CENTRE FOR ECONOMIC REFORM AND TRANSFORMATION
School of Management and Languages, Heriot-Watt University, Edinburgh, EH14 4AS
Tel: 0131 451 42-2 Fax: 0131 451 3498 email: ecocert@hw.ac.uk
World-Wide Web: http://www.sml.hw.ac.uk/cert

Wage determination and wage inequality inside a Russian firm in late transition: Evidence from personnel data – 1997 to 2002*

Thomas Dohmen†

Hartmut Lehmann§

Mark E. Schaffer‡

August 2007
Discussion Paper 2007/04

Abstract

We use personnel data from a Russian firm for the years 1997 to 2002 to study the determinants of wages during transition. Our findings indicate that remuneration is not predetermined by formal rules and a stable institutionalized structure of wages, but rather that local labor market conditions have a strong impact on wage setting at the firm level. In particular, we document that real wages fall substantially during a period of high inflation and worsening local labor market conditions. Relative wage decreases are most pronounced for employees who initially earned the highest rents. The process of rent extraction leads to a strong compression of real wages and real compensation at the firm.

Keywords: personnel economics, wage determination, Russia, transition

JEL Classification: J31, P31

* Dohmen and Lehmann acknowledge financial support from the Deutsche Forschungsgemeinschaft (DFG) within the research program "Flexibilisierungspotenziale bei heterogenen Arbeitsmärkten" (DFGSP1169). Lehmann and Schaffer are grateful to the European Commission for financial support within the 6th framework project "Economic and Social Consequences of Industrial Restructuring in Russia and Ukraine" (ESCIRRU). Schaffer also thanks the William Davidson Institute and the U.S. Department of State (Title VIII) for financial support. The usual caveat applies.
† IZA and DIW. Email: Dohmen@iza.org.
§ DARRT, University of Bologna; IZA; CERT, Heriot-Watt University; WDI and DIW. Email: Hartmut.Lehmann@unibo.it.
‡ CERT, Heriot-Watt University, CEPR, IZA, and WDI, University of Michigan. Contact address: Centre for Economic Reform and Transformation, School of Management and Languages, Heriot-Watt University, Edinburgh EH14 4AS, UK. Email: M.E.Schaffer@hw.ac.uk.

1. Introduction

The literature on wage formation and wage inequality in Russian labor markets, limited in scope and often constrained by data quality has left many controversial issues unresolved. One of the more fundamental issues is the question of which considerations drive managers in the wage determination process. Are Russian wages, for example, formed mainly by institutional factors related to industrial relations and internal labor markets as stressed by Clarke (2002) and Kapelyushnikov (2002) among others, or are managers in their wage decisions mainly led by the interplay of conditions in local labor markets, labor market institutions and considerations to achieve an optimal level of turnover of the workforce?

The first approach, which for shorthand we may call the industrial relations approach to wage determination in Russia, is aptly summarized by Clarke (2002): "The pattern of change in the structure of wages in Russia is consistent with the supposition that employers follow the line of least resistance and in the first instance adjust their hiring and management practices to a relatively stable level and structure of wages, raising money wages uniformly more or less in line with inflation, although with a lag that is the longer the more hard-pressed is the employer, so that differentials emerge corresponding to the relative prosperity of firms." Clarke's argumentation takes recourse to two strands in the literature on wage formation, the industrial relations institutional literature, which sees the wage structure in a firm the result of bargaining between production managers, human resource managers and top management, and the early literature on internal labor markets (Dunlop, 1957, and Doeringer and Piore, 1971). Both these strands, dealing with developed capitalist economies, point to the need to protect the workforce in the firm from shocks that occur in the outside labor market by maintaining a stable and "fair" relative wage

structure also in times of economic hardship. Can wage differentiation in Russia during transition really be explained well by this approach? Are local labor market conditions really as irrelevant as maintained by Clarke?

The second approach to the analysis of Russian wage formation extends standard models of wage determination in capitalist economies to Russia, and assigns an important role to local labor market conditions in the wage formation process. No matter how much bargaining power of workers and employers is assumed in the models underlying the studies, i.e. independent of whether both agents are assumed to have substantial bargaining power as in the studies of Brainerd (2002), Luke and Schaffer (2000) and Commander, Dhar and Yemtsov (1996), whether employers decide unilaterally over wage levels and structure as is mooted in the study by Lehmann, Wadsworth, and Acquisti (1999), or whether the assumption of competitive labor markets is maintained (see e.g. Commander, McHale and Yemtsov, 1995), local labor market conditions are assumed to have a major impact on the decision making process as well as on outcomes.

Having unique longitudinal personnel data from a Russian manufacturing firm, which includes wages and bonuses of each employee, we provide new evidence on the issue of wage formation and differentiation in Russia. If the "industrial relations school" is right, then firms that have increasing profits should attempt to maintain real wage levels as much as is feasible in times of inflation and reverse real wage losses when inflation subsides. And local labor market conditions should play a very subordinate role, if any. We are fortunate to have personnel data for the years 1997 to 2002, a period that includes an episode of high inflation in the aftermath of the August 1998 financial crisis. In addition, the firm in question is in the reported period one of the few enterprises in the sector "machine building and metal works",

which is able to maintain its employment level and shows a strong profit performance. Given our longitudinal personnel data and the profit situation of the firm we are able to provide direct evidence on the validity of the prediction put forth by Clarke and others from the "industrial relations school" of Russian wage formation.

To see whether and how important labor market conditions affect wages, we need, of course, information about the local labor market in which the firm operates. The information we use to this purpose is taken from regional Goskomstat data and from a sample of 33 industrial firms in the same region where the firm is active. We also interviewed the director general of the firm (CEO), after we had analyzed the personnel wage data, to get confirmation or clarification on the motives of management regarding its wage policies.

The main results in the final analysis provide little evidence for the prediction put forth by Clarke and others of the "industrial relations school"; our results rather show that local labor market conditions are one of the main driving forces determining management's wage policies in this Russian firm. In the firm at hand, top management, in particular the CEO, unilaterally determine wages in spite of official bargaining between management and trade union representatives. Before the financial crisis in 1998, labor turnover was very high in the firm. This turnover was driven by voluntary quits as employees saw better opportunities outside the firm. However, as of 1996 orders for the firm's products showed a very robust upturn and the firm was in desperate need of qualified production workers, engineers, etc. To attract these qualified employees and to retain them, top management offered real wages far above the regional and sector averages. After the financial crisis of August 1998 outside opportunities in the local labor market were substantially reduced. This enabled top management to extract rents from the firm's employees through the

erosion of real wages via the high inflation that manifested itself during and after the financial crisis. It curbed earnings most for those who earned the highest rents, resulting in a tremendous compression of real wages that was still in place at the end of the reported period. While nominal wages are never cut in this firm, long lasting real earnings losses were very substantial, and this despite a very strong profit performance.

The remainder of the paper is organized as follows. The next section introduces the firm under study and describes the personnel data set. Section 3 presents the main results of our analysis and establishes some robust evidence about the evolution of wages and total compensation in the firm over the period that encompasses the financial crisis and high inflation. A final section concludes.

2. The firm and its personnel data

The particular firm for which we have data is located in a provincial city in Russia and operates in the "machine building and metal working" sector. After having converted production lines from Soviet times "nearly one hundred percent", according to the director general of the firm (CEO),[1] it produces well equipment for gas and oil production and smith-press equipment. More than ninety percent of its production is destined for the Russian market. It has no local competitors, but nationally it has to compete with more than 5 firms, among them firms importing from the European Union. The firm was founded in the middle of the last century and privatized in 1992. A decade later more than half of the shares were owned by managers and workers, about twenty percent by former employees and roughly a quarter by other Russian entities. By that time the active share owners were the members of the board of directors and top management, to whom dividends are paid as well as to those

[1] Interviews were held with the director general of the firm in the spring of 2002 and in April 2007.

workers who own "privileged shares."[2] While there is collective bargaining at this firm on paper, trade union representatives have virtually no influence on wage policy and wages are set unilaterally by top management. Essentially all important decisions are taken by top managers and in particular by the CEO of this firm.

The firm that is analyzed here has an unusual profit performance in the reported period in relation to the sector in which it operates. As Figure 1 shows, the profitability of our firm and the profitability of the sector move in opposite directions in the years 1997 to 2003. Equally important is the fact that our firm, while having declining profits in the three years after 1997, is able to maintain positive profits throughout, i.e., there is clearly no dramatic negative impact on profits brought on by the crisis of August 1998. The firm is also unusual in its wage policies compared with the machine building and metal working sector, the oblast where it is located and the whole economy. Figure 2 shows a real monthly wage paid by our firm in 1997 and 1998 that is more than 50 percent higher than the wage paid in the sector and more than double the wage paid in the region. In the aftermath of the crisis we see a precipitous fall of the real wage in our firm, while wages in the economy at large, the region and the sector show a more moderate fall. After the crisis the real wage profile in the firm stays flat but shows a continuous rise for the three aggregates. By 2003 the average real wage in the economy and the sector exceed that in our firm. It is noteworthy, though, that the average regional wage remains below the firm's average wage even in 2003.

The firm that we analyze is clearly not representative of the industrial sector in Russia, in that it is more successful than most firms in this sector over the indicated period, and in that collective bargaining is not relevant for wage and employment

[2] Interview with CEO in April 2007.

outcomes. The personnel data of the firm in question are, however, well suited for testing hypotheses emanating from the various schools of thought regarding wage determination by management in Russian firms since the firm belongs to the minority of prosperous enterprises where workers' institutional influences are very limited and thus do not confound this process of wage determination.

The construction of the personnel data proceeded as follows. We created an electronic file based on records from the personnel archive of the firm, and constructed a year-end panel data set for the years 1997 to 2002.[3] We have records of all employees who were employed at any time during this period.[4] The data contain information on individuals' demographic characteristics such as gender, age, marital status and number of children, on their educational attainment, retraining and other skill enhancement activities before joining the firm and during tenure at the firm. We also know the exact date when each employee started work at the firm as well as his/her complete working history before that date. We can trace each employee's career within the firm since we have information on the current position and on all previous positions and the periods when each of them was filled out by the employee. In addition we also know whether someone worked full-time or part-time. For those who separated from the firm we can distinguish between voluntary quit, transfer to another firm, individual dismissal, group dismissal and retirement.

In Russian firms the workforce is often divided into five employee categories: administration (i.e., management) which we label "managers"; accounting and financial specialists whom we label "accountants"; engineering and technical specialists (including programmers) whom we subsume under the term "engineers";

[3] We have also wage data for all months in 2003 except for December. However, since we also lack data on yearly bonuses for 2003, we do not use the compensation data for 2003 in this paper.
[4] Information for top managers is missing for reasons of confidentiality.

primary and auxiliary production workers, whom we label "production workers"; and finally, service staff.[5]

For the years 1997 to 2002 we have monthly wages averaged over the year, and information on the three types of bonuses paid to the workforce: (1) a monthly bonus amounting to a fixed percentage of the wage; (2) an extra annual bonus whose level depends on "the results of the year" (i.e., a form of profit sharing); (3) an annual bonus labeled "other bonus". While production workers never receive a monthly bonus, the bonus labeled "other bonus" is paid to production workers only. Wages are reported by the firm as the employee's average monthly wage in rubles for the year (or fraction of the year, if not employed for the full 12 months), with no adjustment for inflation. The monthly bonus is reported as a percentage of the average monthly wage, and the corresponding ruble figure is recovered by applying the percentage to the nominal monthly wage. The other two bonuses are reported in nominal rubles. The inflation rate in Russia during this period was irregular and sometimes quite high - the price level more than doubled between the start of the financial crisis in July 1998 and April 1999, and was 0-2% per month before and after - and so some care is required to construct appropriate deflators. Because nominal average monthly wage and the nominal monthly bonus are averages for the year, they are deflated into 1997 constant rubles using an annual average CPI, i.e., the average price level for the year relative to the average price level in 1997. The other two bonuses are paid around the end of the year, and so these are converted into 1997 constant rubles using

[5] Only production workers are subdivided into levels, primary production workers having eight and auxiliary production workers having six levels. The Russian term for service staff is младший обслуживающий персонал.

the CPI price level for December of the corresponding year, i.e., the December price level in that year relative to the average 1997 price level.[6]

3. Main Results

Employment

Table 1 shows that employment grew steadily from 3,032 employees to 3,221 employees during the period January 1997 to December 2002, with the exception of the post-crisis year 1999. Yet, the composition of the workforce hardly changed throughout the period. There is a small increase in the share of workers, compensated by negligible falls in the shares of service staff, engineers and accountants, with managers accounting for the same share of 3.8 percent throughout.

Turnover rates, calculated as the sum of hires and separations during a given year normalized by the stock at the beginning of the year, were particularly large in 1997 and 1998 (see Table 2). After the crisis they fell quite dramatically, in 2002 reaching less than half the level of 1997. This secular pattern holds for all employee categories, but turnover was especially turbulent for accountants, production workers and service staff and much more modest for engineering staff throughout the period.

---

[6] We have available monthly data on CPI inflation in Russia overall and in the oblast where the firm is located. In this paper we work primarily with average monthly wages, and so we compare average annual inflation in the oblast with national rates. This shows that inflation in the oblast is very similar to national inflation:

	Russia	Oblast
1997	15.4	14.0
1998	38.1	38.7
1999	98.6	97.9
2000	20.8	20.4
2001	21.6	19.1
2002	16.0	14.5

These indices are based on average monthly price levels calculated using monthly inflation rates. Over the 1997-2002 period, the cumulative price indices diverge by less than 3%. Results using wages and bonuses deflated by the national CPI are therefore essentially identical to those using the oblast CPI. We use the former in what follows.

In addition, while there was a large turnover of managers in the crisis year, there are few managers who enter or leave the firm after 1998.

The fall in turnover rates after the crisis year of 1998 comes about because of a fall in separation *and* hiring rates (see Table 2). The bulk of the separations (about 80 percent) throughout the period are voluntary quits. Therefore the fall in the separation rate in the post-crisis year suggests that the financial crisis restrained many employees from quitting. The firm's employees seem to have been continuously confronted with a more limited array of outside options compared with the situation before the crisis as we now show.[7]

Table 3 that summarizes turnover in a sample of industrial firms from the city where our firm resides can tell us something about local labor market conditions in the period 1998 to 2001.[8] The turnover patterns presented in the regional sample are similar to those for the firm in the years 1998 to 2001. In particular, separation rates fall by similar percentages for all employee categories, while the fall in inflows is more pronounced for our firm than for the regional sample. If we take the turnover rate as an indicator of local labor market conditions, we can infer that outside opportunities have diminished in a substantial fashion for all employee types compared to the period before the crisis. These diminished opportunities can also be seen by the movements of the unemployment rate in the given oblast. Being substantially lower in the pre-crisis years 1995-1997 than the average rate in the Russian Federation, it shot up by roughly five percentage points between 1998 and 1999, and then showed a cumulative fall of one percentage point in the years 2000

[7] One element in an array of outside opportunities was the "suitcase trade", i.e. traveling between Russia and, e.g., China or Turkey and buying and selling certain types of goods informally. Such opportunities were severely reduced after the crisis, resulting in a dramatic fall of the number of "suitcase traders" throughout Russia (Eder, Yakovlev and Çarkoglu, 2003).

[8] We have a balanced panel of 37 firms that represent roughly 15 percent of industrial employment in this city only for these four years. The data of our firm are included in this panel as we want to estimate local labor marker turnover rates.

and 2001. While the local unemployment rate was roughly six percentage points lower than the Russian average in 1998, it was two percentage points higher in 2001. The described trends and relative magnitudes of the unemployment rate as well as the presented turnover patterns estimated from a regional sample of industrial firms demonstrate that local labor market conditions were decisively worse after the crisis year of 1998 and did not recover as rapidly as in the Russian Federation in general.[9]

Wage structure

Figure 4 plots kernel density estimates of the real wage distributions for different employee categories in 1997. It is immediately obvious that there is substantial heterogeneity in wages within employee categories. Moreover, real wage distributions for different employee categories overlap, so that many high paid production workers, for example, earned at least as much as lower paid managers. Service staff had the lowest mean wages in 1997 followed, somewhat surprisingly, by engineers, then production workers and accountants. Managers had the highest wages on average. This ranking of employee group-specific wage distributions remains unchanged throughout the observation period.

Estimates from OLS regressions of log wages in 1997, reported in Table 4, show that service staff earn on average 52 percent less than production workers, while the latter earn around 6 percent more than engineering staff. Accountants and managers earn approximately 50 and 95 percent more than production workers (see column (1)). The estimated coefficients from the augmented Mincer wage regression in column (1) also illustrate that workers with longer tenure and more education receive higher wages. Women earn significantly less than men, while marital status

[9] The sample of firms is not representative in terms of development of total employment in the region, since we have a balanced panel. However, the estimated inflow and outflow rates are indicative of falling outside opportunities after the crisis.

and the number of children do not have a significant impact on wages. The mentioned factors determine the wage structure throughout the observation period, but the size of the effects is attenuated over time.[10] For example, while employees with university degree earned about 13 percent higher wages than employees with only basic education (conditional on employee category) in 1997, their wage mark-up falls to only 11 percent in 2002. It is also striking that wage tenure profiles are much flatter in 2002 than in 1997. In addition, the conditional gender wage gap is reduced between 1997 and 2002 from 27 to 15 percent, and, with the exception of managers, wage differences between employee categories have diminished as well by 2002, an issue to which we return later.

Columns (2) to (6) show wage regressions for the different employee categories. It is noteworthy that in 1997 the conditional gender wage gap was nearly twice as large for production workers as it was for service staff and nearly three times as large in comparison with the gender gap for engineers. Female accountants, on the other hand, experienced a wage premium over their male counterparts when one controls for other factors. Column (5) also makes clear that the larger returns to higher incomplete education compared with the returns to completed higher education for all employees was entirely driven by this relationship for accountants. That accountants who started but did not finish university had higher wages on average than accountants who completed university might strike one as counterintuitive. Confronted with this result, the firm's CEO stated that newly hired university graduates specializing in financial matters received low wages as the supply of these graduates was large, while experienced accountants who had worked long in the firm and some of whom might not have finished higher studies received higher wages. We

[10] The regression results for 2002 are not presented here but available on request.

should also point out, though, that the estimation results are based on only a small number of observations for accountants. In the case of production workers, where the number of observations is large, we get the expected result that workers with secondary and secondary professional education command higher wages than those with basic professional education or less.

Real total compensation was determined by the same factors as wages. This is not surprising since wages made up the lion share of total income in all years as Table 5 shows. In the crisis year of 1998, the wage share rose to more than 90 percent of total income and then declined to slightly more than three quarters of total income in 2002. The shares of all bonus components fell in the crisis year but then more than recovered in the remaining years.

Nominal and real rigidity

An inspection of the data reveals that the firm never cuts nominal wages.[11] Real wages, however, fall markedly in the aftermath of the financial crisis in 1998. Figure 4 and Figure 5 show that real wages and real monthly compensation (measured as the sum of real monthly wages and the monthly share of all real bonus payments for the year) in the upper half of the respective distribution fell most, both in absolute and in relative terms, and recovered least in post crisis years. As a result, kernel density estimates of the wage distributions in 2002, plotted in Figure 6, are clearly to the left of the real wage distributions in 1997, for all employee categories. The real wage distributions in 2002 also appear more compressed. Exactly the same secular patterns

[11] Sources close to the firm's top management told us that the firm never contemplated to cut nominal wages since such cuts might have resulted in even higher quit rates than the ones observed before the crisis.

can be observed for the real monthly compensation distributions, i.e., between 1997 and 2002 we get a shift to the left of these distributions and their compression.[12]

Who bears the burden of the shock? Individual wage mobility

Even though average real wages fall, not all employees are affected by the crisis in the same way. This becomes evident from Figure 7, which plots the kernel density estimate of the distribution function of real wage growth between 1997 and 2002. These heterogeneous real wage growth rates cause substantial relative wage mobility inside the firm as transition rates between quintiles of the wage distribution in 1997 (the origin state) and in 2002 (the destination state), calculated for the balanced panel of those who were continuously employed during the entire period, in Table 5 reveal.[13] For example, only 35 percent of all employees who found themselves in the third quintile of the wage distribution in 1997 remain there in 2002, while 41 percent move up in the wage distribution and 24 percent move down. This pattern is observed for all employment groups, but is particularly marked for production workers.[14] The transition patterns are also very similar albeit slightly stronger for total compensation. Thus, the firm substantially realigned real wages and total compensation during the inflationary period following the financial crisis, especially for the core group of the firm, the production workers.

In order to assess whether particular characteristics systematically determine relative wage growth, we regress the growth rate of real wages between 1997 and 2002 on various individual and job characteristics. We restrict the sample to full-time employees who were continuously employed during the entire observation period.

[12] The real monthly compensation distributions are not shown here but can be provided by the authors.
[13] Some scholars studying Russian labor markets in the first half of the 1990's maintained that there was substantial relative wage mobility in the economy at large (see, e.g. Commander et al., 1995).
[14] Transition matrices showing wage and compensation dynamics for different employee categories are available from the authors on request.

Table 7 contains the regression results with three different specifications of the wage growth equation. Specification (1) estimates wage growth as a function of a cubic in tenure and age, dummies for highest educational attainment, and demographic dummies. This specification assumes that wage growth does not depend on an individual's position in the firm-level wage distribution in 1997. The tenure-wage growth profile can be characterized as follows: tenure and wage growth are inversely related up to approximately 20 years, between 21 and 30 years of tenure wage growth remains flat at roughly minus 22 percent, and wage growth then turns slightly more negative for longer-tenured employees. On this measure, the firm seemed to favor those employees who have been hired more recently. Holding other factors constant, female employees earn a substantial premium if the results of the model in column 1 are to be believed.

Specification (2) adds dummies for the employee's position in the firm-level wage distribution in 1997. This model might still be too simplistic, since it assumes that all employees were confronted with the same wage distribution in 1997. As we have seen, though, the locations and the spreads of the wage distributions for the 5 employee categories were very different in 1997. To take account of this, specification (3) adds controls for the location in the employee category-specific wage distribution and dummies for employee categories. The results of specifications (2) and (3) are similar, and we concentrate our discussion on the results of specification (3).

The impact of tenure, while somewhat attenuated, remains negative throughout the tenure distribution. Secondary professional and higher educational attainment imply higher wage growth, while female employees experience smaller wage growth than their male counterparts. The latter result, reversing the estimated

wage growth premium for female employees in specification (1), can be explained by the fact that women find themselves in 1997 in employee and wage segments that exhibit the highest growth throughout the reported period.

The coefficients on the decile dummies strongly confirm our contention that employees positioned in 1997 in the lower deciles of their respective wage distribution experienced relative gains in the reported period. Location in the lower four deciles implies stronger wage growth than for those employees who were positioned in 1997 in the median decile. These relative gains are monotonically decreasing as we go from the bottom to the 4th decile. In contrast, employees positioned in 1997 in the highest four deciles of their wage distribution are confronted with relative wage losses. Relative to production workers, service staff and engineers have wage gains over the period, while accountants and managers have wage losses albeit of a small order.

In Table 8 we remove the assumption that wage growth is equiproportionate for each quantile across all employee categories, and estimate wage growth regressions for each employee category separately.[15] The results show clear differences in the returns to the various deciles for the five employee categories. In particular, the relative returns for service staff show a much larger spread across the wage distribution than for other employee categories. In addition, production workers experience positive wage growth higher up in the wage distribution than other employees. The overall result is, however, very clear, no matter what the employee category: employees who find themselves in 1997 in the lower part of their respective

[15] Since we use balanced panels in these wage growth regressions and since accountants have a very volatile relationship with the firm over the reported period, we have a very small number of observations for this employee category. This low number is responsible for the insignificance of virtually all coefficients in column 4 of Table 8.

wage distribution experience substantially higher wage growth than those who are located in the upper part.

The estimated effect of all of these determinants on the growth of total compensation are very similar, which is not surprising given that the different bonus payments only account for a small share of total compensation.

Extraction of rents and approaching the outside option

As we have seen, local labor market opportunities seem to have fallen substantially after the crisis year of 1998. These falling outside opportunities made it possible for the top management of the firm to use inflation to erode the rents that the firm's employees enjoyed before the crisis. Table 9, shows that the large positive differences between mean wages in the firm and mean wages in the sample of industrial firms located in the same local labor market turned either negative towards the end of the period or were tremendously reduced. The convergence of average wages in the firm towards average wages in the local labor market started after 1999 when employees' rents peaked. The extraction of rents during the period of real wage adjustment was quite relentless as a comparison of the entries for 1999 and the entries for 2002 reveals. If we link these relative wage movements to the information that we provided about local labor market conditions, it seems plausible that the top management of the firm uses these local labor market conditions as an important element in its calculus regarding wage setting. This conjecture is confirmed by the CEO when asked directly about the determination of wage levels. According to him, three dimensions are relevant for wage determination: the characteristics of a worker, i.e., her/his qualification, tenure, seniority and work experience in general; labor market

conditions, in particular the wage level in the region and the wage level in the sector; and the price of the order in whose production the employee is engaged.

In sum, given our evidence on the time patterns of regional turnover, the regional unemployment rate, declining relative wage gaps and the statement by the CEO of the firm, we are confident that local labor market conditions are of paramount importance in the calculus of top management when it comes to wage setting. It is also our conjecture that in this Russian firm the causal effect runs from turnover to wages and not vice versa. This might seem counterintuitive as one would surmise that high wages would cause a fall in turnover. However, the efficiency wage models that explained the causal effect going from wages to turnover (see, e.g., Salop, 1979) are embedded in a mature capitalist economy that finds itself in a steady state. The Russian economy in the 1990s was clearly not in a steady state but in great turmoil with a tremendous amount of labor reallocation taking place. The CEO of our firm paints the following picture of this dramatic period when explaining the development of wages in the firm: "Higher than regional wages contributed to retaining and attracting highly qualified personnel after difficult crisis years in the beginning of the 1990s, when episodes of forced downsizing due to the output decline took place. Later, in 1995-1996, the firm started to receive orders, production growth began, and there was a need for qualified personnel. Since economic improvement happened all over the country, the only way to retain and attract personnel was to pay high wages. After the 1998 crisis, it was economically expedient to stabilize wages at the regional level."[16] In the final analysis market forces work in the case of our Russian firm and that in a relentless fashion.

[16] Cited from the interview of April 2007.

Inequality

A detailed analysis of the inequality trends in real wages and compensation contributes to a better understanding of the wage determination process in our firm. A comparison of the Figures 3 and 6 reveals that real wage distributions become more compressed. The difference in the median wage and wages for an employee at the 90th percentile of the distribution is reduced by slightly less than 15 percentage points during the period from 1997 to 2002. The gap between the wage of an employee at the 10th percentile of the wage distribution and the median wage narrowed by 37 percentage points from 1997 to 2002. Hence, the fall in wage inequality comes about by relative wage gains of employees in the lower part of the wage distribution. Gini coefficients reported in column (1) of Table 10 corroborate the decline in inequality of wages and total compensation for the entire workforce. The Gini coefficients in columns (2) – (6) show that wage and compensation inequality falls also within all employee categories in the aftermath of the financial crisis. However, this process of wage and compensation compression is not monotonic for all employee categories. For example, inequality fell to very low levels for service staff and managers in 2001, but rises again thereafter.

The Gini coefficient can be written as G= (2/μ)cov(y,F(y)), where y is income, F(y) is the distribution function of y and μ is mean income (see, e.g., Lambert, 2001). A simple algebraic manipulation then arrives at the decomposition of G into its components by income source:

$$G = \sum_k R_k G_k S_k \qquad (1),$$

where R_k is the rank correlation of income source k with the distribution of total income, G_k is the Gini of income source k and S_k is the share of component k in total

income.[17] The decomposition of the Gini coefficient by income source is particularly interesting in our context to establish the contribution of the various components to inequality. The k-th component of equation (1) divided by G, i.e., $\frac{R_k G_k S_k}{G}$, gives us the share of income source k in total inequality. Dividing this expression by S_k shows the inequality component as a fraction of its income share. Finally, $\frac{R_k G_k S_k}{G} - S_k$ approximates the impact of a 1 percent change of income source k on overall inequality. This latter measure can also be understood as income source k's marginal effect relative to the overall Gini (see Lerman and Yitzaki, 1985).

The upper panel of Table 11 presents the Gini coefficients for the different compensation components. Inequality in wages and in the extra bonus gradually falls with the exception that inequality in the extra bonus was zero in the crisis year 1998 since no extra bonus was paid at all. The other two bonus types show a more erratic behavior. The compression in total compensation is less pronounced than the compression in wages, not least because the Gini coefficients of bonuses were far higher than the Gini coefficients of wages (see top panel of Table 11). Despite this large difference between the Gini coefficients of bonus payments and the Gini coefficient of wages, bonuses contributed little to overall inequality for two reasons. First, their shares were small relative to the share of wages (see Table 5). Second, the rank correlations of all bonus payments with the distribution of total income were far weaker than the nearly perfect rank correlation of wages (see bottom panel of

[17] This decomposition is due to Lerman and Yitzaki (1985) who show that
$G = (2/\mu)\sum_{k=1}^{K} \text{cov}(y_k, F) = \sum_{k=1}^{K} [\text{cov}(y_k, F)/\text{cov}(y_k, F_k)][2\,\text{cov}(y_k, F_k)/\mu_k][\mu_k/\mu]$.

Table 11).[18] Wages contributed slightly less to overall inequality than their share in total income, as Table 12 demonstrates, and therefore had a (hypothetical) attenuating impact on overall inequality in all years as the bottom panel of Table 13 reveals. Monthly bonus payments, in contrast, "aggravated" overall inequality in all years apart from 1999.

Alternative measures of inequality such as general entropy indices confirm the findings concerning the larger compression of wages and total compensation in the upper parts of their distributions. The general entropy index, which is given by

$$GEI(\alpha) = \left[\frac{1}{N\alpha(\alpha-1)}\right]\sum_i\left[\left(\frac{x_i}{\mu}\right)^{\alpha} - 1\right] \qquad (2),$$

where N is the number of observational units, x_i is the level of earnings of the i-th observational unit, and μ is mean earnings, allows us to assess whether the change in inequality is mostly driven by changes at the bottom or by changes at the top of the distribution, by varying the parameter α. The index is more sensitive to changes at the top of the distribution the larger is α.[19] Since the fall in the general entropy index for a parameter value of -1 is more pronounced than for a value of 1, we conclude that the relative gains at the bottom of the wage and the compensation distributions are the more important driving factors of the fall in overall inequality. If we give more weight to wages in the lower part of the distribution, our measure of overall wage inequality, GEI(-1) indicates that inequality fell by 62 percent between 1997 and 2002. If, on the other hand, the index is more sensitive to wages in the upper part of the distribution

[18] One might find it puzzling that the Gini of total compensation is very close to the Gini of wages given these far higher Gini coefficients for bonus payments. For example in 1997 the Gini of total compensation amounts to 0.2928 while the Gini of wages is 0.2802. A simple back of the envelope calculation, using equation (1), brings home the point that the large G_k 's of the bonus components are wiped out by their small S_k's and R_k's.

[19] GEI(α) encompasses several well known inequality measures: for example, GEI(0) corresponds to the mean log deviation, GEI(1) to the Theil index and GEI(2) to one half of the square of the coefficient of variation. We use a modified version of the Stata module "descogini" by Alejandro Lopez-Feldman for our calculations. See Feldman (2005).

then measured overall wage inequality fell by "only" 44 percent (see columns (1) and (4) of panel a of Table 13). Falling inequality is mostly driven by compression within the lower part of the wage distribution in all employee categories except for managers.[20]

The general entropy index can also be additively decomposed into the "within" and "between" parts of inequality. This decomposition reveals that inequality within employee categories dominate overall wage inequality in 1997, while in 2002 within and between group inequality are of roughly equal magnitude (see columns (2) and (3) as well as columns (5) and (6) of top panel of Table 14). The *GEI(-1)* and *GEI(1)* measures indicate that within-inequality fell, respectively, by 69 and 60 percent and that between-inequality was reduced by 37 and 1 percent respectively. Most of the compression in the overall wage distribution between 1997 and 2002 occurred because there was tremendous compression of wages within employee categories. These patterns also hold for inequality of total compensation as the statistics in the bottom panel of Table 13 demonstrate. We take these patterns as additional evidence that local labor market conditions strongly impact on the setting of wages in our firm.

5. Conclusions

Having a rich personnel data set of one Russian firm for the years 1997 to 2002 at our disposal, we can trace out the evolution of wages, total compensation and employment in a period that included an episode of high inflation during and in the aftermath of the financial crisis of 1998. The observed evolution points to "price"

[20] For example, wage inequality for service staff and production workers fell by 70 percent and 58 percent if we take GEI(-1), but only by 60 percent and 41 percent respectively if we use GEI(1) to calculate percentage changes in inequality. For managers, on the other hand, these percentage changes amount to 64 and 68 percent. Detailed results are available from the authors upon request.

rather than "quantity" adjustment within the firm during the crisis as employment remained stable but real wages and real compensation fell substantially. Our evidence thus shows that the firm did not refrain from substantially cutting real wages, taking advantage of a high-inflation environment.

The downward adjustment of earnings led to persistent welfare losses among employees since real wages and real compensation levels had not recovered to pre-crisis levels by 2002, even though the firm's financial situation was then better than before the crisis. The firm, which was a high-wage firm prior to 1998, made use of the high inflation that manifested itself during and in the aftermath of the financial crisis in order to extract rents from employees. These welfare losses were, however, not spread evenly across all employees, since the firm curbed earnings most for those who earned the highest rents, resulting in a tremendous compression of real wages. Wage growth regressions spanning the years 1997 to 2002 show disproportionate wage growth for those employees located in the lowest four deciles of the wage distribution in 1997, while employees positioned in the highest four deciles were confronted with relative wage losses. Relative to production workers, service staff and engineers saw wage gains over the period, while accountants and managers had small wage losses.

The firm was in a position to extract rents from its employees because of a fall in outside opportunities in the local labor market as evidenced by dramatically falling separation rates after 1999. At the bottom end of the firm's wage distribution there are, however, smaller rents before the crisis and the firm seems to pay wages closer to the opportunity cost for employees at that end of the distribution throughout the reported period.

Our analysis provides strong evidence for the hypothesis that top managers take local labor market conditions into account when deciding on wage levels. In

times of very high labor turnover they are willing to pay higher than average real wages to attract and retain skilled workers. On the other hand, being reluctant to cut nominal wages, they relentlessly cut real wages when market conditions make this possible. All in all, our evidence clearly shows that market forces strongly influence the wage policies of our firm and that considerations for a stable internal labor market are of less concern.

References

Boeri, Tito and Katherine Terrell (2002), "Institutional determinants of labor reallocation in transition", *Journal of Economic Perspectives*, 16(1), 51-76.

Brainerd, Elizabeth (2002), "Five Years After: The Impact of Mass Privatization on Wages in Russia, 1993-1998." *Journal of Comparative Economics*, 30 (1), 160-190.

Clarke, Simon (2002), "Market and Institutional Determinants of Wage Differentiation in Russia." *Industrial Labor Relations Review*, 55 (4), 628-648.

Commander, Simon, McHale, John, and Yemtsov, Ruslan (1995), "Unemployment, Restructuring, and the Labor Market in Eastern Europe and Russia: Russia." In Simon Commander and Fabrizio Coricelli, Eds., *Unemployment, Restructuring, and the Labor Market in Eastern Europe and Russia,* Washington, DC: EDI/World Bank, 147-191.

Commander, Simon, Dhar, Sumana, and Yemtsov, Ruslan (1995), "How Russian Firms Make Their Employment Decisions." In Simon Commander, Qimiao Fan and Mark E. Schaffer, Eds., Enterprise Restructuring and Economic Policy in Russia., Washington, DC: EDI/World Bank, 52-83.

Doeringer, Peter B. and Michael J. Piore (1971), *Internal Labor Markets and Manpower Analysis,* Heath Lexington Books, Lexington, MA.

Dunlop, John T. (1957), "The Task of Contemporary Wage Theory." In George W. Taylor and Frank C. Pierson, Eds., New Concepts in Wage Determination, New York: McGraw Hill, 117-139.

Eder, M., Yakovlev, A. and A. Çarkoglu, (2003), "The suitcase trade between Turkey and Russia: microeconomics and institutional structure", Working Paper WP4/2003/07, Higher School of Economics, Moscow.

Kapeliushnikov, Rostislaw, (2002), *Rossiiski Rynok Truda: Adaptatsia bez Restrukturizatsii*, Moscow.

Lambert, Peter, J. (2001), *The Distribution and Redistribution of Income*, Manchester University Press, Manchester and New York.

Lehmann, Hartmut, Jonathan Wadsworth and Alessandro Acquisti (1999), "Grime and Punishment: Job Insecurity and Wage Arrears in the Russian Federation." *Journal of Comparative Economics*, 1999, 27(4), 595-617.

Lerman, Robert I. and Shlomo Yitzaki (1985), "Income Inequality Effects by Income Source: A New Approach and Applications to the United States." In The Review of Economics and Statistics, 67 (1), 151-156.

Lopez-Feldman, Alejandro (2005), "DESCOGINI: Stata module to perform Gini decomposition by income source". http://ideas.repec.org/c/boc/bocode/s456001.html

Luke, Peter and Mark E. Schaffer (2000), "Wage Determination in Russia: An Econometric Investigation.", IZA Discussion Paper 143, Bonn.

Salop, Steven C. (1979), "A Model of the Natural Rate of Unemployment." *American Economic Review*, 69 (1), 117-125.

FIGURES

Figure 1

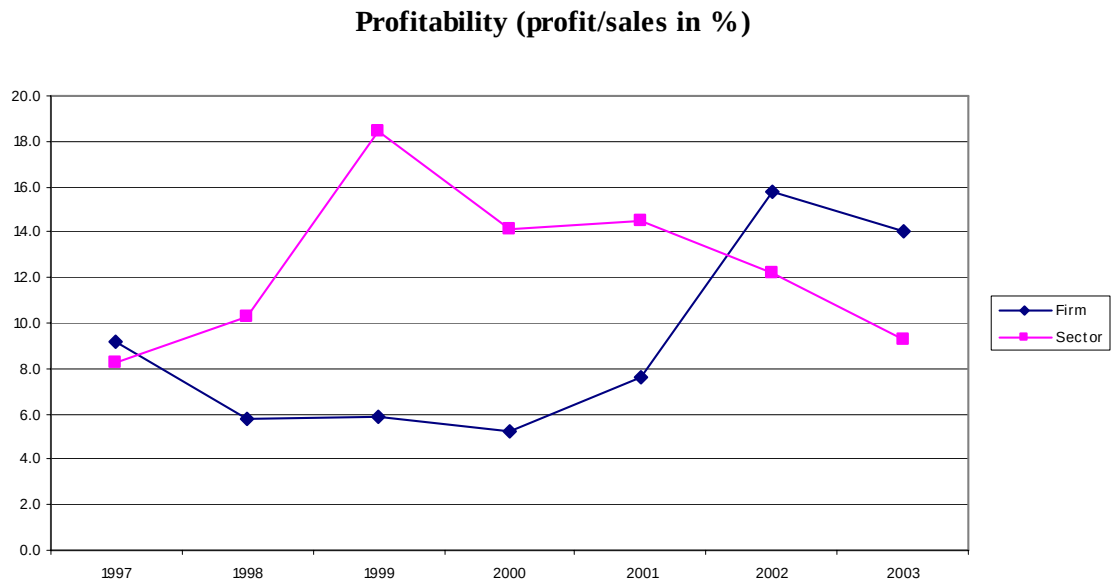

Figure 2

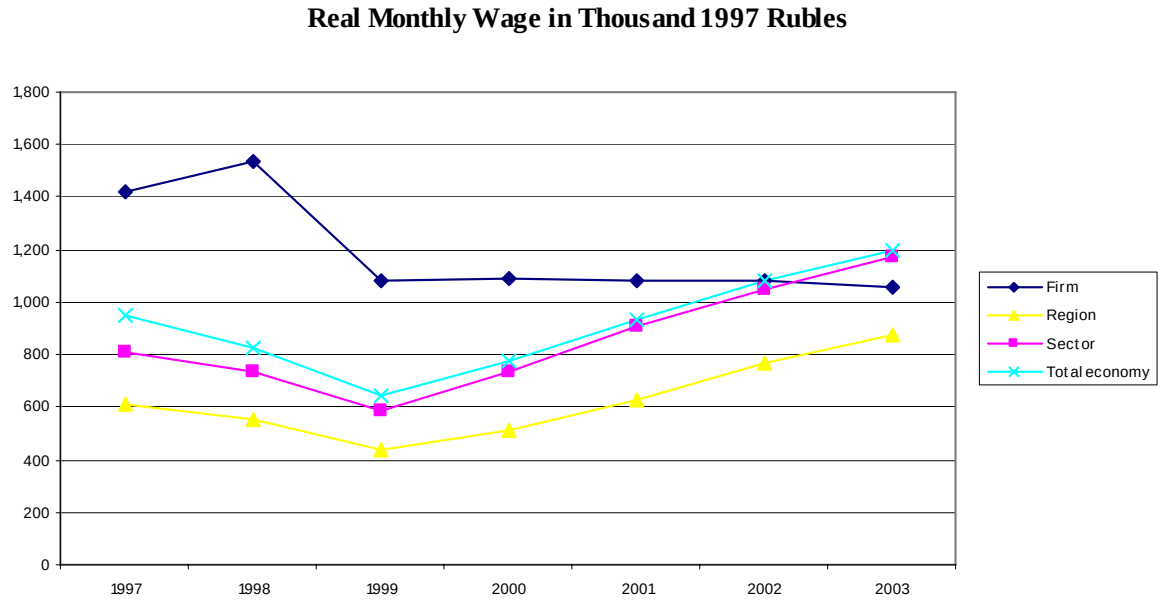

Figure 3

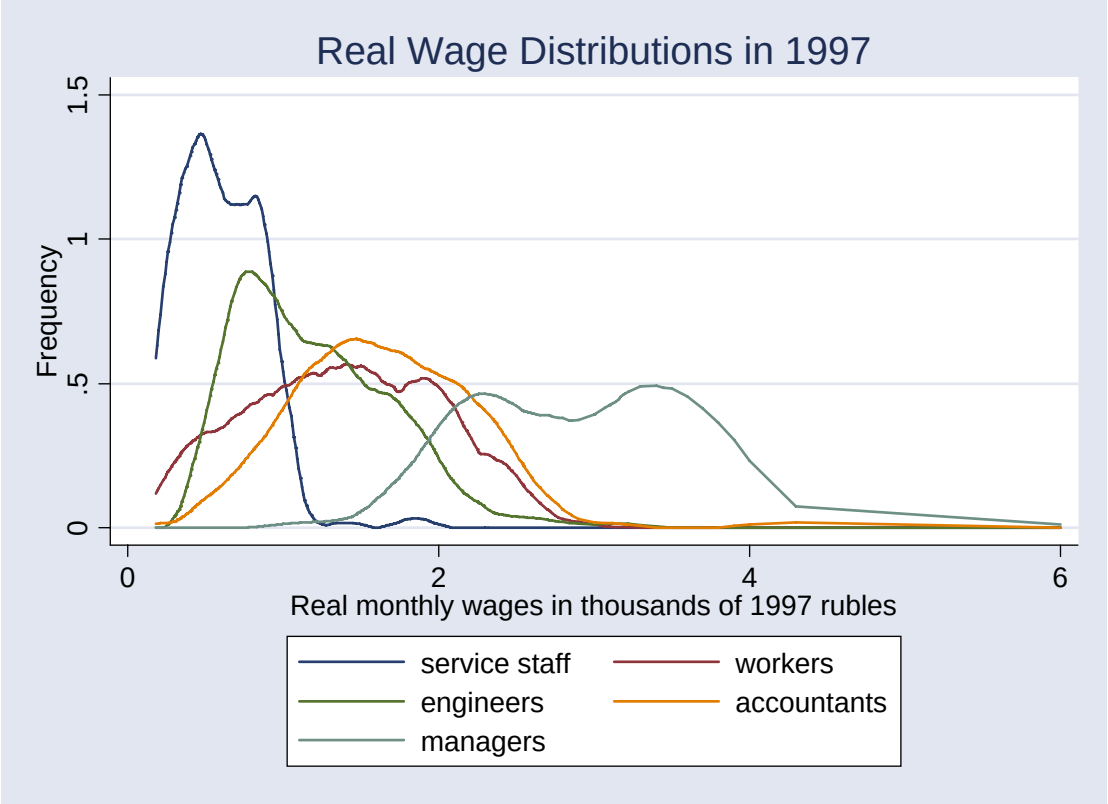

Figure 4 Distribution of basic real wage in rubles - all employees

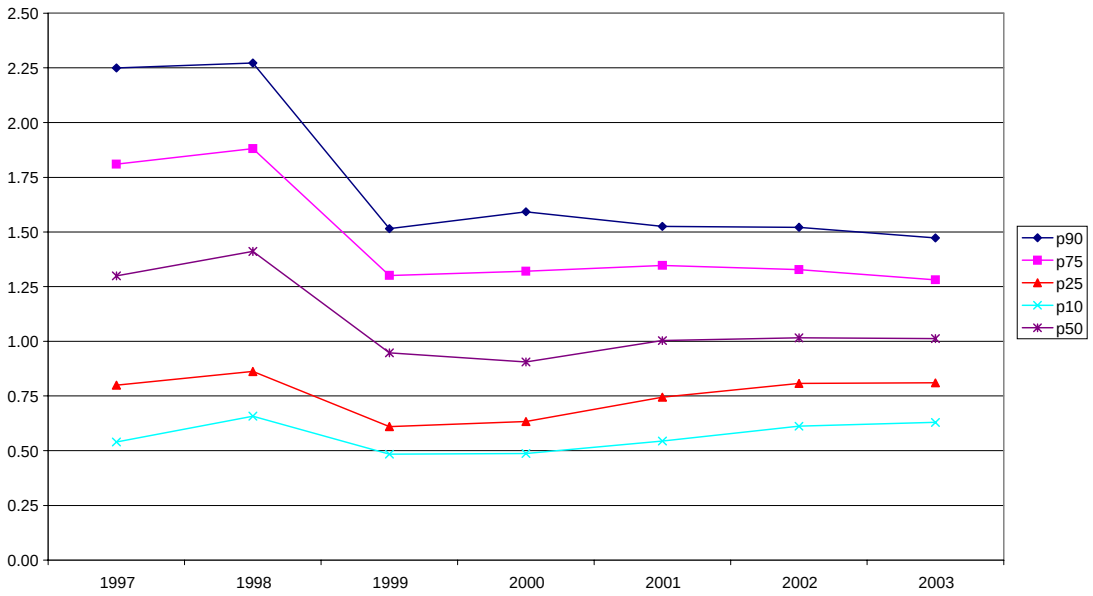

Figure 5 Distribution of total real compensation in rubles - all employees

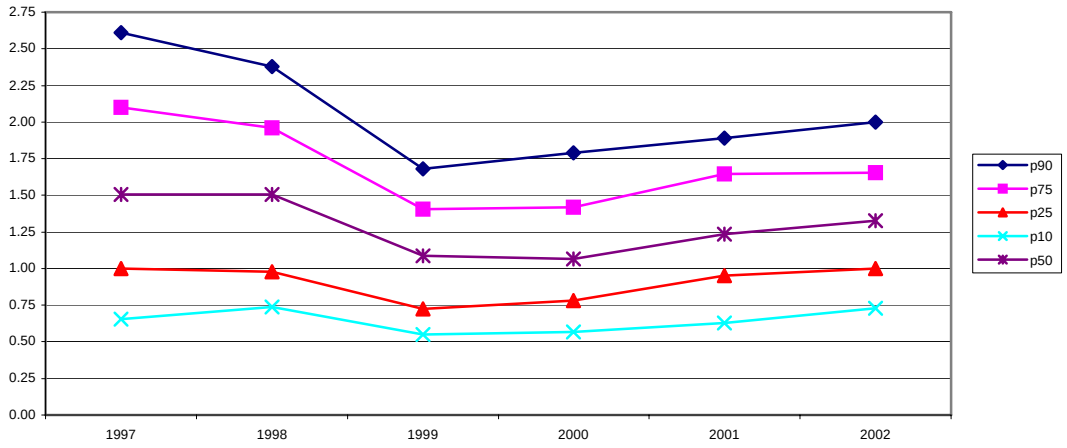

Figure 6

Real Wage Distributions in 2002
Frequency
0
1
2
3
4
0
2
4
6
Real monthly wages in thousands of 1997 rubles
service staff
workers
engineers
accountants
managers

Figure 7

Real wage growth, 1997-2002
Frequency
0
.5
1
1.5
-2
-1
0
1
2
Real wage growth, 1997-2002

TABLES

Table 1: Composition of Workforce (in %), 1997 to 2002

Year	Service staff	Engineers	Production workers	Accountants	Managers	Total	Absolute number of employees
1997	7.1	24.8	62.1	2.2	3.8	100	3032
1998	7.0	24.4	62.6	2.1	3.8	100	3081
1999	6.9	24.6	62.6	2.1	3.8	100	3077
2000	7.0	24.4	62.8	2.1	3.8	100	3110
2001	6.9	24.0	63.2	2.0	3.8	100	3175
2002	6.9	23.7	63.6	1.9	3.8	100	3221

Table 2: Hiring and Separation Rates (in %), 1997-2002

	Service staff			Engineers			Production workers			Accountants			Managers			All Employment		
Year	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
1997	13.7	14.2	27.8	7.8	7.8	15.5	16.4	15.2	31.5	19.1	23.5	42.6	10.8	9.9	20.7	13.9	13.2	27.1
1998	13.3	13.3	26.5	6.3	5.8	12.1	18.0	16.1	34.1	20.0	23.1	43.1	16.1	13.4	29.5	14.7	13.5	28.2
1999	7.6	5.7	13.3	5.3	4.9	10.3	11.8	11.8	23.7	11.1	14.3	25.4	4.3	4.3	8.7	9.6	9.5	19.1
2000	9.3	7.4	16.7	6.4	5.7	12.1	10.7	7.6	18.3	8.2	0.0	8.2	3.5	0.0	3.5	9.2	6.7	15.9
2001	7.8	6.8	14.6	5.7	5.1	10.8	11.5	7.4	19.0	13.6	19.7	33.3	5.0	1.7	6.7	9.6	6.5	16.2
2002	5.4	3.6	9.0	2.9	3.0	5.9	8.7	7.8	16.5	8.1	9.7	17.7	0.0	0.0	0.0	6.7	6.1	12.8

Table 3: Hiring and Separation and Turnover Rates (in %) in sample of industrial firms in the region - 1998-2001

	Service staff			Engineers			Production workers			Accountants			Managers			All Employment		
Year	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
1998	9.2	21.6	30.8	10.8	13.0	23.8	11.3	12.8	24.1	3.1	4.4	7.5	2.1	5.4	7.5	10.9	12.6	23.5
1999	13.2	15.5	28.7	8.6	7.5	16.1	13.1	13.1	26.2	4.1	3.9	8.0	3.6	4.2	7.6	11.5	11.2	22.7
2000	10.1	13.4	23.5	8.3	9.3	17.6	13.1	10.1	23.2	4.7	4.5	9.2	2.6	0.1	2.7	11.2	9.8	21.0
2001	7.2	10.1	17.3	9.1	5.3	14.4	10.9	8.2	19.1	1.8	1.2	3.0	1.7	1.4	3.1	10.2	7.5	17.7

Table 4: Determinants of wages, 1997

	Dependent Variable: log(real wage) in 1997					
	All employees	Service staff	Engineers	Production workers	Accountants	Managers
	(1)	(2)	(3)	(4)	(5)	(6)
Tenure in years	0.028***	0.020	0.026*	0.030***	0.027	0.007
	[0.007]	[0.028]	[0.014]	[0.010]	[0.041]	[0.026]
Tenure squared/100 in years	-0.136**	-0.269	-0.188	-0.119	-0.471	0.021
	[0.067]	[0.251]	[0.134]	[0.089]	[0.481]	[0.237]
Tenure cube /1000 in years	0.025	0.083	0.04	0.014	0.171	-0.007
	[0.016]	[0.055]	[0.033]	[0.021]	[0.152]	[0.058]
Age in years	0.034	0.013	0.012	-0.005	-0.479	-0.588
	[0.038]	[0.176]	[0.074]	[0.049]	[0.290]	[0.424]
Age squared/100 in years	-0.033	-0.009	-0.001	0.08	1.579*	1.541
	[0.103]	[0.469]	[0.198]	[0.133]	[0.819]	[1.059]
Age cube /1000 in years	-0.001	-0.001	-0.002	-0.01	-0.162**	-0.131
	[0.009]	[0.041]	[0.017]	[0.012]	[0.075]	[0.087]
Basic professional	0.037	0.014		0.036		
	[0.029]	[0.087]		[0.033]		
Secondary general	0.079***	-0.027		0.076**		
	[0.028]	[0.089]		[0.032]		
Secondary professional	0.097***	0.028	-0.123	0.100***	0.615	
	[0.030]	[0.104]	[0.277]	[0.036]	[0.390]	
Higher incomplete	0.164**	-0.088	-0.065	0.180	1.406**	0.035
	[0.069]	[0.469]	[0.284]	[0.114]	[0.559]	[0.167]
Higher	0.122***	0.187	-0.073	0.110	0.977**	-0.042
	[0.038]	[0.273]	[0.277]	[0.069]	[0.396]	[0.053]
1 if female	-0.319***	-0.236***	-0.155***	-0.428***	0.584**	-0.044
	[0.019]	[0.071]	[0.030]	[0.027]	[0.284]	[0.060]
1 if single	0.021	0.476	-0.038	0.074	0.109	
	[0.070]	[0.467]	[0.167]	[0.093]	[0.236]	
1 if divorced or widowed	-0.009	0.014	-0.081	-0.005	0.004	-0.056
	[0.035]	[0.093]	[0.074]	[0.050]	[0.132]	[0.071]
1 if 1 child	-0.011	0.434	-0.064	0.035	0.078	0.418
	[0.053]	[0.507]	[0.086]	[0.071]	[0.207]	[0.253]
1 if more than 1 child	0.042	0.487	-0.055	0.080	0.052	0.444*
	[0.057]	[0.498]	[0.096]	[0.076]	[0.236]	[0.254]
Service staff	-0.731***					
	[0.034]					
Engineers	-0.064**					
	[0.030]					
Accountants	0.401***					
	[0.060]					
Managers	0.662***					
	[0.051]					
Constant	-0.622	-1.281	-0.015	-0.252	3.422	7.886
	[0.456]	[2.150]	[0.924]	[0.583]	[3.383]	[5.539]
Observations	3040	213	790	1838	76	123
R-squared	0.35	0.1	0.06	0.24	0.49	0.16

OLS Estimates. Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5: Shares of Monthly Compensation Components

Year	Monthly Wage	Monthly Bonus	Extra Bonus	Other Bonus
1997	0.830	0.080	0.051	0.039
1998	0.916	0.059	0.000	0.025
1999	0.870	0.066	0.043	0.021
2000	0.854	0.066	0.042	0.038
2001	0.797	0.081	0.098	0.025
2002	0.776	0.095	0.088	0.041

Table 6

Transition probabilities between quintiles of real wages in 1997 and 2002 (in %); all continuous employees

		Quintile in real wage distribution (2002)					
		1	2	3	4	5	N (1997)
Quintile in real wage distribution (1997)	1	**57.89**	*30.47*	*8.59*	*1.39*	*1.66*	361
	2	28.5	**34.35**	*25*	*10.28*	*1.87*	428
	3	4.81	19.24	**34.87**	*35.27*	*5.81*	499
	4	0.73	5.13	12.96	**49.39**	*31.78*	409
	5	0	0.49	4.62	22.38	**72.51**	411

Table 7: Real wage growth 1997-2002

	(1)	(2)	(3)
Tenure in years	-0.038***	-0.029***	-0.020**
	[0.013]	[0.009]	[0.009]
Tenure squared/100 in years	0.160**	0.155***	0.101**
	[0.077]	[0.053]	[0.052]
Tenure cube /1000 in years	-0.022*	-0.022**	-0.013
	[0.013]	[0.009]	[0.009]
Age in years	0.04	-0.001	-0.016
	[0.052]	[0.036]	[0.034]
Age squared/100 in years	-0.119	-0.005	0.039
	[0.124]	[0.086]	[0.081]
Age cube /1000 in years	0.011	0.000	-0.003
	[0.010]	[0.007]	[0.006]
Basic professional	0.000	-0.008	0.000
	[0.028]	[0.019]	[0.019]
Secondary general	-0.012	0.024	0.016
	[0.024]	[0.017]	[0.016]
Secondary professional	0.032	0.097***	0.037**
	[0.023]	[0.016]	[0.019]
Higher incomplete	0.056	0.144***	0.066*
	[0.057]	[0.039]	[0.040]
Higher	0.023	0.131***	0.047**
	[0.024]	[0.017]	[0.022]
1 if female	0.087***	-0.035***	-0.050***
	[0.016]	[0.012]	[0.012]
1 if single	-0.061	-0.045	-0.057
	[0.080]	[0.055]	[0.053]
1 if divorced or widowed	-0.015	-0.043**	-0.044**
	[0.027]	[0.019]	[0.018]
1 if 1 child	0.098	0.056	0.045
	[0.062]	[0.043]	[0.041]
1 if more than 1 child	0.063	0.059	0.047
	[0.064]	[0.044]	[0.042]
Position in firm-level wage distribution:			
1st decile		0.563***	
		[0.022]	
2nd decile		0.218***	
		[0.024]	
3rd decile		0.119***	
		[0.023]	
4th decile		0.033	
		[0.023]	
6th decile		-0.098***	
		[0.022]	
7th decile		-0.090***	
		[0.023]	
8th decile		-0.184***	
		[0.024]	
9th decile		-0.195***	
		[0.023]	
10th decile		-0.304***	

			[0.024]
Position in employee category specific wage distribution:			
1st decile			0.559***
			[0.021]
2nd decile			0.251***
			[0.020]
3rd decile			0.183***
			[0.022]
4th decile			0.134***
			[0.020]
6th decile			0.01
			[0.022]
7th decile			-0.088***
			[0.021]
8th decile			-0.193***
			[0.022]
9th decile			-0.154***
			[0.020]
10th decile			-0.291***
			[0.021]
Service staff			0.286***
			[0.018]
Engineers			0.151***
			[0.018]
Accountants			-0.078**
			[0.039]
Managers			-0.089***
			[0.028]
Constant	-0.425	-0.056	0.015
	[0.699]	[0.482]	[0.459]
Observations	1824	1824	1824
R-squared	0.07	0.56	0.61

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 8: Real wage growth 1997-2002 by employee category

	Service staff	Engineers	Production workers	Accountants	Managers
	(1)	(2)	(3)	(4)	(5)
Tenure in years	-0.143**	0.013	-0.027**	-0.239	-0.025
	[0.069]	[0.011]	[0.013]	[0.157]	[0.024]
Tenure squared/100 in years	0.982*	-0.082	0.141*	1.683	0.093
	[0.553]	[0.066]	[0.075]	[1.089]	[0.142]
Tenure cube /1000 in years	-0.209	0.015	-0.019	-0.335	-0.008
	[0.134]	[0.012]	[0.013]	[0.231]	[0.025]
Age in years	-0.234	-0.02	0.046	-0.532	0.914*
	[0.148]	[0.033]	[0.055]	[1.170]	[0.468]
Age squared/100 in years	0.55	0.042	-0.103	1.08	-1.978*
	[0.348]	[0.076]	[0.132]	[2.834]	[1.029]
Age cube /1000 in years	-0.042	-0.003	0.007	-0.071	0.141*
	[0.027]	[0.006]	[0.010]	[0.225]	[0.075]
Basic professional	0.058	-0.460***	-0.018		
	[0.050]	[0.146]	[0.023]		
Secondary general	0.004		-0.001		
	[0.052]		[0.019]		
Secondary professional	0.057	-0.012	0.028	0.172	-0.066
	[0.063]	[0.026]	[0.024]	[0.447]	[0.068]
Higher incomplete	-0.029		0.053	-0.011	
	[0.235]		[0.103]	[0.813]	
Higher	0.125	-0.005	-0.039	0.337	-0.025
	[0.163]	[0.026]	[0.047]	[0.483]	[0.068]
1 if female	-0.036	0.006	-0.111***	-0.29	-0.015
	[0.041]	[0.011]	[0.021]	[0.427]	[0.028]
1 if single	-0.247	0.031	0.139		
	[0.230]	[0.075]	[0.087]		
1 if divorced or widowed	-0.101*	-0.016	-0.025	-0.441**	0.002
	[0.056]	[0.029]	[0.026]	[0.192]	[0.028]
1 if 1 child	-0.066	-0.028	0.232***	0.067	-0.013
	[0.051]	[0.035]	[0.073]	[0.166]	[0.020]
1 if more than 1 child		-0.012	0.219***		
		[0.039]	[0.074]		
Position in employee category specific wage distribution:					
1st decile	0.617***	0.403***	0.674***	0.466	0.419***
	[0.085]	[0.022]	[0.032]	[0.294]	[0.041]
2nd decile	0.287***	0.213***	0.270***	0.264	0.278***
	[0.080]	[0.022]	[0.029]	[0.275]	[0.047]
3rd decile	-0.037	0.161***	0.202***	-0.003	0.254***
	[0.082]	[0.022]	[0.034]	[0.363]	[0.043]
4th decile	0.259***	0.085***	0.137***	0.052	0.103**
	[0.088]	[0.022]	[0.030]	[0.286]	[0.043]
6th decile	-0.083	-0.087***	0.086**	0.107	-0.147***
	[0.083]	[0.023]	[0.035]	[0.310]	[0.045]
7th decile	-0.314***	-0.140***	-0.033	-0.175	-0.116***
	[0.084]	[0.022]	[0.031]	[0.262]	[0.043]
8th decile	-0.550***	-0.186***	-0.162***	-0.043	-0.123***
	[0.085]	[0.023]	[0.034]	[0.344]	[0.039]
9th decile	-0.621***	-0.189***	-0.086***	0.042	-0.158***
	[0.084]	[0.022]	[0.030]	[0.274]	[0.050]
10th decile	-0.761***	-0.287***	-0.241***	-0.096	-0.268***
	[0.084]	[0.023]	[0.032]	[0.295]	[0.044]
Constant	4.054*	0.224	-1.018	8.929	-14.044**
	[2.070]	[0.438]	[0.733]	[16.054]	[7.005]
Observations	151	611	934	36	92
R-squared	0.83	0.75	0.53	0.69	0.9

Standard errors in brackets

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 9

Differences between average wages in firm and average wages in sample of industrial firms in the region in 1997 rubles: 1998-2002

Year	Service workers	Engineers	Workers	Accountants	Managers
1998	100	133	379	792	1468
1999	346	391	803	805	1898
2000	123	-28	261	223	1056
2001	81	-82	195	279	805
2002	-61	-24	119	150	551

Table 10

Evolution of earnings inequality measured by Gini coefficients

	(1)	(2)	(3)	(4)	(5)	(6)
			Panel a: Wages			
Year	Entire workforce	Service staff	Engineers	Workers	Accountants	Managers
1997	0.2801	0.2474	0.2294	0.2507	0.1912	0.1367
1998	0.251	0.1484	0.2239	0.2003	0.1417	0.1082
1999	0.2453	0.0853	0.1954	0.1854	0.1267	0.1202
2000	0.2456	0.0649	0.1786	0.1945	0.1705	0.072
2001	0.2189	0.055	0.1679	0.1792	0.1583	0.0438
2002	0.1995	0.1618	0.1437	0.1725	0.1409	0.0482
			Panel b: Total compensation			
Year	Entire workforce	Service staff	Engineers	Workers	Accountants	Managers
1997	0.2928	0.2416	0.2293	0.2456	0.1903	0.1488
1998	0.2547	0.1474	0.2248	0.2015	0.1423	0.1077
1999	0.2444	0.0855	0.1964	0.1823	0.131	0.1202
2000	0.2464	0.0669	0.1792	0.1972	0.1787	0.073
2001	0.2271	0.0684	0.1681	0.1778	0.1696	0.0447
2002	0.2211	0.162	0.1455	0.1845	0.1454	0.0484

Table 11
Gini decomposition by income source

Year	Monthly Wage	Monthly Bonus	Extra Bonus	Other Bonus
		Gini by income source		
1997	0.2802	0.8069	0.63	0.725
1998	0.251	0.7933	-	0.7027
1999	0.2453	0.7846	0.5467	0.7788
2000	0.2457	0.7759	0.5488	0.7271
2001	0.219	0.7658	0.352	0.7367
2002	0.1996	0.758	0.2724	0.7209
		Gini correlation of income source with distribution of total income		
1997	0.9752	0.6052	0.5787	0.2968
1998	0.9893	0.4063	-	0.4621
1999	0.9895	0.2838	0.5298	0.371
2000	0.9775	0.3499	0.3805	0.5315
2001	0.9711	0.5007	0.6761	0.192
2002	0.9586	0.5955	0.8062	0.3527

Table 12
Contributions of source incomes on inequality

Year	Monthly Wage	Monthly Bonus	Extra Bonus	Other Bonus
		Share of source income in total inequality		
1997	0.7749	0.1333	0.063	0.0288
1998	0.8929	0.0756	-	0.0315
1999	0.8643	0.06	0.0513	0.0245
2000	0.8324	0.0731	0.0354	0.0591
2001	0.7462	0.1364	0.1021	0.0153
2002	0.6707	0.1947	0.0875	0.047
		Inequality components as a fraction of income shares		
1997	0.9333	1.6677	1.2451	0.7349
1998	0.9748	1.2748	-	1.275
1999	0.9932	0.911	1.185	1.1823
2000	0.9745	1.1016	0.8473	1.5682
2001	0.936	1.6878	1.0476	0.6227
2002	0.8649	2.041	0.9928	1.1495
		Impact of 1% change in income source on inequality		
1997	-0.0554	0.0534	0.0124	-0.0104
1998	-0.0231	0.0163	-	0.0068
1999	-0.0059	-0.0059	0.008	0.0038
2000	-0.0218	0.0067	-0.0064	0.0214
2001	-0.051	0.0556	0.0046	-0.0093
2002	-0.1048	0.0993	-0.0006	0.0061

Table 13

General Entropy Index (GEI) and its decomposition into within and between parts

	(1)	(2)	(3)	(4)	(5)	(6)
			Panel a: Wages			
Year		GEI(-1)			GEI(+1)	
	Total	Within	Between	Total	Within	Between
1997	0.1904	0.1515	0.0389	0.1263	0.0914	0.0348
1998	0.1379	0.097	0.0409	0.1001	0.0637	0.0363
1999	0.1151	0.07	0.0451	0.0958	0.0538	0.042
2000	0.1082	0.0626	0.0456	0.0938	0.0539	0.0399
2001	0.095	0.0528	0.0421	0.076	0.0444	0.0315
2002	0.0762	0.0544	0.0217	0.0645	0.0399	0.0245
			Panel b: Total compensation			
Year		GEI(-1)			GEI(+1)	
	Total	Within	Between	Total	Within	Between
1997	0.195	0.1453	0.0497	0.1446	0.086	0.0348
1998	0.1379	0.0976	0.0402	0.1061	0.0636	0.0363
1999	0.1144	0.0688	0.0456	0.0991	0.0525	0.042
2000	0.1086	0.0651	0.0434	0.0987	0.0546	0.0399
2001	0.1017	0.0554	0.0462	0.0853	0.0435	0.0315
2002	0.0941	0.0636	0.0304	0.0826	0.0433	0.0245