"Wage Dispersion in Russia"

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ABSTRACT: *This paper examines the extent to which human capital theory can explain observed wage differentials in the Russian Federation. Wage and income dispersion have increased markedly in Russia in the six years since the transition began. Some studies conclude that this is an indicator that Russian labour markets are becoming more competitive. In this paper, this conclusion is scrutinised from the perspective of human capital theory. Human capital theory predicts that, in unregulated labour markets, workers' remuneration depends on their individual productivity, which is itself a function of experience, education and skill levels, and occupation type. According to this theory, the deregulation of Russian labour markets in the transition to a market economy should make observed wages more dependent on these factors. The extent to which human capital factors influence wages can be viewed as an indicator that labour markets are beginning to 'work'. We use cross-sectional data from the Goskomstat " Russian Longitudinal Monitoring Survey" to characterise wage dispersion in the Russian labour market in 1994. The results suggest that human capital variables explain only a small portion of Russian wage differentials. Much more of Russian wage dispersion can be explained by regional and gender-based wage differentials. Labour markets are effectively segregated by region. This analysis concludes that increased Russian wage dispersion does not indicate that the Russian labour market is becoming more competitive.*

Theme: Transitions in the Labour Market in Eastern Europe
Keywords: Russia, human capital, wage dispersion
JEL-code: J31, O52, P11, J16

Preliminary Version: Please Do Not Quote

26th June, 1997

Many thanks to Gerard van den Berg, Siv Gustaffson, Jesse Levin, and participants in seminars at the Tinbergen Institute Amsterdam, and the University of Amsterdam.

I. Introduction

The purpose of this paper is to show that aggregate measures of wage dispersion in the Russian Federation indicate little about the efficiency of labour allocation in the country. This paper draws on recent work by Newell and Reilly (1996), who use the first round of the Russian Longitudinal Monitoring Survey (RLMS) of 1992, to estimate gender-based wage differentials within and between occupations. The paper makes use of the first round of a new panel of the RLMS, carried out in October and November 1994.

Wage and income dispersion have increased markedly in Eastern European countries in the six years since input and product markets were deregulated. Some studies of wage dispersion conclude that this is an indicator that labour markets have become more competitive. This conclusion relies on the assumption that differences in wages can be attributed to differences in rewards to workers of varying skill levels. Yet there is little consensus amongst economists about what changes in observed wage dispersion imply about the competitiveness of labour markets, and fair skills pricing, or about whether any general results can be derived.

In a 1996 comparison of U.S. male wage dispersion with that of other OECD countries, Blau and Kahn conclude that the larger U.S. dispersion primarily reflects the influence of decentralised wage-setting mechanisms in the U.S.. Blau and Kahn suggest that the low rate of unionisation relative to other OECD countries allows substantially more wage compression at the bottom of the wage distribution. They find that the level of wage centralisation is negatively associated with wage dispersion in OECD countries. This is consistent with the explosion in wage dispersion since the centralised wage setting of the Soviet era was supplanted by the free market.

II. Background

In the Soviet era, worker's salaries were centrally determined. Above this standard wage, workers were paid substantial 'bonuses' by their enterprises, and received non-pecuniary benefits such as highly-subsidised holidays, consumer goods, small private land plots, and childcare.

In 1955 the Soviet Ministry of Labour established the "State Committee on Labour and Social Questions", which played a central role in determining the wage structure for the next 35 years. The long-held official Soviet view on wage-setting was that wages should be determined by the needs of production. Wage structures were revised in the Kruschev era under the assumption that a uniform and equitable wage structure could be created to improve the allocation of labour across sectors Oxensteirna (1990). A 'tariff system' was set up. In this system workers received the basic 'tariff wage' according to branch of industry, required skills, working conditions, and the region in which they worked. This basic wage was not thus related to on-the-job performance.

Prior to economic transition “bonuses” were paid at the enterprise level, and were related to individual and departmental performance (Katz, 1994). These bonuses varied inversely with the conditions of work, and positively with the skill required for the job, and the “economic significance of the work”. Thus those working in “non-productive” sectors such as health care, education, and scientific research had lower average bonuses than those employed in industry.

Although the Soviet regime considered ‘labour shortage’ to be the main constraint facing Soviet economic expansion in the 1980’s, it is unclear if the low levels and quality of output attributed to firms during this time were truly related to labour shortages (Katz, 1994). Many agricultural processes were still being performed manually. The lack of replacement of obsolete equipment in existing firms was disregarded in the drive to create ever more industrial capacity. Moreover enterprises had disincentives to scrapping old machinery because input quotas were based on reported enterprise capacities.

Prior to 1991 it was nearly impossible for Western economists to obtain sample survey data on the Soviet labour market. Thus is still unclear whether small differentials in observed wages in the Soviet era can be fully attributed to an ideologically-based policy of wage compression (Oxenstierna, 1991). Retrospective studies on this era now suggest that the observed small differences in wages by education levels and occupation type can be viewed partly as reflections of a relative scarcity of less-skilled workers. Given that there was universal access to higher education, and a strong cultural valuation for the professions, unskilled workers were in short supply. The heavy industrial bias of the Soviet economy, and the relatively poor working conditions of those engaged in factory work, might partly account for the relatively high blue-collar wages in the late Soviet era (Oxenstierna, 1991).

In the six years since the transition to a market-oriented economy aggregate wage dispersion has increased substantially (Russian Economic Trends, Vol. 4, 1996) . The official Russian statistical agency, Goskomstat, reports that wage dispersion has increased in each year since prices were liberalised. The following table reports dispersion as the standard deviation of the natural logarithm of wages, weighted by employment levels in each Russian industrial sector:

Table 1: Russian Federation Aggregate Wage Dispersion

Year	SD ln wage
1991	0.75
1992	0.99
1993	1.20
1994	1.35
1995	1.44

Source: Russian Economic Trends, 1996

Observers of the Russian economy, amongst them the publication "Russian Economic Trends", often cite figures on aggregate wage dispersion as an indicator that the wage structure is adjusting to reflect human capital factors. Our analysis contests this suggestion. Macroeconomic indicators can tell little about the situation of individual workers if they do not respect existing labour market divisions within the Russian Federation. The relation of Russian wage differentials to skill and education levels, and experience is largely unknown.

Anecdotal evidence about mathematicians working as taxi drivers, or the concert/pianist bus-driver must be taken seriously in any description of the Russian labour market. If the phenomena of highly-trained specialists performing low-skilled jobs is a prevalent one, then individuals are not producing according to their productivity. Individuals with the same level of experience and education cannot be expected to obtain the same earnings, if they are in vastly different occupations. This also has an impact on observed gender-based wage differentials. Occupations are highly gender-segregated despite similar levels of higher education (Newell and Reilly (1996)).

The "Excess Wage Tax" is very important to current employment dynamics and wage levels in Russia (Roxburgh, Shapiro (1996)). This tax was officially part of a Russian profits tax, all though it is operationally quite separate. This wage tax is applied to all establishments irrespective of profitability criteria. In 1994 this tax was applicable at a threshold of six times the minimum wage, above which the rate was 38%. According to the calculations of Roxburgh and Shapiro, the fact that the "Excess Wage Tax" targets the average wage in an enterprise provides an economic incentive to maintain workers who add nothing to the productivity of the enterprise.

Many Russian workers are kept on at very low wages, or sent on administrative leave (often without pay) to reduce the average firm wage below the Excess Wage Tax threshold. According to the official Russian statistical agency, Goskomstat, the amount of workers on "officially-imposed administrative leave" nearly doubled in 1994. The average duration of this leave was 19 days. Administrative leave may be less costly to enterprises than firing a worker, because the enterprise avoids payment of the standard three months severance pay.
To date, economists have done little analysis of labour markets in transition economies, even though random samples of households for many of these countries now exist. Due to the lack of similar data from the period prior to transition, it has been very difficult to draw substantive conclusions about the evolution of skills reallocation since labour markets were deregulated. While it is known that in the U.S. higher wage dispersion partly reflects a relatively high premium to the most skilled members of the labour force, it is not known whether this also accounts for much of the high wage dispersion levels now observed in Russia. The labour markets in Russia are now more highly decentralised than those of many Western European countries, yet the extent to which wage compression at the bottom of the distribution contributes to overall wage dispersion is also largely unknown.

III. Theory about Wage Dispersion

This paper employs human capital theory to compare rates of return to different characteristics of labour force participants, thus shedding light on the wage structure in the Russian Federation in 1994. Rather than assuming that our data set represents one labour market, we first attempt to identify natural segmentation of the labour market, from within the constraints of our data set.

Human capital theory was both stimulated by, and provided support for, the hypothesis that there is a general, positive correlation between education an earnings. According to the theory, an individual will only be induced to undertake additional schooling if s/he is certain of higher lifetime earnings. At the macroeconomic level, the efficient allocation mechanisms of the labour market will ensure both that workers are remunerated according to their marginal product, and that workers obtain jobs which use their skills optimally. Workers are assumed to have access to the necessary equipment to produce according to their ability.

A Mincerian specification is chosen both for reasons of tractability and interpretation: Human capital variables are well defined in the data set, so even their individual failure to suggest significant wage premiums, and their aggregate failure to give high R squared, provides valuable information. In particular, the knowledge that workers' wages are largely unrelated to observable human capital characteristics would suggest a lack of efficiency in the allocation of labour resources. The relative size of this inefficiency might be compared by looking at wage dispersion levels and the explanatory power of the Mincerian regression in other countries.

Neither human capital theory, nor the derived Mincerian regression specification define the limits of a labour market. In fact, the original tests Mincer performed on 1959 Census data of white, American, non-farm males, implicitly assumed that there was one American labour market. If labour was free to migrate within the country, and was compensated for opportunity costs by a higher expected wage in a new location, there would effectively be one national labour market. Whereas this may have been the case in the non-inflationary, strongly-growing economy of Mincer's original data set, there is no reason to assume the same for Russia in 1994.

The chosen Mincerian specification attempts to exploit the natural divisions in the Russian labour market by integrating some local stylised facts into the framework. This is consistent with the spirit of Mincer's original work, which derived many results from the data, and then justified them in terms of the theory. Just as Mincer's original work, and human capital theory, is unspecific with respect to geographic limitations, it also has little to say about gender issues. Although Mincer and Polacheck (1974) is a seminal article about the labour supply of women, the data set from which the first earnings specifications were derived excluded females.

The Mincerian specification has been used for countries of diverse institutional makeup, culture, and stages of development. On aggregate, these studies show that there exist large empirical consistencies in the human capital model's ability to explain educational wage differentials and life-cycle earnings patterns. In adopting this Mincerian specification with our Russian data set our aim is not to test the relative applicability of human capital theory's efficiency assumptions to Russian wage setting. Rather we are interested in looking at the returns to higher education, experience, and occupation type in Russia in 1994.

The 1994 RLMS sample is here divided by gender, occupation, and region, to reflect natural divisions of the Russian labour market. This allows us to measure returns to human capital characteristics within and between our separate labour markets. Our analytical framework is in the spirit of Mincer's original specification, with his original motto "Let's see how far it takes us".

IV. Econometric Specification

The wage equations used in this analysis are based on those emanating from Gary Becker's (1967, 1969) human capital model. This approach follows that of Mincer (1974).

Mincer's experiments using data from the 1959 U.S. census led to his testing of an earnings function of the following form:

$$\ln y = {}_0 + {}_1 s + {}_2 x + {}_3 x^2 + {}_4 s^2 + {}_5 xs + u$$

Here ${}_0$ is a constant, ${}_1$ and ${}_4$ are estimates of the rate of return to education, ${}_2$ and ${}_3$ are quadratic returns-to-experience terms, signed positively and negatively. ${}_5$ is an experience-education interaction term. x and x^2 represent years of experience, and amount to an assumption that wages increase at a decreasing rate in years of experience. A quadratic formulation for years of education (s, s^2) is here also used. u is an error term, which is assumed to be uncorrelated with any other explanatory variables, and to be normally distributed.

Using the 1959 annual earnings of white, non-farm men, Mincer explained 31% of observed wage differentials in his data set with the following equation:

$$\ln Y = \underset{}{4.87} + \underset{(23.4)}{.255}s - \underset{(-7.1)}{.0029}s^2 - \underset{(-31.8)}{.0043}xs + \underset{(63.7)}{.148}x - \underset{(-66.2)}{.018}x^2 \qquad \textbf{(4.1)}$$

nb. Values in parenthesis are t-values. Standard errors were not reported in Mincer (1974).

The coefficient relating to returns to additional years of schooling in (4.1) suggests a 25% return to an additional year of schooling. It is important to note that this coefficient was not robust to different specifications of the earnings function using Mincer's original data set. In OECD countries it is now more normal to find values of this coefficient between 10 and 15%.

Preliminary regressions using the 1994 RLMS suggest returns to human capital of a far smaller magnitude than Jacob Mincer obtained with his original data set. Using the same specification, although with hourly real wages rather than annual, we are able to explain only 4% of total wage differences in the Russian Federation. The ordinary least squares specification is:

$$\ln Y = 6.39^{***} + 0.024s - .0012s^2 - .000063xs + 0.034x^{***} - 0.40x^{2***} \qquad \textbf{(4.2)}$$

***** reject null hypothesis that coefficient is 0 at 1% level.**
**** reject null hypothesis that coefficient is 0 at 5% level.**
*** reject null hypothesis that coefficient is 0 at 10% level.**

Only the constant and the quadratic terms for experience are significant. All of our coefficients have the same sign as Mincer's, although they are of much smaller magnitude. This result gives a flavour for the analysis which will follow: Greater specification of human capital variables will be necessary, as will controls for several other labour-market factors which were not important to U.S. white non-farm males in 1959.

V. Data

The RLMS is a household-based survey which was designed to capture the effects of economic transformation on the welfare of households and individuals. The survey was designed primarily to answer policy-related questions regarding poverty, health, and nutrition, and economic status. Recently- published articles using the first wave of the RLMS (1994) panel have focused on topics such as monitoring nutrition during reform (Popkin et al. (1996)), iron intakes amongst demographic groups, induced abortion, and poverty (Mroz and Popkin (1995)).

The RLMS is unique for it's breadth of coverage of the supply side of the post-transition labour market in Russia. The sampling procedure makes it a nationally representative sample. 4718 households took part in the 1994 survey, and interviews were conducted with as many adult members of each household as possible. All survey respondents were paid for answering questions. The household response rate is above 80%.

The data for on which this empirical analysis is based comes from individual data of the 1994 Russian Longitudinal Monitoring Survey (RLMS). The individual-level wage

and income data of the 1994 survey is used to examine the extent to which human capital variables explain wage differentials. The individual-level survey contains detailed information about occupation, gender, education levels and type, owed wages, unpaid leave, and income from secondary jobs.

Interviews for the 1994 RLMS were carried out in November and December of 1994, and January of 1995. During this time, prices were rising rapidly in Russia. Adjustments are made for inflation using the CPI for the month relating to each individual's monthly wage report. Using October 1994 as the base, reported wages were recalculated to reflect their value in that month.

Detailed information about individual characteristics and working lives was gathered for all household members aged 18 or older. This analysis includes all individuals above age 18 who had worked in the month prior to the survey, were not missing data for any of the key variables, did not report being owed money from their workplace, and reported a wage from their work. [1]

Although much work on wage dispersion sets a lower age limit of 22 to exclude individuals still in school, it is very common for individuals in Russia to work full-time while they study for degrees. For this reason, the minimum age in the sample frame is that at which almost all Russians have completed secondary school. Given the high labour-force participation rate of pensioners, no upper age limit was set. In regressions controlling for gender, region, and occupation, a sample of 1831 people provided responses for all variables.

There are more women than men in the RLMS for every region, although this can largely be accounted for by women's much higher life expectancy. Across all regions there are about 20% less women than men reporting a wage from the previous month's work.

Those who reported a monthly wage had higher average education levels than those of the population. This can be justified from within the human capital framework by the idea that lower-productivity workers are less likely to be offered wages above their reservation wage. It is also consistent with the stylised fact that wage arrears are concentrated in the least-skilled occupations, and that these workers are the most likely to be paid in goods form.

Respondents in the RLMS were asked about their work in several ways, in order to create an accurate job-type coding. The resulting ISCO-88 one-digit codes are sensitive

[1] Whereas Newell and Reilly (1996) eliminate those engaging in individual economic activity, and several other groups, in order to focus on wages received by employees in their primary job, we do not. The occupational ISCO-88 classification used by RLMS Round V takes into account many of these aspects. Moreover, those engaged as employees rather than entrepreneurs are likely not a random sample of the 1994 labour force. According to human capital theory, neither sector of industry nor ownership-type of enterprise should affect observed wages.

to workers' levels of skills and responsibility, and their normal duties, as well as their type of workplace.

The one-digit ISCO-88 occupational coding is used to distinguish between nine occupational groups of varying skill. These codes refer to the primary function performed by the respondent, although it is realised that respondents might also perform secondary tasks related to another grouping. The ISCO-codes implicitly rank by level of skill and responsibility of a job, with category 1 having the highest level, and category 9 (Unskilled workers) the lowest.

Self-employed workers are excluded from the analysis of Newell and Reilly (1996), and many others working with Russian labour market data. Self-employed workers are included here. This is mainly due to the lack of a variable which distinguishes between those employed by others, and those reporting an income from entrepreneurial activity. It was also thought that the selectivity bias implied in eliminating self-employed workers using an imperfect variable would be at least as great as that incurred by leaving them in.

Table 1: RELATIVE WAGES ACROSS REGIONS

	North and North West	**Urals**	**Volga Vaytski and Volga Basin**	**West Siberia**	**East Siberia and Far East**	**Moscow and St. Petersburg Metro**	**Central and Central Black Earth**	**North Caucus**
Proportion of Regional Mean Wage to Russian Mean	1.21	0.94	0.68	1.44	1.30	1.35	0.81	0.75
s.e. of natural log of regional hourly wage	0.87	0.79	0.83	0.91	1.04	.82	0.84	.92
no. of observations	*150*	*329*	*370*	*210*	*158*	*350*	*465*	*266*

Table 1 shows that regions with higher-than-average wages do not necessarily have higher wage dispersion. The Moscow and St. Petersburg Metropolitan area has only the second-highest average wages amongst our sample, with the Western Siberia region reporting higher wages. The relatively-low wage dispersion reported in the Moscow St. Petersburg urban areas suggests that the influx of foreign investment and financial activities in these areas is not in itself an explanation of exploding wage disparities in the Russian Federation.

The high degree of variation in real wages across the Russian Federation is not easily explained by regional differences in types of occupation or higher education of workers. Tables 2 and 3 (below) illustrate this fact.

Table 2: OCCUPATIONAL DISTRIBUTION WITHIN REGIONS

	North and North West	**Urals**	**Volga Vaytski and Volga Basin**	**West Siberia**	**East Siberia and Far East**	**Moscow and St. Petersburg Metro**	**Centra land Central Black Earth**	**North Caucus**
Legislators, Senior Managers, and Officials	.01	.02	.01	.02	.03	.02	.01	.02
Professionals	.13	.18	.17	.23	.16	.32	.23	.18
Technicians and Associate Professionals	.18	.15	.18	.17	.15	.15	.14	.20
Clerks	.06	.06	.09	.06	.11	.04	.08	.07
Service Workers and Market Workers	.11	.09	.08	.09	.13	.08	.06	.10
Skilled Agricultural and Fishery Workers	.01	.00	.00	.00	.00	.00	.00	.00
Craft and Related Trades Workers	.17	.24	.19	.14	.14	.15	.18	.17
Plant and Machine Operators and Assemblers	.18	.16	.15	.20	.16	.10	.17	.15
Elementary (Unskilled) Occupations	.13	.11	.11	.09	.12	.10	.11	.12
Total	***1***	***1***	***1***	***1***	***1***	***1***	***1***	***1***
No. of observations	***150***	***329***	***370***	***210***	***158***	***350***	***465***	***266***

From Table 2 it can be seen that the types of skills possessed by workers in various regions do not vary substantially, despite the large differences in real wages across regions. The Moscow and St. Petersburg metropolitan areas have very high concentrations of professionals, and low proportions of plant and machine operators and assemblers, relative to other areas.

The proportion workers in elementary occupations is similar across regions of the Russian Federation. The following table shows that many workers in "unskilled occupations" have actually completed specialised higher educational training:

Table 2b: Types of Higher Education Completed by Workers in Unskilled Occupations

type of training	**professional courses**	**professional/trade school without secondary education**	**professional/trade school with secondary education**	**graduate school or residency**	**technical/medical school**	**institute, university, or academy training**
proportion of workers in elementary occupations	0.32	0.17	0.21	--	0.34	0.10

Table 3: LEVEL AND TYPE OF HIGHER EDUCATION BY REGION

	North and North West	Urals	Volga Vaytski and Volga Basin	Western Siberia	Eastern Siberia and Far East	Moscow and St. Petersburg Metro	Central and Central Black Earth	North Caucus
Graduate School, Residency	.02	.01	.01	.02	.02	.08	.02	.01
Professional/Technical Trade School, Factory/Manufactory	.10	.14	.10	.08	.11	.08	.15	.08
Professional/ Technical Trade School with Secondary Education	.28	.30	.23	.23	.12	.17	.18	.18
Professional Courses	.32	.25	.23	.31	.34	.36	.28	.35
Institute/University, or Academy	.23	.26	.26	.27	.31	.45	.30	.25
Technical, Medical, Music, Pedagogical, Art School	.37	.37	.38	.40	.40	.34	.33	.39

nb. Total for each column is not necessarily 1.00 because many respondents have completed more than one type of higher education.

Table 4 shows that, amongst those in our sample, an equal portion of women and men had completed institute, university, or academy training. Less women have completed various vocational trainings than have men. Far more women than men have completed technical, medical, music, pedagogical, or art school.

Table 4: LEVEL AND TYPE OF HIGHER EDUCATION BY GENDER

Higher education completed	Men	Women	**Aggregate**
Graduate School, Residency	.03	.02	**.03**
Professional/Technical Trade School, Factory/Manufactory	.14	.08	**.11**
Professional/ Technical Trade School with Secondary Education	.26	.16	**.21**
Professional Courses	.37	.24	**.30**
Institute/University, or Academy	.30	.30	**.30**
Technical, Medical, Music, Pedagogical, Art School	.26	.46	**.37**

Table 5 (below) roughly illustrates how different are the proportions of men and women employed in various occupations. Whereas fifty percent of employed women work in the three most-skilled ISCO-88 categories, only 25% of men are included in these categories.

Table 5 : OCCUPATIONAL DISTRIBUTION ACROSS GENDERS

	Men	**Women**	**AGGREGATED**
Legislators, Senior Managers, and Officials	.02	.01	.02
Professionals	.17	.24	.21
Technicians and Associate Professionals	.06	.25	.16
Clerks	.01	.12	.07
Service Workers and Market Workers	.05	.11	.08
Skilled Agricultural and Fishery Workers	.00	.00	.00
Craft and Related Trades Workers	.30	.07	.18
Plant and Machine Operators and Assemblers	.27	.06	.16
Elementary (Unskilled) Occupations	.09	.13	.11
Number of Observations	**1049**	**1249**	**2298**

Newell and Reilly (1996) calculate the gender wage gap in Russia in 1992 at 30%, with most of this due to differences in rates of return to human capital. The rough descriptive analysis from Tables 4 and 5 seems to support the Newell and Reilly finding that most of gender-based wage differentials are not due to differences in levels of human capital. Amongst skilled workers, gender-concentration in occupations is marked, with women more heavily-concentrated in "high-skill" jobs.

V. Variables

Five 0-1 dummy variables are used to distinguish between types of higher education, with those who completed no higher training as the reference group. Years of job experience is imputed from age by subtracting years of education minus 6. A possible difficulty with this imputation is that many Russians attend night school for their degrees while working full time, so we may be underestimating job experience. We have not here corrected for this possibility. (See also Appendix A: Variable Description).

The regression analysis uses hourly earnings, constructed from the wage reported last month, and the number of hours worked in this primary job. Many respondents reported having received goods in lieu of payment. Many respondents reported a wage, but indicated that they were also owed a sum of money from their employer. In order to eliminate the possibility that the respondent reported only a fraction of the agreed monthly remuneration, we restrict the analysis to those who are owed no money from their employer.

Given that interviews for the RLMS were carried out over a two month period, it was necessary to correct for the high rate of inflation throughout 1994. We do this by calculating real wages from the aggregate-level CPI of October 1994. While this correction does not account for differences in regional costs of living, accurate regional CPIs were unavailable.

Our occupational reference category is "unskilled workers".

VI. ANALYSIS

In the following econometric analysis we compare factors contributing to observed wage gaps by looking at educational, experiential, occupational, geographic, and gender distinctions. First we compute an aggregate wage equation for the full sample frame, and then disaggregate by gender. Then we compute separate wage equations for three of the 8 regions of the Russian Federation. We assess the extent to which differences in occupational, experiential, and educational variables explain wage dispersion within regions.

Given the stylised fact (supported by our analysis) that wage arrears are concentrated in the lowest-wage sectors, we are aware of endogeneous selection. Because the following analysis focuses on explaining wage dispersion, it omits an important part of the labour force currently on compulsory, unpaid leave. 13% of labour force participants in this survey reported that they had been sent on unpaid leave at some time. Due to severe level of wage arrears in Russia in 1994, there were many

RLMS labour market participants who did not report a wage from their primary job in the month prior to the interview. We also exclude those workers who report having received some part of their wages in the form of goods. The most marginalised of Russian workers are excluded from the regression analysis.

In addition to the problem of non-randomly excluding a sizeable portion of the Russian labour force from the econometric analysis, we are aware that the size and composition of the labour force is changing rapidly. The wages we observe will have both pulled people into, and pushed some out of the formal labour force. We have not yet devised a suitable correction for selectivity bias which accounts for both non-participants, and those who are owed wages. In a separate analysis using a multinomial logit specification, we plan to assess how worker characteristics affect the probability of their being a member of the formal labour force.

i. Russian Federation Aggregate (Table 6)

The aggregate analysis suggests that little of Russian wage dispersion can be explained by differences in experience, higher education, and occupation type. The explanatory power of our augmented Mincerian regression is 0.21 when we control for gender and region. Although our regional groupings are ad-hoc in the sense of following the 8 groupings made by the constructors of the data set, almost all of the regional dummies are statistically significant and of large magnitude. The Western Siberian region reports the highest real wages, and the Volga Vaytski and Volga Basin region the lowest. The coefficients on the regional controls are of a much larger magnitude than those for any of the human capital variables.

At the aggregate level, years of experience has a very small but significant effect on reported wages. Hourly wages increase at a decreasing rate for every additional year of job experience. The gender disaggregation of the Russian Federation aggregate data shows that men's wages increase in years of experience more than twice as much as women's.

Those people that have completed institute, university or academy have expected wages 38% higher than those with no higher education. Other educational dummies are insignificant in the aggregated regression. Amongst women, there is a statistically-significant 21% premium to having completed technical or medical training. However, amongst men this variable is insignificant. In the gender-disaggregated regressions, coefficients for the dummy representing institute, university, or academy training are higher for women than for men. Moreover, the smaller positive coefficient for institute, university, or academy training is not statistically significant in the male's wage regression.

Relative to workers engaged in elementary (unskilled) occupations, those in all other occupational categories have higher wages. Although the human capital theory from which this analysis is derived predicts that occupations requiring higher skills will be better remunerated, our results do not suggest this. In particular, the occupational group "professionals" does not have a wage advantage relative to occupations requiring less skill, although professionals have likely completed institute, university, or academy training. Thus it seems that university education is a far better indicator of likely wages than is occupational status.

The wage premiums for women in the highest-skilled occupations (Legislators, Senior Managers and Officials; Professionals; Technicians and Associate Professionals,) are significantly lower than those for men. Women plant and machine operators and assemblers earn more than women in any other education type.

Looking at the variables unrelated to education, experience, or job characteristics, we find that much of wage differentials are explained by these. Using an F test with restricted and unrestricted versions of the aggregate regression, we reject the null hypothesis that the coefficients of our 8 regional dummies are jointly zero. Our t-statistic shows that gender is an important factor in explaining hourly wage differentials, with women receiving 28% lower wages than men with the same level of human capital. This estimate is within one standard error of that obtained by Newell and Reilly (1996) using the 1992 individual-level data from RLMS. Katz (1994) found the gender-based wage differential in the industrial city of Taganrog to be 30% in 1989.

Observed large gender-based differentials in wages do not indicate whether this is an institutional artefact from the Soviet era, or a new phenomena. In Soviet times, issues such as "Equality of Opportunity" and "Equal Pay for Work of Equal Value" did not arise, because no official gender distinctions were made amongst workers. Women did train for the most highly skilled professions such as medicine, engineering, and scientific research in a far greater proportion than in OECD countries.

Although this estimate of the gender-based wage differential is broadly consistent with those obtained by Katz (1994) and Newell and Reilly (1996), this is not sufficient information for concluding that the gender-based wage differential has remained relatively stable over time. There is not a random sample of the former USSR with comparable aggregate-level data, and the city of Taganrog was widely regarded to be unrepresentative of Soviet industrial cities. Also, our results suggest that it is not sufficient to make aggregated measures of wage dispersion, since the regional-based wage differentials are so large.

Those in the Volga Vaytski and Volga Basin earn 78% less than others with the same characteristics in Western Siberia, and those in the North Caucases region 71% less. Those in the Urals region and the Central and Black Earth Region, also earn substantially less than Western Siberians, the reference region. Our gender-disaggregated analysis shows that regional wage differentials are substantially less pronounced amongst women than amongst men, although they have significant explanatory power in both groups.

Table 6: Russian Federation Aggregate Hourly Real Wage Regressions

	Russian Federation			*Females*			*Males*		
	B	**Std. Error**		**B**	**Std. Error**		**B**	**Std. Error**	
constant	7.22	0.12	***	6.80	0.15	***	7.40	0.18	***
experience	0.0203	0.0055	***	0.013	0.0077	*	0.027	0.0081	***
experience squared	-0.00055	0.00011	***	-0.00041	0.00016	**	-0.00066	0.00016	***
professional courses	-0.032	0.048		0.045	0.066		-0.088	0.070	
trade/factory school	-0.042	0.072		0.10	0.1076		-0.14	0.10	
trade/factory school with sec. ed.	0.0087	0.063		0.064	0.093		-0.019	0.089	
tech./med./music/ pedag./art school	0.073	0.054		0.21	0.073	**	-0.039	0.082	
institute/university/academy	0.38	0.066	***	0.56	0.087	***	0.17	0.11	
graduate school	0.098	0.129		0.21	0.20		0.040	0.18	
gender	-0.280	0.076	***						
intermittent work experience	-0.029	0.074		-0.013	0.076				
legislator, senior manager, official	0.35	0.17	**	0.32	0.26		0.43	0.23	*
professionals	0.32	0.084	***	0.27	0.11	**	0.39	0.14	***
tech. and assoc. professionals	0.30	0.081	***	0.26	0.095	***	0.46	.16	***
clerks	0.19	0.100	*	0.20	0.11	*	0.17	0.30	
service and market workers	0.074	0.092		0.050	0.11		0.14	0.17	
skilled agri./fishery workers	0.34	0.36		0.43	0.77		0.38	0.43	
craft and related trades workers	0.40	0.081	***	0.48	0.13	***	0.34	0.12	***
plant/machine operator/assemblers	0.33	0.084	***	0.45	0.13	***	0.25	0.12	**
Central and Central Black Earth	-0.59	0.077	***	-0.52	0.098	***	-0.68	0.12	***
East Siberian and Far Eastern	-0.25	0.098	**	-0.21	0.12	*	-0.33	0.16	**
Moscow, St. Petersburg	-0.17	0.080	**	-0.22	0.11	*	-0.17	0.13	
North Caucuses	-0.71	0.085	***	-0.57	0.11	***	-0.88	0.14	***
North and North West	-0.16	0.096		0.035	0.12		-0.41	0.15	***
Urals	-0.46	0.084	***	-0.39	0.11	***	-0.59	0.13	***
Volga Vaytski and Volga Basin	-0.78	0.080	***	-0.70	0.10	***			
Adjusted R^2	0.21			0.21			0.091		
d.f.	25			24			23		
residual d.f.	1747			944			780		

***** reject null hypothesis that coefficient is 0 at 1% level.**
**** reject null hypothesis that coefficient is 0 at 5% level.**
*** reject null hypothesis that coefficient is 0 at 10% level.**

ii. Regional Analysis (see Table 7):

Our regionally-disaggregated analysis implicitly assumes that different labour markets exist for different regions, and that our regional dummies capture the boundaries of the labour market. While we realise that this is an ad-hoc assumption, it is no less so than that which considers the Russian Federation as one market.

For our regional analysis, we select three of the eight regions of the original analysis. Moscow and St. Petersburg Metropolitan Areas, Volga Vaytski and Volga Basin, and the North Caucuses region were selected because they provided relatively high numbers of observations, and because they reported significantly different levels of wage dispersion.

A. Moscow St. Petersburg Metro Areas

In the Moscow region, 19% of observed wage dispersion could be explained using our augmented Mincerian framework. Those who have completed institute, university or academy training earned a wage premium of 40% over those with no higher education. There were no significant gains for people who had completed other types of post-secondary education. Women earn 42% less than men with similar levels of human capital. Those with institute, university, or academy training earned 49% higher wages than the reference group. Service and market workers in Moscow appear to have significantly lower earnings than the reference group of unskilled workers.

D. Volga Vaytski and Volga Basin Regions

In this region small positive gains to experience were observed. Those who had completed institute, university, or academy observed 80% higher wages than the reference group. Those who had completed the technical or professional trade schools, or professional courses, also had substantially higher primary job wages than the reference group. All occupational groups received substantially higher wages than unskilled workers. Amongst these occupational groups, which require widely disparate skill levels, the occupational wage premiums were not statistically significant.

In contrast with the Moscow region, women did not report significantly lower hourly earnings than men.

F. North Caucuses Region

In this region none of the higher education dummies were significant. Although a large negative coefficient was observed for the gender dummy, it was not significant at the 10% level. Professionals; Technicians and Associate Professionals; Clerks, and Craft and Related Trades Workers had significantly higher incomes than the reference group.

However, the level of this premium was not graduated according to skill. Human capital variables explain less than 10% of observed hourly wage variation in the region.

In the North Caucus region, human capital variables explain much less of observed wage dispersion than they do in the other regions.

Amongst the three regions chosen, coefficients of human capital variables vary greatly in their size, sign, and significance. Wages are generally much higher in Moscow and St. Petersburg Metropolitan Area than in the North Caucus or Volga Vaytski and Volga Basin regions. The Moscow and St. Petersburg Metropolitan Area also had the fewest number of statistically significant human capital variables amongst the three.

Table 7: Regional Level Regressions

	Moscow, St. Petersburg Metropolitan Areas			Volga Vaytski and Volga Basin			North Caucuses		
	B	**Std. Error**		**B**	**Std. Error**		**B**	**Std. Error**	
constant	7.57	0.22	***	5.49	0.25	***	6.71	0.30	***
experience	0.0021	0.013		0.034	0.013	***	-0.0082	0.020	
experience squared	-0.00019	0.00025		-0.00067	0.00026	**	2.71E-05	0.00042	
professional courses	-0.054	0.097		0.24	0.12	**	-0.031	0.16	
trade/factory school	0.11	0.18		0.45	0.18	**	-0.18	0.28	
trade/factory school with sec. ed.	-0.043	0.15		0.30	0.15	**	0.11	0.21	
tech./med./music/ pedag./art school	-0.17	0.11		0.40	0.14	***	-0.13	0.18	
institute/university/academy	0.40	0.14	***	0.80	0.17	***	0.17	0.20	
graduate school	0.12	0.17		0.11	0.45		-0.10	0.68	
gender	-0.42	0.16	***	0.038	0.18		-0.34	0.28	
intermittent work experience	0.082	0.15		-0.16	0.17		0.077	0.27	
legislator, senior manager, official	0.28	0.34		0.98	0.40	**	0.38	0.56	
professionals	0.031	0.16		0.58	0.20	***	0.67	0.25	***
tech. And assoc. professionals	0.0034	0.18		0.39	0.17	**	0.71	0.24	***
clerks	-0.20	0.28		0.38	0.21	*	0.32	0.31	
service and market workers	-0.46	0.21	**	0.22	0.21		0.17	0.29	
skilled agri. And fishery workers	-0.20	0.76					1.93	0.94	**
craft and related trades workers	0.26	0.17		0.74	0.19	***	0.35	0.26	
plant/machineoperators/assemblers	0.15	0.20		0.64	0.21	**	0.20	0.27	
Adjusted R^2	0.19			0.21			.08		
d.f.	18			17			18		
residual d.f.	280			272			190		

***** reject null hypothesis that coefficient is 0 at 1% level.**
**** reject null hypothesis that coefficient is 0 at 5% level.**
*** reject null hypothesis that coefficient is 0 at 10% level.**

Perhaps the most striking feature of the above disaggregation of the Russian labour market is the diversity in wage structure across regions. Not only are median wages and wage dispersions very different between regions, but so are the relative rewards that workers of a given type might expect. Thus, even accounting for the possibility of substantial differences in the cost of living across regions, we might expect significant labour migration to be occurring.

With respect to the relative earnings of women and men, there are also substantial differences between regions. Of the three regions chosen, only the Moscow and St. Petersburg Metropolitan areas reported statistically significant differentials. It is interesting that the highest wage region, Western Siberia, also has the largest gender-based wage differential, 55%, significant at the 10% level. Thus the magnitude and significance of gender-based wage differentials appears to vary positively with relative regional wage levels.

If the high degree of regional real wage variation is robust to differences in the cost of living, we might expect substantial internal migration to be occurring. Individuals might be observed to migrate to areas where their specific characteristics are relatively well-rewarded within the wage structure. In her 1996 paper "The Wheres and Whys of Internal Migration in Russia During Transition", Annette Brown uses the first rounds of the RLMS, and Russian government statistics, to analyse the aggregate and individual determinants of internal migration in Russia during the transition. She shows that inmigration within Russia has responded positively to regional wage differentials during the transition period, and that outmigration has responded negatively. This demonstrates that labour mobility in Russia is at least partially responsive to economic signals.

In Brown's study, the rate of apartment privatisation is shown to have as strong positive effect on total in migration. If this is the case, then efforts at officially reallocating labour, and thus harmonising the wage structures of regions, will be constrained by slow property privatisation.

VII. Conclusions

In this preliminary analysis of the Russian labour market we have attempted to assess whether high observed degrees of wage dispersion indicate that labour markets are becoming more responsive to observable human capital characteristics.We find that experience exerts a statistically significant but very small influence on wages, as does the completion of institute, university, or academy training. Across the Russian Federation, little of observed wage differentials are explained by occupation type. While workers in occupations demanding some skill obtain significantly higher pay than those working in unskilled jobs, pay differences amongst the eight skilled occupation groups are not statistically significant. A large fraction of wage differentials in Russia can be explained by regional and gender-based differences in wage rates.

Here we have used human capital theory to identify the relative importance of different types of observable human capital in determining an individual's wage. We have shown that premiums to education, training, experience, and occupation vary substantially amongst regions and between genders. Our descriptive analysis shows that many of those working in elementary occupations have completed some type of higher education.

Newell and Reilly (1996) note that at least 25% of variations in hourly wages should be explainable by variables of age/experience, and education, according to results from other countries. Neither their results, using the 1992 RLMS, nor ours using the 1994 data, achieve this explanatory power. Nevertheless, the Mincerian regression tells a great deal about the wage structure of Russia in 1994.

Individuals in the RLMS received a substantial portion of their monthly income from sources other than their primary job. (See also Appendix C). Secondary income from additional jobs, profits, and other incidental work make up a significant portion of a Russian worker's earnings. These portions appear to be less related to the type of primary job than to the gender and age group of the worker. Those earning the lowest wages in their primary occupation earn greater fractions of their total income in the secondary sector. Secondary income will be a topic of further analysis.

In their augmentation of the Mincerian regression to include regional controls, Newell and Reilly (1996), take the increased explanatory power of the regression to reflect the role of compensating wage differentials. Their results concur with studies from the Soviet era (Katz, 1994) and with this study in locating the highest regional wage premiums in Siberia. In contrast with Newell and Reilly (1994), however, this analysis does not conclude that compensating wage differentials exist. If regional consumer price differentials are of the magnitude of wage differentials, it is invalid to compare (even inflation-adjusted) rouble wages across regions.

The magnitude of observed regional- based wage differentials, and the substantial differences in regional wage structures, suggests that separate labour markets operate within regions. Without detailed information on cost-of-living variations amongst regions, it is hard to assess what implications these factors will have for migration levels and directions. In particular, it is difficult to assess whether regional labour markets have become more distinct, or more closely integrated, since economic transition began.

This analysis suggests that macroeconomic indicators of increases in wage dispersion in the Russian Federation cannot be taken as a measure of labour market rationalisation. Occupations requiring substantially different skills and levels of responsibility do not have substantial differences in their mean wages. The fact that region and gender are such important factors influencing wages suggests that workers are not remunerated according to relative productivity.

LFP= Labour force participants who reported a wage last month.
i5school= years of schooling, including higher education.
i5age=age of individual (in years) at date of interview, Sept. 1994.
i5insuni=institute, university, academy.
i5gradre=graduate school, residency.
i5profco=professional courses, for example, courses on tractoring, chauffeuring, typing, accounting.
i5tecmed=technical, medical, music, pedagogical, art school.
i5ptufzu=professional/technical trade school, factory/manufactory
trade school, factory/manufactory department, without secondary education
i5ptusec=professional/technical trade school with secondary education.

i5waghou=wage per hour, imputed from responses on wages
earned last month and hours worked last month in primary job.
i5lnwagh=natural logarithm of hourly wage.
I5ilop1=legislators, senior managers, officials
i5ilop2=professionals
i5ilop3=technicians and associate professionals
i5ilop4=clerks
i5ilop5=service workers and market workers
i5ilop6=skilled agricultural and fishery workers.
i5ilop7=craft and related trades workers.
i5ilop8=plant and machine operators and assemblers.
I5ilop9=elementary (unskilled) occupations.

Regional Identifiers:
smosspb= Moscow, St. Petersburg Metro Areas
snonowe= North and North West
sccbla= Central and Central Black Earth
svvvb= Volga Vaytski and Volga Basin

snocauc=North Caucasian
surals=Urals
swsiber=West Siberian
sesibfe= East Siberian and Far Eastern

APPENDIX C: Secondary Income Sources

	Proportion of Last Month's Total Income Earned in Secondary Jobs and from Incidental Income Males	Proportion of Last Month's Total Income Earned in Secondary Jobs and from Incidental Income Females
Legislators, Senior Managers, Officials	0.07	0.14
Professionals	0.12	0.14
Technicians and Associate Professionals	0.15	0.14
Clerks	0.22	0.14
Service Workers and Market Workers	-0.04	0.15
Skilled Agricultural and Fishery Workers	0.15	0.02
Craft and Related Trades	0.05	0.15
Plant and Machine Operators and Assemblers	0.07	0.14
Elementary (Unskilled) Occupations	0.15	0.20
AGGREGATE	0.08	0.15

across workforce= 0.12

Age Group	Proportion of Last Month's Total Income Earned in Secondary Jobs and from Incidental Income
16-25	0.11
26-35	0.08
36-45	0.08
46-55	0.10
55-60	0.27 *
Above 60	0.49*

*includes pensions

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