

# Structure and Distribution of Earnings in Russia, 1994–2003<sup>1</sup>

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**Abstract:** The paper documents changes in the structure of earnings and earnings inequality in Russia for the period 1994–2003 using the RLMS data. The period covers few years of the transformational recession (1994–1998), the financial crisis in 1998 and the first years of economic recovery (2000–2003). A regression-based decomposition reveals that within-group inequality plays the largest, yet diminishing, role. Among the explanatory variables, the largest proportion of earnings dispersion (75%–80% of the explained level of inequality) is explained by the geographical variables and job characteristics. The decomposition results suggest that the rise in inequality after the financial crisis of 1998 is likely to be a result of the differences in the adjustment speeds across regions and industries. Employer ownership is only marginally important; however, its effect has been steadily increasing for women due to the increase in the public-private sector wage gap. Contrary to the initial expectations, the wage inequality in the public sector was different from that in the private sector: both were of a similar level and followed similar patterns of changes.

**Keywords:** earnings inequality, wage determination, transition, Russia

**JEL Classification Numbers:** D31, J24, J31

## 1. Introduction

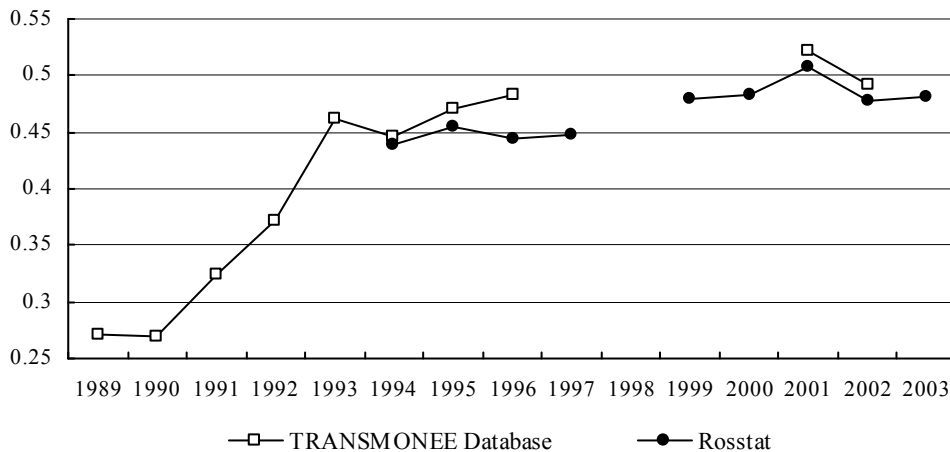
In the early 1990s, at the dawn of radical reforms, the transition to a market economy was expected to result in an increase in earnings inequality as wages were freed from administrative control. All explanations pertaining to such forecasts were related to the need for economic restructuring and rapid resource reallocation. Moreover, wage differentials were expected to increase in order to stimulate labour reallocation from less to more productive sectors. At the beginning of the restructuring, wage differentials were predicted to be determined largely by industry and firm-specific factors since more profitable firms were likely to pay higher wages in order to attract a superior workforce. Over time, the pay differentials were expected to decrease in order to mostly reflect the differences in the workers' human capital. However, the actual labour market developments, in many cases, have been different from the theoretical anticipations. Under such conditions, the importance of empirical analysis grows dramatically. Russia is of particular interest because in Russia, unlike the countries of Central and Eastern Europe, most of

the adjustment was made through wage adjustments rather than through changes in employment (Kapeliushnikov, 2003).

Actual trends in the earnings inequality during the early stage of the Russian transition have been well documented in empirical literature. Many researchers, employing various sources of data, have reported a sharp increase in the earnings dispersion immediately after the transition began. Using aggregate official data, Flemming and Micklewright (1999) reported a dramatic jump in all inequality measures. The Gini coefficient for wages rose from 0.22 at the beginning of the transition period to 0.5 in 1996; the 90/10 decile ratio increased from 3.3 in the late 1980s to 10 in 1995. In addition, household surveys have indicated similar trends. Brainerd (1998) employed the VTsIOM survey and reported that from May 1991 to May 1994, the log wage differential nearly doubled, increasing from 1.08 log points to 2.02 log points. Further, she found that inequality widened in both tails of the earnings distribution; however, the bottom half of the distribution expanded more than the top half. Brainerd speculated that the great spread of differences in the earnings of low-paid workers might be related to the erosion of minimum wages.

The introduction of market reforms led to significant changes in the wage structure based on the revaluation of returns to human capital. Women's wages declined relative to men's earnings in all percentiles of distribution (Brainerd, 1998). The returns to measured skills (education and occupation) increased substantially, along with within-group inequality. Nesterova and Sabirianova (1998) reported that the returns to schooling rose from 2%–5% in the Soviet period to 7%–8% in 1995–1996. In contrast to education premium, experience differentials became more compressed, reflecting the relative demand shift in favour of younger cohorts with more relevant human capital. The average earnings in the private sector grew faster than they did in the public sector, widening the sectoral gap. Further, industry and regional wage differentiation also amplified during the transition period; however, structurally, it remained considerably similar to the late 1980s, with the exception of agriculture whose relative wage fell sharply (Clarke, 2000).

Several alternative hypotheses (not mutually exclusive) have been proposed to explain the changes in the Russian wage structure. The first explanation attributes the growth of earnings inequality to the high compression of wages and, thus, to low levels of inequality under socialism, when a large proportion of wages was determined centrally in accordance with the Uniform Wage Grid. The Soviet pay structure favoured manual workers, particularly those employed in mining, the heavy industry, and military production; further, it offered much lower rewards to activities concerning high education requirements. The liberalisation of wage-setting regulations removed the administrative distortions, resulting in increasing the returns to observed skills (education and

**Figure 1 Evolution of the Gini coefficient for wages, 1989-2003**

occupation) up to their market levels. In addition, hyperinflation at the beginning of the reforms is another, and probably the major, contributing factor to the rise in inequality in the early 1990s. However, as inflation declined, inequality did not reduce. Lehmann and Wadsworth (2001) argued that wage arrears could reinforce an increase in inequality. They demonstrated that most of the earnings dispersion in Russia occurred among the workers affected by the wage arrears; further, they estimated that earnings inequality may have been about 30% lower in the absence of wage arrears. The initial rise in wage inequality can be also related to institutional factors (legal and organisational structure of the enterprise, access to subsidies and ownership) that affect the softness of budget constraints and managerial willingness to share profits apart from any productivity considerations. Using a matched employer-employee dataset based on the Russian Longitudinal Monitoring Survey (RLMS), Sabirianova Peter (2003) compared the relative importance of the institutional and market determinants of wage dispersion. She concluded that during the early transition period (1992–1998), changes in the wage differentials in Russia were primarily explained by institutional factors rather than restructuring and labour reallocation.

Trends in the later transition period are less accurately documented. Figure 1 depicts estimates of the earnings inequality in Russia quoted by the TransMONEE and Rosstat (Russian Statistical Agency) for 1989–2003. While a sharp growth of wage differentiation was observed in the early stage of the transition, with respect to the later period, both the series coherently demonstrate that wage differentiation has significantly slowed down since 1993. The peak of inequality was recorded in 2001, a few years after the financial crisis occurred and economic recovery began. At the same time, we observe hardly any reaction to the beginning of the active

privatisation process and expansion of informality in the Russian labour market. Since 2002, earnings inequality has been decreasing. However, we still do not know the extent to which these changes in the earnings inequality resulted from the changes in the composition of the workforce, and to what extent should they be attributed to the changes in the earnings structure (market returns to characteristics) and institutional constraints (e.g. minimum wages). This paper aims to contribute to bridging this gap.

In this paper, we examine how the enormous structural changes in the Russian economy affected both male and female earnings inequality and earnings distributions during the later stage of the transition process, namely in 1994–2003. Further, we analyze the factors that caused the changes and the manner in which our findings relate to those of the previous empirical researches on the Russian labour market. Previous studies have examined evidence for the changes in wage determinants by using aggregate wage regressions for all workers. In this study, we intend to determine if male and female earnings structures changed in different ways as the transformation matured during the 1990s and the early 2000s in Russia. Furthermore, we give special attention to the impact of the private sector on the structure and distribution of earnings. Many of the existing models concerning economic transition focus on the growth of the private sector as the most influential factor determining the labour market developments (Milanovic, 1999; Aghion and Commander, 1999). It is predicted that overall earnings inequality should rise for the following two reasons: (1) workers move from a less unequal state sector to a more competitive and, hence, more unequal private sector; and (2) due to greater productivity, average wages in the private sector are higher than those in the state sector. However, empirical evidence for this theory remains extremely weak. For instance, in Poland, in contradiction with the theory, earnings inequality within both the private and public sectors grew substantially, and by similar amounts (Keane and Prasad, 2006).

The remainder of this paper is organised in the following manner. The main features of the macroeconomic developments in Russia and the evolution of labour market institutions have been described in Section 2. In Section 3, the dataset has been introduced and the measurement issues have been discussed. Section 4 provides a descriptive account of the changes in earnings inequality in Russia in the period 1994–2003, and Section 5 outlines the methodology of the decomposition analysis and reports the empirical results. Finally, in Section 6, some concluding observations have been provided.

## **2. Macroeconomic context and labour market institutions**

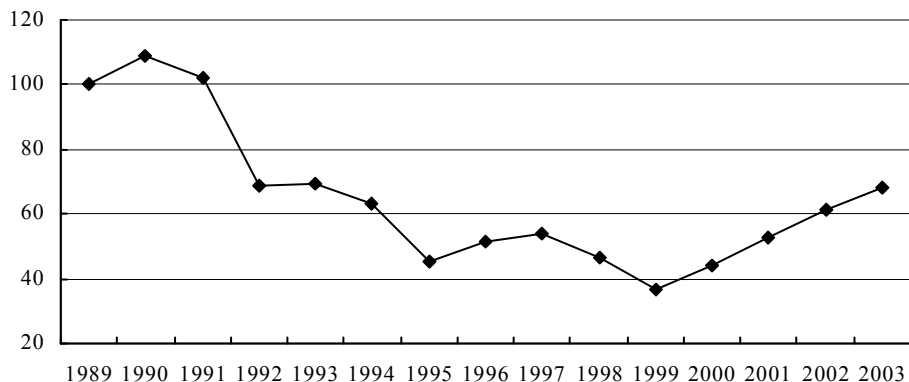
Russia has experienced a dramatic change in its political and economic structures during the last decade. Its transition from a communist to a market economy began with a radical set of reforms implemented in 1992, known as the ‘shock therapy’. In these reforms, the government

liberalised the prices for consumer goods and most other products, with the notable exception of energy and gas. Other aspects of the reforms included mass privatisation in 1993–1994, trade liberalisation and some hardening of budget constraints on state-owned enterprises. Due to the growing wage and inter-firm arrears, the Central Bank failed to eliminate soft budget constraints which further discouraged adjustments. Financial constraints were effectively hardened only when the process of mass privatisation was completed. The pace of privatisation in Russia has been more rapid than that in many other countries in the region. By late 1994, 68% of retail trade firms, 70% of restaurants, 78% of service establishments and about two-thirds of industrial enterprises had been privatised (Brainerd, 2002). Despite this rapid pace, privatisation has not affected the firms' objectives and incentives to restructure.

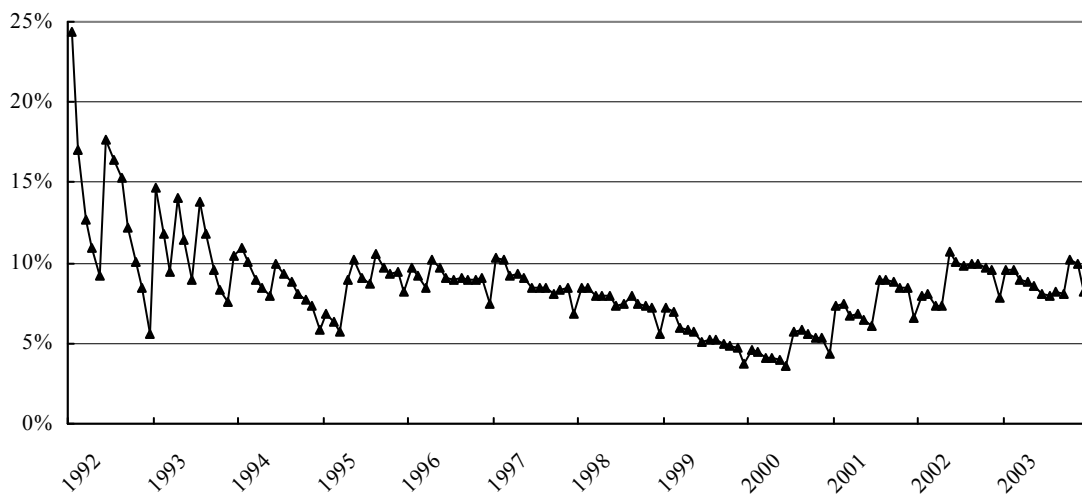
The transition in Russia led to a dramatic contraction of output in 1991–1998, when real GDP fell by a total of 40%. The financial crisis in 1998 resulted in a substantial depreciation of the Russian rouble, giving rise to economic growth which has been quite rapid since 1999. While the restructuring process was accelerated with economic recovery, a large proportion of manufacturing enterprises remained obsolete and uncompetitive.

Further, the transition process involved significant changes in the labour market institutions. Constraints on layoffs were significantly reduced and open unemployment was given legal status. Firms were allowed to determine the employment level and its composition as well as wage levels and pay systems. At present, wages outside the public sector are mostly set through informal firm-level bargaining with little union influence. On the other hand, wages in the public sector are still set in a centralised manner with reference to the Unified Tariff Scale; however, regional authorities and the management of state establishments have been given greater freedom to decide regional allowances and other bonuses.

All available estimates demonstrate that despite the significant negative shocks to output in the early period of transition, there was only a minor change in employment. In the period 1991–1998, the total employment declined by about 15%; the increase in unemployment was also smooth and rather moderate, peaking at 13.3% in 1998. In addition, there was large-scale reallocation of labour from industry to the service sector. In the old corporate sector, the dominant tendency during the 1990s was a gradual job destruction accompanied with a high turnover and a low level of involuntary separations. Old firms preferred to hoard labour in light of the uncertainty with respect to policy and firm or product-specific market prospects. Thus, during the recession period, it was common for firms to provide *de facto* unemployment compensation to workers in the form of minimum wage payments and little or no work requirement. Economic growth led to a substantial increase in labour force participation and a reduction in the unemployment numbers. Most of the increase in employment occurred outside the corporate sector, while large- and medium-sized enterprises continued the process of job destruction. Figure 2 illustrates the development of real wages. At the bottom of the recession,

**Figure 2 Real wages (1989 = 100)**

Source: TRANSMONEE 2006 Database

**Figure 3 Minimum wages, in per cent of average wages**

Source: Rosstat

real wages fell to one-third of the pre-transition level. The actual fall in real wages may have been even more dramatic; this is because official estimates are based on bookkeeping wages and do not account for wage arrears. However, since 2000, Russia has experienced a sustained growth of real wages at a rate which exceeds that of the output growth.

In 1976, minimum wage legislation was established in the USSR and continued to exist after the collapse of the USSR. The value of the minimum wage is set through politico-bureaucratic bargaining between the government and the parliament. This process takes into account budget revenues and domestic politics but completely disregards labour market considerations. Since 1992, the minimum wage has not been an effective floor for wages; this is because in spite of periodic revaluations, it has rarely surpassed 10% of the average wage in the Russian economy (Figure 3).

### **3. Data and measurement issues**

The data used in this paper is obtained from the 1994–2003 waves of the RLMS based on a national probability sample including about 4500 households. For this analysis, we developed eight cross-sections; this was done because the survey was not conducted in 1997 and 1999. The time period chosen in this study covers both the period of post-transformational recession and that of economic growth. In all the waves of the survey, only those individuals employed in organisations and enterprises were required to respond to a question concerning their net earnings at their main workplace during the preceding month. In addition, those who had wage arrears were required to respond to questions pertaining to the amount of overdue wages and the duration of wage arrears. Thereafter, we further narrowed the sample to only those individuals who had reported employment as their major activity and were working between 20 and 80 hours per week (in the reference month). Moreover, we also deleted those who were in the military. Such restrictions allowed us to exclude (1) self-employed individuals, (2) those employed by other individuals, (3) working students and pensioners and (4) unemployed and non-employed individuals with casual labour incomes. However, specific restrictions on age were not imposed. Furthermore, only earnings obtained from the primary workplace were considered; incomes obtained from secondary employment and casual work were ignored.

Due to wage arrears, the responses to the question about earnings received in the reference month (hereafter, actual earnings) contained many missing and zero observations, thereby impeding the calculation of conventional inequality measures. The analysis of actual earnings makes sense only for those who are not in arrears. However, even for those not in arrears, it is difficult to distinguish between contractual wages, bonuses and possible repayments of back wages if these respondents have only recently been able to eliminate wage arrears. Restricting the sample to those who are not in arrears can only be justified if the wage arrears are confined to a relatively small proportion of workers and, more importantly, if the incidence of wage arrears has a random pattern. However, the existing evidence contradicts both these conditions. A sub-sample of those who are not in arrears is not likely to represent the entire population of workers. The share of those in wage arrears in the working sample amounted to 34% in 1994,

37% in 1995, 54% in 1996, 55% in 1998, 23% in 2000, 20% in 2001, 19% in 2002 and 15% in 2003. Thus, at the peak of the non-payment crisis, more than half of the workforce suffered from wage arrears. Hence, excluding these employees would reduce the sample size to ineffective levels. Moreover, wage arrears were not allocated evenly and randomly across workers, firms and regions. They were, instead, systematically related to gender, job tenure, occupation, wage levels, location, industry affiliation, ownership type, age of the firm and the situation of the local labour market (Earle and Sabirianova, 2002). Therefore, a sample restricted to workers who are not in wage arrears would not be representative of the underlying population; further, actual paid earnings are a poor candidate for use in analysis, particularly for the early stage of the transition.

In this paper, following Earle and Sabirianova (2002), we employed contractual wages. For those individuals who were not in wage arrears, the contractual wages coincided with the actual wages. On the other hand, for those who were in wage arrears, the contractual wages were taken as the cumulative debt of the firm to the worker divided by the duration of the debt (in number of full months). In other words, the contractual wages were an estimate of the wages if everyone was paid in full and on time.

Lehmann and Wadsworth (2001) draw attention to the three implicit assumptions which underlie such imputation techniques. The first assumption is that workers will not lose their jobs if employers pay in full. Since there are no estimates with respect to employment responses to wage arrears, we can only speculate about the potential differences between the 'true' wage distribution and the distribution of contractual wages. On the one hand, the use of contractual wages underestimates the degree of inequality when compared with the measures based on actual earnings. This is because it imputes higher wages to all workers who are in wage arrears. On the other hand, if workers affected by wage arrears are crowded at the low end of the wage distribution and are at the risk of losing their job if their employers were forced to pay wages in full, then the use of contractual wages widens the distribution (which would be more compressed in the absence of wage arrears). These two effects partly offset each other, leading to estimates which are close to the 'true' parameters of the underlying earnings distribution. Secondly, imputation assumes that wages are not withheld permanently; rather, the owed wages will be paid eventually, and their value will not change much in real terms. Thirdly, the contractual wages approach rules out welfare consequences of uncertainty regarding future payments. Owed wages, which may or may not be paid, are treated at par with actually paid money.

With regard to the time frame, the general trend in literature is to use monthly wages. Most Russian employees are either salaried or paid on a piece-rate basis; pay-per-hour contracts are not common in Russia. Thus, hourly wage rates can only be obtained by dividing the monthly earnings by the number of hours worked. Hence, errors in measuring the hours of work may aggravate errors in measuring wages, and therefore, using hourly wages is not an error-free



alternative to monthly wages. Many previous studies have shown that Russian enterprises responded to the transitional output shock with a combination of real wage decrease and reduction of hours worked, not with employment reduction. Further, workforce underutilisation varied considerably across firms, regions and industries. Reduction of the working week and incidences of administrative leaves were not evenly distributed among the workers. Therefore, the use of monthly wages may mask variation in hours worked and cause biases in the estimates. In particular, low-wage employees are more likely to work fewer hours, while high-wage employees are likely to work longer hours.

From the theoretical perspective, the use of monthly wages is also advantageous. This is because the use of hourly wages is based on the implicit assumption that hours of work are freely chosen, and so workers can flexibly substitute work for leisure to enhance their welfare. However, this is often not the case. In practice, the hourly wages and working hours can be ‘tied’ to each other in such a manner that the wage rates are not independent of the working hours and a decision is made taking into account both the hours of work and wages. Another possible situation is one where the hours of work are exogenously constrained and labour incomes are not proportional to the hours of work.

The earnings were deflated using the national monthly CPI (November 1994 = 100) quoted by the Rosstat. Samples for all the waves of the survey did not include (1) those from the top 0.25% of earnings distribution (6–8 individuals in each round) and (2) workers with monthly earnings less than  $\frac{2}{3} \times 17600$  roubles (17600 roubles was the mandatory wage minimum in November 1994). These observations are treated as outliers.

A summary of the statistics for both women and men has been presented in Tables 1a and 1b. The tables reveal that the sample composition with respect to most characteristics exhibits a high degree of stability over the relevant period. However, the number of workers with primary education shows a mild decline over this period. This might be attributable to the withdrawal of workers with lower levels of human capital from the labour market, or more likely, it simply reflects cohort effects. The numbers related to service sector employment demonstrate a sustained growth for both men and women. This reflects fundamental shifts in the sectoral allocation of resources during the transition (Lukiyanova, 2003). The trend in the number of respondents working in the private sector exhibits a considerably steady rise during this period; the growth in private sector employment appears impressive particularly for men. Although the trend of growing employment in the private sector is undoubtable, the definition of the private sector is slightly more problematic since sector assignment was based on the responses of the respondents who may not be well informed about the owners of their enterprises. More specifically, those employees who provided negative responses to questions about the presence of foreigners and Russian private owners in the capital of their enterprises were marked as working in the public sectors. As a result, the number of workers in the private sector in the RLMS is

**Table 1a Descriptive statistics for the sample: Females**

	1994	1995	1996	1998	2000	2001	2002	2003
Mean age, years	40.0	39.4	39.5	39.3	39.3	39.7	39.5	39.6
Mean nominal earnings, current rubles	186	388	575	711	1443	2209	2984	3701
Mean earnings, Nov. 1994 rubles	165	153	180	99	116	149	175	192
Percentiles, Nov. 1994 rubles:								
10-th	43	40	47	29	29	40	50	52
50-th (median)	129	120	126	71	80	107	135	149
90-th	323	307	346	214	241	271	323	364
Settlement type, %:								
Moscow & St-Pet.	12.3	10.9	11.4	10.2	6.9	15.6	17.5	16.2
regional capital	35.2	37.4	38.0	40.7	40.8	34.2	32.3	33.4
other medium-size cities	26.6	27.0	26.5	26.7	26.0	25.6	25.8	26.0
small towns (<5000)	6.1	7.1	6.5	6.8	6.9	6.3	6.0	5.3
rural	19.8	17.7	17.6	15.7	19.3	18.3	18.4	19.0
Education								
Primary	1.6	1.2	1.0	0.4	0.1	0.2	0.2	0.2
Incomplete secondary	8.2	8.4	7.6	5.8	5.5	5.0	5.8	5.8
Incomplete secondary + vocational training	2.9	2.3	2.6	1.9	2.7	2.0	2.0	2.4
Complete secondary	18.0	18.8	19.3	17.5	18.4	19.6	19.4	18.7
Complete secondary + vocational training	11.8	13.1	13.4	12.2	14.0	14.6	12.8	14.0
Technical college	33.8	32.6	32.3	36.5	33.3	32.2	33.9	32.0
University	23.7	23.6	23.9	25.6	26.0	26.5	25.9	26.9
Profession								
Managers and professionals	25.3	24.8	26.2	29.4	29.1	31.6	29.0	28.0
Associate professionals	24.7	24.0	23.7	22.4	22.5	20.1	22.5	20.8
Clerks	12.9	12.6	12.7	11.0	10.0	9.3	10.8	10.4
Service workers	10.7	11.7	12.4	15.5	16.6	16.1	14.9	17.5
Skilled agricultural workers	0.1	-	0.1	0.1	0.1	0.1	0.1	0.1
Craft workers	7.2	5.4	6.3	4.0	4.6	4.1	4.7	4.5
Operators and assemblers	5.9	6.9	6.6	7.4	7.1	8.3	7.6	7.6
Elementary occupations	13.3	14.6	12.0	10.2	10.0	10.5	10.5	11.2
Industry								
Mining and manufacturing	23.2	23.2	20.0	19.3	21.2	22.3	22.0	20.8
Agriculture and forestry	6.6	5.4	5.9	3.3	4.0	3.9	3.9	3.0
Transport and communications	5.2	6.4	6.6	6.9	5.4	4.9	4.7	4.8
Construction	4.4	3.9	3.2	2.3	1.7	2.3	2.7	2.7
Retail trade and restaurants	14.3	14.0	16.2	18.2	18.5	18.7	19.3	20.5
Wholesale trade, real estate and business services	1.3	1.6	1.3	1.9	1.5	2.1	2.1	2.5
Public administration	5.8	4.7	5.8	6.1	7.7	6.4	6.0	6.1
Health, education, recreational, cultural activities	29.5	31.7	32.1	32.8	30.9	29.3	28.2	29.3
Other community, social and personal services	9.8	9.3	9.0	9.3	9.2	10.0	11.1	10.3
State sector	77.5	68.9	68.4	66.8	64.9	57.6	54.5	54.1
Sample size	1470	1372	1266	1153	1455	1776	1911	1970

**Table 1b Descriptive statistics for the sample: Males**

	1994	1995	1996	1998	2000	2001	2002	2003
Mean age, years	39.4	39.1	39.1	38.9	38.6	38.5	38.5	38.4
Mean nominal earnings, current rubles	283	592	848	1070	2188	3367	4325	5489
Mean earnings, Nov. 1994 rubles	250	234	265	149	175	227	253	284
Percentiles, Nov. 1994 rubles:								
10-th	59	58	65	43	40	54	68	78
50-th (median)	200	192	210	122	137	171	188	231
90-th	500	473	472	286	357	446	470	520
Settlement type, %:								
Moscow & St-Pet.	11.7	10.6	12.6	9.4	5.2	14.6	16.1	15.9
regional capital	35.3	35.3	35.4	42.1	44.1	36.5	33.6	32.3
other medium-size cities	28.0	28.4	29.0	27.4	28.4	26.3	25.9	27.5
small towns (<5000)	5.5	6.1	5.5	4.8	4.5	5.1	4.1	4.2
rural	19.5	19.7	17.6	16.4	17.8	17.5	20.3	20.2
Education <sup>*)</sup>								
Primary	2.9	2.1	2.1	1.1	1.0	0.7	0.7	0.6
Incomplete secondary	9.9	11.5	10.3	9.7	9.2	8.5	8.7	9.3
Incomplete secondary + vocational training	6.6	6.5	5.8	6.5	6.0	5.3	5.4	6.0
Complete secondary	23.4	26.9	26.9	24.1	23.8	23.7	24.5	23.7
Complete secondary + vocational training	19.9	16.9	16.2	20.4	22.5	21.5	21.6	21.6
Technical college	16.4	16.4	16.9	17.2	17.6	18.2	18.0	18.3
University	20.9	19.9	21.8	21.1	20.0	22.3	21.1	20.6
Profession								
Managers and professionals	17.8	14.6	15.8	17.5	16.8	18.5	18.1	16.1
Associate professionals	4.9	6.6	7.8	8.7	8.4	8.7	9.4	10.4
Clerks	0.9	1.6	1.1	1.8	1.2	1.1	1.9	2.1
Service workers	4.6	6.7	6.0	6.7	4.8	5.7	4.9	5.4
Skilled agricultural workers	0.7	0.3	0.9	0.4	1.0	0.5	0.9	0.9
Craft workers	33.9	31.3	28.7	25.4	28.2	25.8	25.6	25.3
Operators and assemblers	29.6	29.8	27.9	28.1	29.3	28.2	27.9	27.6
Elementary occupations	7.7	9.0	11.8	11.4	10.3	11.4	11.4	12.2
Industry								
Mining and manufacturing	30.9	31.4	28.9	28.9	35.3	34.9	32.1	31.9
Agriculture and forestry	11.0	8.7	8.4	6.6	6.8	6.4	7.4	6.6
Transport and communications	12.6	12.1	12.7	14.8	12.2	10.7	10.7	11.8
Construction	13.7	12.5	11.0	9.6	10.4	9.4	10.8	11.1
Retail trade and restaurants	6.3	7.4	7.6	10.9	9.5	10.4	10.5	11.1
Wholesale trade, real estate and business services	1.7	2.2	2.5	2.7	2.9	3.4	3.2	4.0
Public administration	6.9	7.6	8.2	7.8	6.4	6.4	6.7	6.2
Health, education, recreational, cultural activities	7.5	7.6	9.3	7.0	7.3	7.5	7.8	7.0
Other community, social and personal services	9.4	10.6	11.5	11.8	9.3	11.0	10.9	10.4
State sector	68.0	61.2	59.4	57.1	47.5	44.0	44.4	38.3
Sample size	1438	1301	1091	972	1268	1501	1730	1708

**Table 2 Sample selection**

	Women							
	1994	1995	1996	1998	2000	2001	2002	2003
Not employed	54.5	55.3	56.1	57.9	57.5	56.5	55.5	53.9
Employment is not a major activity	2.4	2.3	2.3	2.3	1.5	1.7	1.7	2.1
Employment is a major activity								
<b>In sample</b>	<b>30.2</b>	<b>29.7</b>	<b>27.3</b>	<b>23.9</b>	<b>28.7</b>	<b>31.0</b>	<b>32.2</b>	<b>33.2</b>
Not in sample because of part-time	5.8	4.2	3.6	4.0	3.5	3.3	3.9	3.6
Not in sample because of missing time data	3.2	4.1	4.5	4.0	4.7	4.0	3.1	4.2
Not in sample because of missing wage data	3.6	4.2	6.1	7.7	3.8	3.2	3.4	2.8
Deleted as outliers	0.3	0.3	0.1	0.2	0.4	0.3	0.2	0.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	4862	4625	4633	4822	5072	5732	5941	5933

lower than the official estimates. The distribution of workers based on settlement type also appears to be changing over time. However, this is likely to be the consequence of greater sample attrition in metropolitan areas as well as further replenishment (Heeringa, 1997). We acknowledge that this may impact earnings dispersion over time, but there is no reasonable method in which this problem can be resolved given the data constraints within the RLMS.

A brief methodological remark concerning the sample is perhaps necessary. Inequality measures based on the RLMS data are likely to underestimate the true level of inequality due to undersampling of the higher paid workers and uneven panel attrition. Undersampling reflects the fact that higher paid workers have a higher propensity to hide their incomes and provide no response to questions about wages. Another problem is that the RLMS sample largely relies on the house stock that existed in 1994, and the sampling procedure does not account for newly built dwellings. While the survey attempts to follow individuals if they move to new dwellings, many of those who have changed their addresses have actually left the sample. Since these are mostly high-paid individuals who buy new flats and houses, the original probability sample becomes distorted over time. Apart from moving to new dwellings, many high-paid individuals do not have spare time and frequently refuse to participate in the survey, thereby leaving the sample.

In addition to the sampling and attrition problems in the RLMS, there may be a problem with regard to selecting our working sample since the number of people who report their wages differs from year to year. This problem relates to the changing stocks of the unemployed and those out of the labour force as well as to the changing number of workers with missing wages and time

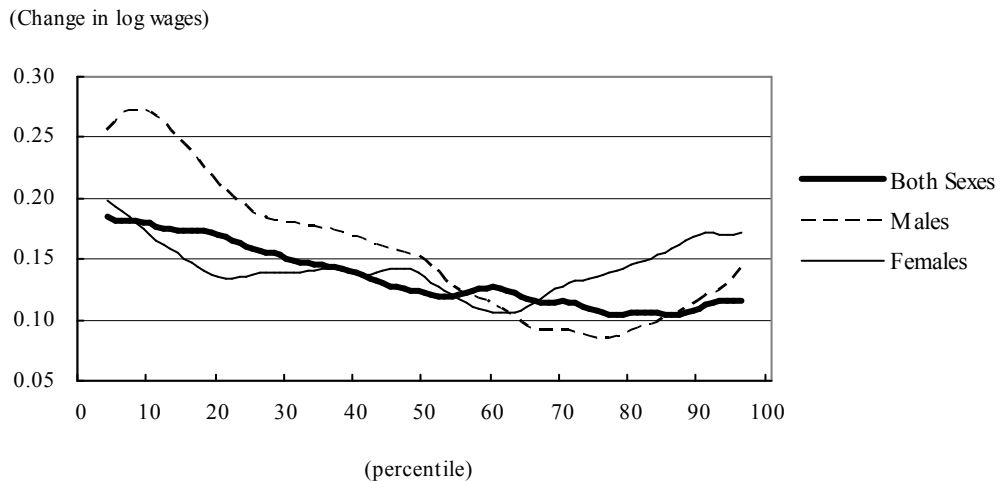
**Table 2 Sample selection (Continued)**

	Men							
	1994	1995	1996	1998	2000	2001	2002	2003
Not employed	38.5	39.3	41.9	46.5	45.2	44.3	45.1	44.4
Employment is not a major activity	2.1	2.3	2.0	2.2	1.8	2.0	1.7	2.0
Employment is a major activity								
<b>In sample</b>	<b>38.2</b>	<b>37.1</b>	<b>31.5</b>	<b>26.9</b>	<b>33.6</b>	<b>35.6</b>	<b>39.1</b>	<b>38.3</b>
Not in sample because of part-time	5.7	4.2	3.1	3.3	3.0	2.9	2.5	2.6
Not in sample because of missing time data	6.7	8.0	8.5	7.4	8.7	7.9	5.6	7.5
Not in sample because of missing wage data	8.4	8.8	12.9	13.7	7.4	7.1	5.8	5.0
Deleted as outliers	0.4	0.3	0.3	0.3	0.5	0.3	0.3	0.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
N	3766	3503	3462	3620	3778	4212	4425	4464

data. Table 2 reveals that in most years, our working sample of women represented about 30% of women aged 15 and above, but in 1998, this percentage decreased to a low of 24% (or 67% and 57% of employed women, respectively). For men the average representativeness in 1994–2003 is around 36%, with the lowest level observed in 1998 equalling 27% (or 63% and 50% of employed men, respectively). A decrease in the probability of entering the sample can be primarily explained by the rise in non-employment (here we make no differentiation between unemployment and inactivity) and the missing data on wages. The latter problem is mainly caused by wage arrears, and, as we believe, it still remains in the data on contractual wages. The effect of missing wages on the calculation of inequality measures is generally uncertain and cannot be estimated without additional assumptions. In this paper, we have assumed that in our data on contractual wages, which have been corrected for wage arrears, missing values are distributed randomly across the entire population of workers. Thus, their effect on inequality measures is neutral. It must be mentioned that exits to non-employment do not hinder the calculation of inequality measures; rather, they help to explain the changes in the underlying wage distribution which would be wider in the absence of such exits.

#### 4. Changes in the earnings inequality

We begin with descriptive statistics and simple decompositions in order to document the changes that occurred in 1994–2003 and uncover the stylised facts about the structure of earnings in the Russian economy.

**Figure 4** Change in log real wages by percentile for males and females (1994-2003)

Nominal earnings rose rapidly during the entire period, but failed to keep pace with the inflation jumps in 1995 and 1998 (Tables 1a and 1b). The financial crisis of 1998 resulted in halving the real earnings for both men and women in comparison to those in 1994. During the period after the crisis, the real earnings rose faster than inflation, and by the end of the period, the median real wages were some 15% higher than what they were in 1994. On observing the earnings distribution for both genders, one may conclude that pay grew at approximately the same rate in all parts of the distribution, with slightly higher gains for the low-paid (Figure 4)<sup>2</sup>. However, there were important differences in the evolution of male and female distributions. For men, the wages grew significantly faster at the bottom of the distribution, so that low-paid men gained relative to other workers over this period. The gains of lower paid women are less pronounced because those at the top of the female distribution also gained relative to middle.

Table 3 provides some standard measures of earnings inequality: three decile ratios, the Gini and Theil coefficients, the coefficient of variation and standard deviation of log-earnings. These measures differ in sensitivity to variances at different parts of the distribution and collectively provide a comprehensive picture. Despite the dramatic changes in the real wages, the overall wage inequality was remarkably stable during this period. However, it did jump by some 10% in the aftermath of the 1998 crisis and remained at higher levels for a couple of years. The crisis caused a widening of dispersion throughout the distribution. Nevertheless, in 2002, the trend reversed again, and in the course of a single year, wage inequality fell back to the level that it was during the mid-1990s. This reversion was caused by the higher rates of wage growth at the bottom half of the distribution. Further, these changes are robust for all inequality measures.

**Table 3 Measures of earnings inequality: Men and women**

	1994	1995	1996	1998	2000	2001	2002	2003	Change 1994–2003
<b>Total</b>									
Gini	0.425	0.426	0.427	0.416	0.442	0.438	0.413	0.419	-0.006
Theil	0.304	0.311	0.316	0.292	0.335	0.340	0.300	0.298	-0.006
CV	0.874	0.902	0.925	0.856	0.942	0.987	0.910	0.869	-0.005
StDev of logs	0.834	0.831	0.811	0.791	0.842	0.830	0.789	0.811	-0.022
Decile ratios:									
90/10	8.59	8.33	8.18	7.74	9.00	7.89	7.08	8.42	-0.17
90/50	2.78	2.66	2.94	2.71	2.77	2.63	2.45	2.74	-0.04
50/10	3.09	3.14	2.78	2.85	3.25	3.00	2.89	3.07	-0.02
<b>Women</b>									
Gini	0.408	0.416	0.423	0.412	0.442	0.427	0.401	0.415	0.007
Theil	0.288	0.302	0.316	0.293	0.349	0.331	0.286	0.298	0.010
CV	0.873	0.911	0.942	0.878	1.010	1.002	0.901	0.892	0.019
StDev of logs	0.782	0.801	0.781	0.763	0.807	0.790	0.754	0.781	-0.001
Decile ratios:									
90/10	7.51	7.65	7.33	7.50	8.30	6.76	6.47	7.00	-0.51
90/50	2.50	2.55	2.75	3.00	3.00	2.54	2.39	2.44	-0.06
50/10	3.00	3.00	2.67	2.50	2.77	2.67	2.71	2.87	-0.13
<b>Men</b>									
Gini	0.410	0.407	0.404	0.390	0.411	0.419	0.402	0.396	-0.014
Theil	0.280	0.279	0.283	0.254	0.286	0.308	0.281	0.263	-0.016
CV	0.814	0.833	0.858	0.780	0.840	0.913	0.863	0.797	-0.017
StDev of logs	0.837	0.804	0.792	0.761	0.819	0.819	0.782	0.790	-0.047
Decile ratios:									
90/10	8.48	8.14	7.32	6.67	8.87	8.25	6.93	6.67	-1.81
90/50	2.50	2.47	2.25	2.35	2.61	2.61	2.50	2.25	-0.26
50/10	3.39	3.30	3.25	2.83	3.40	3.16	2.77	2.97	-0.42
Median women's earnings in percent of median men's earnings	64.5	62.5	60.0	58.2	58.4	62.6	71.8	64.5	

The results obtained in this paper are, in general, consistent with the arrears-adjusted estimates in Lehmann and Wardsworth (2001) for 1994–1998. At the same time, however, the inequality estimates in this paper are slightly lower than those in the official publications (Figure 1). While the trends are considerably similar, according to the Rosstat database maximum inequality was observed in 2001, and in our sample, it peaked in 2000.

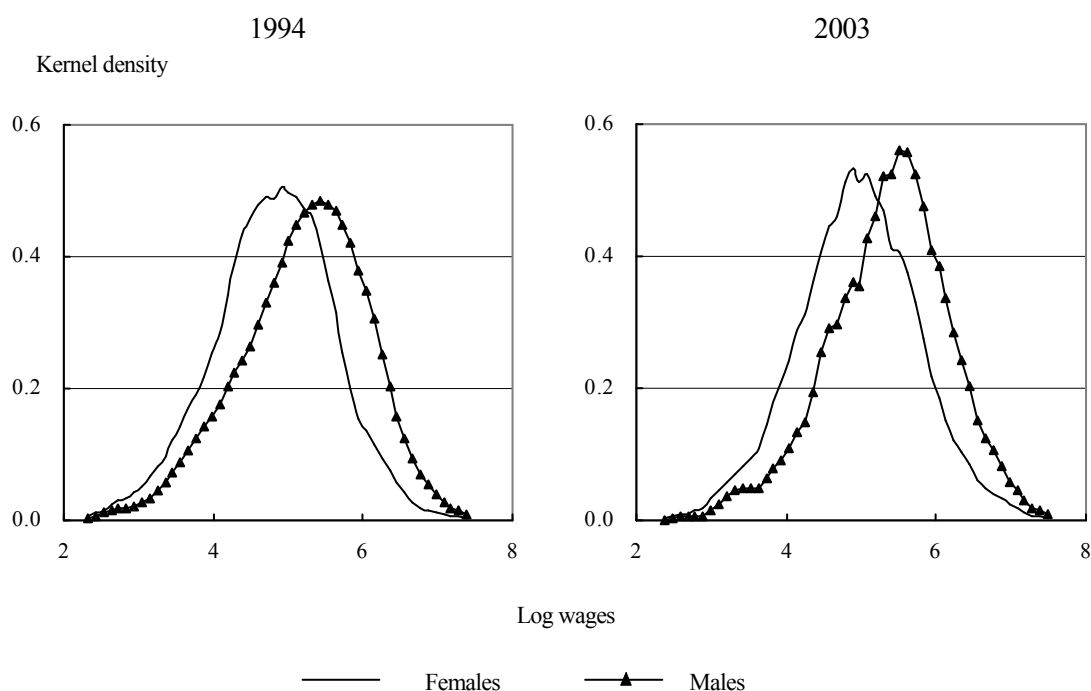
**Figure 5** Change in log real wages by percentile for males and females (1994–2003)

Figure 5 illustrates the kernel density estimates of log earnings for both men and women in 1994 and 2003. The shapes of both the distributions are extremely similar. The men's distribution in both graphs shifts to the right, reflecting the existing gender gap in wages. As shown in the bottom row of Table 3, the earnings of women in relation to those of men were exactly equal in 1994 and 2003. However, during the time period 1996–2000, the relative earnings of women decreased by 4–6 percentage points. This temporary widening in the gender gap contributed to the rise in the overall earnings inequality during these years.

In 1994, women's earnings were distributed slightly more evenly than those of men. However, by 2003, the levels of inequality for both men and women became considerably similar for most measures, albeit over the entire period, the overall inequality decreased more for men than for women. An inspection of inequality indices reveals some movements within the distributions between 1994 and 2003. In the mid-1990s, men had significantly more inequality at the bottom half of the distribution than the women did. On the contrary, in 1996–2000, women had more dispersion than the men had at the top half of the distribution. However, by the end of the period, these differences were eliminated. The only difference which remained between the two distributions was the trend for widening at the bottom half of the female distribution which appeared in 2000 and has not been reversed since. Moreover, this trend is not completely offset

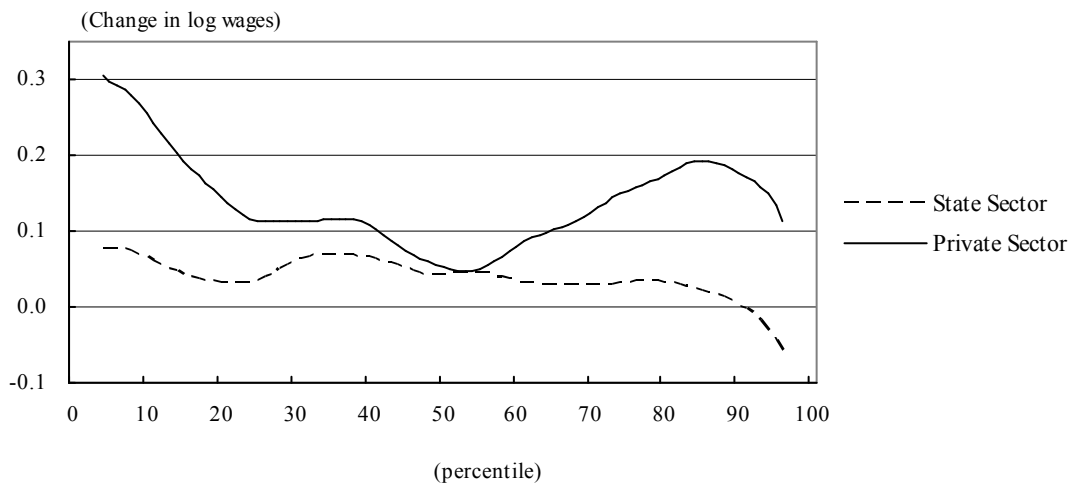
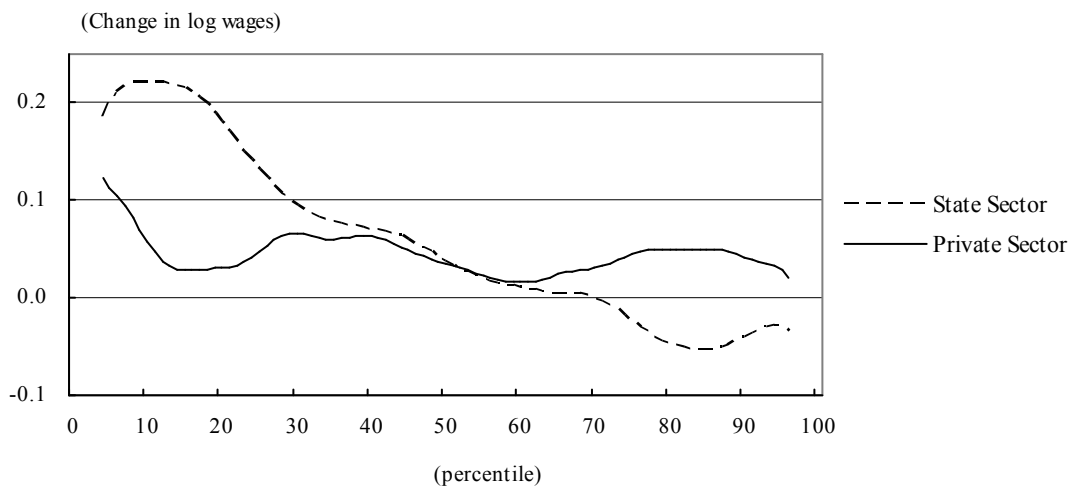


**Table 4 Measures of earnings inequality: The private and the public sector**

	1994	1995	1996	1998	2000	2001	2002	2003	Change 1994–2003
<b>Private sector</b>									
Gini	0.406	0.410	0.431	0.405	0.430	0.429	0.414	0.405	-0.001
Theil	0.277	0.286	0.324	0.273	0.313	0.321	0.300	0.274	-0.003
CV	0.819	0.854	0.935	0.808	0.891	0.932	0.903	0.813	-0.006
StDev of logs	0.821	0.797	0.812	0.796	0.838	0.817	0.791	0.799	-0.022
Decile ratios:									
90/10	8.57	7.84	7.94	7.53	9.46	8.01	7.62	6.81	-1.76
90/50	2.50	2.67	2.78	2.50	2.82	2.56	2.67	2.50	0.00
50/10	3.43	2.94	2.86	3.01	3.35	3.13	2.86	2.72	-0.71
<b>Public sector</b>									
Gini	0.418	0.413	0.408	0.398	0.418	0.414	0.386	0.398	-0.021
Theil	0.295	0.285	0.281	0.270	0.296	0.303	0.259	0.271	-0.024
CV	0.863	0.835	0.839	0.834	0.873	0.930	0.832	0.839	-0.024
StDev of logs	0.813	0.810	0.784	0.742	0.791	0.787	0.741	0.763	-0.050
Decile ratios:									
90/10	8.44	8.00	8.00	7.25	8.19	6.76	6.60	6.86	-1.58
90/50	2.76	2.58	2.55	2.64	2.87	2.50	2.26	2.45	-0.31
50/10	3.06	3.10	3.13	2.75	2.86	2.70	2.93	2.80	-0.26
Median earnings in the state sector in percent of median earnings in the private sector	67.9	68.9	78.3	68.8	59.7	64.0	80.0	70.0	

by the narrowing at the top half of the distribution, and it hampers the reduction of overall earnings inequality for women.

If the rewards to working are at present extremely unequal in Russia, it seems natural to question why this happened. One aspect that many scholars of transition have focused on as the basis for building explanatory theories is the growth of the private sector. Table 4 presents the evolution of inequality measures separately for both the private and public sectors. As can be seen, for most years, inequality was higher in the private sector; however, the difference was much smaller than what could be expected based on the theory. Both sectors responded to the crisis of 1998 with a rise in inequality; the only difference was that in the private sector the reaction was sharper and lasted longer. While in the public sector distribution, the consequences of the crisis were concentrated among the higher paid workers, in the private sector, the widening affected all parts of the distribution. The sharp increase in the public-private sector wage gap in 2000, as shown in the bottom row of Table 4, might have been one of the major factors that

**Figure 6a Change in log real wages by percentile: females (1994-2003)****Figure 6b Change in log real wages by percentile: males (1994-2003)**

contributed to the jump in inequality in this particular year. A plausible story is that the government failed to index the wages of the public sector workers to the rising (two-digit) inflation rates in 1998–1999. The evolution of minimum wages seems to prove this hypothesis. The mandatory minimum wage was only increased in July 2000, after a previous increase in January 1997.

Figures 6a and 6b present the changes in the log earnings in each sector for the period

**Table 5 Relative median earnings by education level**

	1994	1995	1996	1998	2000	2001	2002	2003
<b>Women</b>								
Complete secondary	1.1	1.4	1.6	1.2	1.2	1.2	1.1	1.2
Complete secondary + vocational	1.1	1.4	1.6	1.3	1.4	1.4	1.1	1.3
College	1.3	1.5	1.8	1.4	1.3	1.4	1.2	1.3
University	1.7	1.9	2.0	1.9	2.0	2.1	1.7	2.1
<b>Men</b>								
Complete secondary	1.1	1.1	1.3	1.3	1.3	1.2	1.1	1.3
Complete secondary + vocational	1.4	1.1	1.2	1.3	1.3	1.3	1.1	1.5
College	1.4	1.3	1.5	1.3	1.7	1.4	1.3	1.7
University	1.7	1.5	1.8	2.0	2.0	1.6	1.6	1.8

Note: Reference category is those with incomplete secondary education and less.

1994–2003 separately for both men and women. The developments in the gender-specific distributions were quite different from each other. While women employed in the state sector experienced almost no change in real earnings in all parts of the distribution, men employed in the public sector had substantial wage gains at the bottom, no gains at the middle and suffered losses at the top of the distribution. The gains for women in the private sector are U-shaped across the percentiles of earnings distribution, with relatively high gains (exceeding the gains for the relevant percentiles in the public sector) at the ends and smaller gains at the middle of the distribution. This can be regarded as a sign of polarisation of female employment in the private sector, with a high demand for high and low-skilled female workers and a falling relative demand for female workers with intermediate skill levels. For men employed in the private sector, the wage gains were small but more evenly distributed across the wage levels. In general, the descriptive data in hand appears to lead to the conclusion that growth of the private sector is not the only factor that drives inequality and that additional explanatory factors are required.

The increasing rewards to education may potentially help explain the changes in inequality. The liberalisation of wage-setting policies encouraged the rapid increase in returns to education which were compressed under socialism. Moreover, Commander and Kollo (2004) demonstrated that the transition had a strong bias in the demand against unskilled labour and that the skill content shifted up particularly for blue-collar workers. This change in the demand for skills led to disproportionate job losses among the low-skilled and a decline in their relative wages.

Table 5 presents the median wages according to the level of educational attainment relative to the wages of those with incomplete secondary education or less. In 1994, women had lower returns to education than men at all levels, with the exception of university education.

**Table 6** Inequality within education groups, standard deviation of logs

	1994	1995	1996	1998	2000	2001	2002	2003
<b>Women</b>								
Incomplete secondary and less	0.74	0.74	0.74	0.76	0.79	0.80	0.74	0.75
Complete secondary	0.78	0.83	0.74	0.79	0.80	0.74	0.73	0.79
Complete secondary + Vocational	0.82	0.80	0.72	0.79	0.83	0.79	0.72	0.73
College	0.70	0.75	0.74	0.73	0.76	0.71	0.70	0.77
University	0.79	0.80	0.77	0.73	0.74	0.79	0.74	0.69
<b>Men</b>								
Incomplete secondary and less	0.85	0.82	0.78	0.82	0.82	0.79	0.81	0.78
Complete secondary	0.84	0.77	0.78	0.73	0.85	0.83	0.76	0.81
Complete secondary + Vocational	0.82	0.84	0.77	0.73	0.82	0.83	0.78	0.78
College	0.79	0.78	0.77	0.71	0.70	0.81	0.69	0.70
University	0.77	0.73	0.75	0.73	0.76	0.82	0.74	0.74

Thereafter, the returns to education for women began to rise rapidly and peaked in 1996. Since 1996, only the returns to university education have remained at high levels, while those to other types of education have declined. As a result, at present, for women, only a university degree yields a considerable wage premium. For men, the rise in returns to education was a more gradual process and involved all types of education, not just university level education. The differences in the trends for men and women may be explained by gender asymmetries in the occupational and industrial structures. A larger number of women with low levels of education have left the labour market. Moreover, many women who were displaced from unproductive white-collar positions in the industry experienced downward occupational mobility and found new employment in low-paid sectors such as retail trade and personal services.

The graduate wage differential increased over the period since the number of graduates in the population grew rapidly as a consequence of the growing demand for tertiary education among the youth. The effect of this rise in the number of graduates became pronounced in the labour market in the late 1990s and early 2000s. Further, it might have dampened the rise of real wages among graduates.

The above-mentioned demand-based explanations provide reasons for the changes in the wages between groups defined by education. The developments within groups are another side of the picture. Table 6 reports the changes in the dispersion of earnings over time for various education groups. While inequality is high for all education groups, it tends to be lower among those with higher levels of educational attainment. This contradicts the usual findings concerning inequality within education groups in advanced economies wherein university and college graduates normally have higher wage dispersion. This may be attributed to the fact that

higher educated workers, on average, have the ability to adapt to the disequilibria. This idea was originally proposed by Schultz (1975) and has been discussed in more detail in the context of transition to a market economy in Fleisher et al. (2005).

## 5. Regression analysis of the changes in wage inequality

A significant drawback of simple decompositions by sector and education level, as done above, is that partitioning the population in different ways does not help in isolating the contribution of each characteristic while fixing the others. An alternative approach proposed by Fields (2002) is based on a model that simultaneously considers the impact of several given characteristics on earnings and allows us to distinguish the contributions of each characteristic.

The starting point is an ordinary Mincerian wage equation in which the log wages are regressed on a set of explanatory variables. The estimated coefficients capture the impact of the various individual characteristics on the wages. The measured dispersion of earnings can be presented in terms of variances and covariances of the explanatory variables. The contribution of each characteristic is given by

$$S_k = \frac{Cov(\beta_k X_k, Y)}{\sigma^2(Y)} = \frac{\beta_k \sigma(X_k) Corr(X_k, Y)}{\sigma(Y)}, \quad (1)$$

where  $S_k$  is the proportion of inequality resulting from the  $k$ -th explanatory variable,  $\beta_k$  is the estimated coefficient of the  $k$ -th explanatory variable ( $X_k$ )<sup>3</sup>.

We estimated a separate model for each survey dataset by using the following regressors: education (measured as the highest education level attained; 5 categories), occupation (9 categories), actual labour market experience, experience squared, tenure, tenure squared, log of working hours, a dummy for employer ownership, a dummy for being in wage arrears, industry dummies, a dummy for marital status, a dummy for living in Moscow or St Petersburg, region (at the level of the primary sampling unit which is normally an oblast) and a dummy for the interview month in order to control for the possible seasonal effects in payments.

The results of Fields decomposition have been presented in Table 7. The underlying earnings equations for the selected years have been presented in Tables 8a and 8b.

The estimated coefficients of the human capital variables are generally well determined in all years. The low significance of the coefficients of education levels can be explained by the inclusion of the occupation variables into the regression. However, despite controlling for occupation, we find significant positive returns to university degree and technical college (for the latter not in all years) for both men and women. This finding suggests that workers with higher education still receive a positive premium even when the occupation does not match their

**Table 7 Fields decomposition**

	1994	1995	1996	1998	2000	2001	2002	2003
<b>A. Women</b>								
<b>Demography:</b> Marital status	0.001	0.003	0.001	0.000	0.000	0.000	0.000	0.000
<b>Human capital</b>	<b>0.091</b>	<b>0.089</b>	<b>0.081</b>	<b>0.102</b>	<b>0.093</b>	<b>0.094</b>	<b>0.102</b>	<b>0.123</b>
Schooling	0.037	0.024	0.028	0.023	0.041	0.041	0.039	0.046
Potential experience	0.005	0.020	0.010	0.022	0.013	0.007	0.007	0.007
Tenure	0.000	0.000	-0.001	0.001	-0.001	-0.002	0.001	0.000
Occupation	0.049	0.045	0.044	0.057	0.041	0.048	0.056	0.070
<b>Job characteristics</b>	<b>0.141</b>	<b>0.147</b>	<b>0.118</b>	<b>0.168</b>	<b>0.194</b>	<b>0.154</b>	<b>0.121</b>	<b>0.147</b>
Working time	0.012	0.011	0.017	0.032	0.025	0.019	0.019	0.022
Industry	0.076	0.077	0.063	0.086	0.098	0.084	0.053	0.065
State sector	0.010	0.016	0.010	0.014	0.041	0.027	0.024	0.034
Arrears	0.043	0.043	0.029	0.035	0.031	0.024	0.025	0.026
<b>Geography</b>	<b>0.138</b>	<b>0.136</b>	<b>0.155</b>	<b>0.098</b>	<b>0.152</b>	<b>0.165</b>	<b>0.187</b>	<b>0.176</b>
Living in Moscow or St.Petersburg	0.021	0.048	0.045	0.029	0.039	0.074	0.103	0.086
Region	0.116	0.088	0.110	0.069	0.113	0.091	0.084	0.089
<b>Seasonality</b>	<b>-0.002</b>	<b>0.001</b>	<b>-0.002</b>	<b>0.001</b>	<b>-0.001</b>	<b>0.011</b>	<b>0.012</b>	<b>0.010</b>
<b>Residual</b>	<b>0.633</b>	<b>0.624</b>	<b>0.647</b>	<b>0.632</b>	<b>0.562</b>	<b>0.577</b>	<b>0.579</b>	<b>0.545</b>
<b>B. Men</b>								
<b>Demography:</b> Marital status	<b>0.004</b>	<b>0.007</b>	<b>0.001</b>	<b>0.015</b>	<b>0.017</b>	<b>0.003</b>	<b>0.003</b>	<b>0.003</b>
<b>Human capital</b>	<b>0.051</b>	<b>0.066</b>	<b>0.062</b>	<b>0.067</b>	<b>0.079</b>	<b>0.070</b>	<b>0.084</b>	<b>0.084</b>
Schooling	0.016	0.010	0.027	0.011	0.033	0.026	0.032	0.020
Potential experience	0.014	0.024	0.000	0.013	0.009	0.008	0.010	0.012
Tenure	0.000	0.000	0.001	0.003	-0.001	0.000	0.000	0.000
Occupation	0.021	0.031	0.034	0.041	0.038	0.036	0.042	0.051
<b>Job characteristics</b>	<b>0.146</b>	<b>0.140</b>	<b>0.120</b>	<b>0.142</b>	<b>0.166</b>	<b>0.165</b>	<b>0.130</b>	<b>0.146</b>
Working time	0.011	0.015	0.020	0.025	0.017	0.018	0.023	0.019
Industry	0.094	0.088	0.076	0.088	0.122	0.106	0.075	0.084
State sector	0.009	0.018	0.009	0.013	0.005	0.013	0.009	0.020
Arrears	0.032	0.019	0.016	0.016	0.022	0.028	0.024	0.023
<b>Geography</b>	<b>0.169</b>	<b>0.179</b>	<b>0.200</b>	<b>0.126</b>	<b>0.210</b>	<b>0.183</b>	<b>0.201</b>	<b>0.178</b>
Living in Moscow or St.Petersburg	0.053	0.073	0.067	0.024	0.035	0.094	0.127	0.057
Region	0.116	0.106	0.133	0.103	0.175	0.090	0.074	0.121
<b>Seasonality</b>	<b>-0.006</b>	<b>-0.001</b>	<b>-0.001</b>	<b>0.001</b>	<b>0.001</b>	<b>0.010</b>	<b>0.009</b>	<b>0.010</b>
<b>Residual</b>	<b>0.636</b>	<b>0.610</b>	<b>0.618</b>	<b>0.648</b>	<b>0.528</b>	<b>0.569</b>	<b>0.573</b>	<b>0.580</b>

education level. Returns to occupation exhibited a clear tendency to rise over the period under consideration. Returns to experience were extremely low—about 1.5% for both men and women. Further, returns to tenure were also small and even negative for large tenures. These findings indicate that Russian firms still place minimal value on both firm-specific and general work experience. In keeping with the other estimates previously reported for the Russian economy (see e.g. Nesterova and Sabirianova, 1998), it can be stated that experience gained during the Communist period is not valued in a market economy.

Overall, the estimated industry effects are generally well determined. The industry effects appear to be more important for men than for women. However, for both genders, wage premiums—*ceteris paribus*—are significantly negative in agriculture and public health and education. For men, relative wages have been declining in public administration as well as in transport and communications. For women, wage premiums have been falling in wholesale trade, transport and communications and construction. In all these sectors, women still receive, on average, higher wages than in mining and manufacturing, albeit these premiums are no longer significant. It appears that despite the technological changes and intensive labour reallocation towards the service sector, traditional industrial sectors continue to pay higher wages. Clearly, the industry structure used in this paper is not detailed enough to make ultimate conclusions about the dynamics of inter-industry wage differentials. We may only speculate that the Russian industry (particularly, its mining segment) is deeply involved in international trade and that the rising prices for Russian main exports (crude oil and gas) have resulted in an increase in the wages in this sector. Other sectors have been unable to keep pace with the rising wages in the mining sector.

The private sector wage premium exhibits different patterns for men and women. For women, the sectoral pay differential was considerably small in 1994; thereafter, it widened significantly over the period under consideration. For men, the public-private sector wage gap tended to decline in 1994–2000; since 2001, it has been steadily rising and, at present, it is much smaller than that for women. However, the lower wages for men employed in the public sector might have already been reflected in the higher negative wage differentials in health and education and other government-funded industries.

Being in wage arrears has a significant negative effect on wages. Such an effect was smaller when the incidences of wage arrears were higher. The residents of Moscow City and St. Petersburg earn higher wages than workers in other parts of the country.

In order to discuss the results of the Fields decomposition, we classified all the independent variables into the following four groups: demographic, human capital, job characteristics and geographical characteristics. Since the earnings equation itself explains about 30%–45% of the total variation in monthly earnings, the largest contribution is that of the residual term, i.e. within-group inequality. This means that most of the inequality cannot be attributed to

**Table 8a Wage equations, women (selected years)**

	1994		1996		1998	
	coef	se	coef	se	coef	se
Married	0.039	0.048	0.046	0.049	0.005	0.041
Education (default-complete secondary)						
Primary	-0.043	0.170	-0.137	0.229	0.192	0.298
Incomplete secondary	-0.059	0.085	-0.149	0.101	0.031	0.113
Incomplete secondary + vocational training	-0.139	0.110	-0.162	0.130	0.021	0.156
Complete secondary + vocational training	-0.022	0.064	0.005	0.064	0.011	0.070
Technical college	0.225***	0.052	0.087	0.054	0.132**	0.057
University	0.358***	0.067	0.200***	0.066	0.299***	0.067
Experience	0.012**	0.006	0.012*	0.006	0.024***	0.006
Experience sq	-0.000**	0.000	-0.000**	0.000	-0.001***	0.000
Tenure	0.009	0.006	0.014**	0.006	0.005	0.007
Tenure sq	-0.012	0.019	-0.030	0.019	0.004	0.021
Occupation (default-elementary occupations)						
Managers	0.475**	0.196	0.530*	0.283	0.720***	0.123
Professionals	0.424***	0.075	0.498***	0.081	0.642***	0.082
Associate professionals	0.251***	0.064	0.397***	0.073	0.449***	0.076
Clerks	0.145**	0.070	0.223***	0.080	0.265***	0.084
Service workers	0.091	0.084	0.124	0.089	0.286***	0.084
Craft workers	0.400***	0.085	0.230**	0.096	0.347***	0.116
Operators and assemblers	0.400***	0.088	0.399***	0.096	0.366***	0.093
Hours of work (log)	0.358***	0.079	0.378***	0.084	0.515***	0.087
Industry (default-Mining and manufacturing)						
Agriculture and forestry	-0.260***	0.086	-0.171*	0.098	-0.225*	0.117
Transport and communications	0.186**	0.087	0.027	0.086	0.225***	0.085
Construction	0.271***	0.087	0.179	0.113	-0.018	0.135
Retail trade and restaurants	-0.051	0.072	0.051	0.075	-0.135*	0.071
Wholesale trade, business services	0.354**	0.157	0.472***	0.164	-0.052	0.142
Public administration	0.061	0.084	-0.062	0.092	-0.166*	0.093
Health and education	-0.322***	0.056	-0.329***	0.062	-0.492***	0.066
Other services	-0.096	0.069	0.107	0.077	-0.111	0.079
State sector	-0.103**	0.046	-0.083*	0.048	-0.113**	0.049
Wage arrears	-0.375***	0.039	-0.242***	0.042	-0.242***	0.041
Living in Moscow or St-Pet.	0.325*	0.170	0.573***	0.191	0.563**	0.232
Region	Yes		Yes		Yes	
Month of interview	Yes		Yes		Yes	
Constant	2.904***	0.348	2.995***	0.366	1.783***	0.511



**Table 8a Wage equations, women (selected years) (Continued)**

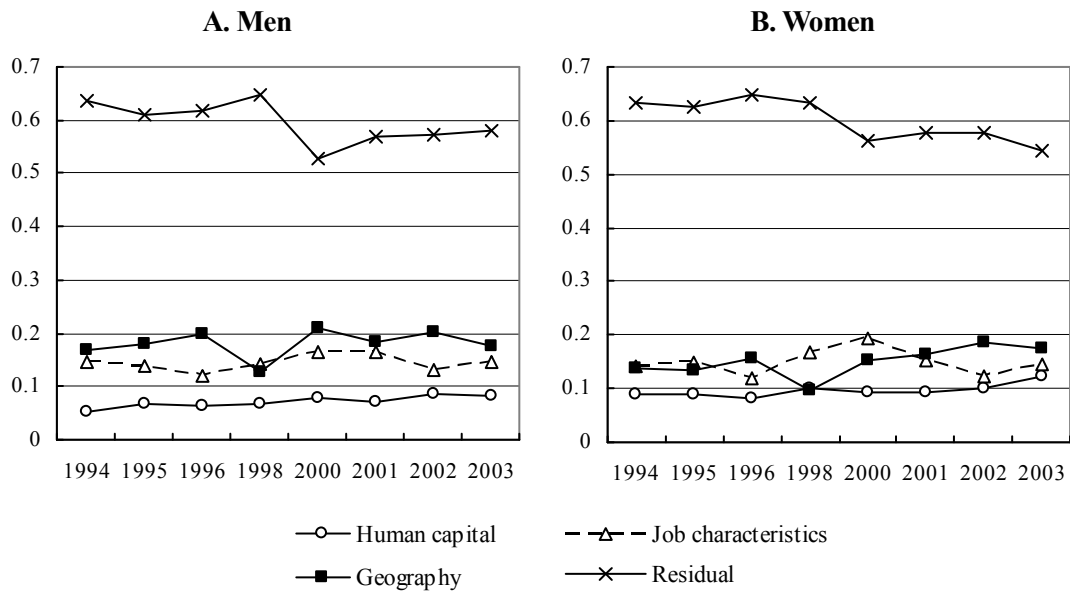
	2000		2002		2003	
	coef	se	coef	se	coef	se
Married	-0.002	0.037	0.002	0.030	-0.000	0.029
Education (default-complete secondary)						
Primary	0.476	0.426	0.344	0.412	-0.312	0.334
Incomplete secondary	-0.026	0.101	0.052	0.084	-0.046	0.078
Incomplete secondary + vocational training	-0.221*	0.121	-0.136	0.127	-0.110	0.109
Complete secondary + vocational training	0.119**	0.059	-0.049	0.051	0.010	0.048
Technical college	0.133***	0.050	0.065	0.042	0.118***	0.041
University	0.413***	0.061	0.322***	0.049	0.396***	0.049
Experience	0.022***	0.005	0.014***	0.005	0.016***	0.004
Experience sq	-0.001***	0.000	-0.000***	0.000	-0.000***	0.000
Tenure	0.014**	0.006	0.011**	0.005	0.012**	0.005
Tenure sq	-0.026	0.019	-0.021	0.015	-0.028*	0.015
Occupation (default-elementary occupations)						
Managers	0.438***	0.096	0.615***	0.078	0.788***	0.087
Professionals	0.523***	0.075	0.397***	0.063	0.529***	0.060
Associate professionals	0.401***	0.069	0.338***	0.058	0.405***	0.055
Clerks	0.210***	0.077	0.210***	0.063	0.311***	0.060
Service workers	-0.026	0.080	0.033	0.066	0.134**	0.062
Craft workers	0.320***	0.098	0.284***	0.082	0.424***	0.080
Operators and assemblers	0.272***	0.084	0.196***	0.069	0.417***	0.066
Hours of work (log)	0.532***	0.079	0.388***	0.069	0.439***	0.064
Industry (default-Mining and manufacturing)						
Agriculture and forestry	-0.302***	0.098	-0.166**	0.083	-0.276***	0.090
Transport and communications	0.207**	0.084	0.093	0.073	0.086	0.070
Construction	0.231*	0.132	0.161*	0.089	0.121	0.090
Retail trade and restaurants	0.058	0.067	-0.024	0.054	-0.049	0.053
Wholesale trade, business services	0.026	0.136	-0.160	0.101	0.087	0.090
Public administration	0.035	0.079	-0.007	0.072	-0.049	0.069
Health and education	-0.463***	0.062	-0.327***	0.053	-0.375***	0.051
Other services	-0.108	0.070	-0.038	0.056	-0.046	0.055
State sector	-0.258***	0.045	-0.179***	0.039	-0.226***	0.038
Wage arrears	-0.298***	0.043	-0.268***	0.039	-0.359***	0.042
Living in Moscow or St-Pet.	0.919***	0.159	0.716***	0.153	0.637***	0.149
Region	Yes		Yes		Yes	
Month of interview	Yes		Yes		Yes	
Constant	1.711***	0.354	2.797***	0.301	2.805***	0.338

**Table 8b Wage equations, men (selected years)**

	1994		1996		1998	
	coef	se	coef	se	coef	se
Married	0.118*	0.069	0.021	0.075	0.226***	0.068
Education (default-complete secondary)						
Primary	0.105	0.154	-0.452**	0.225	0.058	0.368
Incomplete secondary	0.059	0.100	-0.104	0.136	0.151	0.148
Incomplete secondary + vocational training	-0.072	0.087	-0.061	0.106	0.022	0.101
Complete secondary + vocational training	0.020	0.058	-0.029	0.066	-0.021	0.064
Technical college	0.137**	0.062	0.108	0.066	0.046	0.070
University	0.203***	0.078	0.166**	0.078	0.166**	0.080
Experience	0.014*	0.007	-0.009	0.008	0.008	0.008
Experience sq	-0.000***	0.000	0.000	0.000	-0.000*	0.000
Tenure	0.006	0.006	0.015*	0.008	0.019**	0.008
Tenure sq	-0.010	0.020	-0.052**	0.025	-0.062**	0.025
Occupation (default-elementary occupations)						
Managers	0.413**	0.171	0.981***	0.280	0.443***	0.133
Professionals	0.319***	0.110	0.394***	0.108	0.439***	0.115
Associate professionals	0.420***	0.120	0.342***	0.112	0.376***	0.110
Clerks	0.232	0.213	0.186	0.210	-0.120	0.176
Service workers	0.394***	0.131	0.114	0.123	0.128	0.122
Skilled agricultural workers	0.329	0.252	0.088	0.287	0.689*	0.379
Craft workers	0.205**	0.085	0.209**	0.083	0.207**	0.086
Operators and assemblers	0.238***	0.086	0.271***	0.083	0.178**	0.085
Hours of work (log)	0.335***	0.095	0.457***	0.105	0.411***	0.118
Industry (default-Mining and manufacturing)						
Agriculture and forestry	-0.507***	0.083	-0.362***	0.108	-0.548***	0.119
Transport and communications	0.063	0.068	0.157**	0.078	0.200**	0.078
Construction	0.134**	0.064	0.196**	0.078	0.128	0.087
Retail trade and restaurants	-0.194*	0.099	-0.078	0.105	0.000	0.098
Wholesale trade, business services	-0.022	0.149	0.046	0.150	0.131	0.145
Public administration	-0.073	0.095	0.041	0.100	0.061	0.109
Health and education	-0.484***	0.085	-0.372***	0.093	-0.342***	0.108
Other services	-0.092	0.073	-0.100	0.081	0.065	0.086
State sector	-0.092**	0.046	-0.078	0.055	-0.100*	0.057
Wage arrears	-0.279***	0.043	-0.130***	0.049	-0.108**	0.049
Living in Moscow or St-Pet.	0.820***	0.232	0.848***	0.238	0.455	0.368
Region	Yes		Yes		Yes	
Month of interview	Yes		Yes		Yes	
Constant	3.118***	0.453	2.992***	0.464	2.563***	0.575

**Table 8b Wage equations, men (selected years)(Continued)**

	2000		2002		2003	
	coef	se	coef	se	coef	se
Married	0.296***	0.059	0.075*	0.045	0.095**	0.046
Education (default-complete secondary)						
Primary	0.201	0.400	0.464*	0.272	0.221	0.276
Incomplete secondary	-0.111	0.118	0.135	0.102	0.021	0.093
Incomplete secondary + vocational training	-0.103	0.092	-0.074	0.083	-0.024	0.082
Complete secondary + vocational training	-0.022	0.056	0.009	0.045	0.045	0.047
Technical college	0.162***	0.061	0.151***	0.049	0.119**	0.050
University	0.342***	0.069	0.318***	0.057	0.211***	0.058
Experience	0.013*	0.007	0.017***	0.005	0.017***	0.006
Experience sq	-0.000**	0.000	-0.001***	0.000	-0.001***	0.000
Tenure	0.008	0.006	0.007	0.005	0.011*	0.005
Tenure sq	-0.013	0.018	-0.010	0.015	-0.020	0.016
Occupation (default-elementary occupations)						
Managers	0.540***	0.100	0.441***	0.083	0.648***	0.092
Professionals	0.423***	0.098	0.526***	0.081	0.555***	0.079
Associate professionals	0.348***	0.093	0.432***	0.074	0.478***	0.074
Clerks	0.297	0.187	0.457***	0.121	0.552***	0.122
Service workers	0.337***	0.126	0.418***	0.095	0.341***	0.093
Skilled agricultural workers	0.919***	0.203	0.061	0.175	0.194	0.195
Craft workers	0.397***	0.073	0.400***	0.059	0.385***	0.060
Operators and assemblers	0.376***	0.073	0.427***	0.059	0.406***	0.060
Hours of work (log)	0.357***	0.096	0.457***	0.078	0.382***	0.079
Industry (default-Mining and manufacturing)						
Agriculture and forestry	-0.500***	0.099	-0.475***	0.082	-0.568***	0.083
Transport and communications	-0.053	0.067	0.043	0.059	-0.101*	0.057
Construction	0.158**	0.067	0.095*	0.057	0.094	0.058
Retail trade and restaurants	0.062	0.087	-0.080	0.066	-0.094	0.065
Wholesale trade, business services	-0.004	0.114	-0.283***	0.090	-0.130	0.085
Public administration	-0.174*	0.096	-0.216***	0.081	-0.204**	0.081
Health and education	-0.664***	0.087	-0.427***	0.073	-0.511***	0.077
Other services	-0.137*	0.073	-0.184***	0.059	-0.182***	0.060
State sector	-0.033	0.046	-0.067*	0.041	-0.134***	0.041
Wage arrears	-0.212***	0.049	-0.248***	0.043	-0.307***	0.047
Living in Moscow or St-Pet.	0.827***	0.247	0.885***	0.166	0.423**	0.188
Region	Yes		Yes		Yes	
Month of interview	Yes		Yes		Yes	
Constant	2.293***	0.463	2.604***	0.340	3.397***	0.427

**Figure 7 Fields decomposition**

observable characteristics. However, the joint explanatory power of regressors has been increasing since 1996 for women and 1998 for men. Thus, wage determination in Russia is to a lesser extent influenced by the unobservable factors, implying the decline of wage differences among observationally identical workers (see also Figure 7).

Among the explanatory variables, the largest proportion of earnings dispersion is explained by the geographical variables and job characteristics. In sum, they account for 75%–80% of the explained level of inequality. Geographical factors appear to be important in explaining the inequality for men, particularly in the first half of the period under consideration. It should be noted, however, that the increasing contribution of living in metropolitan areas may be partly spurious and may be caused by the replenishment of the sample in the RLMS<sup>4</sup>. Nevertheless, this does not invalidate the conclusion pertaining to the high regional polarisation in Russia. Further, the decomposition results suggest that the rise in inequality after the financial crisis of 1998 is likely to be a result of the differences in the adjustment speeds across regions and industries. The role of these two components increased considerably after the crisis, and then returned back to its original levels before the crisis.

Industry affiliation of the employer plays the leading role among job characteristics. It explains about 8%–10% of the total variance in monthly earnings. While ownership type is marginally important, its influence has been steadily growing since 2000, at a notably higher rate for women. Theoretically, there are several reasons for industry and sector wage differentials:

(1) unequal incidences of rent sharing between managers and workers across industries and sectors, (2) increased productivity due to restructuring and (3) self-selection of workers into certain industries and private firms. However, the evidence concerning these issues is limited, and we do not have sufficient firm characteristics in the dataset. A matched employer-employee dataset is needed to investigate this problem in detail. Further, the RLMS does not allow for distinguishing clearly between ‘new’ private and privatised firms. All the remaining job characteristics (wage arrears and working time) explain about 5%–8% of the total earnings dispersion. The contribution of wage arrears is more in periods when a smaller number of workers were affected by the problem; when the problem became common and extended to a majority of the workers, its effect faded.

The human capital characteristics (education, occupation and experience) explain about 15%–25% of the explained wage variation. For women, the human capital characteristics contribute more to earnings inequality than for men. However, for both men and women, the importance of human capital characteristics has been increasing. In addition, education has been less important in explaining inequality than occupation. Further, experience and tenure have been of minor importance throughout the period under consideration. Finally, the effects of marital status are generally poorly determined in most years and merit no additional comment.

## **6. Conclusions**

This paper documents the changes in the size of the wage distribution in Russia for the period 1994–2003. This period does not include the first two years of the transition to a market economy, but it covers few years of the transformational recession (1994–1998), the financial crisis in 1998 and the first years of economic recovery (2000–2003). In our opinion, it is of particular importance to analyse what happened in Russia because this country is known to have the largest increase in wage inequality in the aftermath of the ‘big-bang’ reforms.

In our study, we did not find any single trend in the evolution of wage inequality over the entire period. The developments varied considerably in the sub-periods. More specifically, the overall wage inequality stayed stable in 1994–1996, then it jumped following the 1998 crisis and remained at a higher level for the next three years. In 2002, the trend reversed again, and in the course of a single year, wage inequality fell to the level that it was in the mid-1990s. Further, economic growth favoured the lower part of the wage distribution, narrowing the distance between the extremes of the distribution.

In addition, we conducted a detailed examination of the reasons for the changes in wage inequality. The structure of inequality did not change much over the period from 1994 to 2003. Our analysis revealed a large residual or unexplained component in the earnings determination process and in the factor shares describing the level of earnings inequality. It is worth noting,

however, that over the period, the unexplained factor's share components exhibited a steady decline, mirroring the improvements in the fits of the underlying earnings equations. The regional variables explain the largest proportion of wage dispersion (over 35%–40% of the explained variation and 15%–20% of the total variation). Nearly equivalent is the contribution of job characteristics, with industry affiliation of the employer playing the leading role. Human capital characteristics (education and occupation) explain about 8%–10% of the total variation (about 20% of the explained variation), and their contribution tended to rise in the aftermath of the 1998 crisis. Our results suggest that despite macroeconomic instability, the differences in wages were permanent rather than temporary. Moreover, the differences in the individual earnings were not smoothed over the life cycle, and returns to experience were extremely low.

Furthermore, we found that employer ownership was only marginally important; however, its effect has been steadily increasing for women due to the increase in the public-private sector wage gap. Contrary to the initial expectations, the wage inequality in the public sector was different from that in the private sector: both were of a similar level and followed similar patterns of changes. Similarities in the changes in wage inequality within the sectors may be an indication of the problems in the Russian private sector in that privatisation has not resulted in active restructuring or changes in the wage-setting behaviour of privatised firms.

## Notes

<sup>1</sup> I am grateful to Randell Filer, Vladimir Gimpelson, Reuben Gronau and Rostislav Kapelyushnikov for their valuable comments and suggestions.

<sup>2</sup> These findings do not refute the recent conclusion of the World Bank experts that Russian economic growth since 1998 has been pro-poor (World Bank, 2005). As shown in Table 2, the economic growth caused a considerable increase in employment rates, generating new jobs for those who were previously non-employed and thus, providing additional incomes for poor households.

<sup>3</sup> Ravallion and Chen (1999) and Krstić et al. (2007) provide applications of this methodology in the transition context for an analysis of inequality in China and Serbia, respectively.

<sup>4</sup> However, this effect holds in the weighted sample as well. We do not present the results for the weighted sample in this paper because of the smaller sample size. Moreover, originally the RLMS was designed as a self-weighting sample 100.

## References

- Aghion, P. and Commander, S. (1999) "On the dynamics of inequality in the transition", *Economics of Transition*, Vol. 7.

- Brainerd, E. (1998) “Winners and losers in Russia’s economic transition”, *American Economic Review*, Vol. 88.
- Brainerd, E. (2002) “Five years after: The impact of mass privatization on wages in Russia, 1993-1998”, *Journal of Comparative Economics*, Vol. 30.
- Clarke, S. (2002) “Market and institution determinants of wage differentiation in Russia”, *Industrial and Labor Relations Review*, Vol. 55.
- Commander, S. and Kollo, J. (2004) “The Changing Demand for Skills: Evidence from the Transition”, *IZA Discussion Paper*, No.1073.
- Earle, J. and Sabirianova, K. (2002) “How late to pay? Understanding wage arrears in Russia”, *Journal of Labor Economics*, Vol. 20.
- Fields, G. (2002) “Accounting for income inequality and its change: A new method with application to the distribution of earnings in the United States”, School of Industrial Relations, Cornell University, Ithaca, NY, mimeo.
- Fleisher, B., Sabirianova, K. and Wang, X. (2005) “Returns to skills and speed of reforms: Evidence from central and eastern Europe, China and Russia”, *Journal of Comparative Economics*, Vol. 33.
- Flemming, J. and Micklewright, J. (1999) “Income distribution, economic systems and transition”, in Atkinson, A. and Bourguignon, F. (eds.) *Handbook of Income Distribution*, Elsevier Science BV.
- Heeringa, S. (1997) “Russia Longitudinal Monitoring Survey (RLMS): Sample attrition, replenishment, and weighting in rounds V-VII”, mimeo, <http://www.cpc.unc.edu/projects/rlms/project/samprep.pdf>
- Juhn, C., Murhy, K. and Pierce, B. (1993) “Wage inequality and the rise in returns to skill”, *Journal of Political Economy*, Vol. 101.
- Keane, M. and Prasad, E. (2006) “Changes in the structure of earnings during the Polish transition”, *Journal of Development Economics*, Vol. 80.
- Krstić, G., Litchfield, J. and Reilly, B. (2007) “An anatomy of male labour market earnings inequality in Serbia, 1996-2003”, *Economic Systems*, Vol. 31.
- Lehmann, H. and Wadsworth, J. (2001) “Wage arrears and the distribution of earnings in Russia”, *WDI Working Paper*, No.421.
- Lukiyanova, A. (2003) “Transition to post-industrial society? A study of the service sector employment in Russia”, *EERC Working Paper*, No.03/09.
- Nesterova, D. and Sabirianova, K. (1998) “Investment in human capital under economic transformation in Russia”, *EERC Working Paper*, No.99/04.
- Ravallion, M. and Chen, S. (1999) “When economic reform is faster than statistical reform: Measuring and explaining income inequality in rural China”, *Oxford Bulletin of Economics and Statistics*, Vol.61.

- Sabirianova-Peter, K. (2003) "Skill-biased transition: The role of markets, institutions, and technological change", *IZA Discussion Paper*, No.893.
- Schultz, T. (1975) "The value of the ability to deal with disequilibria", *Journal of Economic Literature*, Vol. 13.
- World Bank (2005) *Russian Federation: Reducing Poverty through Growth and Social Policy Reform*, Report No. 28923-RU.