

The Wage Arrears Crisis in Russia

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Abstract

In this paper, we propose an analytical framework suggesting that wage nonpayment in the Russian state sector and privatized factories, which resulted from acute cash flow problems in both, reflected an implicit contract among the government, managers and labor against worker layoff.

We analyze the impact of wage nonpayment on workers grouped by demographic features, occupation and job location on the basis of a panel data set covering the years 1994 to 1996. Based on a multivariate specification that incorporates these features, we find that the frequency and amount of wage withholding increased sharply in 1996. While wages were denied less frequently and in lower amounts to low paid workers by age, occupation and location, this pattern (for which we find a correlation between the frequency of wage nonpayment and wage level at the regional level), needs to be confirmed with further statistical tests.

While the practice of wage nonpayment tended to push families into poverty and increase their expectation of living in poverty in the immediate future, it also raised the likelihood of workers holding additional jobs and undertaking informal paid activity. At the same time, the frequency and magnitude of barter payments to workers in our sample were not sufficient to exercise a significant effect in mitigating the adverse effects of wage arrears.

The Wage Arrears Crisis in Russia

Introduction

The failure of Russian institutions to fully pay their employees had become a crisis by 1996 creating serious difficulties for the continuing prospects of Russia's market economy reforms.¹ According to official estimates, outstanding wage arrears increased substantially throughout 1996, rising from 22,114 billion rubles at the end of the first quarter (constituting 71 percent of the monthly wage bill) to 38,712 billion rubles at the end of the fourth quarter (at 114 percent of the monthly wage bill).² Averaged over employees who were actually owed wages, the stock of outstanding unpaid wages amounted to approximately 275 percent of one month's wages (*RET*, 1997.1, p.71).

How does the situation in 1996 compare to the earlier years of the transition? Comparison of total wage arrears in 1996 to earlier years is problematic because sectors for which wage arrears are reported are not comparable: only medium and large-sized enterprises in industry, construction, and agriculture reported data on wage arrears from 1992-94; the transportation sector was added in 1995; in 1996, four noncommercial sectors were added -- health care, education, culture, and science. We can however assess changes since 1992 by looking at the three continually covered sectors. In the table below, the constant dollar value of

¹Institutional failure to pay employees is but one component of a wider nonpayment crisis that includes tax and inter-enterprise arrears. Clearly, the various elements of the Russian nonpayments crisis are interrelated, i.e inter-enterprise arrears contribute to enterprises failing to fully pay their workers on time due to the resulting liquidity constraints; tax arrears similarly lead to wage arrears indirectly as the government fails to fully pay suppliers on time, and directly as it fails to pay employees in the "budget sector" (sectors directly funded by local and federal government budgets). In this study, we do not analyze the impact of these factors on the wage arrears problem, though some of the regional and occupational patterns that we later present can be interpreted in light of the broader nonpayment crisis.

²These figures are based on eight sectors (namely, industry, agriculture, construction, transportation, education, culture, health care, and science) for which wage arrears have been reported beginning in 1996, and which constitute approximately 78 percent of total official employment in 1995. They exclude wage arrears in the financial sector, trade, and public administration, which are evidently negligible (see *Russian Economic Trends*, hereafter *RET*, vol.5(3)), and do not cover the large military sector in which wage arrears are believed to be quite substantial. Again, data on wage arrears in the noncommercial sector are only available for medium and large-sized enterprises.

outstanding wage arrears increased between 1992 and 1996 by approximately 17-fold in industry, 10-fold in construction, and 12-fold in agriculture. As percentage of the sector's monthly wage bill, the increase was approximately 22-fold in industry,

Trends in Sectoral Wages Arrears

(1) Outstanding wage arrears (billions of December 1995 rubles)

| | <u>Industry</u> | <u>Construction</u> | <u>Agriculture</u> |
|------|-----------------|---------------------|--------------------|
| 1992 | 1,034 | 541 | 397 |
| 1993 | 2,653 | 840 | 2,092 |
| 1994 | 5,019 | 1,686 | 3,009 |
| 1995 | 7,734 | 1,941 | 2,571 |
| 1996 | 18,185 | 5,310 | 4,855 |

(2) Ratio of outstanding wage arrears to the monthly wage bill (percent)

| | | | |
|------|-----|----|-----|
| 1992 | 5 | 6 | 6 |
| 1993 | 13 | 10 | 36 |
| 1994 | 31 | 23 | 68 |
| 1995 | 61 | 40 | 102 |
| 1996 | 111 | 74 | 158 |

SOURCE: *RET*, 1997.1

12-fold in construction, and 26-fold in agriculture. Thus, the problem of wage arrears, which have been continually rising over the course of the transition, became acute in 1996. As a result, strikes, which were remarkably low during the early years of the transition, rose significantly in 1996 -- the number of working days lost to strikes in December 1996 exceeded the total number of days lost in 1995. Again, these strikes were concentrated mainly in coal mining and

education, two sectors that have experienced high levels of wage arrears.³

Despite the mounting wage arrears and the widely recognized and publicly articulated concern over the issue,⁴ evidence relating to the demographic aspects of the problem and an in-depth study of the distribution of wage arrears among Russian workers by demographic features, occupation, and job location have been missing. In this paper, we employ a unique household database of the Russian population to fill this gap and address several issues. In Section I, we define the analytical framework underpinning the emergence and escalation of wage nonpayment from the budget and by enterprises. We argue that government decision makers and enterprise managers facing cash flow problems and reluctant to fire workers, resorted to enforcing lower wages among employees by denying them wages rather than removing them from the payroll. Second, based on traditional employment policies, labor market practices, and emerging job possibilities in Russia, we suggest several hypotheses in Section II about our expectations relating to the relative severity of wage nonpayment by gender, age and education, by occupation, and by job location. Third, we provide evidence in Section III on the level, trend, and occurrence of wage arrears by demographic, occupation, and job location variables, one at a time, during the period 1994-1996. In Section IV, we extend our univariate analysis of wage arrears to a multivariate specification involving the demographic, occupation and job location variables. In Section V, we provide evidence suggesting that the pattern of wage nonpayment in Russia's regions was influenced more by fairness to the low-paid workers evidently by managers withholding relatively less payment from them than by considerations of retaining (the relatively more discriminated) high-paid workers on the payroll in the interest of productivity gain. We analyze the impact of wage arrears on the respondents' viewing of their future well-being and their likelihood of being in poverty in Section VI.⁵ We then investigate

³Miners had also previously gone on strike to protest wage arrears in February 1995.

⁴The government's failure to fully pay its employees is a fraction of the payments problem. In June 1997, wage arrears in the eight sectors of the economy (mentioned earlier) amounted to 53.9 trillion rubles of which 11 trillion rubles (20.4 percent of the total) were due to nonpayment from local and federal budgets. Wage arrears to the military were estimated separately at 5.4 trillion rubles.

⁵Wage nonpayment not only reduces family disposable income directly but also cuts into family wealth because wage arrears are not indexed. This means that even if Russian workers were to be

barter arrangements between enterprises and workers in Section VII with a view to judging the emergence of barter practices in response to wage arrears. In Section VIII, we assess the impact of wage arrears on the likelihood that people will either hold multiple jobs or additionally engage in less formal, paid economic activity. We summarize our findings in the concluding Section IX.

I. The Analytical Framework: Why Mounting Wage Arrears?

Workers were denied wages, and increasingly so from 1994-1996 (the years covered here) because the government and enterprises faced mounting cash flow problems.

The federal treasury's ability to collect taxes had weakened over time: in 1996, the tax collection amounted to 60 percent of projected revenues forcing the government to trim outlays and stay within the budget deficit targets. Even as tax collection was lagging, the budgeted allocations earmarked for payments to employees were diverted to other uses by local governments and military generals.

Among the tax delinquents on the list of the federal treasury were large enterprises, especially in the energy sector, whose lagging tax payments strained the government's ability to pay its suppliers of energy and military items, in turn causing them to withhold wages from their employees.

Not only were the financial links between the government and enterprises impaired as the transition proceeded, but inter-enterprise connections deteriorated affecting their financial viability. Among the most affected were military factories and energy suppliers. The former faced varying, drastic cutbacks in state orders, and the latter continued supplying energy to households at subsidized rates without being fully compensated from the budget. At the same time, industrial enterprises built up a massive debt to the energy sector.

Could the government and enterprises have acquired cash by borrowing from the banks and the public? The budget-deficit targets specified by the International Monetary Fund and approved by the Duma increasingly lowered and ultimately (by mid-1997) ruled out government borrowing from the central bank. As interest payments from the federal budget escalated,

eventually repaid, they would have suffered a significant loss given the high monthly inflation rates that persisted to the end of 1996.

government borrowing from the public and the commercial banks was also restricted. By mid-1997, the government was left with tax revenues and receipts from sales of government stock in privatized companies as the sole financing sources.

Enterprises were reluctant to borrow from banks at prohibitive interest rates in order to pay workers. The rediscount rate set by the central bank was brought down from over 200 percent in 1992 to about 35 to 40 percent in 1996, the latter rate beginning to reflect the cost of borrowing in the market. The annualized rate of interest on government short-term treasury bills toward the end of 1996 was around 25 to 30 percent. With annual inflation running close to 20 percent at the time, government borrowing tended to soak funds from the banks. Enterprises and local governments also invested available cash in treasury bonds to earn positive real interest income rather than use it for paying employees.

Serious though the cash-flow problems were for the government and the enterprises, these were necessary but not sufficient grounds for them to resort to withholding wage payments and enforcing effective downward wage flexibility on the workforce. The alternative of releasing workers from the payroll was not acted upon energetically.

Bound by the Soviet-era tradition of nominal full employment, workers and managers were unwilling to opt for the market economy solution of rapid layoffs. Managers, constrained by the “workers are my family” syndrome put workers on reduced pay and forced vacations without pay rather than render them jobless. With such paternalism in swing, managers could siphon off factory funds for personal gain or lucrative investments rather than wage payment. Workers, accustomed to receiving an array of benefits, including school, hospital, and day-care services, as well as low-cost housing, all attached to the factory, settled for receiving these entitlements with reduced pay in preference to losing their jobs and the associated benefits. Managers and workers thus opted for informal arrangements involving implicit payoffs for both sides rather than explicit contract renegotiations which characterize market economies. The symbiotic, negotiating stance persisted in the post-privatization period because most factories selected the privatization option which allowed 51 percent stock ownership to managers and workers.

The government let these arrangements balloon into a full-blown crisis by failing to

revise the tax code in time, collect taxes under the prevailing tax provisions, and enforce bankruptcies in the least viable factories. Its Bankruptcy Resolution of 20 May 1994 laid down the procedures for converting privatized factories into economically viable units. The resolution ruled out further state subsidies while granting enterprises an 18-month moratorium on repaying debts, during which time enterprise managers were to sell off assets and find new investors. In practice, the bankruptcy resolution was applied to prevent massive enterprise liquidations and worker layoffs. With 40 to 70 percent of the plants in some regions economically unviable, managers needed incentives to redesign rather than close them. In market economies, bankruptcy procedures are carried out by independent participants such as arbiters, bankruptcy court judges, and accountants. By contrast, the Russian approach was embodied in a bureaucratic pyramid: the Federal Bankruptcy Agency, functioning since September 1993, influenced and monitored the decisions of the local bankruptcy agencies covering 82 regions. Till the end of 1995, former First Deputy Prime Minister Oleg Soskovets personally oversaw the restructuring of large units in the defense, heavy industrial, and energy-producing sectors of the economy. Despite the presence of private auditors, decisions regarding the fate of most factories were hardly the work of independent experts applying objective economic criteria.

By early August 1994, a hundred factories were on the auditors' insolvency list, with several dozen being added each day. But insolvency did not imply liquidation, for there was in place a top-down, bureaucratized industrial policy calculated to facilitate factory conversion. Russian industry top-heavy with huge and unwieldy units, hobbled by slow-moving management, and watched by a government legitimately concerned with the social consequences of enterprise failures or reorganizations, was thus geared for sluggish but pell-mell change at the start of 1996.

1996, however, was the nadir of faltering state authority in Russia's fledgling market economy marked by the collapse of contractual obligations and their enforcement. The government, having failed to boost tax collection despite the setting of the Temporary Emergency Commission, resorted to more wage sequestration. Enterprises withheld tax and wage payments. Local governments diverted federal funds earmarked for employee remuneration. Army generals used budgetary allocations meant for soldiers' pay for weapons procurement and maintenance of military bases. Preparations for the Presidential elections of

June 1996 and President Yeltsin's prolonged recuperation to normal health after his reelection ruled out new initiatives for breaking the expedient web of arrangements, involving wage nonpayment, among the government, enterprises and labor. The Soviet-era social contract of "they pretend to pay us and we pretend to work for them" had been revived by cash-strapped employers violating wage contracts with a permissive workforce as state authority weakened.

The new, reformist government appointed in March 1997 faced public outcry over wage nonpayment and the IMF mandate (incorporated in the budget deficit target) of an early liquidation of government debts. By June 1997, the government had paid off pension arrears with a World Bank credit earmarked for the purpose. President Boris Yeltsin issued a decree in July ordering the government to clear outstanding payments to state workers by the end of the year, with wage debts to the military to be paid by October. The President also suggested to Gennadii Seleznev, Chairman of the State Duma (lower house of the Russian parliament) that the Russian Criminal Code be supplemented with a clause stipulating that state officials and enterprise managers, who failed to pay wages or pension contributions, be deprived of the right to occupy certain posts or imprisoned for a period of between one and ten years.

Over the long haul, the solution of the payments problem will require fundamental changes in the Russian economy. In the short-run, a significant portion of government arrears will undoubtedly be cleared via settlement of tax arrears by large natural monopolies such as Gazprom, revenues from successive rounds of sale of government stocks in privatized companies and credits from international agencies. These arrears can be brought under control if current attempts to adopt a realistic federal budget, to reform the tax code and collect taxes, and effectively supervise the disbursement of funds allocated to local governments are implemented. Enterprise-based wage arrears, approximately 80 percent of the total, present a formidable problem defying an early resolution. In the short run, some of these debts can be discounted at various rates requiring judgment calls with regard to the enterprises involved. This is a less costly option for the workers than eventually having the debts completely written off. In the long run, wage nonpayment will decline if enterprise restructuring aimed at releasing excess labor

moves forward⁶, and bankruptcy laws are enforced leading to closure of unviable enterprises.

On current indications, wage nonpayment to workers will have peaked in 1996 brought on by cash flow problems in the government sector and privatized enterprises, accentuated by the traditional reluctance of managers to layoff workers, and facilitated by the widespread weakening of contractual obligations and their enforcement by state organs. Before stating suitable criteria for assessing the impact of wage arrears by demographic features, occupation, and job location of households, we define our expectations of this pattern by presenting a number of hypotheses based on Russian employment and labor market practices and the effects of transition policies on different regions and occupations.

II. Expected Pattern of Wage Arrears by Demographic Features, Occupation, and Job Location of Of Households: Some Hypotheses

We adopt three measures for assessing wage nonpayment. These are the fraction of household respondents who were denied wages (hereafter the frequency or occurrence of nonpayment), the average cumulated ruble value of wages withheld at the time of interview (hereafter the amount or magnitude of nonpayment), and finally, the cumulated value divided by average monthly wage (hereafter the relative amount or the ratio of nonpayment). These three criteria are discussed later.

A caveat is in order in formulating the hypotheses about the expected patterns of wage nonpayment. Respondents in a given age group were likely to be denied wages more frequently and in larger amounts than those in another group. However, the relative amounts or ratios of nonpayment might not work out to be unfavorable for the former because these depend additionally on the monthly wage. Therefore, we suggest our hypotheses with regard to the simpler and easily tractable measures of the frequency and amount of wage nonpayment.

Given these two criteria, how might one expect wage nonpayment to vary by the demographic features of gender, age and education, by occupation, and job location?

⁶See Aukutsionek and Kapeliushnikov (1996) for a discussion of the incentives that prompt Russian enterprise managers to retain rather than layoff redundant workers. Also see Desai and Idson, 1997.

As already noted, the choices facing state sector employers and enterprise managers were to retain a worker with full wage and benefits, or remove him from the job, or deny him payment for some time while keeping him on the job. Given the cash flow problem, it was difficult for an employer to keep him on the job at the old wage. At the same time, managerial predisposition in favor of keeping workers on the job, workers' readiness to accept temporary wage loss in return for the entitlements by being officially on the payroll, and government hesitation against implementing bankruptcy laws slowed the pace of involuntary job loss. The feasible option was to slow employee layoff and enforce a flexible wage by withholding payment.

State sector decision makers and enterprise managers were therefore likely to devise strategies of wage nonpayment which best helped them lower wage outlays and maintain or increase sales revenues. The managers of financially stressed companies, unlike those in charge of a few viable units, would focus on the short term problem of juggling their finances rather than on the long term goal of trimming the workforce with a view to promoting enterprise productivity and profitability. The two-track strategy of trimming wage outlays and managing financial inflows implied that managers who chose to withhold wages of the better paid, more productive workers ran the risk of affecting their productivity through the nonpayment disincentive or their loss to another job. Given the high labor turnover in Russian factories, employees with marketable skills and opportunities could be expected to move to a better job in the enterprise or leave it altogether.⁷ Holding back wages of the better paid workers in the interest of containing the wage bill could therefore backfire.

Which of the two tendencies--holding on to the better paid, more productive workers in the interest of maintaining revenue inflows or retaining and paying the less paid workers with a view to managing the wage bill--operated in the decision making calculations of Russian factory managers? Such trade-offs were unlikely to prevail in the wage nonpayment practices of the state sector in which wages could be expected to be withheld in a pro rata or ad hoc fashion

⁷For a discussion of job turnover in Russian enterprises, see Gimpelson (1996) and Desai and Idson (1997). In the Russian context, job turnover usually implies moving to a different job within the enterprise (without abrogating the wage contract) rather than quitting the job altogether and moving to a different enterprise or location. The intra-enterprise job turnover has been high in Russia from the Soviet days.

when revenue shortfalls appeared. We expect managers of cash-strapped factories to be motivated as much by fairness as by productivity orientation especially if they are holdovers from Soviet days and have risen to the top from the factory floor. A systematic wage denial to the less educated, less skilled, low paid workers--most of them young entrants, women, and workers on the brink of retirement-- would, in our view, be unlikely. Better paid workers could experience wage nonpayments often and in large amounts as managers steered between the Scylla of wage bill trimming and the Charybdis of revenue enhancement.

Based on this analytical framework, we provide a few hypotheses of wage nonpayment by demographic features, occupation and job location.

Wage Nonpayment Hypotheses with regard to Demographic Features

We begin with the potential impact of employer decision making on nonpayment to women. Russian women have combined household chores with job responsibilities and have failed to upgrade their skills through training. They are therefore concentrated in low paid jobs. Being a relatively less heavy burden on the wage bill, they were likely to experience wage nonpayment less frequently and in lower amounts for the years under consideration. On the other hand, they might be regarded as supplementary, household wage earners by managers. Having failed to improve their clout through factory networking for lack of time and motivation, they could be subjected to more frequent wage withholding and over a longer time than a comparable male employee.⁸ In that case, they could experience wage nonpayment more frequently and in larger amounts than men.

We turn next to the possible relationship between age and the frequency and amount of wage arrears. The youngest workers--17 to 25 years of age, new entrants in the workforce with less skill and shorter work experience and concentrated in the lowest wage scale-- were likely to be subjected to less frequent and smaller wage withholdings than employees in the subsequent age groups with more experience, better skill and higher pay. (Mean, per person monthly wages by select demographic characteristics are reported in Table 7.1.) The frequency and amounts

⁸For a discussion of Russian employment patterns, wage policies, and worker training opportunities across gender, age and occupation, see Desai and Idson (1997).

withheld could peak for the most skilled workers with highest pay scales between the ages of 36 and 45 years.⁹ Beyond this age, with declining pay scales, wage nonpayment could be less frequent and in lower amounts. It is however difficult to predict the cutoff point at which the switch could take place.

What might one expect of the connection between education and wage nonpayment? Two factors are relevant here. First, in Russia as in some industrial countries, the most educated, among them scientists and researchers, earn less than skilled machine operators and engineers in factories. Their retention on the factory payroll has relatively less impact on the wage bill. Therefore, the wages of the former subset at the apex of the education hierarchy may be withheld less frequently and in lower amounts than those of the latter who precede them in the educational hierarchy. Paradoxically, the most educated factory employees--for example, research workers and architects in the design department--could experience wage nonpayment with similar frequency and amount as the less educated employees, close to the bottom of the education hierarchy who also earn less. Second, the most educated personnel in former, government-financed institutions and in nuclear power plants could experience more frequent and larger wage nonpayments than the less educated because of the worsening finances in these places.

Wage Nonpayment Hypotheses with regard to Job Location

Wage withholding will vary depending on a region's general economic viability, the commitment of the local administrations to continue paying wages to state employees from federally transferred funds, the prevalence in a region of defense and heavy industries located in company towns, and above all, the domination in the region of the natural resource sector with high wages. (Mean, per person monthly wages by region are reported in Table 7.2.)

Moscow, a bustling financial center with construction and restructuring boom differs sharply from other regions. Problems of converting military plants in Western Siberian company towns, among them Armaz and Krasnoyarsk, have aggravated the economic plight of their highly paid technicians with few alternative job opportunities. Again, workers in Moscow and the resource-rich regions in the Northern Territories, the Far East, West and East Siberia, have on

⁹We are grateful to Vladimir Gimpelson for suggesting this hypothesis to us.

average higher wages than in Central and Central-Black Earth regions, Volga-Vyatski and Volga Basin, and Northern Caucasus. Employees in the former group could be subjected to more frequent and higher wage nonpayments than in the latter. The wage arrears problem in the Premorye region of the Far East was worsened by a prolonged power struggle between the regional governor, Nazdratenko and the Federal Government which accused the governor of misusing federal funds.

It is difficult for us to link the impact of these specific regional factors on wage nonpayment. The eight regions adopted here are vast and we have not been able to connect the sampled households to a smaller location such as a (defense industry) town enabling us to formulate precise hypotheses and leaving us, at best, with broad judgments about the regional variations in wage nonpayment.

Nonpayment Hypotheses with regard to Occupation

We expect occupational wage nonpayment likelihood to be determined by the ranking of the occupations in the wage hierarchy. For example, the least paid groups, among them unskilled workers and clerks were less likely to be subjected to wage nonpayment than technicians and professionals, somewhat better paid, followed by the next groups with higher wages, among them workers in crafts and related trades, and plant and machine operators. At the same time, legislators, senior managers and officials could be expected to suffer less impact of wage nonpayment despite high salaries because of their political and managerial clout. On the other hand, army officers with high pays in our sample could be expected to incur the heaviest wage nonpayment in view of the drastic cutback in military allocations from the budget and the diversion of the funds by army generals, mentioned above, for weapons procurement and maintenance of bases.

We interpret our wage arrears estimates, presented below, in light of these expectations by demographic features, job location, and occupation. Before proceeding to an analysis of the univariate patterns of wage arrears, we briefly discuss our data sources and the organization of our empirical results.

Our empirical analysis is based on the Russian Longitudinal Monitoring Survey (RLMS), a nationally representative household-based panel of the Russian people. The survey project has

currently gone through two phases, each phase comprising of a different panel of households for which interviews were conducted with every member of the household. Phase I is composed of four rounds of interviews conducted during 1992 and 1993; Phase II has to date undergone three rounds of interviews, Rounds V-VII, each fielded in the Fall of 1994, 1995 and 1996, respectively. The survey contains detailed information on demographic and employment characteristics by occupation and job location which help us analyze the labor market experiences of Russian households as the transition to a market economy has proceeded.¹⁰

Although the RLMS began in 1992, our analysis is restricted to the 1994-6 period because data on unpaid wages only became available in Phase II of the survey. Respondents were asked a series of questions concerning nonpayment of wages. Table 1 gives details of the survey questions¹¹ which form the focus of our investigation. These survey responses help us gain new insights into the wage arrears crisis.

Our empirical results are organized as follows. In Tables 2-6, we report univariate patterns, separately for each year under consideration, broken down by a number of demographic attributes in order to uncover features of the nonpayments crisis that are masked by the aggregate official statistics. Table 2 states the percentage of the sampled respondents that have not been fully paid for their labor, the absolute average value of outstanding wages, and the ratio of outstanding wage arrears to actual, per person monthly wages (as opposed to contracted wages which are used later). Table 2.1 presents these wage nonpayment measures separately for men and women. In the succeeding tables, we similarly report our wage arrear measures separately by age in Table 3; by educational attainments in Tables 4.1 and 4.2; by eight major regional groups in Tables 5.1 and 5.2; and finally, by major occupational groups in Tables 6.1 and 6.2. The discussion of the univariate patterns of Tables 2-6 is extended into a multivariate analysis of the frequency (among respondents) and magnitude of wage arrears over the 1994-96 period. These

¹⁰Information on the structure of the survey, the questionnaires, and data sources may be obtained over the internet at <http://www.cpc.unc.edu/rlms>.

¹¹These questions were asked of all respondents who indicated that they were either at work or on unpaid or paid leave. However, our analysis focuses on arrears of the subset of respondents who were receiving positive wages from their primary jobs at the time of the interviews.

results are presented in Table 7. Our estimates of the correlation between regional wage levels (of Table 7.1) and the regional ratios of the nonpayment frequencies among the relatively low and high wage earners are stated in Table 7.2. Our measures of the respondents' expectations about their well-being in the subsequent year are reported in Tables 8.1 and 8.2. Tables 9.1 and 9.2 present our analysis of the effect of wage arrears on the likelihood that a family will end up in poverty. Patterns in the frequency (among respondents) and magnitude of barter arrangements are stated in Tables 10.1 and 10.2 in which we empirically consider the relationship between wage arrears and barter. These tables also report our estimates of outstanding net arrears, i.e. wage arrears net of barter payments (both measured in rubles). Finally, we present our estimates of the impact of wage arrears on supplemental activities such as secondary jobs and informal (but paid) self-employment in Tables 11.1 and 11.2.

III. Univariate Patterns of Wage Arrears

We present these wage arrears patterns in Tables 2-6 limiting our analysis to people aged 16-64 who reported that they were currently receiving positive wage payments.¹²

Each table records mean values of the relative frequencies of respondents denied wages (Pjowed), the cumulated, average amounts withheld in constant 1995 December rubles (Amtowed) and the ratios of these amounts with respect to average monthly wages (Amtw) from 1994 to 1996 by demographic characteristics followed by job location and occupation. These estimates provide the impact of a given attribute, for example age, on the frequencies, amounts and ratios of wage nonpayment without separating the influence of other factors. For example, the youngest respondents may be denied less amounts than older workers not only because they are concentrated in less paid occupations but also because they are less educated and therefore earn less. The multivariate estimates of Table 7 with respect to each attribute have an edge over these univariate estimates because we can measure the impact of age on wage nonpayment from

¹²The restriction to ages 16-64 reduces the sample of respondents with positive wages by 70 (1.9 percent), 72 (2.2 percent), and 48 (1.8 percent) people in 1994, 1995, and 1996 respectively. 67.34 percent, 67.0 percent and 65.58 percent of the respondents between the ages of 16 and 64 reported that they were either at work or on unpaid or paid leave in 1994, 1995, and 1996 respectively. 75.2 percent, 70.9 percent, and 61.5 percent of these groups reported receiving wages in the three years.

these estimates by controlling the values of other attributes such as occupation, job location, education etc. at specified levels.

The univariate estimates however have a useful feature providing yearly wage nonpayment trends for respondents grouped according to an attribute which can then be verified in the multivariate specification. These mean estimates indicate if the frequencies, amounts and ratios have a trend across age (five groups), education (seven levels), occupation (nine types), or job location (eight regions) in a given year. For example, in Table 3, the mean estimates of the frequencies and amounts of nonpayments by age go up from 17 to 45 years (divided in three age groups) during 1994-96 but they tend to decline from 46 to 64 years (divided in two age groups). This pattern needs to be investigated in a multivariate context: do the estimates of the nonpayment frequencies and amounts of the multivariate specification with respect to age alone support the univariate pattern of nonpayment improving with people over the age of 45 years when the other attributes are fixed at specified levels?

With these qualifications, we proceed to analyze our univariate estimates of Tables 2 -6. A major finding of the estimates is that the nonpayment situation had generally improved with respect to the three measures in the tables in 1995. The frequencies, amounts, and the ratios (of the amounts of nonpayments to monthly wages) had generally declined for the attributes from table to table. (The 1995 declines are also seen in the charts.) Therefore, we omit 1995 from our analysis in this section.

The percentage of people in our sample who were owed wages (row 1) increased from 29.72 percent in 1994 to 44.83 percent in 1996 in Table 2. Average (per person) outstanding enterprise debt to workers (row 2) similarly increased from 769,855 rubles in 1994 to 1,082,462 rubles in 1996, expressed in constant December 1995 values.¹³ Calculated as ratios of average

¹³Our analysis here focuses on the first moment of the distribution. Information on the frequency distribution of outstanding enterprise debts to workers reported in Appendix 2 brings out the pattern of the higher moments of the distribution. Thus, in 1994 and 1995, the amounts owed tend to be concentrated toward relatively lower values but in 1996, the degree of skewness falls and less of the probability mass is concentrated in the left tail (with lower outstanding debts) suggesting a relative shift toward upper ranges of the frequency distribution of outstanding enterprise debts to workers.

(real) monthly wage (row 3)¹⁴, outstanding enterprise obligations to their employees increased from approximately three times the monthly wage in 1994 to over five times in 1996. These figures are higher than the aggregate numbers reported in Section I above.¹⁵

We see in Table 2.1 that males were more likely than females to be denied payment on time, and also to be owed more wages when not fully paid on time. The difference in the outstanding arrears between men and women tended to diminish between 1994 and 1996. This narrowing reversed the gender pattern of the ratio by 1996: i.e. women were owed more payments than men by 1996 when these are calculated as proportions of monthly wages. (The narrowing of these gender differences is also evident in Figure 2.)

We see in Table 3 that wage nonpayment frequencies, amounts, and the ratios of accumulated arrears to monthly wages increased for all age groups between 1994 and 1996. Across the five age groups, the frequencies and amounts of nonpayments increased from 17 years to 45 years (divided in three groups) and dropped thereafter from 46 to 64 years (distributed in two groups). We do not detect a systematic pattern with respect to the inter-age group ratios.

Turning to wage nonpayment across educational groups in Tables 4.1 and 4.2, we notice that the relative frequency of arrears among respondents, the ruble value of arrears, and the accumulated arrears in relation to monthly wages increased between 1994 and 1996 for all

¹⁴The ratios in Tables 2-6 are calculated by dividing outstanding amounts owed to respondents at the time of the interview with the actual wage payment in the preceding month. Given the prevalence of wage nonpayment, actual payment in the previous month will often understate the contracted monthly wage. This may explain why our estimates of the ratios of outstanding arrears to monthly wages are higher than official aggregate estimates which use contracted monthly wages in the denominator. This problem might be overcome by calculating a contracted wage for our sample respondent as the actual amount paid plus some portion of the outstanding enterprise debt to the individual because the amount owed to the worker is cumulative rather than incurred in the previous month. Since we know the number of months over which the enterprise has owed wages to the worker, we can use the information to approximate the fraction of outstanding debt with which to augment actual wage payment to the worker in the previous month. This procedure which we employ in our subsequent analysis starting with Table 7 will be subject to measurement error because we do not know the debt which was incurred in the past 30 days. This problem with regard to wage nonpayment combined with the nonrandom distribution of the frequency and magnitude of nonpayment across workers creates biases in the estimates of wage regressions using the RLMS data set (see Newell and Reilly, 1996; Glinskaya and Mroz, 1996 for similar reservations).

¹⁵These estimates assume that wage rates are not affected by the increasing practice of firms to avoid paying full wages to employees, although labor supply and demand may be affected by the practice thereby influencing contracted wage levels.

groups. Across the five education groups, we do not notice a distinct association of the frequency and amount withheld with the education level.

The regional patterns of Tables 5.1 and 5.2 show that wage nonpayment had increased in all the regions in terms of the three measures in 1996 compared to 1994. The frequency of wage arrears was smaller among Moscow and St. Petersburg respondents than among those sampled in other regions with the pattern holding for the years under consideration. For example, in 1996 about 26 percent of the Moscow and St. Petersburg respondents in the sample were owed wages, whereas the percentage of people who were owed wages in the other regions varied from approximately 37 percent in the Central and Central Black-Earth region to about 59 percent in the Northern and North Western region.

As already noted, Moscow and St. Petersburg led the regions with the lowest frequency of wage withholding and ranked second with respect to the ratio (of wage nonpayment to monthly wage). The three regions of Central and Central Black-Earth, Volga-Vyatski and Volga Basin, and North Caucasus were ahead of Moscow and St. Petersburg in terms of *lower* average amount withheld evidently reflecting their lower average wages. Eastern Siberia and the Far East, and the Northern and North Western regions (in that order) were the worst performers in terms of the three measures with the Urals and Western Siberia below them (with increasing hardship) in the ranking. We compare these regional patterns of univariate estimates with those resulting from the multivariate specification of Table 7.

Patterns of wage arrears reported in Tables 6.1 and 6.2 reveal substantial variation in our three measures of wage arrears across occupational groups.¹⁶

¹⁶Appendix 3 lists the four-digit occupational categories that were grouped into nine, one-digit groups (see Appendix 1) by RLMS according to the International Standard Classification of Occupations (ISCO). To quote from a RLMS homepage document: "Occupations were coded according to the four-digit International Standard Classification of Occupations: ISCO-88 (Geneva: International Labour Office, 1990). Considerable care was devoted to taking into account the idiosyncrasies of the Russian labor market. For example, *medsestra* is normally translated to mean "nurse." The ISCO classifies nurses as professionals and defines professionals as those involved in 'increasing the existing stock of knowledge, applying scientific and artistic concepts and theories to the solution of problems, and teaching about the foregoing in a systematic manner. Most occupations in this major group require skills at the fourth ISCO skill level.' Since Russian nurses do not normally function at this level and were never considered to be professionals in the former Soviet Union, they were classified at the level which the ISCO assigns to nurses' aides in the West." We have deleted the 6000 group, "Skilled Agricultural and Fishery Workers"

Regarding the frequency of payment arrears to respondents by occupation (Table 6.1), the fractions which were denied wage payments increased in each group between 1994 and 1996, the highest having been reported for 1996 in the military (at 92 percent), and the lowest in the service and market sector (at 30 percent). In Table 6.2, outstanding payment arrears in constant rubles had gone up among all groups; so had the ratio of outstanding amounts to monthly wages except for a decline with respect to legislators, senior managers and officials who seemed to have succeeded in raising their monthly wages.

What pattern do the estimates suggest in the three measures across the nine occupational groups for 1994 and 1996? First, we take the inter-occupation frequencies and amounts of nonpayments. Respondents in the lowest wage scales, among them the service and market workers, clerks, and unskilled workers had generally the lowest frequencies and amounts of nonpayments. These were followed by technicians, professionals, and craft and related trade workers, the next higher in the pay scales, with higher frequencies and amounts of nonpayments. The groups with the highest occurrences and amounts of nonpayments also with top pay scales were plant and machine operators and assemblers, and army respondents (in 1996). Legislators, senior managers and officials, incurred least frequent wage arrears (along with clerks) but their amounts withheld were high close to those for machine and plant operators.

The inter-occupation ratios of nonpayments to monthly wages have an interesting pattern in 1996. Legislators, senior managers and officials, and army respondents are at the top with the lowest ratios (despite highest wage nonpayments) reflecting improved monthly wages for them. A second interesting feature is the better performance of plant and machine operators and craft workers with lower ratios who outstripped unskilled workers, professionals and clerks (who were ahead with lower ratios in 1994) by evidently improving their monthly wages.

In conclusion, the frequencies, amounts and ratios of nonpayment to monthly wages rose in 1996 compared to 1994 for all our univariate measures and attributes. These univariate patterns of wage nonpayment by an attribute, for example, gender, education, age, occupation and region need to be checked via a multivariate specification. For example, women turned out

due to insufficient observations.

to be less discriminated than men with respect to the frequency and amounts of nonpayments; the measures of frequencies and amounts rise up to a certain age and then decline. They also put certain regions, Western Siberia, the Urals, Eastern Siberia and the Far East, and the North and North-West (in that order of deteriorating performance) as the worst discriminated regions with respect to wage nonpayment. Do these results survive in a multivariate specification?

IV. Patterns of Multivariate Wage Nonpayments

We extend the single variable approach of Tables 2-6 to a multivariate formulation in which the frequency of being owed wages (*Pjowed*) and the ruble value of outstanding enterprise debt to workers (*Amtowed*) are adopted as the dependent variables.¹⁷ The estimates are presented in Table 7.¹⁸

Three caveats qualify our analysis of the multivariate specification of this and the remaining sections. First, we adopt the group with secondary school training, the lowest in formal schooling (*Education 1*), as our reference category. Second, we estimate the impact of wage nonpayment by occupation in relation to the frequency and amount of nonpayment in the service and market sector which is our benchmark occupation. We assume that employees in the service and market sector were least vulnerable to the vagaries of wage nonpayment because the sector has been the most dynamic in the economy with less cash-flow problems. Finally, we accept Moscow and St. Petersburg, economically the most energetic in the transition, as the reference region for our analysis of the regional pattern of wage nonpayment.

We notice that the univariate patterns of Tables 2-6 tend to persist when a number of demographic, occupational, and job location explanatory variables are simultaneously introduced in the two regressions.

¹⁷We express *Amtowed* as a natural log (in a single-log specification) in order to more readily interpret covariate effects in percentage terms. Note that rather than estimate regressions with the dependent variable defined as the ratio of amount owed to wage payment (*Amtw*), we include monthly wage as a regressor.

¹⁸ The wage variable used in Table 7 and the subsequent tables is an estimate of contracted wages which are actual wages paid plus an estimate of the monthly outstanding wage obligations by the employers (calculated as the cumulated nonpayments divided by the number of months for which these wages have been owed). Details are in footnote 14.

Thus, the coefficients of the year dummies (dum1994 and dum1995) in the first regression suggest only a marginal increase, between 1994 and 1995, in the frequency of wage nonpayment but a substantial rise in 1996 over 1994.¹⁹ Similarly, consistent with the patterns in Table 2, the average value of outstanding wage debt fell between 1994 and 1995 by about 18 percent, but then increased by approximately 41 percent in 1996 over 1994.²⁰

Regarding gender differentials, the positive coefficient of the female dummy in the first regression suggests that female respondents were more likely to experience wage nonpayment than men (contrary to our univariate mean estimates of Table 2.1), but the outstanding average debt to female employees was less than for men (similar to the pattern of Table 2.1) as suggested by the negative coefficient in the second regression. Univariate comparisons therefore do not necessarily give unambiguous results. It would seem that wages of female employees, whom managers tended to regard as second job holders with less maneuverability in the work place, were withheld more frequently but the amounts withheld were smaller because women were concentrated in low-wage occupations.

The frequency and magnitude of arrears were likely to increase with age and subsequently decline; for example, the coefficients of the quadratic formulation with respect to age indicate that wage debt tended to be more frequent and larger with age up to approximately 35 years declining thereafter. This finding supports similar results in Table 3 in terms of univariate mean values.

Workers with longer tenure were more likely to be owed wages and the outstanding arrears also tended to be larger (row 6, columns 2 and 3). The positive seniority effect may seem surprising because we might expect senior workers to have greater maneuverability within the

¹⁹When we calculate the slope of the function at mean values for all explanatory variables, we find that the likelihood of being owed wages was approximately 1.9 percent higher in 1995 than in 1994, and about 15.6 percent higher in 1996 than in 1994. Similar calculations indicate that government employees were about 7 percent more likely to be owed wages than nongovernment workers, and women were about 5.1 percent more likely to experience wage arrears than men. The slope transformations for the covariate effects of Table 7 are available on request.

²⁰These values are calculated from the coefficients of the year dummies in rows 1 and 2 of column 3 using the formula $\exp(x) - 1$, which gives the approximate percentage effect of a dummy on the dependent variable in a semi-log specification.

organization with the potential of using it to avoid being subjected to wage nonpayment.²¹ The higher frequency and larger amounts of wage nonpayment might result from higher wages associated with longer tenure.

Respondents in government-owned enterprises were more likely to experience wage arrears (row 7, column 2), but the accumulated arrears were no different from those for nongovernmental employees (as evidenced by the insignificant coefficient estimate in row 7, column 3).

Our estimates of the frequency and amount of wage arrears with respect to education level do not show a systematic pattern and, in that regard, support our univariate estimates of Tables 4.1 and 4.2 suggesting similar lack of association between wage nonpayment and education level. The majority of the nonpayment frequency estimates are statistically not significant suggesting that the workers in the different categories were likely to encounter wage nonpayment frequencies no different from the arrear frequency of the reference group with secondary education. The average amounts owed by education level, when they are statistically significant, again fail to show a systematic association.

The regional patterns of the frequencies and amounts of outstanding arrears (rows 15-21, column 3) are similar to the univariate results in picking out respondents in the Northern and North Western region, Eastern Siberia and the Far Eastern Region, and Western Siberia (with respect to amount only) --heavily resource-oriented and populated with high wage earners--as the worst likely sufferers. Again, low-wage North Caucasus and Central and Central Chernozem are singled out, same as in the univariate estimates, as the regions least likely to be hit by nonpayment in terms of both measures.

Among the occupations, legislators, senior managers and officers as well as clerks were as likely to incur wage nonpayment in frequency and amount as our reference category of service and market worker. (The estimates are statistically not significant.) The former benefitted from their decision making influence and the latter because of their low wages. Respondents in the

²¹In the Russian context, the positive effect may reflect managers renegeing on seniority rights in implicit contracts (Lazear, 1979) during adverse economic times (see Idson and Valletta, 1996, for evidence of this practice in the U.S.).

military were most likely to be subjected to wage nonpayment in frequency and amount. (Row 29, columns 2 and 3) These results are similar to those of Tables 6.1 and 6.2 with univariate estimates. The amounts withheld were likely to be high as in Table 6.2 for the high wage occupations of machine operators, craft workers and military respondents. Legislators, senior managers and officials (despite high wages) were likely to suffer less wage arrears along with unskilled workers, clerks, and professionals. (rows 22-28, columns 2 and 3).

Two noteworthy conclusions emerge from the estimates of the multivariate specification: first, the frequencies and amounts of nonpayments are likely to be positively associated with wage levels--the higher the wage level in terms of occupation (for example, machine operators, assemblers, craft workers), region (rich in resources, among them Western Siberia, Eastern Siberia and the Far East, the North and the North-West), and age (average wage rises with age up to a point), the higher the frequency and amount withheld. Managerial decision making with respect to wage nonpayment seemed to be tilted in favor of fairness rather than productivity orientation assuming that higher wages reflected higher productivity.

Second, the exception to this pattern of the association of higher wage nonpayment (in frequency and amount) with the wage level occurred paradoxically with two groups depending on the weight they could exercise in influencing wage nonpayment decision making: Thus, legislators, top managers, and officers were least likely to be discriminated against because they could swing it in their favor despite their high wage levels, and women were likely to be less favored than men despite having lower wages because they could not influence managerial decision making.

Our analysis of the estimates of Table 7 brings us back to the issue we raised earlier, namely, how did Russian managers select workers who should bear the brunt of implicit downward wage adjustment via partial wage withholding? How did they resolve the conflict inherent in the goal of maintaining equity among their workers while retaining their productive employees? The pre-transition tradition of firms acting as production units and providers of social services tended to uneasily coexist as growing market pressures and hardening budget constraints required managers to use wages and employment policies less as mechanisms for fulfilling social welfare goals and more for bottom line profit calculations. We address this issue

by analyzing the data of Table 7.1 that reflect the influence of equity considerations in the allocation of wage arrears.

V. Equity, Markets, and Wage Arrears

Table 7.1 provides evidence of the influence of equity concerns in the distribution of wage arrear frequencies across high and low wage workers. Our empirical strategy is to evaluate whether regions that were relatively poor, i.e. had relatively low real monthly wages (calculated via regional price deflators), tended to have a lower likelihood of wage withholding from lower wage workers than regions with relatively higher real wages. For each of the eight regional groups, we calculate the ratio of the percentage of respondents with wages below the regional median wage who are owed wages to the percentage of respondents with wages above the regional median wage who are owed wages. Equity considerations in the distribution of wage arrears will generally predict that this ratio should be lower (higher) in regions with relatively lower (higher) average monthly real wages.

This prediction is largely borne out in Table 7.1 where we list regions from top to bottom in descending order of average monthly real regional wages and report the relative frequencies of wage arrears for low and high wage groups for each year and region. (Actual wage levels are listed in parentheses below the name of each region.) The pattern of the regional frequency ratios is not strictly monotonic,²² but the ratios generally decline as we move down each column supporting our prediction. Again, the correlation between average regional real wages and the entries in the cells is positive for each year and significant for 1995 (at the 3 percent level) and for 1996 (at the 8 percent level).

Similar correlation estimates linking wage nonpayment frequencies to wage levels by occupation, age and education did not provide conclusive evidence in favor of the influence of

²²When we aggregate the data for the three years, the correlation coefficients indicate a stronger monotonic decline between the frequency ratios and regional wages. (These results are available on request).

equity considerations in managerial decision making with regard to wage nonpayment.²³

VI. Wage Arrears, Expectations about the Future, and Poverty

How did wage arrears color peoples' expectations about their future well-being? Did they make people feel poorer? Did they result in higher poverty rates? Tables 8.1-9.2 provide insights into these two questions.

We address the first question by constructing two measures of pessimism about the future which are stated in Table 8.1. Comparing the mean values between rows in each panel, we see that when people were currently owed wages, they expected their family to be worse off in the next twelve months (Betwor) and more concerned about their ability to provide themselves with the bare essentials in the next twelve months (Agetne).

It is possible that workers who were owed wages had demographic attributes (for example, they were close to retirement or were poorly educated) that made them vulnerable in the current economic situation or they lived in poor regions (North Caucasus, for example). In other words, high wage arrears might be proxying the impact of these factors without contributing per se to people's expectations about their future well-being. In Table 8.2, we assess the relationship between wage arrears and pessimism about future well-being in a multivariate context. In both regressions, the dependent variable is coded such that higher values indicate greater pessimism about future well-being, i.e. a positive coefficient estimate means that the attribute is associated with a more negative assessment about the future. For example, the positive coefficient estimate of the female dummy (row 4) indicates that women tended to be more pessimistic about their future economic well-being than men, while the negative coefficient of the "education 6" dummy, representing university graduates, indicates that people with this education level were likely to be more optimistic about their future prospects (than those in the reference category of secondary education) after taking into account their contracted wage levels, age, current tenure, and so forth. The striking conclusion of relevance

²³We intend examining this issue further by disaggregating the data and adopting other measures such as the decile ratio of the bottom and the top ten percent wage earners for estimating the correlation between the wage level and the frequency and amount of wage nonpayment.

here is that, after we statistically control for personal attributes, occupational differences, and job location, we notice that wage arrears exerted a significant effect on future expectations, raising concern about future well-being (as seen from the positive coefficients on Pjowed in columns 2 and 3).

We extend the analysis further in Tables 9.1 and 9.2 by exploring the effect of wage arrears on the actual incidence of poverty rather than on expectations about future well-being.²⁴ Three conclusions follow from the analysis. Poverty, measured in terms of percentage of respondents below the poverty line, had increased in Russia during the transition irrespective of whether they were owed wages. The incidence of poverty, based on the percentage of people who were in families with income below regional poverty thresholds,²⁵ had increased more rapidly between 1994 and 1996 for people who were owed wages. Finally, the percentage in poverty was higher in all years for people who were owed wages.

This impact of wage arrears on poverty in Table 9.2 remains highly significant when we control for demographic and job market attributes of the respondents. Based on the estimates of the second specification (column 2), women were more likely to be in poverty (the coefficient of the female dummy is positive at 0.0772); higher education groups generally were less likely to experience poverty (the coefficients are negative); and the occurrence of poverty was higher in most regions relative to that in Moscow and St. Petersburg. Again, the effect of wage arrears on the likelihood of a family being in poverty increased in 1996, as reflected by the significant and positive interaction effect. Thus, in specification (2) we see that the effect of wage arrears on the likelihood of being in poverty in 1994, which is 0.4924 (row 3), rises to 0.7563 (0.4942+0.2621, from rows 3 and 5) in 1996. The impact of wage arrears on poverty had increased in 1996.

VII. Barter and Wage Arrears

²⁴See Milanovic (1996), and Gregory (1997) for discussions of trends in Russian poverty and issues relating to its measurement.

²⁵These thresholds are based on income requirements needed to meet minimum nutritional norms. Given the important role of social transfers and intra-family transfers (see Cox, Eser, and Jimenez, 1995), household expenditure might be a preferred measure of living standards (see Mikhalev, 1996). We intend pursuing this line of inquiry based on the RLMS data set in a separate paper.

Along with escalating wage arrears, barter arrangements between enterprises and their employees and among enterprises as payments for their output have increased in Russia. Forms of near money that provide liquidity, facilitate transactions, and contribute to price flexibility have also appeared (see Woodruff, 1996). Liquidity constraints have evidently contributed to wage arrears and barter of goods for labor services in Russia.²⁶

We note in Table 10.1 that the prevalence and ruble value of barter transactions between enterprises and their employees had decreased between 1994 and 1995, followed by a strong rebound in 1996, producing a significant increase in the occurrence, but not in the value of barter over the three year period. When we analyze these patterns in a multivariate context in Table 10.2, the decline between 1994 and 1995 in the probability of occurrence and in the value of barter is significant (row 1 of regressions 1-3), but the increase between 1994 and 1996 is not significant (row 2 of regressions 1-3).

Turning to the demographic distribution of the frequency and magnitude of barter, we notice in regression (1) that women were generally less likely to receive barter. When we restrict the analysis to workers who were currently owed wages in regression (2), we see that there was no relationship between gender and the likelihood of receiving barter. It appears that among workers who were not owed wages, men were more likely than women to receive pay in term of goods, but there was no difference among workers who were currently owed wages.

Turning to the effect of other explanatory variables, we fail to see a connection between tenure and the likelihood or value of barter. We notice that the likelihood of receipt of goods and their value increased with age to approximately 35-40 years old declining thereafter. Budget sector workers were significantly less likely to receive barter payments (row 9, regressions 1 and 2); when they did, these payments were no different from those received by nongovernmental workers. Again, barter was more common in most regions than in Moscow and St. Petersburg (evidenced by the positive coefficients of the region dummies in regressions 1 and 2), but conditional on receiving partial payment in goods, these payments, on average, do not suggest a

²⁶Pendergast and Stole (1996) provide arguments for barter within organizations that are not based on liquidity constraints per se. Among these are the ability of enterprises to reduce excess inventories creating negotiations between enterprises and workers for mutually beneficial barter arrangements (see Roha and Schulhof, 1996), and use goods as a source of price flexibility (see Stigler, 1969).

regional pattern (the regional dummies in regression 3 are statistically not significant).

While trends in barter between 1994 and 1996 are relevant to our analysis, our central focus is to check if barter transactions responded to the presence of wage arrears. The positive coefficient of *pjowed* (row 3, regression 1) indicates that the likelihood of receiving barter was greater for respondents who were owed wages. Again, the significantly positive coefficient of *ln(Amtowed)*, the amount of outstanding wage arrears owed to employees (row 4, regression 2), indicates that, for individuals who were owed wages, the likelihood of receiving goods increased with the ruble value of outstanding arrears.²⁷ Finally, the significantly positive coefficients of *ln(Amtowed)* (row 4, regression 3) indicates that the value of the goods received, conditional on receipt of goods, also increased with the ruble value of outstanding arrears. These results provide evidence that barter transactions arose partly in response to wage arrears.²⁸

Finally, we analyze the patterns of enterprise net debts to employees by measuring the differences between outstanding wage arrears and goods received, both calculated in rubles. When we compare the mean net debts of Table 10.2 (last row) to those reported in Table 2 (row 2), we observe that goods received by employees have only a marginal effect on outstanding enterprise debts to employees.²⁹ We also notice from the estimates (last column) that the sign and magnitude of the coefficients of the regressors are generally similar to those for

²⁷In regression (2), we restrict the analysis to respondents who were currently owed wages. Therefore, the estimate of the variable *ln(Amtowed)* reflects the effect of the change in the value of outstanding debt to a worker per se rather than a combination of this effect and the likelihood of having his wage withheld, i.e. of observing a positive value for the variable *Amtowed*.

²⁸If enterprise managers undertake barter transactions for enforcing wage flexibility in the presence of downwardly rigid nominal wages, then barter may decline if market forces result in lower wages. Markets require incentives for efficient functioning, but traditions, administrative rules, and political considerations may work against wage flexibility. In that case, barter practices may increase. If firms resort to barter in response to liquidity constraints, then the prevalence and magnitude of barter may increase unless the macroeconomic environment improves and the nonpayments crisis is resolved.

²⁹The values of *Goodsv* and *Amtowed-Goodsv* in Table 10.1 (rows 1 and 2) may seem at variance with the values reported for *Amtowed* in Table 2 (row 2). In other words, subtracting *Goodsv* of Table 10.1 from *Amtowed* of Table 2 yields a smaller value of *Amtowed-Goodsv* than is reported in the last row of Table 10.1. These values are however consistent because the values for *Goodsv* reported in Table 10.1 (row 2) are calculated on the basis of the subset of people who received goods in lieu of wages, whereas (*Amtowed-Goodsv*) involves all respondents who were owed wages, i.e. for calculating net debt, we set *Goodsv* equal to zero for people who were owed wages but who did not receive goods in lieu of wages.

ln(Amtowed) reported in Table 7. Therefore, while barter payments may have the potential to mitigate the hardships to which employees are subjected by wage nonpayment, it appears that the magnitude and prevalence of payment in goods and services in lieu of wages to the sampled Russian households were so small that they were unlikely to counteract the adverse impact of wage arrears.

VIII. Wage Arrears and Supplemental Economic Activity

We finally investigate the effect of nonpayment of wages on multiple job holding and informal, supplemental work for pay. Traditional models of moonlighting behavior argue that workers take second jobs when they are underemployed on their main job, defined as desiring more work hours than their main employer makes available to them, i.e. the wage rate on their main job is greater than their marginal rate of substitution between earnings (consumption) and leisure at current hours of work.³⁰ This framework assumes that workers are paid for the hours that they work, i.e. they are underemployed if they want to earn more income by working more (paid) hours. Nonpayment of wages may be seen in a similar light: workers, unable to generate their desired income on their primary jobs³¹, engage in supplemental employment in order to meet their income goals. It would therefore not be surprising to find that the wage arrears crisis has real effects on the economy, in addition to those generated by induced changes in expenditure, in that labor supply responses are induced in the form of supplemental economic activity.³²

We consider two forms of secondary economic activity. The variable *adpdjb* is a dummy

³⁰See Shisko and Rostker (1976), and Paxson and Sicherman (1996) for discussions of theoretical models of multiple job holding decisions.

³¹Depending on management behavior it might be more accurate to model the labor supply effects of wage arrears as a cut in wage rates (in the case where management tends to withhold pay based on a percentage of earnings), or a limitation on available paid hours (in the case where management tends to cease payments after a certain threshold level of earnings is reached).

³²Wage arrears may also produce labor supply effects in primary employment, i.e. increase quits from enterprises and sectors that fail to fully pay their wage obligations. The Soviet-era linkage of social services and housing to the employing enterprise limits these mobility responses.

that indicates whether or not a person holds a second job for pay, which we call formal secondary employment. The variable *engiea* is a dummy that indicates whether or not the respondent does any additional work for pay, although the actual survey question (see Table 11.1) clearly addresses less formal forms of work, largely self-employment activities. While the latter survey question was asked of all respondents, the former was only asked of people who reported that they currently held a job. As noted above, we have restricted our sample to people who indicated that they held a job (the wage arrears questions were only asked of these people), and we further impose the sample restriction of positive wage payments, thereby deleting from the sample people who held jobs but were currently on voluntary or involuntary leave. While the variable *adpdjb* will tend to capture more formal supplemental work, and the variable *engiea* will reflect less formal supplemental work and was addressed to a wider group of respondents, our sample restrictions ensure that in both cases we are looking at a similar group of people.³³

The simple univariate patterns in Table 11.1 suggest that, in 1995 and 1996, people who were owed wages were more likely to hold second jobs (*adpdjb*), and, in all years, people who were owed wages, were more likely to engage in supplemental individual economic activity (*engiea*). We also see, from the significantly positive coefficient of *Pjowed* in Table 11.2, that this relationship remains robust when we include other covariates, providing compelling evidence that wage nonpayment had distinct labor supply effects with respect to multiple job holding and less formal supplemental work. While wage arrears provided downward wage flexibility allowing firms to retain redundant workers, they also acted to stimulate employment (measured by total hours worked) and output through these induced labor supply effects. It is also interesting to note that women were less likely to engage in supplemental work activities,

³³These sample restrictions might bias our estimates of supplemental work activity and the effect of arrears on supplemental labor supply decisions because people on leave will tend to have different incentives for engaging in supplemental work from those currently receiving wages. The direction of the bias is also not obvious because those on voluntary leave, including maternity leave, might have relatively high reservation wages during their leave and hence be less likely to find alternative work, while those on involuntary leave may be in greater need of supplemental income. We hope to extend the analysis and consider the effects of these restrictions more fully in future work.

possibly due to family obligations.³⁴ When we split the sample by gender (not shown), we also find that wage arrears had a significant and positive effect on supplemental labor supply for men, but an insignificant (though positive) effect for women, reflecting either family constraints or possibly the influence of secondary-earner-status of many women.³⁵

IX. Summary

In this paper, we have developed a statistical profile of the impact of wage arrears on Russian workers grouped by demographic features, occupation and job location.

We argue that wage nonpayment, which peaked in 1996, was brought on by cash flow problems in the government sector and privatized enterprises. It was further accentuated by the traditional reluctance of managers to lay off workers and facilitated by the widespread weakening of contractual obligations on the part of employers. In particular, enterprise managers could be seen as devising strategies of wage nonpayment which best helped them lower wage outlays and maintain or increase sales revenues. They could hold on to the better paid, more productive workers in the interest of maintaining revenue inflows (the productivity orientation strategy) or retain and pay the low paid workers, playing fair by them while maintaining the wage bill.

Among our major findings, based on a multivariate specification incorporating the demographic, occupation and job location variables, are the following:

The relative frequency of workers denied wages and the amount of wage nonpayment in constant rubles sharply increased in 1996.

Female workers were denied wages more frequently than male employees evidently suggesting their less bargaining power. The outstanding average debt to female employees was however less than that for men reflecting women workers' concentration in low paid jobs.

Nonpayment likelihood increased with age up to approximately 37 years, falling

³⁴We intend analyzing this provisional hypothesis in future work by looking at the effects of marriage and children on labor supply behavior.

³⁵We plan to assess this possibility by incorporating total family earnings, especially spousal earnings, into the analysis, in addition to looking at the effect of wages rates on secondary jobs for men and women in order to look at the effects of opportunities in the secondary job market for men and women on secondary labor supply decisions.

thereafter. This feature approximately follows the pattern of average monthly wage initially rising with age and then declining.

Wage arrears likelihood and amounts increased with job tenure.

The likelihood and amount of nonpayment were generally higher in all regions relative to Moscow and St. Petersburg, revealing increasing nonpayment in frequency and amount as one moved up from the lower wage to the higher wage, resource-rich regions. Our statistical test supports this regional pattern suggesting that equity considerations in favor of the relatively less well off workers in the poorer regions may have influenced wage nonpayment decisions.

The likelihood and amount of nonpayment also increased from the low paid occupations (among them unskilled workers and clerks) to the high paid jobs (such as those of machine operators). However, our statistical test does not support an association between the frequency of nonpayment rising with average wage level.

The practice of nonpayment increased the likelihood that families would be actually pushed into poverty and that they would expect to live in poverty in the immediate future.

While payment in the form of goods in lieu of wages has the potential of mitigating the adverse effects of wage arrears, the frequency and magnitude of barter in our sample were not sufficient to have a significant effect.

Finally, wage nonpayment had increased the likelihood of workers holding additional jobs and undertaking informal paid activity.

In conclusion, our sample, covering respondents from the age of 16 to 64 and receiving positive wages at the time of the interviews, excludes Russia's unemployed--currently estimated at 10 percent of the workforce--, and the pensioners who have been pushed below poverty levels. From this perspective, our sample deals with a special group of losers in Russia's market transition. Nevertheless, our analysis of the wage arrears phenomenon, unique to Russia, provides important conclusions relating to its impact on Russian households divided by their demographic features, occupations and job locations.

Table 1: Variable Definitions and Questionnaire Items

Variable Names

Variable Construction

I. Wage Arrears

| | |
|---------|---|
| Pjowed | “At the present time, does your place of work owe you any money, which for various reasons was not paid on time?” We coded this question into a dummy variable which is 1 if the respondent said “Yes”, and is 0 if the respondent said “No”. |
| Amtowed | “How much money in all have they not paid you?” Respondents skipped this question if they answered that their employer did not owe them wages. (The amount owed was adjusted to December 1995 rubles.) |
| Amtw | Ratio of Amtowed to monthly (deflated) wage payment (see note below). |

II. Barter

| | |
|--------|--|
| Goodsp | “Have you received in the last 30 days at this enterprise in lieu of payment for your labor something from its production or from the production of another enterprise?” We coded this question into a dummy variable which is 1 if the respondent said “Yes”; it is 0 if the respondent said “No”; the variable was left out if the respondent was not owed any wages (i.e. Pjowed equals 0). |
| Goodsv | “Estimate, please, how much the product you received cost in rubles, regardless of what you did with it?” Respondents skipped this question if they answered that they did not receive goods in lieu of wages (i.e. Goodsp equals 0). (The amount is deflated to December 1995 rubles.) |

NOTES: Monthly wages, used as the denominator for Amtw, are taken from the questionnaire item, “how much money in the last 30 days did you receive from your primary workplace after taxes? If you received all or part of the money in foreign currency, please convert all into rubles, and name the total sum.” In the tables that follow, we deleted the responses when the individual reported either zero monthly wage or monthly wage in excess of 5,000,000 real rubles (with December 1995 as the base year and month).

**Table 2: Descriptive Statistics (Currently Employed Respondents),
Wage Arrears on the Primary Job**

| <u>Wage Arrears</u> | <u>1994</u> | <u>1995</u> | <u>1996</u> |
|--|-------------------------------|--|--|
| Pjowed: Percentage of people who are owed wages | 29.72 (45.7) [3,489] | 28.93 (45.4) [3,045] | 44.83 ^{b,c} (49.7) [2503] |
| Amtowed: Average wages owed | 769,855 (804,100) [870] | 690,465 ^a (780,951) [748] | 1,082,462 ^{b,c} (979,503) [944] |
| Amtw: Average ratio of wages owed to monthly wages received | 3.0967 (7.542) | 3.0211 (5.754) | 5.1052 ^{b,c} (10.202) |

NOTES: Annual averages are reported with standard deviations in parentheses. The sample sizes are stated in square brackets. The questionnaire items that are used in the construction of the above variables are stated in Table 1. The variable names are listed above in bold letters. Superscripts a, b, and c denote significant differences (at 10 percent or better) between 1994 and 1995, 1995 and 1996, and 1994 and 1996, respectively. All values are in terms of December 1995 rubles.

Table 2.1: Gender Patterns in Wage Arrear Frequencies (Pjowed), Amounts of Outstanding Wage Arrears (Amtowed), and Ratios of Amtowed to Monthly Wages (Amtw)

| | <u>1994</u> | <u>1995</u> | <u>1996</u> |
|--------------------|----------------------|------------------------|--------------------------|
| <u>(1) Pjowed</u> | | | |
| Female | 27.879 ^d | 28.204 | 43.192 ^{b,c,d} |
| Male | 31.821 | 29.774 | 46.790 ^{b,c} |
| <u>(2) Amtowed</u> | | | |
| Female | 562,164 ^d | 446,551 ^{a,d} | 925,061 ^{b,c,d} |
| Male | 1,005,035 | 959,044 | 1,274,677 ^{b,c} |
| <u>(3) Amtw</u> | | | |
| Female | 2.676 ^d | 2.634 ^d | 5.252 ^{b,c,d} |
| Male | 3.573 | 3.447 | 4.927 ^{b,c} |

NOTES: The cells report the values for each variable separately for females and males. We restrict the analysis to respondents who reported positive wages. Superscripts a, b, c, and d denote significant differences (at 10 percent or better) between 1994 and 1995, 1995 and 1996, 1994 and 1996, and between females and males, respectively.

Table 3: Pjowed, Amtowed, and Amtw among Respondents Grouped by Age

| Age Group | 1994 | 1995 | 1996 |
|---|---|--|--|
| 17-25 years | 23.725 649,040 3.079 [451] | 22.889 461,758 ^a 2.399 [450] | 34.783 ^{b,c} 998,051 ^{b,c} 5.693 ^{b,c} [345] |
| 26-35 years | 32.308 ^d 785,446 ^d 2.860 [975] | 30.440 ^d 669,018 ^{a,d} 2.892 [772] | 46.493 ^{b,c,d} 1,038,050 ^{b,c} 4.760 ^{b,c} [613] |
| 36-45 years | 33.932 ^d 827,063 ^d 3.709 [1,058] | 32.953 ^d 690,761 ^a 2.770 ^a [965] | 47.138 ^{b,c,d} 1,127,179 ^{b,c} 5.912 ^{b,c} [821] |
| 46-55 years | 26.912 725,304 2.156 [680] | 28.897 ^d 837,182 ^d 3.066 ^a [571] | 46.405 ^{b,c,d} 1,162,166 ^{b,c,d} 4.421 ^{b,c} [459] |
| 56-64 years | 22.430 701,332 3.395 [321] | 20.922 755,078 ^d 5.716 ^d [282] | 43.701 ^{b,c,d} 997,491 ^{b,c} 3.886 ^{c,d} [254] |
| $\sigma, \sigma/\bar{x}$ (across age groups) | 4.564, 0.164 62,614, 0.085 0.527, 0.173 | 4.571, 0.168 125,037, 0.183 1.194, 0.354 | 4.614, 0.106 67,930, 0.064 0.765, 0.155 |

NOTES: Each cell reports the percentage of respondents in each age group that are currently owed wages by their employers (Pjowed) in the first row; the average outstanding wage arrears (Amtowed) in the second row, and the average ratio of outstanding wage arrears to monthly wages received (Amtw) in the third row. We restrict the analysis to respondents who reported positive wages. The sample sizes of respondents with positive wages in each age group are reported in square brackets. The last three rows report the standard deviations in mean values and the coefficients of variation for Pjowed, Amtowed, and Amtw across education groups. Superscripts a, b, c, and d denote significant differences (at 10 percent or better) between 1994 and 1995, 1995 and 1996, 1994 and 1996, respectively. Superscripts d, e, f, and g denote significant differences (at 10 percent or better) between 1) each age group and the 17-25 group, 2) the 26-45 and 46-55 groups, 3) the 26-45 and 56-64 groups, and 4) the 46-55 and 56-64 groups, respectively.

Table 4.1: Pjowed by Education Groups

| <u>Education Group</u> | <u>1994</u> | <u>1995</u> | <u>1996</u> |
|---|-----------------------------|-----------------------------|---------------------------------|
| No training besides secondary school | 29.59 [507] | 26.98 [404] | 42.50 ^{b,c} [280] |
| Additional training besides secondary school: | | | |
| Professional courses (i.e. chauffeuring, typing, accounting) | 33.84 ^d [922] | 31.00 ^d [600] | 47.22 ^{b,c,d} [540] |
| PTU, FZU, FZO* without a secondary education | 35.93 ^d [334] | 29.53 ^a [254] | 42.58 ^{b,c} [209] |
| PTU with a secondary education | 27.77 [594] | 28.89 [488] | 45.09 ^{b,c} [397] |
| Technical, medical, music, pedagogical, art school | 29.76 [1,055] | 30.31 [871] | 47.56 ^{b,c,d} [778] |
| Institute, university, academy | 28.01 [846] | 27.75 [710] | 40.69 ^{b,c} [607] |
| Graduate school, residency | 13.21 ^d [53] | 27.27 ^a [44] | 61.54 ^{b,c,d} [26] |
| $\sigma, \sigma/\bar{x}$ (across education groups) | 7.3118, 0.2584 | 1.5500, 0.0538 | 7.0066, 0.1499 |

NOTES: Each cell reports the percentage of respondents in each education group that are currently owed wages by their employers. The sample sizes are reported in square brackets. We restrict the analysis to respondents who reported positive wages. The last row states the standard deviations in mean values and the coefficients of variation across education groups. Superscripts a, b, c, and d denote significant differences (at 10 percent or better) between 1994 and 1995, 1995 and 1996, 1994 and 1996, and between the “no training besides secondary school” category and the indicated educational category, respectively.

*PTU, FZU and FZO represent professional/technical trade school, factory/manufacturing trade school (a training program located in factories), and factory/manufacturing department (a specific type of training program), respectively.

Table 4.2: Amtowed and Amtw by Education Groups

| <u>Education Group</u> | <u>1994</u> | <u>1995</u> | <u>1996</u> |
|--|---|--|---|
| No training besides secondary school | 664,890 2.556 [129] | 627,622 3.189 [95] | 827,353 ^{a,b} 3.994 ^c [93] |
| Additional training besides secondary school: | | | |
| Professional courses (i.e. chauffeuring, typing, accounting) | 840,047 ^d 3.722 ^d [252] | 859,061 ^d 3.557 [153] | 1,043,386 ^{b,c,d} 4.982 ^{b,c} [207] |
| PTU, FZU, FZO* without a secondary education | 814,768 ^d 3.732 [93] | 626,843 ^a 2.105 ^{a,d} [63] | 1,031,227 ^{b,c,d} 3.819 ^c [72] |
| PTU with a secondary education | 726,555 3.063 [135] | 672,619 3.329 [118] | 910,394 ^{b,c} 4.611 ^{b,c} [152] |
| Technical, medical, music, pedagogical, art school | 739,043 2.547 [271] | 665,161 2.859 [229] | 1,205,234 ^{b,c,d} 5.569 ^{b,c,d} [323] |
| Institute, university, academy | 824,269 ^d 2.681 [208] | 736,636 2.686 [168] | 1,212,236 ^{b,c,d} 4.620 ^{b,c} [215] |
| Graduate school, residency | 672,660 0.884 ^d [5] | 732,603 1.229 ^d [8] | 1,240,478 ^c 4.594 ^{b,c} [11] |
| $\sigma, \sigma/\bar{x}$ (across education groups) | 72,532, 0.0961 0.9637, 0.3516 | 81,853, 0.1164 0.8075, 0.2982 | 160,255, 0.1502 0.5863, 0.1275 |

NOTES: Each cell reports the average outstanding wage arrears, Amtowed, in the first row, and the average ratio of outstanding wage arrears to monthly wages received, Amtw, in the second row. The sample sizes are reported in square brackets. We restrict the analysis to respondents who reported positive wages. The last two rows report the standard deviations in mean values and the coefficients of variation across education groups. Superscripts a, b, c, and d denote significant differences (at 10 percent or better) between 1994 and 1995, 1995 and 1996, 1994 and 1996, and between the “no training besides secondary school” category and the indicated educational category, respectively.

*See note to Table 5.1

Table 5.1: Pjowed by Region

| <u>Region</u> | <u>1994</u> | <u>1995</u> | <u>1996</u> |
|--|----------------|-----------------------------|-------------------------------|
| Moscow and St. Petersburg | 20.22 [450] | 16.98 [371] | 25.55 ^{b,c} [321] |
| Northern and North Western | 36.18 [246] | 40.89 [247] | 59.09 ^{b,c} [198] |
| Central and Central Black-Earth | 26.32 [661] | 23.53 [595] | 36.94 ^{b,c} [517] |
| Volga-Vyatski and Volga Basin | 30.52 [580] | 34.30 ^a [481] | 48.45 ^{b,c} [386] |
| North Caucasus | 25.39 [386] | 27.16 [335] | 44.77 ^{b,c} [239] |
| Urals | 33.15 [543] | 30.82 [503] | 51.44 ^{b,c} [416] |
| Western Siberia | 29.39 [313] | 29.32 [249] | 50.66 ^{b,c} [229] |
| Eastern Siberia and Far Eastern | 43.87 [310] | 35.23 ^a [264] | 54.82 ^{b,c} [197] |
| $\sigma, \sigma/\bar{x}$ (across regions) | 7.255, 0.2368 | 7.413, 0.2489 | 10.734, 0.2310 |

NOTES: Each cell reports the percentage of respondents in each region that are currently owed wages by their employers. The sample sizes are reported in square brackets. We restrict the analysis to respondents who reported positive wages. The last row states the standard deviations in mean values and the coefficients of variation across regions. Superscripts a, b, and c denote significant differences (at 10 percent or better) between 1994 and 1995, 1995 and 1996, and 1994 and 1996, respectively.

Table 5.2: Amtowed and Amtw by Region

| <u>Region</u> | <u>1994</u> | <u>1995</u> | <u>1996</u> |
|--|-----------------------------------|--|---|
| Moscow and St. Petersburg | 845,499 2.067 [76] | 628,192 ^a 3.021 [52] | 1,053,821 ^{b,c} 3.501 ^c [71] |
| Northern and North Western | 1,091,889 2.563 [77] | 1,063,316 3.418 ^a [83] | 1,643,399 ^{b,c} 7.959 ^{b,c} [86] |
| Central and Central Black-Earth | 686,474 3.164 [147] | 609,084 3.004 [118] | 905,599 ^{b,c} 4.001 [172] |
| Volga-Vyatski and Volga Basin | 496,693 4.452 [152] | 499,866 3.034 [139] | 808,704 ^{b,c} 5.037 ^b [155] |
| North Caucasus | 492,355 2.655 [84] | 565,227 2.282 [76] | 853,671 ^{b,c} 3.368 ^b [95] |
| Urals | 772,407 2.913 [155] | 630,773 ^a 2.284 [142] | 1,105,476 ^{b,c} 4.797 ^{b,c} [186] |
| Western Siberia | 954,046 4.356 [74] | 670,206 ^a 2.598 ^a [59] | 1,258,710 ^{b,c} 6.223 ^{b,c} [99] |
| Eastern Siberia and Far Eastern | 1,079,536 1.986 [105] | 1,039,546 4.958 ^a [79] | 1,415,612 ^{b,c} 7.361 ^{b,c} [80] |
| $\sigma, \sigma/\bar{x}$ (across regions) | 235,853, 0.2939 0.9401, 0.3114 | 214,875, 0.3013 0.8582, 0.2791 | 292,298, 0.2585 1.7380, 0.3291 |

NOTES: Each cell reports average outstanding wage arrears, Amtowed, in the first row and the average ratio of outstanding wage arrears to monthly wages received, Amtw, in the second row. The sample sizes are reported in square brackets. We restrict the analysis to respondents who reported positive wages and positive outstanding wage arrears. The last two rows report the standard deviations in mean values and the coefficients of variation across regions. Superscripts a, b, and c denote significant differences (at 10 percent or better) between 1994 and 1995, 1995 and 1996, and 1994 and 1996, respectively.

Table 6.1: Pjowed by Occupation

| <u>Occupation</u> | <u>1994</u> | <u>1995</u> | <u>1996</u> |
|--|----------------|-----------------------------|-------------------------------|
| Legislator, Senior Manager, Official | 23.53 [51] | 15.45 [123] | 35.00 ^b [20] |
| Professional | 30.04 [749] | 30.48 [502] | 45.86 ^{b,c} [519] |
| Technician, Associate Professional | 26.27 [552] | 26.23 [507] | 46.08 ^{b,c} [408] |
| Clerk | 25.96 [235] | 21.01 ^a [238] | 34.29 ^{b,c} [210] |
| Service Worker, Market Worker | 17.67 [249] | 20.61 [262] | 30.15 ^{b,c} [199] |
| Craft or Related Trades | 31.83 [644] | 32.14 [501] | 51.12 ^{b,c} [403] |
| Plant or Machine Operator or Assembler | 37.79 [614] | 35.94 [512] | 49.16 ^{b,c} [419] |
| Elementary (Unskilled) Occupation | 29.14 [350] | 32.09 [349] | 40.35 ^{b,c} [285] |
| Army | 26.92 [26] | 34.29 [35] | 92.31 ^{b,c} [26] |
| $\sigma, \sigma/\bar{x}$ (across occupations) | 5.361, 0.1915 | 7.125, 0.2656 | 17.511, 0.3657 |

NOTES: Each cell reports the percentage of respondents in each occupation that are currently owed wages by their employers. The sample sizes are reported in square brackets. We restrict the analysis to respondents who reported positive wages. The last two rows report the standard deviations in mean values and the coefficients of variation across occupations. Superscripts a, b, and c denote significant differences (at 10 percent or better) between 1994 and 1995, 1995 and 1996, and 1994 and 1996, respectively.

Table 6.2: Amtowed and Amtw by Occupation

| Occupation | 1994 | 1995 | 1996 |
|--|-----------------------------------|--|---|
| Legislator, Senior | 1,127,025 | 777,325 | 1,240,458 |
| Manager, Official | 1.986 [8] | 2.255 [16] | 1.463 [4] |
| Professional | 730,389 2.630 [199] | 637,513 3.233 [127] | 1,110,394 ^{b,c} 5.240 ^{b,c} [211] |
| Technician, Associate Professional | 543,284 2.366 [131] | 513,866 2.090 [117] | 994,712 ^{b,c} 6.055 ^{b,c} [161] |
| Clerk | 556,672 2.030 [55] | 397,233 ^a 2.932 ^a [42] | 892,965 ^{b,c} 5.996 ^{b,c} [62] |
| Service Worker, Market Worker | 542,867 1.884 [39] | 446,973 1.914 [47] | 746,081 ^{b,c} 4.052 ^{b,c} [54] |
| Craft or Related Trades | 883,797 3.330 [172] | 935,182 3.217 [140] | 1,158,321 ^{b,c} 4.855 ^{b,c} [168] |
| Plant or Machine Operator or Assembler | 1,043,023 4.592 [181] | 957,719 4.384 [149] | 1,254,722 ^{b,c} 4.551 [169] |
| Elementary (Unskilled) Occupation | 519,843 3.092 [76] | 394,665 ^a 2.353 ^a [95] | 841,011 ^{b,c} 5.108 ^{b,c} [95] |
| Army | 1,861,793 3.038 [6] | 1,151,216 2.025 [12] | 2,217,246 ^b 3.934 ^b [12] |
| $\sigma, \sigma/\bar{x}$ (across occupations) | 437,868, 0.5045 0.8616, 0.3108 | 277,918, 0.4027 0.8065, 0.2975 | 434,074, 0.3736 1.3867, 0.3025 |

NOTES: Each cell reports the average outstanding wage arrears, Amtowed, in the first row and the average ratio of outstanding wage arrears to monthly wages received, Amtw. The sample sizes are reported in square brackets. We restrict the analysis to respondents who reported positive wages. The last two rows report the standard deviations in mean values and the coefficients of variation across occupations. Superscripts a, b, and c denote significant differences (at 10 percent or better) between 1994 and 1995, 1995 and 1996, and 1994 and 1996, respectively.

Table 7: Multivariate Estimates of Wage Arrears

| <u>Explanatory Variable</u> | <u>Pjowed</u> | <u>ln(Amtowed)</u> |
|-----------------------------|-------------------------------|-------------------------------|
| dum1995 | 0.0562 ^d (0.0371) | -0.1635 ^a (0.0469) |
| dum1996 | 0.4368 ^a (0.0382) | 0.3451 ^a (0.0443) |
| female | 0.1500 ^a (0.0387) | -0.2056 ^a (0.0474) |
| age | 0.0417 ^a (0.0098) | 0.0279 ^b (0.0125) |
| age ² | -0.0006 ^a (0.0001) | -0.0004 ^b (0.0002) |
| tenure | 0.0012 ^a (0.0002) | 0.0008 ^a (0.0002) |
| government | 0.2115 ^a (0.0362) | -0.0533 (0.0450) |
| education 2 | 0.0911 ^b (0.0384) | -0.0150 (0.0452) |
| education 3 | 0.0001 (0.0589) | -0.0481 (0.0698) |
| education 4 | -0.0381 (0.0466) | -0.0874 ^d (0.0553) |
| education 5 | 0.0121 (0.0384) | 0.1036 ^b (0.0451) |
| education 6 | -0.1031 ^b (0.0503) | 0.1081 ^c (0.0603) |
| education 7 | -0.1984 (0.1510) | -0.4210 ^b (0.1953) |
| ln (rmwage) | 0.3247 ^a (0.0207) | 0.6730 ^a (0.0254) |
| region 2 | 0.5731 ^a (0.0726) | 0.5141 ^a (0.0903) |
| region 3 | 0.3437 ^a (0.0597) | 0.2532 ^a (0.0806) |
| region 4 | 0.5904 ^a (0.0620) | 0.2706 ^a (0.0811) |
| region 5 | 0.4761 ^a (0.0677) | 0.2309 ^a (0.0888) |
| region 6 | 0.5534 ^a (0.0609) | 0.3490 ^a (0.0792) |
| region 7 | 0.3833 ^a (0.0699) | 0.5494 ^a (0.0903) |
| region 8 | 0.6328 ^a (0.0713) | 0.4892 ^a (0.0889) |

(continued on the next page)

Table 7: Multivariate Estimates of Wage Arrears (continued)

| <u>Explanatory Variable</u> | <u>Pjowed</u> | <u>ln(Amtowed)</u> |
|-----------------------------|-------------------------------|------------------------------|
| occupation 1 | -0.1055 (0.1365) | 0.1080 (0.1952) |
| occupation 2 | 0.3118 ^a (0.0747) | -0.0328 (0.0974) |
| occupation 3 | 0.2279 ^a (0.0703) | -0.0326 (0.0923) |
| occupation 4 | 0.0812 (0.0821) | 0.1502 (0.1087) |
| occupation 6 | 0.3594 ^a (0.0720) | 0.1476 ^d (0.0931) |
| occupation 7 | 0.3639 ^a (0.0719) | 0.1955 ^b (0.0920) |
| occupation 8 | 0.4471 ^a (0.0761) | 0.1071 (0.0984) |
| military | 0.5291 ^a (0.1624) | 0.4110 ^b (0.1781) |
| constant | -6.6413 ^a (0.3268) | 3.1874 ^a (0.4112) |
| (pseudo) R ² | 0.0869 | 0.3907 |
| Test 1 (education) | 14.48 ^b | 2.93 ^a |
| Test 2 (region) | 136.67 ^a | 8.54 ^a |
| Test 2 (occupation) | 66.69 ^a | 2.59 ^a |
| Sample size | 7,869 | 2,414 |

NOTES: 1. The first regression (Pjowed) is estimated by maximum likelihood probit. The second regression ln(Amtowed) is estimated by ordinary least squares, with the sample restricted to people who reported wage nonpayment.

2. The coefficient estimates are reported with standard errors in parentheses. Significance at the 1 percent, 5 percent, 10 percent, and 15 percent levels are denoted by superscripts a, b, c, and d respectively.

3. The rows labeled Test 1, Test 2, and Test 3 report joint significance test statistics for the six education dummies, the seven regional dummies, and the eight occupation dummies, respectively.

Table 7.1: Mean Wages by Select Demographic Characteristics

| | <u>1994</u> | <u>1995</u> | <u>1996</u> |
|--|-------------|-------------|-------------|
| <u>Occupation</u> | | | |
| Army | 1,460,257 | 973,992 | 1,527,045 |
| Legislator, Senior Manager, Official | 1,117,261 | 1,164,415 | 1,986,828 |
| Plant or Machine Operator or Assembler | 845,238 | 827,426 | 972,033 |
| Craft or Related Trades | 819,415 | 749,721 | 927,312 |
| Professional | 818,504 | 688,146 | 901,689 |
| Technician, Associate Professional | 616,651 | 644,785 | 860,595 |
| Service Worker, Market Worker | 602,309 | 575,716 | 719,360 |
| Clerk | 484,695 | 460,557 | 602,452 |
| Elementary (Unskilled Occupation) | 399,069 | 412,033 | 593,808 |
| <u>Education</u> | | | |
| Graduate school, residency | 1,019,747 | 926,717 | 794,274 |
| Institute, university, academy | 907,020 | 828,941 | 988,299 |
| Professional courses | 755,068 | 761,182 | 886,214 |
| PTU with a secondary education | 728,579 | 649,626 | 799,988 |
| PTU, ...,without a secondary education | 706,860 | 670,237 | 759,894 |
| Technical, ..., art school | 704,330 | 671,622 | 866,774 |
| Secondary school | 545,808 | 513,564 | 700,803 |
| <u>Age</u> | | | |
| 36-45 years | 808,926 | 725,303 | 842,479 |
| 26-35 years | 718,687 | 691,686 | 919,753 |
| 46-55 years | 707,072 | 727,842 | 871,040 |
| 17-25 years | 647,774 | 604,779 | 817,605 |
| 56-64 years | 551,979 | 498,068 | 696,407 |

NOTES: Occupation, education, and age groups are listed in descending order of 1994 wages. The cell values are mean real monthly wages for each demographic group. The standard deviations are available on request.

**Table 7.2: Equity Considerations and Wage Arrears:
Regional Pjowed Among Relatively Low and High Wage Earners**

| | <u>1994</u> | <u>1995</u> | <u>1996</u> |
|--|------------------|------------------|------------------|
| Western Siberia (1,031,608; 1,113,793; 1,312,666) | 1.0851 | 1.6053 | 1.6916 |
| Northern and North Western (1,020,819; 915,112; 1,221,732) | 0.5665 | 0.6878 | 0.7200 |
| Moscow and St. Petersburg (899,332; 859,997; 1,024,842) | 0.6227 | 0.9683 | 0.4862 |
| Eastern Siberia and Far East (988,329; 779,702; 980,506) | 0.5900 | 0.4630 | 0.8503 |
| Urals (695,738; 597,803; 804,534) | 0.5228 | 0.4947 | 0.5763 |
| Central and Central Black-Earth (582,873; 576,573; 689,148) | 0.5655 | 0.6856 | 0.6433 |
| North Caucasus (484,276; 501,725; 669,472) | 0.6969 | 0.6619 | 0.6267 |
| Volga-Vyatski and Volga Basin (484,549; 468,029; 559,816) | 0.5670 | 0.5000 | 0.5876 |
| Correlation between wage levels and cell entries (significance level in parentheses) | 0.3664 (0.32) | 0.7627 (0.03) | 0.6459 (0.08) |

NOTES: The regions are listed in descending order of average wage in each region (based on the average wage over the three year period 1994-96); average wages for 1994, 1995, and 1996 are listed in that order in parentheses between each region. Each cell reports the ratio of the percentage of people in the region with wages below the median wage who are owed wages to the percentage with wages above the median wage who are owed wages.

Table 8.1: Assessment of Future Welfare By Respondents and Wage Arrears

Betwor

“Do you think that in the next 12 months you and your family will live better than today, or worse?” The responses are coded from 1 representing “much better” through 5 representing “much worse.”

| | <u>1994</u> | <u>1995</u> | <u>1996</u> |
|------------------------------|------------------------------|------------------------------|------------------------------|
| Owed Wages (Pjowed=1) | 3.5727 ^a [812] | 3.5015 ^a [684] | 3.4418 ^a [842] |
| Not Owed Wages (Pjowed=0) | 3.3572 [2,251] | 3.3051 [1,937] | 3.2073 [1,158] |

Agetne

“How concerned are you about the possibility that you might not be able to provide yourself with the bare essentials in the next 12 months?” The responses are coded from 1 representing “not concerned” through 5 representing “very concerned.”

| | <u>1994</u> | <u>1995</u> | <u>1996</u> |
|------------------------------|------------------------------|------------------------------|------------------------------|
| Owed Wages (Pjowed=1) | 4.2486 ^a [869] | 4.2389 ^a [745] | 4.3068 ^a [942] |
| Not Owed Wages (Pjowed=0) | 4.0399 [2,431] | 4.0623 [2,150] | 3.9610 [1,360] |

NOTES: Each cell reports the mean value for a given variable separately for respondents who are and who are not owed wages. The sample sizes are reported in square brackets. We restrict the analysis to respondents who report positive wages. Superscript a denotes significant differences (at 10 percent or better), for each year, between respondents who are and who are not owed wages.

Table 8.2: Multivariate Estimates of Respondents' Concerns About Their Future Welfare

| <u>Explanatory Variable</u> | <u>Betwor</u> | <u>Agetne</u> |
|-----------------------------|-------------------------------|-------------------------------|
| Pjowed | 0.2434 ^a (0.0291) | 0.3025 ^a (0.0301) |
| dum1995 | -0.0931 ^a (0.0298) | -0.0138 (0.0306) |
| dum1996 | -0.1250 ^a (0.0326) | -0.0107 (0.0330) |
| female | 0.0978 ^a (0.0316) | 0.2011 ^a (0.0320) |
| age | 0.0628 ^a (0.0079) | 0.0698 ^a (0.0079) |
| age ² | -0.0005 ^a (0.0001) | -0.0009 ^a (0.0001) |
| tenure | 0.0004 ^a (0.0001) | 0.0004 ^a (0.0001) |
| government | 0.0486 ^c (0.0294) | 0.0489 ^c (0.0299) |
| education 2 | -0.0802 ^a (0.0318) | -0.1177 ^a (0.0321) |
| education 3 | 0.0207 (0.0487) | 0.0736 ^d (0.0503) |
| education 4 | -0.0044 (0.0383) | 0.0226 (0.0394) |
| education 5 | 0.0268 (0.0318) | -0.0089 (0.0322) |
| education 6 | -0.1109 ^a (0.0413) | -0.0747 ^c (0.0406) |
| education 7 | 0.1144 (0.1131) | -0.0027 (0.1120) |
| ln (rmwage) | -0.1816 ^a (0.0167) | -0.2599 ^a (0.0172) |
| region 2 | 0.2623 ^a (0.0601) | 0.3667 ^a (0.0602) |
| region 3 | 0.1357 ^a (0.0467) | 0.1881 ^a (0.0455) |
| region 4 | 0.2767 ^a (0.0498) | 0.2586 ^a (0.0491) |
| region 5 | 0.1458 ^a (0.0533) | 0.3218 ^a (0.0535) |
| region 6 | 0.2772 ^a (0.0488) | 0.2975 ^a (0.0482) |
| region 7 | 0.1932 ^a (0.0563) | 0.5241 ^a (0.0574) |
| region 8 | 0.2327 ^a (0.0580) | 0.4008 ^a (0.0588) |

(continued on the next page)

Table 8.2: Multivariate Estimates of Respondents' Concerns About Their Future Welfare (continued)

| <u>Explanatory Variable</u> | <u>Betwor</u> | <u>Agetne</u> |
|-----------------------------|------------------------------|-------------------------------|
| Occupation 1 | -0.0873 (0.1017) | -0.3608 ^a (0.1004) |
| Occupation 2 | 0.0222 (0.0588) | -0.2005 ^a (0.0605) |
| Occupation 3 | -0.0526 (0.0550) | -0.2069 ^a (0.0572) |
| Occupation 4 | 0.0816 (0.0643) | -0.2016 ^a (0.0668) |
| Occupation 6 | -0.0165 (0.0564) | -0.1045 ^c (0.0584) |
| Occupation 7 | 0.0631 (0.0568) | -0.0483 (0.0591) |
| Occupation 8 | 0.0003 (0.0604) | -0.0403 (0.0632) |
| Military | 0.3836 ^a (0.1365) | -0.1875 (0.1344) |
| (pseudo) R ² | 0.0453 | 0.0399 |
| Test 1 (education) | 17.76 | 20.58 |
| Test 2 (region) | 48.51 | 111.41 |
| Test 3 (occupation) | 19.64 | 29.98 |
| Sample size | 7,098 | 7,817 |

NOTES: 1. The regressions are estimated by maximum likelihood ordered probit.

2. The coefficient estimates are reported with standard errors in parentheses. Significance at the 1 percent, 5 percent, 10 percent and 15 percent levels are denoted by superscripts a, b, c, and d respectively.

3. The rows labeled Test 1, Test 2, and Test 3 report joint significance test statistics for the six education dummies, the seven regional dummies, and the eight occupation dummies, respectively.

Table 9.1: Wage Arrears and the Frequency of Poverty

| | <u>1994</u> | <u>1995</u> | <u>1996</u> |
|------------------|---------------------|-----------------------|-----------------------|
| Not Owed Arrears | 7.915 | 14.443 ^b | 12.889 ^c |
| Owed Arrears | 11.206 ^a | 26.897 ^{a,b} | 25.277 ^{a,c} |

NOTE: Each cell entry gives the percentage of respondents from age 16 to 64 in families with family incomes below regional poverty thresholds. The first row gives poverty percentages for respondents who reported that they were owed wages by their employers; the second row gives poverty percentages for people who did not report that they were owed wages by their employers. Superscripts a,b,c indicate significant differences (at 10 percent or better) in poverty rates between respondents based on whether or not they are owed wages by their employers, between 1994 and 1995, and between 1994 and 1996, respectively.

Table 9.2: Wage Arrears and the Frequency of Poverty

| | (1) | (2) |
|------------------|-------------------------------|-------------------------------|
| dum1995 | 0.4716 ^a (0.0496) | 0.4074 ^a (0.0602) |
| dum1996 | 0.5800 ^a (0.0534) | 0.4748 ^a (0.0701) |
| Pjowed | 0.6532 ^a (0.0456) | 0.4942 ^a (0.0802) |
| Pjowed x dum1995 | - | 0.1948 ^c (0.1048) |
| Pjowed x dum1996 | - | 0.2621 ^a (0.1082) |
| female | -0.0642 (0.0521) | 0.0772 ^b (0.0339) |
| age | 0.1220 ^a (0.0133) | 0.1224 ^a (0.0133) |
| age ² | -0.0015 ^a (0.0002) | -0.0016 ^a (0.0002) |
| tenure | -0.0004 ^d (0.0002) | -0.0004 ^d (0.0002) |
| government | 0.0467 (0.0478) | 0.0465 (0.0478) |
| education 2 | -0.1091 ^b (0.0530) | -0.1066 ^b (0.0530) |
| education 3 | -0.0089 (0.0737) | -0.0044 (0.0737) |
| education 4 | -0.0613 (0.0592) | -0.0601 (0.0592) |
| education 5 | -0.1565 ^a (0.0522) | -0.1573 ^a (0.0523) |
| education 6 | -0.2948 ^a (0.0724) | -0.2892 ^a (0.0726) |
| education 7 | 0.5509 ^d (0.3612) | 0.5643 ^d (0.3621) |
| ln(rmwage) | -0.7341 ^a (0.0290) | -0.7329 ^a (0.0290) |
| region 2 | 0.4648 ^a (0.1040) | 0.4559 ^a (0.1042) |
| region 3 | -0.0186 (0.0878) | -0.0228 (0.0879) |
| region 4 | 0.2438 ^a (0.0867) | 0.2390 ^a (0.0868) |
| region 5 | 0.0898 (0.0943) | 0.0827 (0.0944) |
| region 6 | 0.0907 (0.0888) | 0.0849 (0.0889) |
| region 7 | 0.3462 ^a (0.1032) | 0.3348 ^a (0.1035) |
| region 8 | 0.3698 ^a (0.1009) | 0.3654 ^a (0.1010) |

(continued on the next page)

Table 9.2: Wage Arrears and the Frequency of Poverty
(continued)

| | (1) | | (2) | |
|-------------------------|----------------------|----------|----------------------|----------|
| occupation 1 | -0.6133 ^a | (0.2421) | -0.2291 ^c | (0.1223) |
| occupation 2 | -0.2052 ^b | (0.0952) | -0.2083 ^a | (0.0678) |
| occupation 3 | -0.3189 ^a | (0.0857) | -0.1582 ^a | (0.0619) |
| occupation 4 | -0.1506 ^d | (0.0943) | -0.0644 | (0.0715) |
| occupation 7 | -0.0537 | (0.0872) | -0.0515 | (0.0617) |
| occupation 8 | -0.1229 | (0.0876) | -0.0701 | (0.0616) |
| occupation 9 | -0.1578 ^c | (0.0878) | 0.0617 | (0.0624) |
| military | -0.5867 ^c | (0.3425) | -0.5459 ^a | (0.1738) |
| constant | -5.7658 ^a | (0.4191) | -2.4031 ^a | (0.1751) |
| (pseudo) R ² | 0.2175 | | 0.2186 | |
| Test 1 (education) | 26.00 ^a | | 25.55 ^a | |
| Test 2 (region) | 57.02 ^a | | 55.78 ^a | |
| Test 3 (occupation) | 22.58 ^a | | 22.85 ^a | |

NOTES: 1. The regressions are estimated by maximum likelihood probit. The sample size is 7,491.

2. The coefficient estimates are reported with standard errors in parentheses. Significance at the 1 percent, 5 percent, and 10 percent levels are denoted by superscripts a, b, and c, respectively.

3. The rows labeled Test 1, Test 2, and Test 3 report joint significance test statistics for the six education dummies, the seven regional dummies, and the eight occupation dummies, respectively.

4. For both regressions, the dependent variable is P_index which is defined as 1 if the family income (adjusted for family structure) fell below the poverty threshold, and as 0 if the family income did not fall below the poverty threshold.

Table 10.1 Barter and Net Outstanding Payments Arrears

| | <u>1994</u> | <u>1995</u> | <u>1996</u> |
|--|------------------|-------------------------------|-----------------------------------|
| <u>Barter</u> | | | |
| Goodsp: the percentage of respondents who are currently owed wages that have received at least partial payment in goods | 13.164 [866] | 9.103 ^a [736] | 15.060 ^{b,d} [923] |
| Goodsv: the average value of goods received by respondents who have received goods in lieu of wage payments | 226,013 [110] | 164,651 ^a [64] | 191,138 ^d [135] |
| <u>The Value of Net Outstanding Payment Arrears</u> | | | |
| Amtowed-Goodsv | 738,655 [862] | 672,910 ^a [733] | 1,037,080 ^{b,c} [919] |

NOTES: Mean values are reported with sample sizes in parentheses. We restrict the analysis to respondents who reported positive wages and who were owed wages by their employer (i.e. if $p_{jowed}=1$). Superscripts a, b, and c denote significant differences (at 10 percent or better) between 1994 and 1995, 1995 and 1996, and 1994 and 1996, respectively (superscript d denotes a significant difference at 15 percent). Values reported for the variable (Goodsp) each year are the percentage of respondents who received goods in lieu of wage payments (restricted to people for whom $p_{jowed}=1$). The cell entries for the variable (Goodsv) is the average ruble value of goods received, in lieu of wage payments, for those respondents who did receive goods (i.e. if $Goodsp=1$). The entries for the variable (Amtowed-Goodsv) represent the average ruble value of outstanding wage arrears net of compensating payments in terms of goods (calculated for respondents who were owed wages (i.e. if $p_{jowed}=1$)).

Table 10.2: Multivariate Estimates of Net Outstanding Payments Arrears and Barter

| | <u>Goodsp</u> | | <u>ln(Goodsv)</u> | | <u>ln(Amtowed-Goodsv)</u> | |
|------------------|-------------------------------|-------------------------------|-------------------------------|-----------------------------|---------------------------|--|
| | (1) | (2) | (3) | (4) | | |
| dum1995 | -0.128 ^b (0.056) | -0.235 ^a (0.094) | -0.345 ^b (0.162) | -0.228 ^a (0.068) | | |
| dum1996 | -0.644 (0.057) | 0.075 (0.083) | -0.119 (0.138) | 0.282 ^a (0.064) | | |
| pjowed | 0.594 ^a (0.050) | - | - | - | | |
| ln(Amtowed) | - | 0.195 ^a (0.041) | 0.205 ^a (0.071) | - | | |
| female | -0.107 ^c (0.058) | -0.042 ^d (0.093) | -0.250 ^d (0.159) | -0.190 ^a (0.069) | | |
| age | 0.045 ^a (0.015) | 0.039 (0.0244) | 0.112 ^a (0.043) | 0.022 (0.018) | | |
| age ² | -0.0006 ^a (0.0002) | -0.0005 ^d (0.0003) | -0.0015 ^a (0.0005) | -0.001 (0.001) | | |
| tenure | -0.0002 (0.0003) | -0.0006 (0.0004) | 0.0001 (0.0007) | 0.004 (0.003) | | |
| government | -0.320 ^a (0.050) | -0.500 ^a (0.078) | -0.084 (0.124) | 0.057 (0.065) | | |
| education 2 | 0.116 ^b (0.056) | 0.166 ^b (0.084) | 0.098 (0.139) | -0.006 (0.066) | | |
| education 3 | -0.032 (0.086) | 0.005 (0.129) | 0.008 (0.214) | -0.117 (0.101) | | |
| education 4 | 0.103 ^d (0.065) | 0.119 (0.101) | -0.215 (0.157) | -0.142 ^c (0.080) | | |
| education 5 | 0.071 (0.058) | 0.090 (0.086) | -0.039 (0.146) | 0.099 ^d (0.065) | | |
| education 6* | -0.059 (0.080) | -0.106 (0.123) | 0.120 (0.238) | 0.173 ^b (0.088) | | |
| education 7 | - | - | - | -0.478 ^c (0.280) | | |
| ln (rmwage) | -0.170 ^a (0.029) | -0.343 ^a (0.055) | 0.028 (0.082) | 0.741 ^a (0.037) | | |
| region 2 | 0.340 ^a (0.116) | 0.377 ^c (0.216) | 0.089 (0.460) | 0.394 ^a (0.131) | | |
| region 3 | 0.017 (0.105) | 0.267 (0.203) | 0.391 (0.443) | 0.113 (0.118) | | |
| region 4 | 0.064 (0.108) | 0.443 ^b (0.201) | 0.113 (0.442) | 0.153 (0.118) | | |
| region 5 | 0.466 ^a (0.105) | 0.501 ^a (0.210) | 0.190 (0.451) | 0.126 (0.129) | | |
| region 6 | 0.308 ^a (0.101) | 0.491 ^a (0.198) | 0.044 (0.443) | 0.264 ^b (0.115) | | |
| region 7 | 0.339 ^a (0.114) | 0.700 ^a (0.208) | 0.263 (0.445) | 0.328 ^a (0.131) | | |
| region 8 | 0.799 ^a (0.105) | 1.057 ^a (0.202) | 0.643 (0.429) | 0.136 (0.130) | | |

(continued on the next page)

Table 10.2: Multivariate Estimates of Net Outstanding Payments Arrears and Barter (continued)

| | <u>Goodsp</u> | | <u>ln(Goodsv)</u> | | <u>ln(Amtowed-Goodsv)</u> | |
|-------------------------|----------------------------|----------------------------|-----------------------------|------------------------------|---------------------------|-----|
| | (1) | (2) | (3) | (4) | (4) | (4) |
| occupation 1 | 0.703 ^a (0.163) | 0.452 (0.368) | -1.228 ^b (0.587) | 0.316 (0.2801) | | |
| occupation 2 | -0.089 (0.117) | 0.090 (0.197) | -0.619 ^c (0.346) | 0.192 (0.1403) | | |
| occupation 3 | 0.013 (0.106) | 0.198 (0.185) | -0.767 ^a (0.310) | 0.191 ^d (0.1326) | | |
| occupation 4 | 0.061 (0.121) | 0.140 (0.210) | -0.600 ^c (0.345) | 0.442 ^a (0.1564) | | |
| occupation 6 | 0.134 (0.106) | 0.152 (0.188) | -0.607 ^c (0.329) | 0.390 ^a (0.1340) | | |
| occupation 7 | 0.239 ^b (0.105) | 0.301 ^c (0.185) | -0.680 ^b (0.322) | 0.419 ^a (0.1325) | | |
| occupation 8 | 0.348 ^a (0.105) | 0.401 ^b (0.188) | -0.308 (0.311) | 0.110 (0.1421) | | |
| constant | -0.375 (0.467) | -0.135 (0.809) | 7.141 ^a (1.374) | 2.1345 ^a (0.5976) | | |
| (pseudo) R ² | 0.1181 | 0.1196 | 0.0684 | 0.2646 | | |
| Test 1 (educ.) | 8.90 ^d | 6.68 | 0.69 | 2.41 ^b | | |
| Test 2 (region) | 118.25 ^a | 54.28 ^a | 1.98 ^c | 2.20 ^b | | |
| Test 3 (occup.) | 47.14 ^a | 8.84 | 1.58 ^d | 2.91 ^a | | |
| Sample size | 7,768 | 2,374 | 291 | 2,356 | | |

NOTES: 1. Regressions (1) and (2) are estimated by maximum likelihood probit. Regression (3) is estimated by maximum likelihood tobit. Regression (4) is estimated by ordinary least squares.

2. The coefficient estimates are reported with standard errors in parentheses. Significance at the 1 percent, 5 percent, 10 percent, and 15 percent levels are denoted by superscripts a, b,c, and d, respectively.

3. The rows labeled Test 1, Test 2, and Test 3 report joint significance test statistics for the six education dummies, the seven regional dummies, and the eight occupation dummies, respectively.

4. The sample for regressions other than (1) is restricted to people who indicated that they were owed wages by their employers (i.e. if $p_{jowed}=1$); regression (3) is additionally limited to people who reported receiving goods in lieu of wage payments (i.e. if $Goodsp=1$).

5. Respondents in the military are deleted because none of the people serving in the military reported receiving goods in lieu of wages (i.e. $Goodsp=0$ for all respondents in the military).

* 6. Education categories 6 and 7 have been combined into a single variable (=1 if either education 6=1 or education 7=1) for the first two regressions because none of the respondents with education 7=1 received goods in lieu of wages (i.e. $Goodsp=0$ for all respondents with education 7=1).

Table 11.1: Wage Arrears and Secondary Economic Activity

Adpdjb

“Tell me, please, do you have some other kind of work?” The responses are coded as 1 if the answer is “yes” and as 0 if the answer is “no.”

| | <u>1994</u> | <u>1995</u> | <u>1996</u> |
|------------------------------|------------------|-----------------------------|-----------------------------|
| Owed Wages (Pjowed=1) | 4.358 [872] | 6.409 ^a [749] | 5.938 ^a [943] |
| Not Owed Wages (Pjowed=0) | 4.986 [2,447] | 4.032 [2,158] | 4.145 [1,375] |

Engiea

“Tell me, please, in the last 30 days did you engage in some additional kind of work for which you got paid? Maybe you sewed someone a dress, gave someone a ride in a car, assisted someone with apartment or car repairs, purchased and delivered food, looked after a sick person, or did something else that you were paid for?” The responses are coded as 1 if the answer is “yes” and as 0 if the answer is “no.”

| | <u>1994</u> | <u>1995</u> | <u>1996</u> |
|------------------------------|-----------------------------|-----------------------------|-----------------------------|
| Owed Wages (Pjowed=1) | 8.955 ^a [871] | 7.363 ^a [747] | 7.864 ^a [942] |
| Not Owed Wages (Pjowed=0) | 7.435 [2,448] | 4.912 [2,158] | 4.814 [1,360] |

NOTES: Each cell reports the mean value (multiplied by 100) for the relevant dummy variable separately for respondents who were, and who were not owed wages. The sample sizes are reported in square brackets. We restrict the analysis to respondents who reported positive wages. Superscript a denotes significant differences (at 10 percent or better), for each year, between respondents who were, and who were not owed wages.

Table 11.2 Multivariate Estimates of Wage Arrears and Secondary Economic Activity

| <u>Explanatory Variable</u> | <u>Adpdjb</u> | <u>Engiea</u> |
|-----------------------------|-------------------------------|-------------------------------|
| Pjowed | 0.1471 ^a (0.0555) | 0.2323 ^a (0.0506) |
| dum1995 | 0.0293 (0.0585) | -0.1344 ^a (0.0539) |
| dum1996 | 0.0144 (0.0633) | -0.1346 ^b (0.0577) |
| female | -0.2573 ^a (0.0602) | -0.3629 ^a (0.0566) |
| age | 0.0517 ^a (0.0164) | 0.0187 (0.0146) |
| age ² | -0.0007 ^a (0.0002) | -0.0004 ^b (0.0002) |
| tenure | 0.0001 (0.0003) | -0.0002 (0.0003) |
| government | 0.0989 ^c (0.0594) | -0.1242 ^c (0.0507) |
| education 2 | 0.0981 ^c (0.0607) | 0.1660 ^a (0.0532) |
| education 3 | -0.0379 (0.1054) | 0.0021 (0.0867) |
| education 4 | 0.1288 ^c (0.0749) | 0.1799 ^a (0.0644) |
| education 5 | 0.0172 (0.0610) | 0.0822 ^d (0.0569) |
| education 6 | 0.2122 ^a (0.0757) | 0.0911 (0.0745) |
| education 7 | 0.3789 ^b (0.1581) | 0.3191 ^c (0.1788) |
| ln (rmwage) | -0.1071 ^a (0.0318) | -0.0824 ^a (0.0286) |
| region 2 | -0.1906 ^c (0.1084) | -0.3561 ^a (0.1031) |
| region 3 | -0.3180 ^a (0.0837) | -0.3726 ^a (0.0781) |
| region 4 | -0.4787 ^a (0.0941) | -0.3770 ^a (0.0834) |
| region 5 | -0.3846 ^a (0.1008) | -0.2299 ^a (0.0870) |
| region 6 | -0.2906 ^a (0.0883) | -0.5440 ^a (0.0871) |
| region 7 | -0.1826 ^a (0.1016) | -0.4513 ^a (0.1010) |
| region 8 | -0.1085 ^a (0.1021) | -0.0818 ^a (0.0919) |

(continued on the next page)

Table 11.2: Multivariate Estimates of Wage Arrears and Secondary Economic Activity

| <u>Explanatory Variable</u> | <u>Adpdjb</u> | <u>Engiea</u> |
|-----------------------------|-------------------------------|------------------------------|
| Occupation 1 | 0.0464 (0.1840) | -0.2710 (0.2416) |
| Occupation 2 | 0.1856 ^c (0.1094) | 0.2746 ^a (0.1122) |
| Occupation 3 | 0.0041 (0.1061) | 0.2377 ^b (0.1061) |
| Occupation 4 | -0.1522 (0.1343) | 0.1710 (0.1282) |
| Occupation 6 | -0.1399 (0.1103) | 0.3212 ^a (0.1051) |
| Occupation 7 | -0.4094 ^a (0.1189) | 0.2121 ^b (0.1070) |
| Occupation 8 | -0.1206 (0.1201) | 0.0022 (0.1206) |
| Military | -0.3871 (0.2891) | -0.0864 (0.2617) |
| (pseudo) R ² | 0.0555 | 0.0655 |
| Test 1 (education) | 19.95 ^a | 20.12 ^a |
| Test 2 (region) | 34.65 ^a | 58.34 ^a |
| Test 3 (occupation) | 32.56 ^a | 24.15 ^a |
| Sample size | 7,857 | 7,848 |

NOTES: 1. The regressions are estimated by maximum likelihood ordered probit.
 2. The coefficient estimates are reported with standard errors in parentheses. Significance at the 1 percent, 5 percent, 10 percent, and 15 percent levels are denoted by superscripts a, b, c, and d respectively.
 3. The rows labeled Test 1, Test 2, and Test 3 report joint significance test statistics for the six education dummies, the seven regional dummies, and the eight occupation dummies, respectively.

Appendix Table 1: Additional Variable Definitions

| <u>Explanatory Variable</u> | <u>Definition</u> |
|-----------------------------|--|
| dum1995 | dummy=1 for Round VI (1995) data |
| dum1996 | dummy=1 for Round VII (1994) data |
| Female | dummy=1 if female |
| Education 1 | dummy=1 if no training besides secondary school (reference category) |
| Education 2 | dummy=1 if professional courses (i.e. chauffeuring, typing, accounting) |
| Education 3 | dummy=1 if PTU, FZU, FZO (see Table 5.1 note for details), without a secondary education |
| Education 4 | dummy=1 if PTU with a secondary education |
| Education 5 | dummy=1 if technical, medical, music, pedagogical, art school |
| Education 6 | dummy=1 if institute, university, academy |
| Education 7 | dummy=1 if graduate school, residency |
| Age | respondent age (restricted to ages 16-64) |
| Tenure | months employed on current job |
| Government | dummy=1 if employed by a firm at least partly owned by the government |
| ln (rmwage) | logarithm of real monthly wage payments |
| Region 1 | dummy=1 if Moscow and St. Petersburg (reference category) |
| Region 2 | dummy=1 if Northern and North Western |
| Region 3 | dummy=1 if Central and Central Black-Earth |
| Region 4 | dummy=1 if Volga-Vyatski and Volga Basin |
| Region 5 | dummy=1 if North Caucasus |
| Region 6 | dummy=1 if Urals |
| Region 7 | dummy=1 if Western Siberia |
| Region 8 | dummy=1 if Eastern Siberia or Far Eastern |

(continued on the next page)

Appendix Table 1: Additional Variable Definitions (continued)

| <u>Variable</u> | <u>Definition</u> |
|-----------------|--|
| Occupation 1 | dummy=1 if a Legislator, Senior Manager, or Official (1110-1590) |
| Occupation 2 | dummy=1 if a Professional (2000-2460) |
| Occupation 3 | dummy=1 if a Technician, or Associate Professional (3111-3480) |
| Occupation 4 | dummy=1 if a Clerk (4000-4223) |
| Occupation 5 | dummy=1 if a Service, or Market Worker (5100-5230, reference category) |
| Occupation 6 | dummy=1 if in a Craft or Related Trades (7000-7442) |
| Occupation 7 | dummy=1 if a Plant or Machine Operator or Assembler (8000-8340) |
| Occupation 8 | dummy=1 if in an Elementary (Unskilled) Occupation (9111-9999) |
| Military | dummy=1 if in the Army (0110) |

Respondent's concerns about their future welfare and the Poverty Index:

| | |
|---------|---|
| Betwor | response to the question, "do you think that in the next 12 months you and your family will live better than today, or worse?" Coded from 1 to 5, where 1 = "You will live much better," 2 = "You will live somewhat better," 3 = "Nothing will change," 4 = "You will live somewhat worse," and 5 = "You will live much worse". |
| Agetne | response to the question, "how concerned are you about the possibility that you might not be able to provide yourself with the bare essentials in the next 12 months?" Coded from 1 to 5, where 1 = "Not at all concerned," 2 = "Not too concerned," 3 = Both yes and no," 4 = "A little concerned," and 5 = "Very concerned". |
| P_index | dummy=1 if family income (adjusted for the structure of the family, i.e. number and age of children, number and gender of adults, number of elderly) falls below the poverty threshold, and =0 if family income does not fall below the poverty threshold. The threshold is calculated on the basis of a subsistence minimum consumption bundle, using subsistence food amounts for approximately 55 food items for five demographic groups (young children, older children, adult males, adult females, and the elderly), and regional average prices for each item (for ten regions). |

NOTE: The numbers in parentheses after the one-digit occupation groups are the four-digit occupation groups, reported in Appendix 3, that comprise each category.

Appendix Table 2: The Frequency Distribution of Amtowed

| | <u>1994</u> | <u>1995</u> | <u>1996</u> |
|---------------------|-------------|-------------|-------------|
| 1-199,000 | 17.53 | 21.64 | 9.94 |
| 200,000-399,000 | 21.95 | 25.59 | 14.96 |
| 400,000-599,000 | 16.74 | 16.49 | 14.86 |
| 600,000-799,000 | 9.62 | 8.58 | 9.63 |
| 800,000-999,000 | 8.82 | 5.28 | 9.94 |
| 1,000,000-1,199,000 | 6.45 | 6.73 | 4.61 |
| 1,200,000-1,399,000 | 3.85 | 1.85 | 7.07 |
| 1,400,000-1,599,000 | 0.68 | 1.19 | 2.46 |
| 1,600,000-1,799,000 | 2.38 | 2.64 | 7.07 |
| 1,800,000-1,999,000 | 2.04 | 0.92 | 0.51 |
| 2,000,000-2,999,000 | 4.98 | 4.62 | 9.73 |
| 3,000,000-3,999,000 | 2.26 | 2.11 | 2.97 |
| 4,000,000-5,000,000 | 1.02 | 1.19 | 2.87 |
| >5,000,000 | 1.70 | 1.19 | 3.38 |
| Sample size | 884 | 758 | 976 |

NOTE: Each cell reports the percentage of working respondents with positive wage arrears (i.e. those reporting positive monthly wage payments and who were owed wages), whose outstanding nonpayment fell into the relevant category.

Appendix 3: Four-digit Occupation Codes
International Standard Classification of Occupations (ISCO)

- 1110 Legislators
- 1120 Senior government officials
- 1130 Traditional chiefs and heads of villages
- 1141 Senior officials of political-party organizations; revolutionaries
- 1142 Senior officials of employers', workers' and other economic-interest organizations
- 1143 Senior officials of humanitarian and other special-interest organizations
- 1210 Directors and chief executives
- 1221 Production and operations department managers in agriculture, hunting, forestry and fishing
- 1222 Production and operations department managers in manufacturing
- 1223 Production and operations department managers in construction
- 1224 Production and operations department managers in wholesale and retail trade
- 1225 Production and operations department managers in restaurants and hotels
- 1226 Production and operations department managers in transport, storage and communications
- 1227 Production and operations department managers in business services
- 1228 Production and operations department managers in personal care, cleaning and related services
- 1229 Production and operations department managers not elsewhere classified
- 1231 Finance and administration department managers
- 1232 Personnel and industrial relations department managers
- 1233 Sales and marketing department managers
- 1234 Advertising and public relations department managers
- 1235 Supply and distribution department managers
- 1236 Computing services department managers
- 1237 Research and development department managers
- 1239 Other department managers not elsewhere classified
- 1299 Landowners; gentry (pomeshchik)
- 1311 General managers in agriculture, hunting, forestry and fishing
- 1312 General managers in manufacturing
- 1313 General managers in construction
- 1314 General managers in wholesale and retail trade
- 1315 Commandants (not military); administrator with higher or specialized secondary education
- 1316 General managers in transport, storage and communications
- 1317 General managers of business services
- 1318 General managers in personal care, cleaning and related services
- 1319 General managers not elsewhere classified
- 1510 Master with higher education; steward; bailiff (prikazchik)
- 1520 Landowner; khoziain; edinolichnik; building owner
- 1530 Coop owner

1540 Dvorianin; noblemen; shliakhta; prince; statskii covetnik
1550 Small business owner
1590 Other
2000 "Intelligentsia;" scientific worker, NEC
2111 Physicists and astronomers
2112 Meteorologists
2113 Chemists
2114 Geologists and geophysicists
2121 Mathematicians and related professionals
2122 Statisticians
2131 Computer systems designers and analysts
2132 Computer programmers
2139 Computing professionals not elsewhere classified
2141 Architects, town and traffic planners
2142 Civil engineers
2143 Electrical engineers
2144 Electronics and telecommunications engineers
2145 Mechanical engineers
2146 Chemical engineers
2147 Mining engineers, metallurgists and related professionals
2148 Cartographers and surveyors
2149 Architects, engineers and related professionals not elsewhere specified,
engineers with higher education n.e.c.
2211 Biologists, botanists, zoologists and related professionals
2212 Pharmacologists, pathologists and related professionals
2213 Agronomists and related professionals
2221 Medical doctors
2222 Dentists
2223 Veterinarians
2224 Pharmacists
2229 Health professionals (except nursing) not elsewhere classified (medik with
higher education)
2230 Nursing and midwifery professionals
2300 Teachers with higher education
2310 College, university and higher education teaching professionals (including
prepodavатели in VUZ)
2320 Secondary education teaching professionals; teachers (uchitelia)
2331 Primary education teaching professionals
2332 Pre-primary education teaching professionals
2340 Special education teaching professionals
2351 Education methods specialists
2352 School inspectors
2359 Other teaching professionals not elsewhere classified
2411 Accountants
2412 Personnel and careers professionals

2419 Business professionals not elsewhere classified
2421 Lawyers
2422 Judges
2429 Legal professionals not elsewhere classified
2431 Archivists and curators
2432 Librarians and related information professionals
2400 Art critics
2441 Economists
2442 Sociologists, anthropologists and related professionals
2443 Philosophers, historians and political scientists
2444 Philologists, translators and interpreters
2445 Psychologists
2446 Social work professionals
2451 Authors, journalist and other writers
2452 Sculptors, painters and related artists
2453 Composers, musicians and singers
2454 Choreographers and dancers
2455 Film, stage and related actors and directors
2460 Religious professionals
3111 Chemical, physical and science technicians
3112 Civil engineering technicians
3113 Electrical engineering technicians
3114 Electronics and telecommunications engineering technicians
3115 Mechanical engineering technicians
3116 Chemical engineering technicians
3117 Mining and metallurgic technicians
3118 Draughts persons
3119 Physical and engineering science technicians not elsewhere classified; engineers without higher education, n.e.c.; lab workers
3121 Computer assistants
3122 Computer equipment operators
3123 Industrial robot controllers
3131 Photographers and image and sound recording equipment operators
3132 Broadcasting and telecommunications equipment operators
3133 Medical equipment operators
3139 Optical and electronic equipment operators not elsewhere classified
3141 Ships' engineers
3142 Ships' deck officers and pilots
3143 Aircraft pilots and related associate professionals
3144 Air traffic controllers
3145 Air traffic safety technicians
3151 Building and fire inspectors
3152 Safety, health and quality inspectors
3211 Life science technicians
3212 Agronomy and forestry technicians

3213 Farming and forestry advisors
3221 Medical assistants
3222 Sanitarians
3223 Dieticians and nutritionists
3224 Optometrists and opticians
3225 Dental assistants
3226 Physiotherapists and related associate professionals
3227 Veterinary assistants
3228 Pharmaceutical assistants
3229 Modern health associate professionals (except nursing) not elsewhere classified
(medik with secondary education)
3231 Nursing associate professionals; nurses without higher education, n.e.c.
3232 Midwifery associate professionals
3241 Traditional medicine practitioners
3242 Faith healers
3310 Teachers with less than higher education
3320 Pre-primary education teaching associate professionals
3330 Special education teaching associate professionals
3340 Other teaching associate professionals; vocational education masters
3411 Securities and finance dealers and brokers
3412 Insurance representatives
3413 Estate agents
3414 Travel consultants and organizers
3415 Technical and commercial sales representatives
3416 Buyers; purchasing agents
3417 Appraisers, valuers and auctioneers
3419 Finance and sales associate professionals not elsewhere classified
3421 Trade brokers
3422 Clearing and forwarding agents
3423 Employment agents and labor contractors
3429 Business services agents and trade brokers not elsewhere classified
3431 Administrative secretaries and related associate professionals
3432 Legal and related business associate professionals
3433 Bookkeepers
3434 Statistical, mathematical and related associate professionals
3439 Administrative associate professionals not elsewhere classified
3441 Customs and border inspectors
3442 Government tax and excise officials
3443 Government social benefits officials
3444 Government licensing officials
3449 Customs, tax and related government associate professionals n.e.c.
3450 Police inspectors and detectives
3460 Social work associate professionals
3471 Decorators and professional designers
3472 Radio, television and other announcers

3473 Street, night-club and related musicians, singers and dancers
3474 Clowns, magicians, acrobats and related associate professionals
3475 Athletes, sports persons and related associate professionals
3479 Artistic directors (khudruk); cultural-educational workers
3480 Religious associate professionals
4000 Sluzhashchie (non-manual workers, often implies specialized education)
4111 Stenographers and typists
4112 Word-processors and related operators
4113 Data entry operators
4114 Calculating machine operators
4115 Secretaries
4121 Accounting and bookkeeping clerks
4122 Statistical and finance clerks
4131 Stock clerks
4132 Production clerks
4133 Transport clerks
4141 Library and filing clerks
4142 Mail carriers and sorting clerks
4143 Coding, proof-reading and related clerks
4144 Scribes and related workers
4190 Other office clerks
4211 Cashiers and ticket clerks
4212 Tellers and other counter clerks
4213 Bookmakers and croupiers
4214 Pawnbrokers and money-lenders
4215 Debt-collectors and related workers
4221 Travel agency and related clerks
4222 Receptionists and information clerks
4223 Telephone switchboard operators
5100 Servants
5111 Travel attendants and travel stewards
5112 Transport conductors
5113 Travel guides
5121 Housekeepers and related workers
5122 Cooks
5123 Waiters, waitresses and bartenders
5131 Child-care workers
5132 Institution-based personal care workers
5133 Home-based personal care workers
5139 Personal care and related workers not elsewhere classified
5141 Hairdressers, barbers, beauticians and related workers
5142 Companions and valets
5143 Undertakers and embalmers
5149 Other personal services workers not elsewhere classified
5151 Astrologers and related workers

5152 Fortune-tellers, palmists and related workers
5161 Fire-fighters
5162 Police officers
5163 Prison guards
5169 Protective services workers not elsewhere classified
5210 Fashion and other models
5220 Shop salespersons and demonstrators
5230 Stall and market salespersons
6111 Field crop and vegetable growers
6112 Tree and shrub crop growers
6113 Gardeners, horticultural and nursery growers
6114 Mixed-crop growers
6121 Dairy and livestock producers
6122 Poultry producers
6123 Apiarists and sericulturists
6124 Mixed-animal producers
6129 Market-oriented animal producers and related workers not elsewhere classified
6130 Market-oriented crop and animal producers
6141 Forestry workers and loggers
6142 Charcoal burners and related workers
6151 Aquatic-life cultivation workers
6152 Inland and coastal waters fishery workers
6153 Deep-sea fishery workers
6154 Hunters and trappers
6210 Subsistence agricultural and fishery workers
7000 Masters; brigadiers n.e.c. (not in agriculture)
7100 Construction workers n.e.c.
7111 Miners and quarry workers
7112 Shot firers and blasters
7113 Stone-splitters, cutters and carvers
7121 Builders, traditional materials
7122 Bricklayers and stonemasons
7123 Concrete placers, concrete finishers and related workers
7124 Carpenters and joiners
7129 Building frame and related trades workers not elsewhere classified; prorab
(construction superintendents)
7131 Roofers
7132 Floor layers and tile setters
7133 Plasterers
7134 Insulation workers
7135 Glaziers
7136 Plumbers and pipe fitters
7137 Building and related electricians
7139 Germetchik and other workers in the final stages of construction
7141 Painters and related workers

7142 Varnishers and related painters
7143 Building structure cleaners
7211 Metal molders and coremakers
7212 Welders and flame cutters
7213 Sheet-metal workers
7214 Structural-metal preparers and erectors
7215 Riggers and cable-splicers
7216 Underwater workers
7221 Blacksmiths, hammer-smiths and forging-press workers
7222 Tool-makers and related workers
7223 Tokar (7213, lathe operator)
7224 Shlifovshchitsa (grinder/polisher)
7231 Mekhanik (mechanic)
7232 Aircraft engine mechanics and fitters
7233 Agricultural- or industrial-machinery mechanics and fitters
7241 Slesar (locksmith)
7242 Electronics fitters
7243 Electronics mechanics and servicers
7244 Telegraph and telephone installers and servicers
7245 Electrical line installers, repairer and cable jointers
7311 Precision-instrument makers and repairers
7312 Musical-instrument makers and tuners
7313 Jewelry and precious-metal workers
7321 Abrasive wheel formers, potters and related workers
7322 Glass-makers, cutters, grinders and finishers
7323 Glass engravers and etchers
7324 Glass, ceramics and related decorative painters
7331 Handicraft workers in wood and related materials
7332 Handicraft workers in textile, leather and related materials
7341 Compositors, typesetter and related workers
7342 Stereotypers and electrotypers
7343 Printing engravers and etchers
7344 Photographic and related workers
7345 Bookbinders and related workers
7346 Silk-screen, block and textile printers
7411 Butchers, fishmongers and related food preparers
7412 Bakers, pastry-cooks and confectionery makers
7413 Dairy-product makers
7414 Fruit, vegetable and related preservers
7415 Food and beverage tasters and graders
7416 Tobacco preparers and tobacco products makers
7421 Wood treaters; coopers (cask makers)
7422 Cabinet-makers and related workers
7423 Woodworking-machine setters and setter-operators
7424 Basketry weavers, brush makers and related workers

7431 Fibre-preparers
7432 Weavers, knitters and related workers
7433 Tailors, dressmakers and hatters
7434 Furriers and related workers
7435 Textile, leather and related pattern-makers and cutters
7436 Sewers, embroiderers and related workers
7437 Upholsterers and related workers
7441 Pelt dressers, tanners and fellmongers
7442 Shoe-makers and related workers
8000 Masters; brigadiers in plants and factories; skilled factory workers n.e.c.
8111 Mining-plant operators
8112 Mineral-ore- and stone-processing-plant operators
8113 Well drillers and borers and related workers
8121 Ore and metal furnace operators
8122 Metal melters, casters, and rolling-mill operators
8123 Metal-heat-treating-plant operators
8124 Metal drawers and extruders
8131 Glass and ceramics kiln and related machine operators
8139 Glass, ceramics and related plant operators not elsewhere classified
8141 Wood-processing-plant operators
8142 Paper-pulp-plant operators
8143 Papermaking plant operators
8151 Crushing-, grinding- and chemical-mixing-machinery operators
8152 Chemical-heat-treating-plant operators
8153 Chemical-filtering- and separating-equipment operators
8154 Chemical-still and reactor operators (except petroleum and natural gas)
8155 Petroleum- and natural-gas-refining-plant operators
8159 Chemical-processing-plant operators not elsewhere classified
8161 Power-production-plant operators
8162 Steam-engine and boiler operators
8163 Incinerator, water-treatment and related plant operators
8171 Automated-assembly-line operators
8172 Industrial-robot operators
8211 Machine-tool operators (rotary milling)
8212 Cement and other mineral products machine operators
8221 Pharmaceutical- and toiletry-products machine operators
8222 Ammunition- and explosive-products machine operators
8223 Metal finishing-, plating- and coating-machine operators
8224 Photographic-products machine operators
8229 Chemical-products machine operators not elsewhere classified
8231 Rubber-products machine operators
8232 Plastic-products machine operators
8240 Wood-products machine operators
8251 Printing-machine operators
8252 Bookbinding-machine operators

8253 Paper-products machine operators
8261 Fibre-preparing-, spinning- and winding-machine operators
8262 Weaving- and knitting-machine operators
8263 Sewing-machine operators
8264 Bleaching-, dyeing- and cleaning-machine operators
8265 Fur- and leather-preparing-machine operators
8266 Shoemaking- and related machine operators
8269 Textile-, fur- and leather-products machine operators not elsewhere classified
8271 Meat- and fish-processing-machine operators
8272 Dairy-products machine operators
8273 Grain- and spice-milling-machine operators
8274 Baked-goods, cereal and chocolate-products machine operators
8275 Fruit-, vegetable- and nut-processing-machine operators
8276 Sugar production machine operators
8277 Tea-, coffee- and cocoa-processing-machine operators
8278 Brewers', wine- and other beverage-machine operators
8279 Tobacco production machine operators
8281 Mechanical-machinery assemblers
8282 Electrical-equipment assemblers
8283 Electronic-equipment assemblers
8284 Metal-, rubber- and plastic-products assemblers
8285 Wood and related products assemblers
8286 Paperboard, textile and related products assemblers
8290 Other machine operators and assemblers
8311 Locomotive-engine drivers
8312 Railway brakemen, signalers and shunters
8320 Drivers not specified
8321 Motor-cycle drivers
8322 Car, taxi and van drivers
8323 Bus and tram drivers
8324 Heavy truck and lorry drivers
8331 Motorized farm and forestry plant operators
8332 Earth-moving- and related plant operators
8333 Crane, hoist and related plant operators
8334 Lifting-truck operators
8340 Ships' deck crews and related workers
9111 Street food vendors
9112 Street vendors, non-food products
9113 Door-to-door and telephone salespersons
9120 Shoe cleaning and other street services elementary occupations
9131 Domestic helpers and cleaners
9132 Helpers and cleaners in offices, hotels and other establishments
9133 Hand-laundresses and pressers
9141 Building caretakers
9142 Vehicle, window and related cleaners

9151 Messengers, package and luggage porters and deliverers
9152 Doorkeepers, watchpersons and related workers
9153 Vending-machine money collectors, meter readers and related workers
9161 Garbage collectors
9162 Sweepers and related laborers
9211 Farm-hands and laborers; dekkhanin; kolkhoznik; krest'ianin; doyarka; teliatnitsa;
vinarka; pastukh; chaban; polevod; osemenitel
9212 Forestry laborers
9213 Fishery, hunting and trapping laborers
9311 Mining and quarrying laborers
9312 Construction and maintenance laborers: roads, dams and similar constructions
9313 Building construction laborers
9321 Assembling laborers
9322 Hand packers and other manufacturing laborers
9329 Unskilled workers, n.e.c.
9331 Hand or pedal vehicle drivers
9332 Drivers of animal-drawn vehicles and machinery
9333 Freight handlers
9999 Housewives; students; pupils; unemployed
0110 Armed forces



Figure 1: Pjowed by Gender
Source: Tables 2 and 2.1

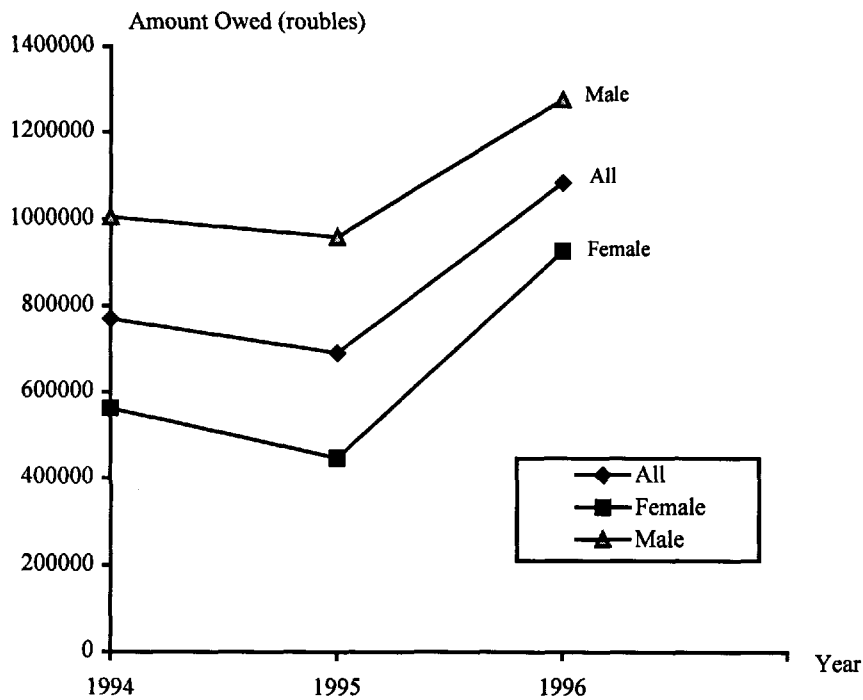


Figure 2: Amtowed by Gender
Source: Tables 2 and 2.1

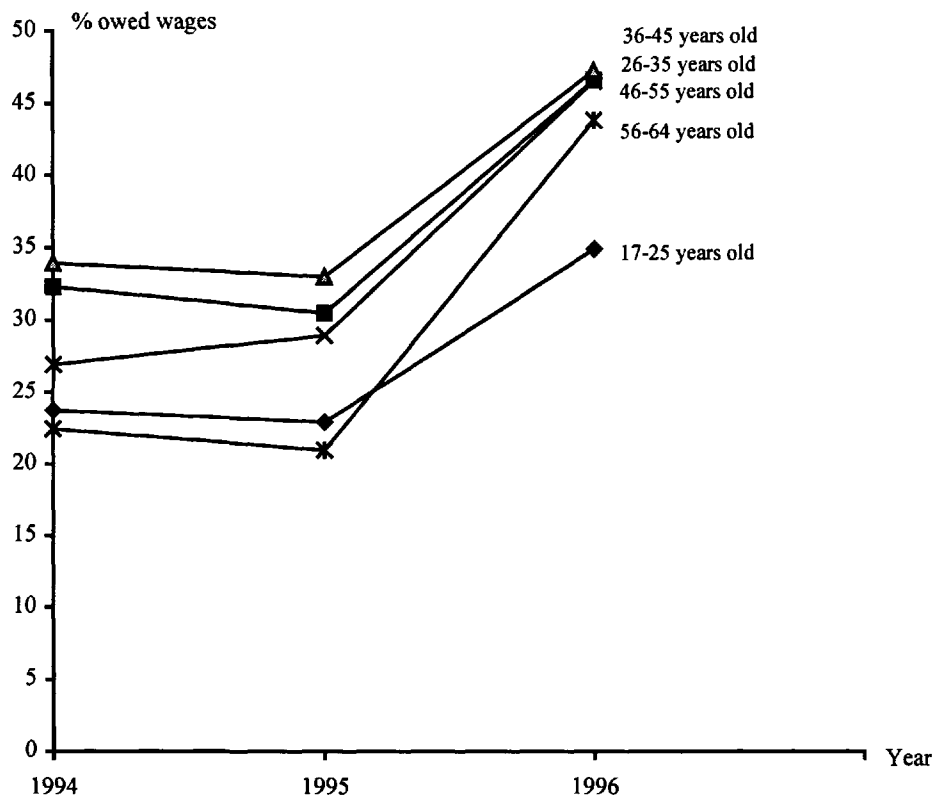


Figure 3.1: Pjowed by Age
Source: Table 3

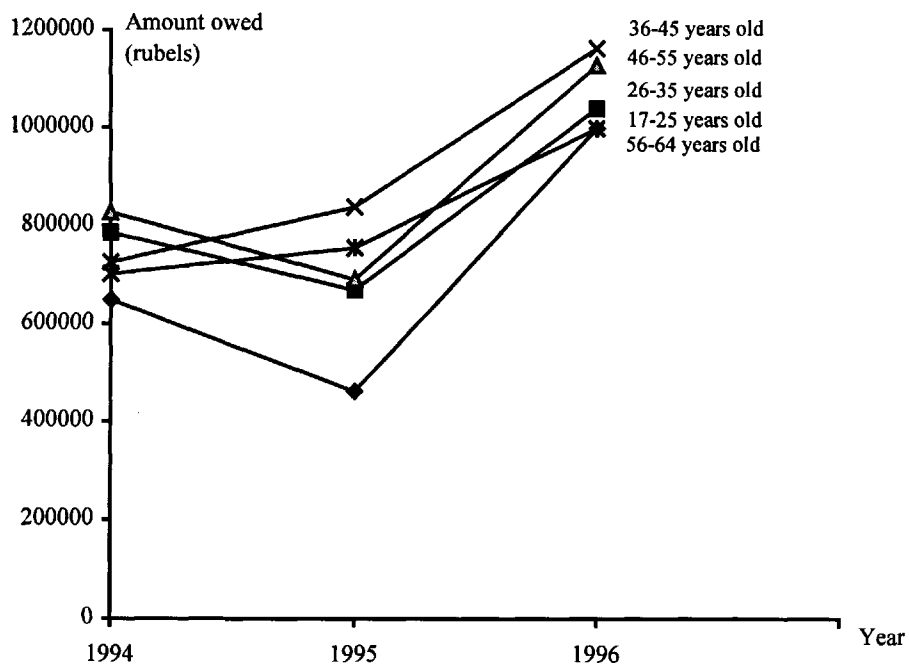


Figure 3.2: Amtowed by Age
Source: Table 3

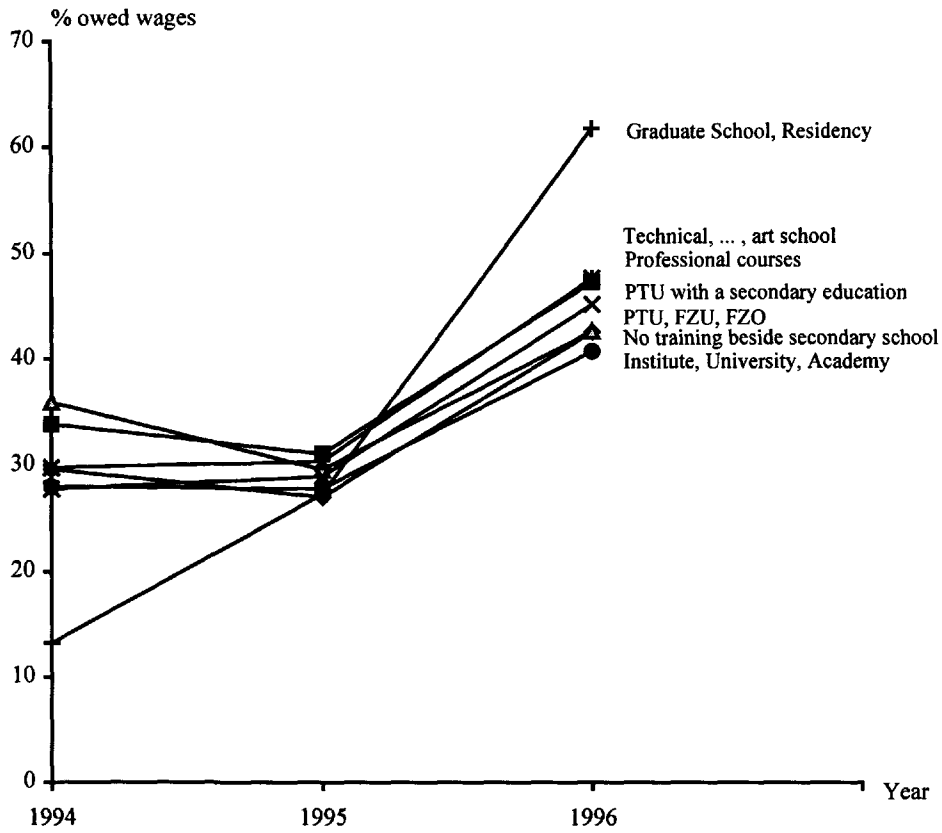


Figure 4.1: Pjowed by Education
Source: Table 4.1

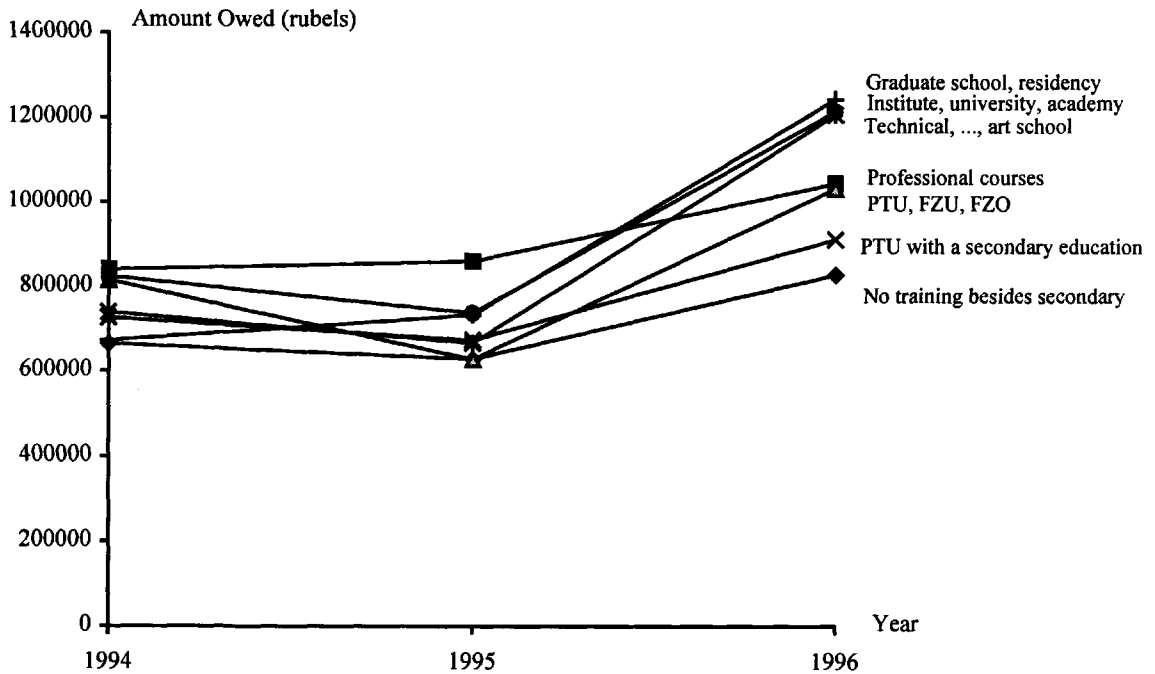


Figure 4.2: Amtowed by Education
Source: Table 4.2

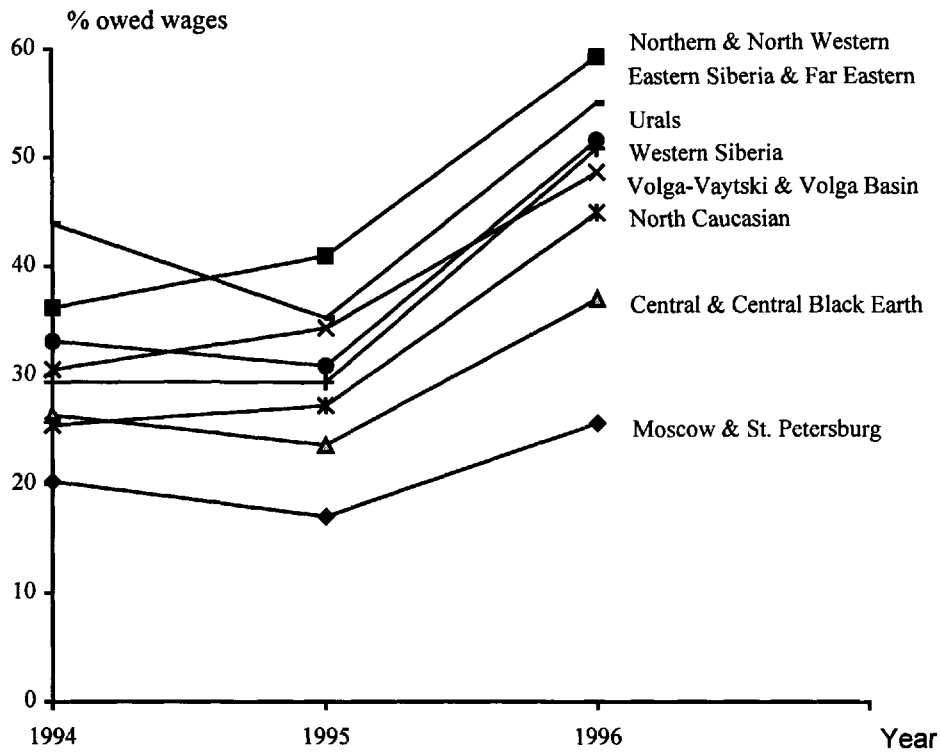


Figure 5.1: Pjowed by Region
Source: Table 5.1

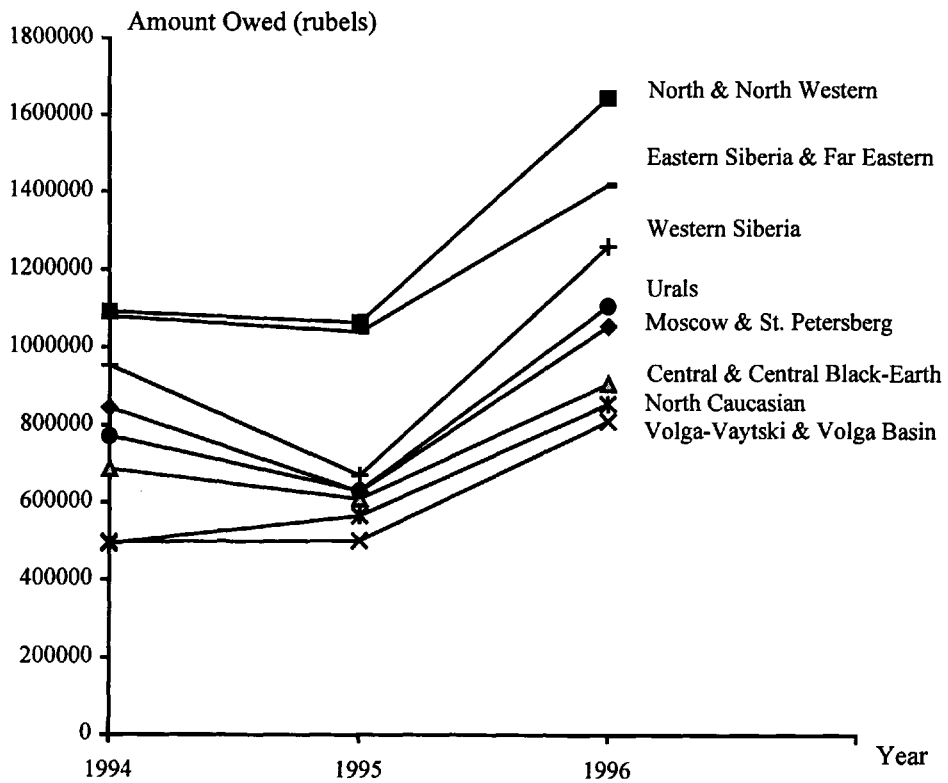


Figure 5.2: Amtowed by Region
Source: Table 5.2



Figure 6.1: Pjowed by Occupation

Source: Table 6.1

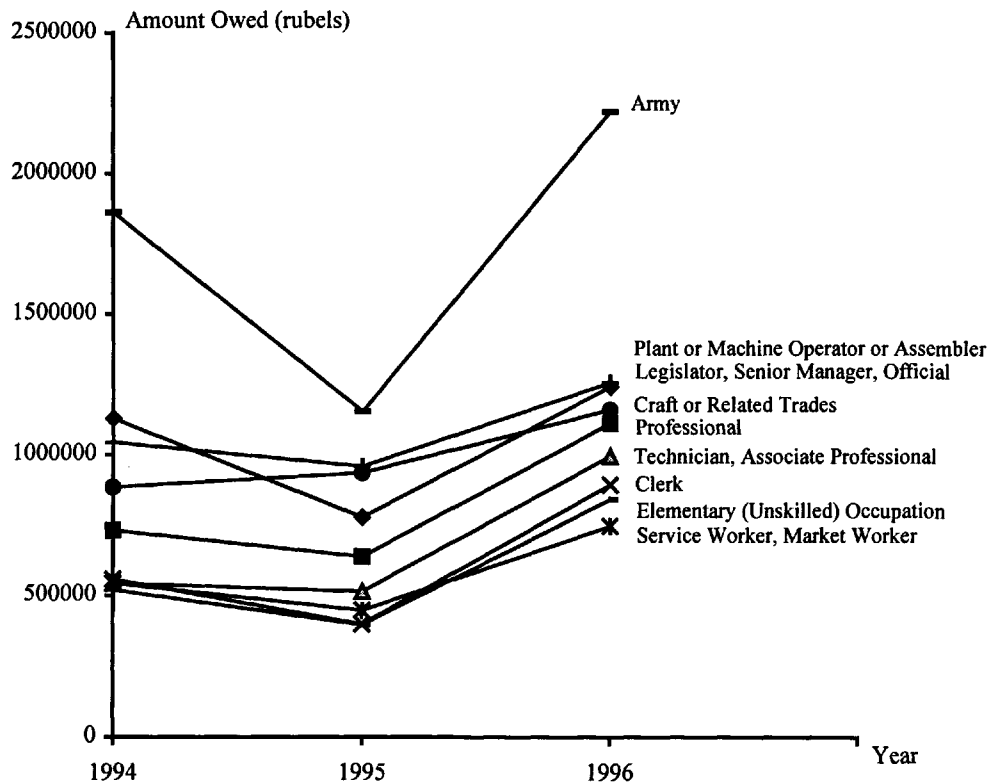


Figure 6.2: Amtowed by Occupation

Source: Table 6.2

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