion has shown, to work full time, despite the fact that, as noted earlier, the weekly hours women employ in unpaid family work has been very high all over transition. To cope with this huge amount of work, women could move to jobs or sectors where it is more difficult to monitor their effort and where, consequently, wages are lower<sup>18</sup>. Instead, men put more effort in their work not only because their effort is easier to monitor, but also because, as suggested by the glass ceiling effect in Figure 2, they have better perspectives of career. Which empirical evidence is there available to document this hypothesis?

Table 3 provides a detailed sectoral breakdown of the composition of employment by gender in the three years object of study. In addition to the shares of men and women over total employment in each sector, the table gives also the ratio to the national average wage that each sector provides to its employees in the third column. A value of the ratio above (below) 100 suggests that the sector is offering wages higher (lower) than the national average. The fourth column gives the share of each sector over total employment. The table clearly shows that a dramatic redistribution of employment by gender has occurred over time and especially

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<sup>18</sup> Men might work in manufacturing sectors or jobs within each sector that are closely related to production, whereas women might work more frequently in (personal) services and white-collar jobs.

in the first period from 1996 to 2001. In 1996, men and women were almost evenly distributed across sectors. In 2001, women appear more frequent in traditionally female sectors, especially services, whereas their share dramatically reduces in the so-called “material production” sector, which was the most valued sector in Soviet times and remain such in modern Belarus, as column 3 of the table shows. This massive process of horizontal segregation, caused probably by job-to-job moves<sup>19</sup>, might be behind the reduced impact of the predicted component of the GWG. Horizontal segregation might be seen as the outcome in Belarus of the same underlying forces that have led to increasing inactivity rates in other transition countries (see, for instance, Giddings, 2002, p. 487).

**[Table 3 about here]**

To appreciate the size of the reshuffling of women across sectors of employment, notice that it has been able to outweigh the dramatic increase in the educational level of women compared to men, that Pastore and Verashchagina (2006b) noted already for the pre-2001 period and that has continued until 2004. Similar to other countries worldwide, also in Belarus women’ access to tertiary education has increased dramatically. In recent years it has been even proportionally higher resulting in almost equal composition of skilled labour force by gender. According to the population census, 17 out of 1000 men had higher education in 1959, 78 in 1979 and 141 in 1999. The corresponding figures for women are 15, 63 and 139 (MSA). Table 4 provides a snapshot of educational levels of women and men with a breakdown by employment, unemployment and inactivity in the three years considered as based on the BHSIE. Like in mature market economies, the educational level of old women (now pensioners) is much lower than that of young active women and also of men of the same age. For instance, female pensioners holding a university degree are less numerous of male pensioners. The situation dramatically changes when one looks at the young generation of active women. In this case, the share of women holding a university or technical high

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<sup>19</sup> Unfortunately, it is not possible to document this process of reshuffling of work across sectors in the BHSIE.

secondary degree is much higher than that of men and is increasing at a relatively fast pace over time.

**[Table 4 about here]**

An indicator of the process of horizontal segregation is the marked tendency of women to pool in educational branches which virtually give access to low productivity and, therefore, low wage sectors. Table 5 contains the distribution of people with tertiary education by subject of degree and gender in 1996 and 2001. The last column reports the conditional wage effect of each type of diploma as obtained in estimates of augmented earnings equations in Pastore and Verashchagina (2006b, Table 5). The figures are averages of the 1996 and 2001 coefficients. The table gives evidence of the fact that the process of feminisation observed looking at the employment distribution by gender is taking place also before labour market entry. A “feminisation of higher education” has been noted also relative to other transition countries (see, among others, Orazem and Vodpovec, 2000; Giddings, 2002, p. 487)

**[Table 5 about here]**

In fact, women tend to get a university degree in such fields as pedagogic studies and humanities, which are necessary to access jobs that are typically occupied by women and pay a relatively lower return also in Belarus. In addition, in both years, the share of women holding a degree in economics, medicine and natural sciences is higher than average, whereas it is lower than average in engineering, military school and agriculture. There are little changes in the distribution of women according to the subject degree over the period considered, which suggests a further strengthening of the existing pattern.

A counterargument to the hypothesis that women are reducing their work effort is that the difference in returns to skills in favour of men is reducing over time according to Table 2. If women are reducing their effort in market work, why is the male advantage reducing over time? In other words, why is there a reduction in the gender differences in observed prices for the same productivity characteristics? One possible explanation is that, due to the low wages

obtained in the main job, men might have dramatically increased their commitment and effort in secondary jobs and reduced their effort in their main job. Which evidence does the BHSIE provide about this? Table 6 shows that the declared share of men involved in secondary job holding is very low and not dissimilar from that of women. This is in contrast with massive anecdotal evidence and might reflect the difficulty of people to declare to have a secondary job for fiscal reasons. However, Table 7 highlights that even with these limitations in mind, although still low, the share of men having occasional jobs is higher than that of women. Moreover, occasional jobs provide their male holders with quite a high income, especially if compared with the low average income.

**[Table 6 and 7 about here]**

Other data provide further support to the hypothesis that also men are recently increasing their effort in secondary and occasional jobs. Using the Social Monitoring Survey<sup>20</sup>, Sokolova (2005) finds that the share of people having additional sources of income is around 29%, of which 35.1 are men and 23.0% are women. Two components are detected. The professional active behaviour (people that have a secondary job which is related to the main job) regards only 10% of which 8.6% of men and 10% for women. The non-professional active behaviour is 19% of which 26.5% of men and 13% of women. Representing a considerable contribution to labour incomes, occasional and secondary jobs may reduce the effort that people attach to the main job. This in turn would be a signal of reduced productivity at the work place and might contribute also to explain the persistent gap between productivity and wages in Belarus that Haiduk et al. (2005) noted.

Is there a way to compare the impact of educational upgrading of women versus the impact of their segregation in low wage industries? Figure 5 gives the contribution of observed productive characteristics on the GWG in terms of log of total monthly wages in the three

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<sup>20</sup> The Institute of Sociology of the National Academy of Sciences of the Republic of Belarus collects the Social Monitoring Survey. In the reference year 2002 the size of the sample was 1131 persons.

years considered as obtained applying the JMP (1993)<sup>21</sup>. The Figure suggests that the higher and increasing educational level made women able to “swim upstream” and to more than offset unfavourable changes in the structure of employment until 2001. Nonetheless, the impact of the increase in education was reducing over time and, as a consequence, changes in women’ observed characteristics contributed to increase, not to reduce the GWG in 2004. In other words, the increase in female educational attainment had less an effect compared to the increasing presence of women in low pay jobs over the period considered.

**[Figure 5 about here]**

Finally, different from comparable studies on other FSU republics surveyed in the previous Section (Brainerd, 2000; Anderson and Pomfret, 2003), in Belarus the residual wage distribution has tended to reduce, not to increase the GWG: in fact, women have benefited both of changes in the degree of wage inequality and of gains in the mean female rank in the male residual distribution. This is hardly surprising if one considers the remarkable stability of the Gini coefficient over the decade object of this study and documented in Table 8.

**[Table 8 about here]**

To sum up, Belarus is similar to other FSU republics in as much as the share of female employment has been stable due to labour hoarding. In fact, the country is an extreme case of FSU republic, where labour hoarding has maintained unchanged female employment. However, while in other FSU republics the wage distribution has become much dispersed during transition, it has remained, instead, much compressed in Belarus.

### **Concluding remarks**

The apparent stability of employment and participation rates would form the a priori expectation that the slow transition process was gender neutral in Belarus. However, the

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<sup>21</sup> The decomposition of the GWG based on JMP (1993) is similar to that of JMP (1991), but is relative to a given point in time. The results relative to the log of hourly wages and of net monthly wages are not reported, but available on request from the authors, because they are very similar.

evidence provided in this paper suggests the existence of sizeable changes in the unconditional GWG from 1996 to 2004 and the analysis of the components of this change unravel a possibly different interpretation, namely that transition hit women more than men also in Belarus. In other FSU Republics (Brainerd, 2000; Anderson and Pomfret, 2004), women experienced a reduction in wages more than in employment and participation rates. Belarus can be seen as a particular case of the FSU case, whereas the GWG more than doubled, but employment and activity rates remained unchanged.

To explain stability of activity rates *and* sizeable reductions in female unconditional average wages in Belarus, this paper elaborates an analytical framework where female labour demand is reducing, but female labour supply is rigid. Labour demand is shifting leftward as a consequence of the reduced effort and productivity of women in market work. Labour supply is fairly rigid due to the tendency of state firms to hoard female labour, and the need of women to keep their low wage jobs to grasp the fringe benefits attached to those jobs and to integrate their spouses' low income. This case is different from that of other CIS countries, where wages have adjusted, but also labour supply has reduced. It is even more different from CEECs countries, where labour supply has reduced relatively more, due to rigid wage setting mechanisms.

The results of a JMP (1991) decomposition of changes in the GWG from 1996 to 2004 are consistent with the predictions of the analytical framework now summarised. The analysis shows that, differently from Russia, Ukraine and the Kyrgyz Republic (Brainerd, 2000; Anderson and Pomfret, 2003), most of the increase in the GWG is due to changes in observed prices for female skills. Observed characteristics have reduced the gap until 2001. Since then they have started to increase the gap. This is suggestive of the hypothesis that the effort of women to increase their qualification level has been progressively offset by a dramatic process of (horizontal) segregation that has pushed them into low wage, typically female occupations in the public and social services and out of the "material production sector". This hypothesis is



confirmed by JMP (1993) decomposition analysis. Finally, different again from comparable studies on other FSU republics (Brainerd, 2000; Anderson and Pomfret, 2003), the residual wage distribution has tended to reduce, not to increase the GWG: indeed, women have benefited both of changes in the degree of wage inequality and of gains in the mean female rank in the male residual distribution. This is hardly surprising if one considers the remarkable stability of the Gini coefficient over the decade object of this study.

This research brings to the fore the economic side of the deteriorating position of women in the Belarusian labour market, which seems to be the driving component of gender-related problems in the country. Gender differences in pay are not only unjust; they are also detrimental to the well functioning of the economy, causing in addition poverty and social exclusion. In Belarus, the contribution of women work to the well-being of the household is decisive. Therefore, if women face difficulties in finding highly paid jobs, households run a serious risk of falling into poverty traps, since, among other reasons, children can be involved in supporting the household income rather than investing in their future.

The findings of this paper suggest that, although lower than in Russia and Ukraine, the GWG is dramatically on the rise in Belarus. This requires not only to protect women from “market forces”, which makes female labour too expensive for the employers, but also the need to contrast the prevailing stereotype of a woman destined rather to perform family duties. The latter does not allow for any progress in terms of sharing responsibilities at home, creating therefore difficulties for women with high attachment to the labour market, eventually producing a discouraging affect due to the double burden of paid and unpaid work. The priority instead should be increasing the competitiveness of women at the labour market. First of all, this implies control over the gender distribution in educational establishments, preventing girls concentration in specialities, mainly Humanities, that do not allow for access to gainful employment in the future. The evidence provided in this paper suggests, in fact, that

this might be driving the rise in the GWG in Belarus. In turn, this also requires faster adjustment of the education system to the changing needs of the labour market.

Moreover, attention should be paid to the overall changing pattern of women' behaviour, especially at the beginning of their working career. The drastic reduction in fertility rates, for example, can be a sign of women anticipating their career prospects to suffer from inevitable interruption, while they tend to put ever more weight to their professional growth. Working out suitable schemes for the conciliation of working and maternity, including part-time job opportunities for the period of maternity, would allow to first minimize the drop-out from the labour market, but also make smoother the transition from maternity back to work, preventing the devaluation of female labour.

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## TABLES

**Table 1. Previous studies on CIS countries using the JMP (1991) decomposition**

Author	Country	Period	Change in GWG	Observed quantities	Observed prices	Unobserved quantities	Unobserved prices
Anderson and Pomfret (2003)	Kyrgyz Republic (KLSMS)	1993-97	0.304 (hw; no ind/occ) 0.285 (hw; with ind/occ)	-0.027 0.021	0.027 0.066	0.339 0.214	-0.055 -0.016
Brainerd (2000)	Ukraine (VTsIOM)	1991-94	0.274 (mw)	-0.011	-0.0113	-0.052	0.349
	Russia (General Social Survey)	1991-94	0.150 (mw)	0.003	-0.013	-0.041	0.198
	Hungary (Labour Force Survey, Tarki)	1986-91	-0.054 (mw)	-0.023	-0.004	-0.284	0.257
	Poland (Household Budget Survey)	1986-92	-0.124 (mw)	-0.015	-0.001	-0.153	0.045
	Czech Republic (Class and Social Structure Survey)	1984-92	-0.049 (mw)	-0.02	0.010	-0.256	0.217
	Slovak Republic	1984-92	-0.093 (mw)	-0.032	0.008	-0.250	0.182
Giddings (2002)	Bulgaria	1992-95	-0.087 (mw)	-0.014	-0.017	-0.122	0.066
Hunt (2002)	Eastern Germany (GSOEP)	1990-94	-0.112 (mw)	-0.035	0.009	-0.102	0.017
Orazem and Vodopivec (2000)	Estonia (Retrospect. LFS)	1989-94	-0.140 (hw)	-0.020	-0.060	-0.146	0.046
	Slovenia (Social security data)	1987-91	-0.030 (hw)	-0.012	-0.014	-0.100	0.097
Reilly (1999)	Russia (RLMS)	1992-96	-0.014 (mw) -0.007 (hw)	-0.018 -0.007	-0.018 -0.043	-0.078 -0.011	0.100 0.054

**Notes:**

<sup>a</sup> mw stands for monthly wages; hw stands for hourly wages.

<sup>b</sup> Anderson and Pomfret (2003) provide two types of results for the Kyrgyz Republic, one based on wage equations including industry and occupation variables, and the other without them.

<sup>c</sup> Note that a positive (negative) sign means an increase (a reduction) in the GWG.

**Table 2. Decomposing the change in the GWP over time (between the years 1996-2001, and 2001-2004) (based on JMP, 1991)**

Reference term		Total difference (male-female) (1)	Predicted gap (2)		Residual gap (3)	
Hourly wage	2004	0.12829	0.03014		0.09815	
	2001	0.11659	-0.02825		0.14485	
	1996	0.08601	-0.08911		0.17512	
	$\Delta$ GWG [04-01]	0.0117	0.05839		-0.04670	
			<i>Q</i>	<i>P</i>	<i>Q</i>	<i>P</i>
			0.01335	0.04504	-0.03742	-0.00928
	$\Delta$ GWG [01-96]	0.03058	0.05879		-0.02821	
			<i>Q</i>	<i>P</i>	<i>Q</i>	<i>P</i>
0.01351			0.04528	-0.02342	-0.00479	
Net monthly wage	2004	0.16489	0.04477		0.12012	
	2001	0.12546	-0.07597		0.15627	
	1996	0.08029	-0.01097		0.13642	
	$\Delta$ GWG [04-01]	0.04200	0.05734		-0.01534	
			<i>Q</i>	<i>P</i>	<i>Q</i>	<i>P</i>
			0.01099	0.04635	0.00227	-0.01761
	$\Delta$ GWG [01-96]	0.04516	0.06500		-0.01984	
			<i>Q</i>	<i>P</i>	<i>Q</i>	<i>P</i>
0.04099			0.02401	-0.00188	-0.01796	
Total monthly wage*	2004	0.17164	0.04848		0.12317	
	2001	0.12745	-0.00868		0.13614	
	1996	0.07614	-0.07817		0.15432	
	$\Delta$ GWG [04-01]	0.04419	0.05716		-0.01297	
			<i>Q</i>	<i>P</i>	<i>Q</i>	<i>P</i>
			0.01030	0.04686	0.01056	-0.02354
	$\Delta$ GWG [01-96]	0.05389	0.07108		-0.01719	
			<i>Q</i>	<i>P</i>	<i>Q</i>	<i>P</i>
0.04651			0.02457	0.00017	-0.01736	

*Note:* Wages are expressed in natural logs.

\* Differently from the Net monthly wage this includes also various forms of additional monetary as well as in-kind payments.

**Source:** Own elaboration on the BHSIE.

**Table 3. The gender composition of industrial employment (1996, 2001 and 2004)**

Branch of the main job	1996				2001				2004			
	Male %	Female %	% of the aver. wage in the field to the average in the country	% of the Total	Male %	Female %	% of the aver. wage in the field to the average in the country	% of the Total	Male %	Female %	% of the aver. wage in the field to the average in the country	% of the Total
Industry*	0.49	0.51	108.56	25.26	52.27	47.73	110.68	24.77	55.70	44.30	111.30	25.67
Agriculture*	0.48	0.52	55.94	20.67	61.28	38.72	64.13	16.02	59.91	40.09	65.17	14.10
Forestry	0.41	0.59	84.74	1.69	86.36	13.64	90.95	1.11	85.00	15.00	87.31	1.30
Fishery	0.43	0.57	74.12	0.12	80.00	20.00	101.46	0.08				
Transportation and communication	0.50	0.50	114.22	6.82	63.07	36.93	111.66	7.01	65.07	34.93	117.43	6.79
Construction	0.49	0.51	123.64	6.71	80.30	19.70	125.74	6.83	80.35	19.65	121.37	7.36
Trade and public catering	0.45	0.55	99.62	8.26	21.80	78.20	88.72	10.64	26.43	73.57	74.70	10.51
Material and technical supply and sales activity	0.51	0.49	90.25	0.61	74.19	25.81	117.03	0.52	47.37	52.63	96.19	0.31
Procurement	0.75	0.25	97.25	0.07	71.43	28.57	62.79	0.12	50.00	50.00	73.42	0.10
Information and computer services	0.42	0.58	132.99	0.20	40.00	60.00	174.17	0.08	90.00	10.00	95.53	0.16
Real-estate activities	0.67	0.33	250.32	0.05	-	-	-		50.00	50.00	97.20	0.06
Commercial and market activity	0.50	0.50	225.76	0.13	42.86	57.14	158.67	0.12	50.00	50.00	99.85	0.10
Geology and mineral wealth prospecting	0.45	0.55	159.84	0.18	57.14	42.86	119.36	0.12	80.00	20.00	180.49	0.24
Other types of activities in material production	0.54	0.46	110.04	0.40	57.45	42.55	88.42	0.79	62.75	37.25	100.09	0.83
Housing and communal services	0.42	0.58	96.99	2.73	62.45	37.55	101.11	3.99	61.51	38.49	102.64	4.09
Non-production consumer services	0.46	0.54	81.04	1.19	28.57	71.43	79.17	0.82	13.16	86.84	69.08	0.62
Health care, sports and social security	0.46	0.54	92.44	7.24	15.73	84.27	82.40	7.80	13.58	86.42	83.15	7.89
Education	0.45	0.55	92.70	9.92	19.13	80.87	85.12	11.60	18.23	81.77	83.79	11.58
Culture and art	0.51	0.49	86.63	1.16	27.06	72.94	87.76	1.43	32.22	67.78	75.66	1.46
Science and scientific activities	0.47	0.53	155.01	0.63	25.81	74.19	107.14	0.52	38.00	62.00	104.02	0.81
Credit and finance, insurance, pensions security	0.48	0.52	113.74	1.09	26.76	73.24	122.41	1.19	29.27	70.73	145.67	1.33
Administration	0.51	0.49	144.09	4.64	60.63	39.37	134.96	4.27	50.94	49.06	140.28	4.30
Public associations	0.64	0.36	76.57	0.23	33.33	66.67	72.48	0.15	26.09	73.91	86.93	0.37
Total				100 (6,038)				100 (5,947)				100 (6,156)

**Note:** \* In 2004, Fishery is included.

**Source:** Own elaboration on the BHSIE.

**Table 4. Educational levels of men and women (1996, 2001, 2004)**

Education	Employed			Unemployed			Pensioners			All		
	1996	2001	2004	1996	2001	2004	1996	2001	2004	1996	2001	2004
<i>All</i>												
Candidate or doctor of science	0.5	0.3	0.4	-	-	-	-	0.3	0.1	0.3	0.3	0.3
University degree (5 years)	17.9	20.4	20.2	8.6	7.8	12.5	6.8	7.8	11.5	13.6	14.9	16.1
Technical secondary education	21.5	28.9	27.3	17.0	21.5	20.0	10.6	15.2	15.7	17.8	23.2	22.1
Vocational secondary education	26.9	19.4	24.3	35.7	25.2	26.3	5.7	4.1	4.8	21.4	14.6	18.0
General secondary education	23.0	25.8	24.1	26.5	36.5	31.2	7.6	13.2	16.4	20.3	24.5	23.1
Compulsory education or below	10.3	5.2	3.9	12.3	9.0	10.1	69.2	59.3	51.6	26.6	22.4	20.47
Total	6454	6659	6245	642	488	522	2622	2760	2527	10543	11079	10971
<i>Men</i>												
Candidate or doctor of science	0.7	0.5	0.4	-	-	-	-	0.7	0.1	0.4	0.5	0.3
University degree (5 years)	16.3	18.5	18.1	9.2	8.4	9.6	10.6	11.0	14.6	13.9	14.9	15.5
Technical secondary education	15.1	22.8	20.2	12.3	18.1	16.2	8.8	14.6	13.7	13.1	19.2	17.2
Vocational secondary education	31.0	22.5	28.4	37.2	26.4	28.2	7.8	5.9	7.4	26.1	17.9	22.2
General secondary education	24.5	29.5	27.8	25.7	36.5	33.8	6.8	12.9	17.0	22.1	27.6	26.1
Compulsory education or below	12.4	6.4	5.18	15.6	10.7	12.3	66.0	55.0	47.2	24.4	19.9	18.7
Total	3212	3181	2992	358	299	302	851	919	810	4735	4896	4860
<i>Women</i>												
Candidate or doctor of science	0.3	0.1	0.4	-	-	-	-	0.2	0.1	0.2	0.1	0.2
University degree (5 years)	19.4	22.1	22.1	7.8	6.9	16.4	5.0	6.2	10.0	13.5	15.0	16.5
Technical secondary education	27.8	34.5	33.8	22.9	27.0	25.0	11.5	15.5	16.6	21.6	26.5	26.0
Vocational secondary education	22.9	16.6	20.5	33.8	23.3	23.6	4.7	3.3	3.6	17.5	12.1	14.7
General secondary education	21.6	22.5	20.7	27.5	36.5	27.7	8.0	13.4	16.1	18.9	22.0	20.7
Compulsory education or below	8.1	4.2	2.62	8.1	6.3	7.3	70.8	61.5	53.7	28.4	24.3	21.9
Total	3242	3478	3253	284	189	220	1771	1841	1717	5808	6183	6111

**Source:** Own elaboration on the BHSIE.



**Table 5. Field of higher education attained by gender**

Field of study	Education attainment						Wage effect
	1996			2001			1996-'01 <sup>a</sup>
	Men	Women	Total	Men	Women	Total	Total
Economics	39	108	147	48	134	182	0.73
in %	6.14	14.5	10.65	7.22	15.67	11.97	
Medicine	25	56	81	20	53	73	0.84
in %	3.94	7.52	5.87	3.01	6.2	4.8	
Engineering	248	142	390	262	197	459	0.70
in %	39.06	19.06	28.26	39.4	23.04	30.2	
Natural Sciences	23	40	63	23	33	56	0.65
in %	3.62	5.37	4.57	3.46	3.86	3.68	
Humanities	38	75	113	62	108	170	0.72
in %	5.98	10.07	8.19	9.32	12.63	11.18	
Pedagogic	82	264	346	79	269	348	0.53
in %	12.91	35.44	25.07	11.88	31.46	22.89	
Military school	96	2	98	75	0	75	0.47
in %	15.12	0.27	7.1	11.28	0	4.93	
Agriculture	84	58	142	96	61	157	0.55
in %	13.23	7.79	10.29	14.44	7.13	10.33	
Total	635	745	1,380	665	855	1,520	
in %	100	100	100	100	100	100	0.74

**Note:** <sup>a</sup> The last column reports wage effects by type of degree as an average between the 1996 and 2001 coefficients, reported separately in Pastore and Verashchagina (2006b, Table 5). Note also that the wage effect of military school is low, because it is partly caught by a separate dummy for those employed in the military sector (45% higher wage than average).

**Source:** Own elaboration on the BHSIE.

**Table 6. Several job holding**

Number of jobs	1996		2001		2004	
	Freq.	Percent	Freq.	Percent	Freq.	Percent
<b>Men</b>						
0	2,010	40.64	2,168	43.82	2,043	41.22
1	2,919	59.02	2,767	55.92	2,895	58.41
2	17	0.34	13	0.26	17	0.34
3	...	...	...	...	1	0.02
Total	4,946	100.00	4,948	100.00	4,956	100.00
<b>Women</b>						
0	2,869	48.05	2,892	47.73	2,855	46.83
1	3,085	51.67	3,151	52.01	3,217	52.76
2	16	0.27	16	0.26	23	0.38
3	1	0.02	...	...	2	0.03
Total	5,971	100.00	6,059	100.00	6,097	100.00

**Note:** 0 includes also those who are not eligible for work.

**Source:** Own elaboration on the BHSIE.

**Table 7. Different sources of income**

		1996		2001		2004	
		Nobs	Average Income	Nobs	Average Income	Nobs	Average Income
<b>Main job</b>	<i>Men</i>	3261	964.4799	3078	87944.9	3204	247484.3
	<i>Women</i>	3210	803.8542	3255	74006.33	3314	206301.6
<b>Other jobs</b>	<i>Men</i>	29	785.4138	21	15718	26	42074.39
	<i>Women</i>	32	213.8125	32	19986.34	41	51700.54
<b>Occasional jobs</b>	<i>Men</i>	397	601.0176	312	47122.39	313	90104.48
	<i>Women</i>	287	400.4111	205	33771.61	199	45428.85
<b>Entrepreneurial activities</b>	<i>Men</i>	24	1632.292	34	115975.6	66	446285.1
	<i>Women</i>	10	1849.4	13	119134.2	39	348172

**Note:** Income data is in terms of monthly average.

According to the National Bank of the Republic of Belarus, the average per year official exchange rate was in 1996: 13.3 thousands BYR/USD; 2001: 1580 BYR/USD; 2004: 2160 BYR/USD.

**Source:** Own elaboration on the BHSIE.

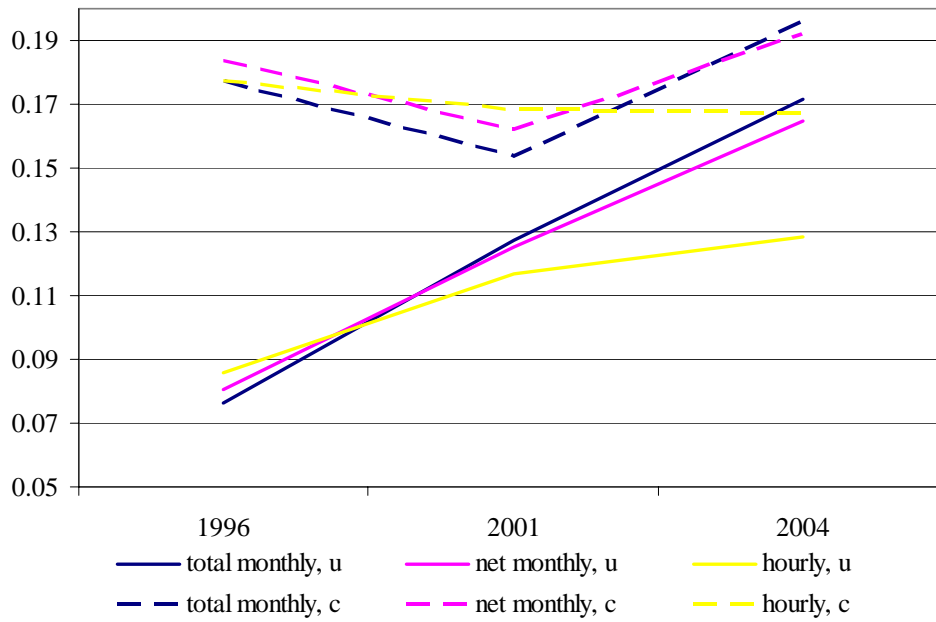
**Table 8. Gini coefficients**

<b>Year</b>	<b>Type of Wage</b>	<b>All</b>	<b>Men</b>	<b>Women</b>
<b>1996</b>	Hourly wage	0.36	0.38	0.34
	Net monthly wage	0.36	0.40	0.32
	Total monthly wage*	0.36	0.39	0.32
<b>2001</b>	Hourly wage	0.32	0.34	0.30
	Net monthly wage	0.31	0.33	0.30
	Total monthly wage*	0.31	0.33	0.30
<b>2004</b>	Hourly wage	0.32	0.32	0.30
	Net monthly wage	0.32	0.33	0.30
	Total monthly wage*	0.32	0.33	0.30

**Source:** Own elaboration on the BHSIE.

**Figures**

**Figure 1. The conditional (c) versus unconditional (u) GWG over time (1996-2004)**

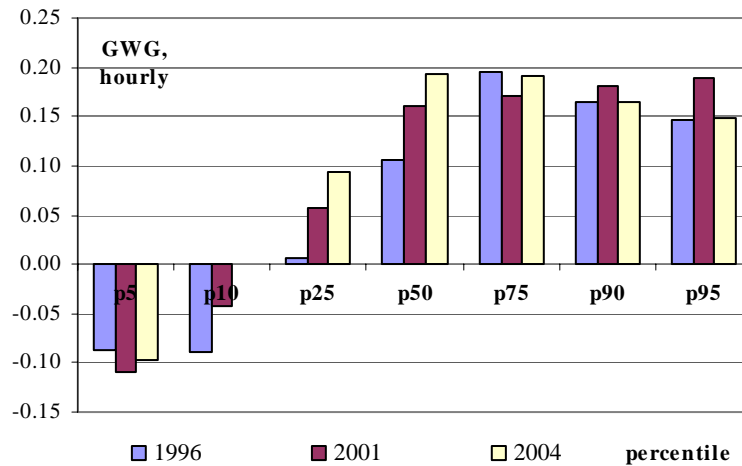


**Note:** All wages are in natural logs. Total monthly wage includes the wage from the main job as well as various forms of monetary and in-kind payments related to the main job. The unconditional GWG is based on an OLS estimate including only the constant term and a gender dummy. The conditional GWG is obtained from mincerian OLS estimates including controls for educational levels, work experience, marital status, disability, industry, firm's ownership and regions.

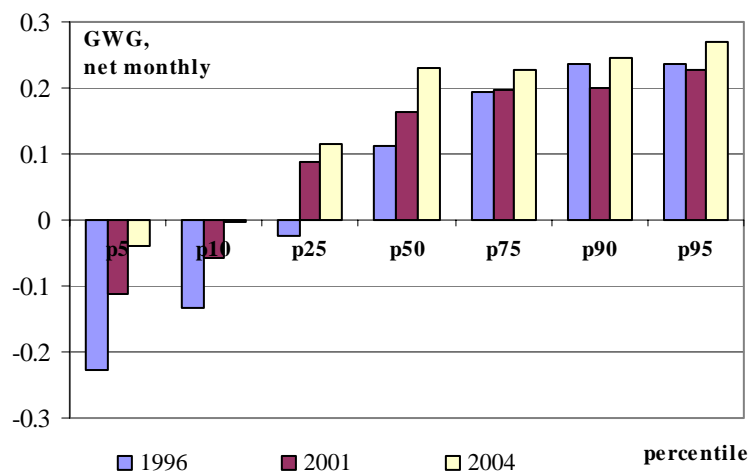
**Source:** Own elaboration on the BHSIE.

**Figure 2. The unconditional GWG at different points of the wage distribution**

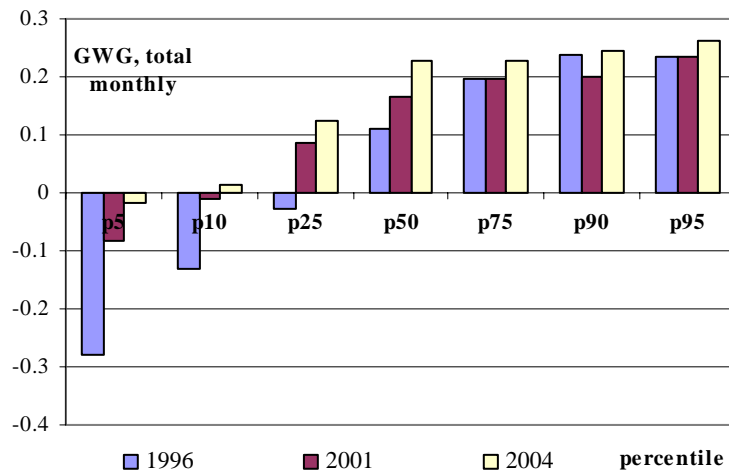
**A) Based on hourly wage**



**B) Based on net monthly wage from the main job**

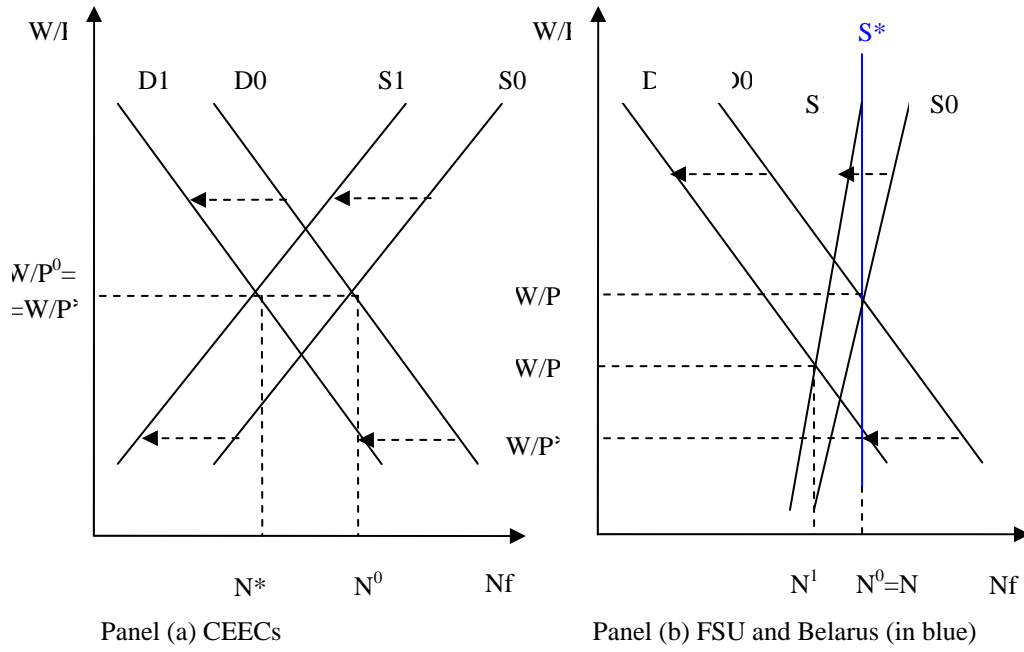


**C) Based on total monthly wage from the main job**



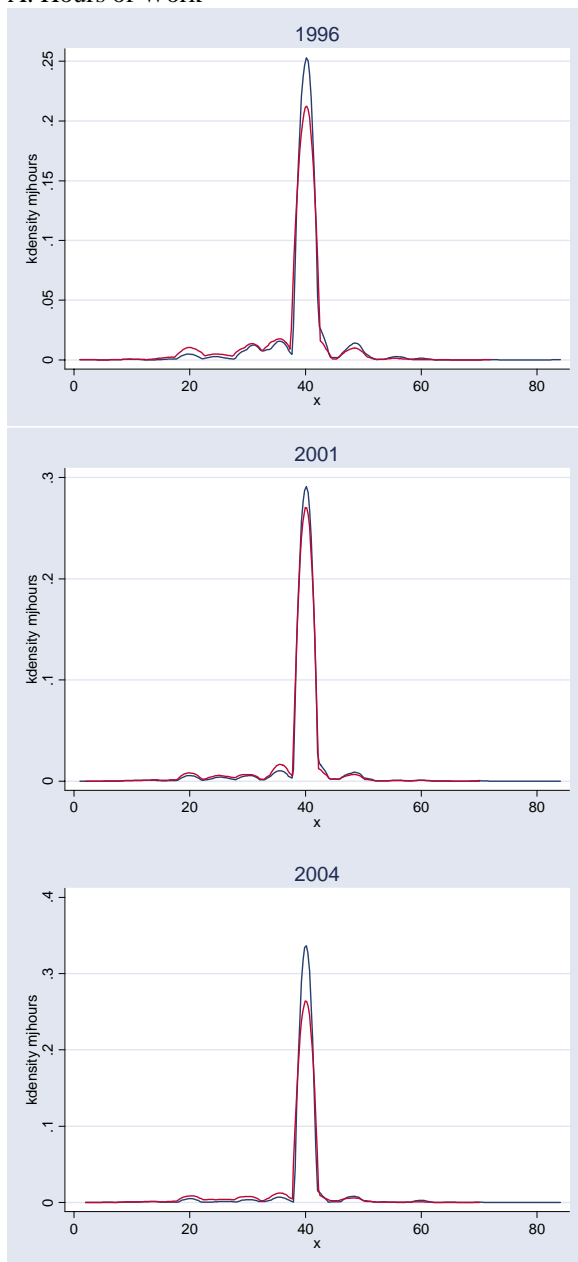
**Source:** Own elaboration on the BHSIE.

Figure 3. Distortions in the female labour market in CEECs and FSU republics

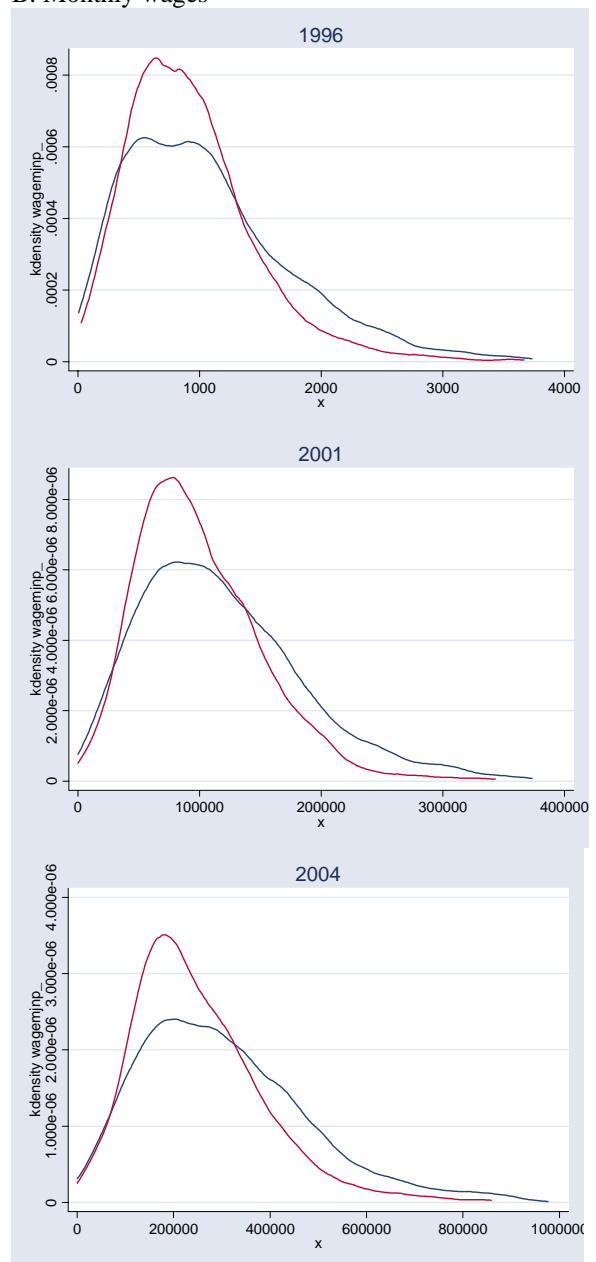


**Figure 4. Kernel Density Estimates of Distribution of Work Hours and Monthly Wages\***

**A. Hours of Work**



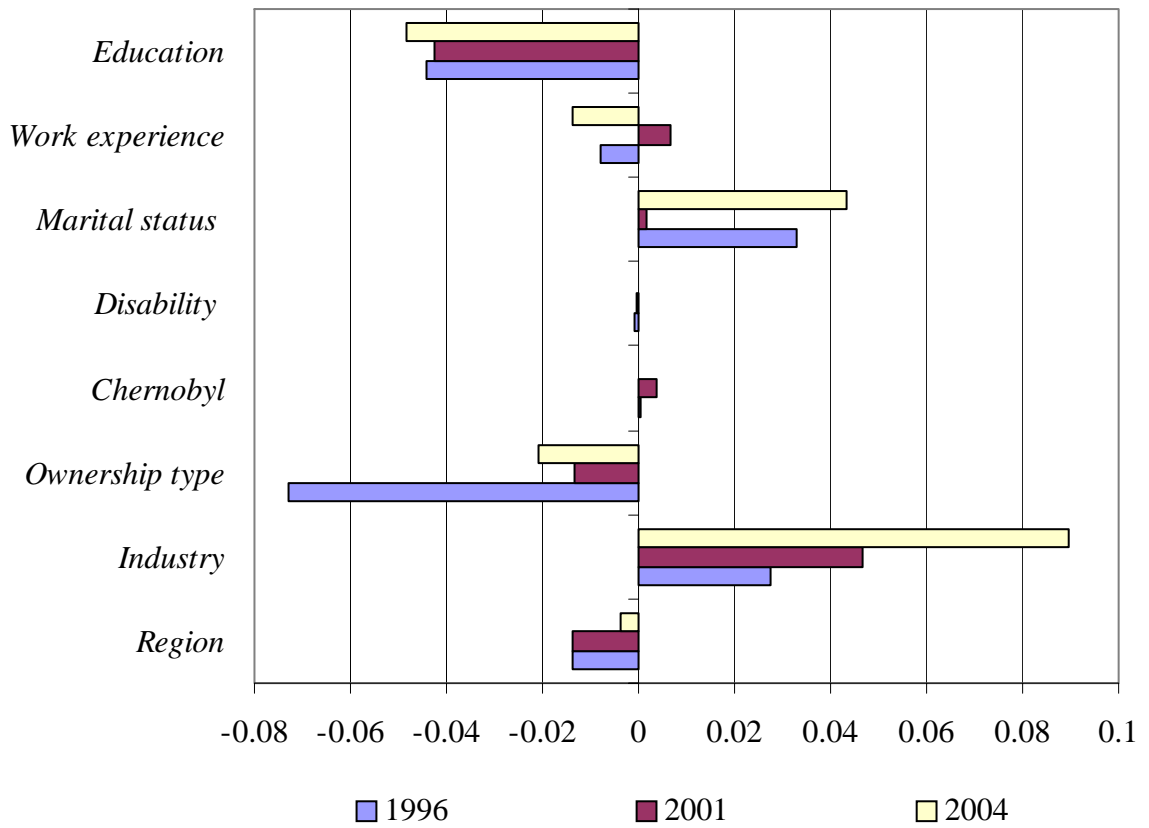
**B. Monthly wages**



**Note:** \*Only main job hours and wages considered; Blues line - Men, Red - Women.

**Source:** Own elaboration on the basis of the BHSIE.

**Figure 5. Contribution of observed characteristics to the GWG in the JMP (1993)**



**Note:** Total monthly wage from the main job is taken as a reference.

**Source:** Own elaboration on the BHSIE.