How Does Privatization Affect Workers? The Case of the Russian Mass Privatization Program

By: Elizabeth Brainerd

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Elizabeth Brainerd
Economics Department
Williams College

and

Visiting Scholar
Center for International Development
Harvard University

Abstract: This paper explores the effect of mass privatization and the development of a new private sector in Russia on the wage and skill distributions in the private and state sectors of the economy. Two questions this paper seeks to answer are: (1) Does wage-setting behavior in privatized firms resemble that of state or private sector firms? and (2) Do rewards to skills differ between the state and private sectors? Analysis of two household surveys conducted over the 1990s indicates that there is a positive premium to work in private sector firms over state enterprises and privatized state enterprises, and that this differential is reduced but not eliminated by controlling for differences in firm and worker characteristics and in hours worked across sectors. Evidence also indicates that newly privatized state enterprises pay higher wages than state enterprises in some years, even though the distribution of skills and returns to skills in the two sectors appear to be quite similar throughout the period. Higher wages in privatized firms likely reflects rent-sharing between workers and managers rather than increased efficiency due to privatization, although the evidence is inconclusive on this point.

JEL classification: J31, P23, P31

Key words: privatization, wages, Russian labor market

I. Introduction

The Russian program to privatize its state enterprises that began in June 1992 undoubtedly comprises the largest-scale effort ever to effect a mass transfer of ownership from state to private hands. Mired in controversy from its inception, the program nevertheless succeeded in transferring a substantial share of enterprises out of the control of the state in a remarkably short time period. The speed and scale of Russia's mass privatization program were achieved in large part because the program allowed workers and managers to acquire significant stakes in their enterprises, a strategy that gained the support of an important segment of the population. In the immediate aftermath of the first phase of the mass privatization program, the dominant form of ownership in Russia was 'insider' ownership.

A growing body of literature has examined the outcome of the mass privatization programs in Russia and other formerly socialist countries; this research has focused on the important question of whether the change in ownership leads to restructuring and enhances the efficiency of firms' operations. Analysts studying the impact of privatization on firms in developed countries similarly concentrate on the effects of privatization on firm efficiency as reflected in stock market performance, principle-agent interactions and product market performance.[1] Relatively little research, either for transition economies or for other countries, has investigated the impact of privatization on labor market outcomes such as changes in the relative wages of workers in privatized firms.[2]

This paper explores the effect of mass privatization and the growth of the new private sector on the wage and skill distributions in Russia. It seeks to determine whether there is a

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[1]See Megginson and Netter (1998) for a comprehensive survey of this literature.

[2]One exception is Haskel and Szymanski (1993), who analyze the effects of privatization in the UK on wages and employment in privatized firms.

wage differential between the state, privatized, and new private sectors in Russia, and if so how this wage differential has evolved over the course of the transition. This issue is important not only for understanding how privatization has affected workers and possibly contributed to growing wage inequality in Russia, but also for assessing whether wage-setting behavior differs between state, privatized and new private sector firms. While previous research using firm-level data for Russia shows few differences in outcomes and restructuring between state and privatized enterprises (at least in the short term following privatization), it is possible that differences in wage-setting behavior between state and privatized enterprises exist and reflect emerging differences in firms' objective functions and constraints.[3]

The results indicate that workers in privatized enterprises indeed earned a positive wage premium relative to their state sector counterparts, at least in the early and later phases of the privatization program. The evidence suggests that the distribution of skill and the returns to skill are similar between state and privatized firms, so one must search elsewhere for explanations of the wage premium in the privatized sector. Several possible sources of the wage differential are briefly explored: rent-sharing between managers and workers in privatized firms; increased productivity due to restructuring; and selection of firms to be privatized. The evidence on these issues is limited but suggests that the first explanation is most likely. Wages in private sector firms are also examined and found to be substantially higher than wages in state and privatized enterprises, although the differences narrowed slightly over the 1990s. Private sector firms appear to employ more skilled workers and to reward those skills more highly than do state and privatized enterprises.

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[3]Employment changes in privatized firms relative to state enterprises are also of interest, but are ignored in this paper due to lack of relevant data on this issue.

II. Related research

Several papers to date have analyzed state-private sector wage differentials in transition economies. Two of the earlier studies include Flanagan (1995) and Večerník (1995), who analyze changes in wage differentials in the Czech Republic before and after the introduction of market reforms. Both conclude that private sector wages exceeded state sector wages in 1993 and 1994. Average wages are also higher in newly privatized state firms compared with unprivatized state firms (Večerník 1995), but this differential disappears once one controls for differences in education and experience between the two types of ownership (Flanagan 1995). Večerník (1995) also shows that wage dispersion is higher in the private sector than in the state sector in the Czech Republic in these years.

Similar work has examined changes in the wage distribution in Poland before and after the 'big bang' in 1990. Rutkowski (1996) uses official published data based on employer surveys to study changes in the wage distribution between 1987 and 1993. He concludes that private sector pay exceeded state sector pay in Poland in 1993, and that the wage distribution in the private sector was more disperse than that in the state sector. Newell and Socha (1998) use household survey data to compare changes in the Polish wage distribution between 1992 and 1996. While their analysis confirms that private sector monthly wages were higher than state sector wages in Poland in 1992, by 1996 this advantage had disappeared and state sector wages were slightly higher than private sector wages. Moreover, the authors show that if one controls for the difference in hours between the state and private sector, the private sector wage premium in Poland in 1992 disappears as well.

A related strand of literature analyzes the impact of privatization on firm behavior, particularly whether privatization, as intended, induces restructuring and enhances firm efficiency in Russia. Most of this literature is based on relatively small surveys of firms

conducted in the mid-1990s; despite differences in samples and methodology, however, most studies conclude that privatization has had a negligible impact on firm behavior in Russia, at least in the years immediately following the implementation of the privatization program (Earle *et al* 1996; Filatotchev *et al* 1996; Jones 1998).[4] These results concur with findings of a recent study of privatization in Poland, Hungary, and the Czech Republic, which found that, while privatization to outside owners has a statistically significant impact on revenue and productivity, the performance of firms privatized to 'insiders' is indistinguishable from that of state-owned enterprises (Frydman *et al* 1999). A dissenting study is Earle and Estrin (1998), which concludes that a higher share of private ownership in a firm is related to better firm performance and adjustment relative to state firms in Russia. There is a consensus across studies that the dominant form of ownership is 'insider ownership', although increasing proportions of shares are slowly being transferred from workers to managers and from workers to outside owners. A recent study confirms these conclusions and further shows that managers effectively collude with workers to preserve insider control (Filatotchev *et al* 1999).

III. Institutional background: how Russia was privatized[5]

When Russia became an independent state in late 1991, it inherited an economic structure in which nearly 85 percent of workers were employed in state-owned enterprises. Remarkably, by the end of the first phase of Russia's mass privatization program in mid-1994, over two-thirds of the country's industry had been privatized and over 40 million Russian citizens owned stock in firms or mutual funds. Given the country's starting point, the political opposition to the

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[4]See Estrin and Wright (1999) for a comprehensive survey of this literature.

[5]This description of the privatization program in Russia draws on Ash and Hare (1994), Bornstein (1994), Boycko, Shleifer and Vishny (1995), Frydman, Rapacynski and Earle (1993) and *Russian Economic Trends* (1994).

privatization program, and the continuing instability in the country, Russia's mass privatization program has been the most improbable component of its economic reform program. Its (relative) success was due to a mixture of factors, including the remarkable political skills of Anatoly Chubais, who headed the privatization program in the crucial early years; the recognition of the interests of managers, workers and regional government leaders in the program; and a strong appeal to the public through the distribution of share vouchers and a well-crafted advertising campaign.

Russia's mass privatization program officially began on October 1, 1992 and its first stage concluded on July 1, 1994. The immediate goal of the program was to de-politicize state-owned firms, i.e. to take away politicians' control over firms so that firm output and management practices would respond to the preferences of consumers and shareholders rather than to the preferences of politicians.

Small firms (firms with less than 200 employees and charter capital of less than 1 million rubles) were privatized through cash auctions or competitive tenders organized by local governments. Under this program by late 1994 68 percent of retail trade firms, 70 percent of restaurants and 78 percent of service establishments had been privatized.[6]

Medium and large enterprises were privatized through a more complex process.[7] These firms were first corporatized, meaning they were re-registered as joint stock companies with 100 percent equity owned by the government and governed by a board of directors comprising management, workers, local government officials and officials from the State Property

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[6]See Barberis et al (1996) for an analysis of small-scale privatization in Russia based on a survey of 452 privatized shops.

[7]Firms in certain industries -- such as rail transport, space exploration and health and education -- were prohibited from privatization. Privatization of firms in other sensitive areas such as the armaments industry, the energy sector and the communications industry required a government decision.

Committee. Workers in the enterprise then voted on one of three possible "insider benefit" options. Under the first option workers received 25 percent of (non-voting) shares for free, with an option to buy 10 percent more shares at a nominal price. The second option was an employee-management buyout, in which management and workers could buy up to 51 percent of (voting) shares in the enterprise. Most enterprises (73 percent) were privatized under this option, while 25 percent selected the first option. The remaining 2 percent were privatized under a third option that gave special responsibilities and privileges to a small group of insiders.

After corporatization, typically 29 percent of the enterprise's shares were then sold at a voucher auction. In late 1992 all Russian citizens received one (tradeable) voucher with a nominal value of 10,000 rubles (roughly the equivalent of the average monthly wage in the last quarter of 1992) which could be used to buy shares in one's own firm, in another firm at a voucher auction, in a private voucher investment fund, or be sold on the open market. Over 15,000 firms representing two-thirds of all eligible firms held voucher auctions in the first phase of the privatization program.

In the next phase of the privatization program, the remaining shares in the enterprise – the government stake – were sold through investment tenders to a core investor in exchange for a commitment to future investment in the company. This phase of the privatization program is ongoing but is proceeding at a slower pace than did the first phase of the program, and its effectiveness in enhancing corporate governance has been limited by the lack of transparency of the process in many cases and the apparent ease with which well-connected parties are able to obtain stakes at below-market prices.

Results of privatization. As a result of the first phase of the privatization program, by the end of 1994 over two-thirds of all industrial enterprises were out of state hands, and overall employment in state enterprises had fallen to 45 percent of total employment. Despite the rapid

pace of the privatization program, however, as noted above some observers have argued that privatization has had little effect on firms' objectives and incentives to restructure. This sentiment is echoed by workers in privatized firms, who believe that privatization has had little influence on their firms.

Evidence on worker attitudes toward privatization is provided by a household survey conducted by the All-Russian Center for Public Opinion Research in April 1994. This survey questioned 1,597 workers, of whom 421 or 26.4 percent worked in firms that had gone through the privatization process. Most of the privatized firms were in industry (68.9 percent), as well as in trade and public catering (14.3 percent) and agriculture (13.3 percent).

Few workers believed that privatization benefited either their firm or themselves personally. Of those employed in privatized firms, only 9.3 percent believed that privatization had improved the economic position of their firm. Most (42.0 percent) believed it had no influence, while nearly one-quarter believed it had worsened the economic position of the firm. Similarly, only 11.2 percent of these workers believed that they had personally gained from their firm's privatization. Twenty percent felt they had lost personally; the majority believed their position was unchanged. Monthly wages of workers in privatized firms in this sample are slightly higher than those in state sector firms (143,378 rubles/month versus 125,342) but are lower than wages of workers in private sector firms (185,802 rubles/month).

IV. Theoretical framework

Previous theoretical work on the impact of privatization on wages has shown that privatization may either increase or decrease wages, depending on the assumptions made regarding the firm's market power and objectives, worker bargaining power, and the nature of wage determination in firms. Haskel and Szymanski (1993), for example, model privatization as

a reduction in both union bargaining power and the firm's market power, so that privatization results in lower wages for workers. Goerke (1998), in contrast, shows that if state enterprises pay efficiency wages and if privatization increases the weight given to profit maximization in the firm's objective function, then privatization will lead to an increase in wages.

The key feature of privatization in Russia than an appropriate model will capture is the increase in worker power that resulted from insider privatization. Here, a simple model is sketched which takes this into account.

The state-owned enterprise is assumed to maximize a weighted average of profits and personal benefits to the politician or manager of the firm, where, for simplicity, personal benefits are assumed to depend only on employment in the enterprise:

$$V = \gamma(pf(L) - wL) + (1-\gamma)B(L) \qquad (1)$$

where p is the price of output, f(L) is a production function, L is employment, w is the wage, B is the personal benefit accruing to the politician or manager controlling the firm, and γ is the weight given to profit maximization. It is assumed that both state-owned enterprises and privatized firms have some market power, so that there is a possibility of rent-sharing between the firm and workers. Due to the rules of privatization in Russia, it may be the case that state-owned enterprises have more market power than do privatized firms – especially as privatization progresses over time – but the implications of this difference are not explored here.[8] The term $B(L)$, with $B'(L) > 0$, captures the possibility that a politician may gain the support of workers if they are employed by the firm (as in Shleifer and Vishny 1994), or that managers may wish to employ additional workers for a variety of reasons: in order to have a ready supply of skilled

[8]For an analysis of the impact of privatization, competition and changing budget constraints on enterprises in Russia, see Earle and Estrin (1998).

workers should product demand recover; because the manager perceives that this may help to obtain or maintain subsidies from the state; or for paternalistic reasons wishes to maintain excess employment.

The representative worker seeks to maximize utility which depends on the wage, the probability of employment in the firm, and the wage in alternative employment:

$$U = eu(w) + (1-e)u(w_a) \qquad (2)$$

where w is the wage paid by the firm, w_a is the alternative wage, and e is the probability of employment in the firm.

Given the perception that real wages in Russia are extremely flexible (Layard and Richter 1995), it is plausible to assume that firms operate on the labor demand curve, in other words that managers and workers bargain over wages but the firm sets employment given the wage. In this context, Russian workers have agreed to accept low wages in exchange for relatively high levels of employment.[9]

The generalized Nash bargaining solution of this 'right-to-manage' model maximizes the weighted product of (1) and (2), net of the alternative wage or profit earned if no agreement between the two parties is reached:

$$\underset{w}{Max}\, U^{\beta} V^{1-\beta}$$

$$= [eu(w) + (1-e)u(w_a) - u(w_a)]^{\beta}[\gamma pf(L) - wL) + (1-\gamma)B(L) - 0]^{1-\beta}$$

$$= \{e[u(w) - u(w_a)]\}^{\beta}[\gamma pf(L) - wL) + (1-\gamma)B(L)]^{1-\beta} \qquad (3)$$

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[9]See Luke and Schaffer (2000) for a discussion of the right-to-manage versus the efficient bargaining model for Russia.

where β is the bargaining power of workers. Differentiating (3) with respect to w and rearranging gives:

$$\frac{\beta e u'(w)}{u(w) - u(w_a)} = \frac{(1-\beta)\gamma L}{\gamma(pf(L) - wL) + (1-\gamma)B(L)} \tag{5}$$

Using the first-order approximation:

$$\frac{u'(w)}{u(w) - u(w_a)} \cong \frac{1}{w - w_a} \tag{5}$$

and substituting $\pi = pf(L) - wL$ and solving for w gives:

$$w = w_a + \frac{\beta}{1-\beta}\left[\frac{\pi}{e} + \frac{(1-\gamma)}{\gamma}\frac{B(L)}{e}\right] \tag{6}$$

This expression shows that the wage depends positively on the outside wage, worker bargaining power and profits, and negatively on the weight the manager or politician assigns to profits.[10]

Several terms in this expression will change when a firm is privatized: clearly, β increases because of the power gained by workers under 'insider' privatization in Russia. This effect captures the possibility that, after privatization, managers will share rents with workers in order to gain their support. In addition, it is likely that privatization will result in an increase in the weight given to profit maximization in the firm's objective function, γ. Since these two forces work in opposite directions on the wage, the impact of privatization on wages is theoretically ambiguous: if insider-owned firms put relatively little weight on profit

[10]This is similar to a model developed in Hildreth and Oswald (1997), which shows that, in an efficient bargaining framework, wages and profits per worker are positively related.

maximization and their workers and managers take a short-term view of the firm's prospects, wages may be higher in these enterprises than in state enterprises as workers appropriate rents. On the other hand greater emphasis on profits may reduce wages in privatized firms relative to state-owned firms.

Regarding wage differentials in new private sector firms, there are several reasons to expect that private sector wages might exceed wages of similar workers in state and privatized firms. First, if workers perceive that job security is more tenuous in private sector firms than in state sector firms, they may demand a wage premium for work in the private sector. Second, private firms may need to pay a higher wage to attract workers from the state sector, assuming that private firms are reluctant to hire from the pool of unemployed. Private firms may also pay efficiency wages in order to induce greater effort among the workforce.

V. Econometric issues

While comparing wages in the state, privatized and new private sectors may seem a simple task, it is less straightforward than it appears. Ideally one will control for differences in hours worked across the three sectors, as well as differences in non-wage compensation among the different types of firms. Data limitations, particularly regarding the latter issue, prevent a thorough analysis of these points, although to the extent possible they are addressed in the empirical work below. If possible one should also make a careful distinction between workers employed in newly privatized firms and workers employed in new private firms, but this distinction is sometimes unclear in the available data.

Perhaps the most important difficulty one faces in estimating a state-privatized sector wage gap, however, is in accounting for issues of selection that are likely to affect the estimate. The ideal approach to investigating the effect of privatization on the wage structure is to

randomly privatize firms; a simple comparison of mean wages in the two sectors then provides an unbiased estimate of the state-privatized sector wage differential. In Russia, however, firms were not randomly assigned to be privatized and workers have been able to move freely between the state and privatized (and new private) sectors of the economy. In essence not one but two selection problems may bias the results: the selection of enterprises to be privatized – perhaps better enterprises were privatized first, for example – and the selection of workers into the state, privatized or new private sectors. Since workers and firms may be self-selected, simply comparing mean wages across sectors gives a biased estimate of the wage differential between state, privatized, and new private-sector firms. One can argue that worker self-selection is likely to be relatively small at least in the early phase of the privatization program, because worker mobility was limited by the short time period in which to respond to wage differences, but certainly it may emerge as a factor in later years.

Several approaches (described below) are used in this paper to control for selection bias and to assess its effect on the state-privatized sector wage gap. These approaches, however, prove sensitive to specification or can only be implemented on a small sub-sample of the data; as a result few conclusions can be drawn regarding the impact of selection bias on the estimates.

Rather than attempting to estimate "true" wage differentials between the state, privatized, and private sectors by correcting for selection, therefore, for the most part this paper simply examines these wage differentials and some of the possible sources of the differences, and also addresses the issue of whether selection on observable worker characteristics appears to be occurring in Russia. Thus in considering the estimates of the wage differentials presented below, it should be kept in mind that these estimates include the impact of differing unmeasured worker and firm characteristics across sectors.

VI. Empirical analysis

The primary source of data for this analysis is a series of monthly household surveys conducted by the All-Russian Centre for Public Opinion Research (known as VTsIOM, its Russian acronym) in 1993, 1994, 1997 and 1998. VTsIOM was founded by the highly respected sociologist Tatiana Zaslavskaya in the mid-1980s and has been conducting household surveys since 1989. A supplemental source of household survey data is provided by the second round of the Russian Longitudinal Monitoring Survey (RLMS), a panel household survey conducted in 1994, 1995, 1996 and 1998. Both surveys are based on a three-stage stratified random sampling design in which the country is first stratified by large regions; primary sampling units are then selected from within the strata with probabilities proportionate to size, and households are randomly selected from rosters. The measure of wages used in both surveys is the wage received in the previous month after taxes. Since all surveys were conducted over the course of several months in each year and for many years in the 1990s the Russian economy experienced high inflation, the monthly wages are deflated into consistent units within each survey using regional price indices (for 1993 and 1994) or the national consumer price index (for 1995 - 1998). For example, the 1993 VTsIOM surveys were conducted in March, April, May and June of that year; the wages for these surveys were pooled and deflated into February 1993 rubles. A similar procedure was used for the other surveys. The samples analyzed in all surveys are men age 18 - 59 and women age 18 - 54; this restricts the sample to the working-age population since the retirement age in Russia is age 60 for men and age 55 for women. The analysis also excludes individuals who report earning less than one-half the minimum wage in the relevant month; this eliminates the (relatively few) wage observations that appear to be coding errors.

The surveys have a number of strengths and weaknesses. The advantages of the VTsIOM surveys include their reasonably good information on the type of ownership in the firm in which

the respondent works – although it is not ideal – and the relatively large sample size of the 1993 and 1994 surveys (N = 8,914 and N = 4,939, respectively). The primary disadvantages are that information on hours worked is not included in the surveys, so one cannot control for differences in hours between the state and private sectors, and the sample over-represents highly educated individuals relative to the population as a whole (see Appendix Table 1, which shows the sex, age, education and regional distribution of these surveys compared with these distributions tabulated from the 1994 Microcensus).[11]

The RLMS, in contrast, appears to include a greater share of less educated individuals than do the VTsIOM surveys and is thus more representative in that sense. Moreover, the panel aspect of the data in principle allows one to track wage changes among workers who switch between state and private sector employment; the data sets also include information on hours worked although this information is missing for about 10 percent of the observations. The RLMS also has several drawbacks. The survey omits the industry classification of the enterprise the respondent works in, so one cannot control for this important variable. It is also impossible to distinguish between state firms and newly privatized state firms based on the ownership questions asked in the survey. Finally, the attrition in the survey, combined with the payment provided by the RLMS to respondents for completing the survey, likely affects the representativeness of the sample: one would expect that, over the course of the panel, the attrition rates for highly-paid workers exceed those of low-paid workers, and this may affect comparisons of wages in the state and private sectors.

Both the VTsIOM surveys and the RLMS share some problems in common. A difficult issue arising in any attempt to measure wages in Russia in the 1990s is the problem of wage arrears and how to treat them in empirical work. Both surveys include questions regarding

[11]Weights are used in the regression analysis to attempt to correct for this problem.

whether the respondent was affected by wage arrears, but only the 1998 surveys provide enough information for one to compute the contractual wage due the worker. While this problem is unlikely to greatly affect the 1993 and 1994 surveys because the scale of wage arrears was still relatively limited in those years, for subsequent years this problem may affect the results. It does appear that workers in state enterprises are more likely to be affected by wage arrears than are private sector workers, although the latter group is far from immune from the problem (see Earle and Sabirianova 1999 on this issue). As a first step, all wage regressions include a dummy variable for whether or not the respondent is owed back wages by their enterprise.

A second issue that will affect the results for both surveys is the possibility that a worker misreports the ownership type of their firm. Given the speed and, at times, confusion with which the mass privatization program was implemented in Russia, it is likely that some workers were misinformed about the ownership status of their firm. This will introduce measurement error into the regressions and will lead to attenuation bias, and the problem will be exacerbated in any empirical work that exploits the panel aspect of the RLMS. Unfortunately it is impossible to gauge the extent of this type of misclassification error based on currently available data.

Changes in ownership

Russia's mass privatization program has created a marked shift in ownership structure of Russian firms as intended. Figures 1 and 2 show the changes in ownership by number of enterprises and by employment, respectively, in recent years. As indicated in Figure 1, by the beginning of 1998 fewer than 350,000 enterprises and organizations remained in state or municipal hands; this comprised 12.4 percent of all firms. Nearly three-quarters of firms were privately owned while the remaining firms had a mixed form of ownership; this latter form mostly includes privatized state enterprises in which the state retains a stake in the charter capital

(Gimpelson and Lippoldt 1999). While such a high share of private ownership in the economy would seem to indicate a stunning success of the privatization program, it should be noted that these official figures likely overestimate the share of the private ownership in the economy.[12] Moreover, the distribution of employment by form of ownership differs markedly from the distribution of firms by form of ownership (Figure 2). While state sector employment fell sharply from its level of 82.6 percent in 1990 to 40 percent in 1997, the latter figure is far greater than the 12 percent share of firms that remained state-owned in 1997. The discrepancy between employment share and the number of firms by type of ownership is due to the difference in firm size by type of ownership: state firms tend to be large enterprises comprising several hundred or thousands of workers, while private sector firms are much smaller on average, with less than one hundred workers the norm in this sector.

Table 1 describes the VTsIOM survey data by form of ownership, and provides the official data on employment shares shown in Figure 2 in the bottom panel for comparison; the distribution of employment by ownership type for the RLMS data is given in Table 3. While the survey data parallel the official data in showing a large decline in state sector employment between 1993 and 1998 and an increase in private sector employment, the survey data indicate higher levels of state sector employment and substantially lower levels of private sector employment than do the official data. This is likely due at least in part to the private-sector bias of the official data noted above, as well as misreporting by survey respondents. The "true" amount of private sector employment may be impossible to measure precisely because of these problems as well as the blurring of ownership forms that seemed prevalent in the Russian

[12]This point is made by Gimpelson and Lippoldt (1999); the upward bias is likely due to the inclusion of old collective farms, leased enterprises and other types of firms that are not purely private in the 'private' category. See this article for a careful discussion of the official statistics on private sector employment and an analysis of private sector employment in several regions of Russia in 1996.

economy of the 1990s. Table 1 also shows that employment by form of ownership differs markedly for men and women, with a higher share of women working in state sector firms and a higher share of men in private sector firms.

The state-private sector wage differential

As noted above, an issue of central importance is the wage-setting behavior of newly privatized firms. These firms are likely to be similar in size, industrial distribution and workforce composition to state enterprises – especially in the early years of the privatization program – so differences in wage setting behavior between newly privatized and state firms may indicate that privatization has affected firm behavior.

The basic wage data for the VTsIOM surveys are presented in Table 2. In all the years represented in the table, the average monthly wage among workers in state enterprises is less than the average monthly wage for workers in state joint stock companies, which in turn is substantially less than the average monthly wage of workers in private sector firms. For the purposes of this paper it is assumed that state joint stock companies are enterprises in an early phase of privatization, i.e. that they have been corporatized as described in section III above.[13] Workers in state enterprises earned about 85 percent of their counterparts in state joint stock companies for most of the 1993 - 1998 period, although wages in the two sectors were nearly equal in 1994. The most dramatic difference in wages is between the state and private sector: state sector workers earned less than half the wages of private sector workers in 1993; while this ratio rose slightly in subsequent years state sector workers still earned only 61 percent of private sector workers in 1998. These differences are less extreme for women, for whom the public

[13]Whether these enterprises have sold shares in voucher auctions is an issue that cannot be resolved with the available data.

sector wage penalty is less severe than that for men.

The RLMS, the second source of data used for this study, also indicates a substantial state-private sector wage gap, although it is smaller than that suggested by the VTsIOM surveys: the ratio of state to private sector wages in that survey was 0.77 in 1994, compared with a ratio of 0.64 in the VTsIOM survey of the same year. This ratio declined between 1994 and 1995 then increased in subsequent years. The source of the difference in the state-private sector wage ratios is likely (at least in part) the difference in the definition of state and private sector firms between the two surveys. In the VTsIOM surveys, the worker can identify one of eleven ownership types: state enterprise (includes armed forces and government administration); state joint stock company; collective farm; consumer cooperative; enterprise purchased by workers; leased enterprise; non-state joint stock company; private company; enterprise with participation of foreign capital; social organization (fund, party, movement, trade union), and self-employed. In the RLMS, the respondent answers three questions about the firm's ownership status: (1) Is the firm owned by the state (yes/no)? (2) Is the firm owned by a Russian individual or group of individuals? and (3) Is the firm owned by a foreigner or group of foreigners? It is unclear from these questions to which category a respondent would assign a state joint stock company, and it is therefore impossible to distinguish workers in newly privatized firms in this dataset. As a result, the RLMS analysis in this paper is based on only two categories of ownership: an individual is coded as working in a state enterprise if they replied "yes" to the state ownership question and in the private sector if they answered "yes" to the second or third questions. For the analysis based on the VTsIOM data, much of the empirical work divides ownership into three categories: individuals who work in state enterprises, those who work in state joint stock companies, and private sector (and other) workers. However, to enable comparisons with the RLMS a "state-private" sector variable is defined as well, in which an individual is coded as

working in the state sector only if they answer "state enterprise" to the ownership question (in other words, state joint stock companies are coded as being in the private sector). Depending on how survey respondents interpret the state ownership question in the RLMS, therefore, the two definitions of the state and private sectors in the VTsIOM and RLMS surveys may encompass quite different forms of ownership.

Whatever the reason for the discrepancy in the state-private sector wage differential in the two surveys, however, on one point they are in agreement: there is a substantial gap in average monthly wages between state and private sector workers in Russia.

One source of the difference in wages between the two sectors is likely to be differences in hours worked; it is probable that private sector workers work more hours on average than those employed in the state sector. While one cannot address this issue using the VTsIOM data, the RLMS does query respondents on their usual monthly hours, enabling one to calculate hourly wages for workers in these surveys. This is done in Table 3, which also presents information on sample size and employment by sector for the RLMS. According to this survey, private sector workers do work more hours on average than state sector workers, and the difference has been increasing over time: average hours in the state sector in 1994 were 158.7 hours per month, versus 166.0 in the private sector (so that state hours were 95.6 percent of private hours); by 1998 these figures were 160.8 and 178.4, respectively, so that state hours were only 90.1 percent of private hours.[14]

Even accounting for these differences in hours worked between the state and private sectors, however, a substantial gap in wages remains: the ratio of state to private sector average

[14]Note that roughly 10 percent of workers reporting positive wages in the RLMS failed to report hours worked, so that estimates of the wage gap based on hourly wages use fewer observations than those based on monthly wages and may be slightly biased from differential non-reporting between sectors.

hourly wages was 81.8 percent in 1994, narrowing to 86.9 percent in 1998.

Another potential source of compensation differences between the state and private sectors is in the provision of non-wage benefits to employees by firms. It is well known that Russian enterprises have traditionally provided a wide array of services and benefits to their workers, either free of charge or at highly subsidized prices. These benefits include housing, medical services, vacations, day care, and subsidized food and other goods. While evidence suggests a modest reduction in these benefits by Russian firms as a whole over the course of the transition (Tratch *et al* 1996), it is likely that the provision of such benefits differs substantially between state and private sector firms. The VTsIOM and RLMS surveys cannot address this issue, but one survey of workers in 1995 indicated that workers in newly privatized firms received similar benefits to those in state firms, while workers in new private firms received many fewer benefits (Rose 1996). It is unsurprising that state joint stock companies are acting more like state enterprises in this sense, because, unlike new private sector firms, these enterprises were already providing significant nonwage benefits to workers before they were privatized. If one were able to measure and value these nonwage benefits, it is possible – perhaps even likely – that the total compensation of state firms by this measure would exceed the total compensation provided to workers by private firms.

Returning to the state-private sector gap in wages, one can further explore this differential by estimating an OLS log wage equation that includes a dummy variable for state sector employment. These regressions were estimated for each year of both surveys; the equations include controls for worker characteristics (education, potential experience and its square, gender, and whether the respondent was affected by wage arrears) and firm characteristics (industry [VTsIOM data only], firm size and region) so that if the state-private wage differential is due, for example, to differences in the distribution of worker characteristics between the two

sectors or to differences in the industrial or size distribution of firms, then the wage differential should be substantially reduced or eliminated in these regressions. The coefficients on the state sector variable in these regressions are given in the top panel of Table 4 (VTsIOM surveys) and in the bottom part of Table 3 (RLMS). Although in both surveys the wage gap by this measure is smaller than the simple wage differences discussed earlier, there nevertheless remains a large and statistically significant difference in private- and state-sector monthly wages. The coefficient on the state sector variable is -0.218 (SE=0.037) in the 1993 VTsIOM survey and -0.136 (0.043) in the 1994 RLMS. These coefficients fall in subsequent years but by 1998 increase and nearly approach the earlier levels at -0.215 (0.056) and -0.125 (0.037) in the VTsIOM and RLMS surveys, respectively. Using the RLMS hourly wages, a statistically significant gap on the order of 10 percent remains between the state and private sectors in 1994 and 1995, but the coefficient becomes statistically insignificant in the 1996 and 1998 surveys. The VTsIOM surveys also show that the penalty for state sector employment is greater for women than for men in most years.

Turning to relative wages in state joint stock companies, the middle panel of Table 4 shows the coefficients on state joint stock companies and private firms separately, with state sector firms the omitted variable. These results indicate that workers in state joint stock companies earned nearly 13 percent more than their state sector counterparts in 1993. Again similar to the trends shown by the unadjusted wage differentials, the advantage in state joint stock company wages goes to zero in 1994, before rebounding again in 1998. A further comparison of wages between state and privatized enterprises is shown in the bottom panel of Table 4, which restricts the sample to industrial firms only and excludes all private sector and other types of firm. Although previous regressions include controls for firm characteristics, this sample is limited to a homogenous set of firms and may better control for unobserved firm

characteristics than did the previous regressions. Nevertheless, the results are similar to those using the whole sample: workers in privatized enterprises earned a positive wage premium in 1993 and 1998, although the wage premium in the latter year falls rather than increases as it did in the whole sample. The wage premium in the private sector over the 'pure' state sector (middle panel, Table 4) is large and highly statistically significant in all years – on the order of 21 - 28 percent – and it shows a slight narrowing over the period.

A closer look at the state-privatized sector wage gap

Having established that there was a positive return to work in the privatized sector over the state sector in 1993 and 1998, a key issue is whether this premium is due to increased rent-sharing with workers, increased productivity as a result of privatization, or because selection gives a biased estimate of the wage differential. Given the lack of enterprise information in these datasets it is difficult to assess this issue empirically, but there are several clues that suggest the first explanation is more likely, at least in 1993.

The most obvious reason is that the 1993 surveys were conducted in April through June of that year, an early phase of the privatization program, so that little restructuring or worker mobility is likely to have occurred by that point. Moreover, this explanation seems to be supported by the workers themselves. The 1993 VTsIOM surveys asked workers why their wage increased in the last two months (conditional on the wage having increased); the results are shown in Table 5. Most workers believe their wages rose due to inflation, but the results vary by type of ownership: workers in both privatized and private sector firms are more likely to believe that higher wages are related to increased firm profitability. Of all workers, those in privatized firms are least likely to attribute higher wages to harder work on their part. This suggests that rent-sharing, rather than increased productivity, is the source of wage differences in the

privatized sector in 1993.[15]

It is possible, of course, that privatized firms had undertaken pre-privatization restructuring and that the enhanced productivity resulted in higher wages, but (limited) evidence suggests that this is not the case. A small sub-sample of the 1993 and 1994 VTsIOM surveys contained a question regarding whether the worker's enterprise was scheduled to be privatized in upcoming months (for 1993, n=1,452; for 1994, n=532); this allows one to compare wages in privatized enterprises with wages in firms that are due to be privatized in the near future.[16] Although this technique fails to control for all forms of selection bias, it does control for the bias resulting if firms undertook pre-privatization restructuring, and is appealing in the sense that it creates a control group that is quite similar to the firms that have been privatized. A comparison of mean wages between the two types of enterprises indicates that wages were slightly higher in both years in the firms that were due to be privatized: in 1993, for example, the average wage in privatized firms was 19,648 rubles, compared with 21,820 rubles in firms scheduled to be privatized. However, once one includes controls for the worker's education, gender, work experience, and region, the difference becomes statistically insignificant in both years. This suggests that enterprises undertook few productivity-enhancing measures prior to restructuring, or if they did that the measures resulted in higher wages only with a lag.

As noted above other types of selection bias may at work: better firms may be the ones to be privatized; or more skilled workers may have migrated from state to privatized firms (or private firms) seeking better opportunities. In either of these cases, the positive wage premium

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[15]This is in contrast to the findings of La Porta and López-de-Silanes (1999) regarding the impact of privatization on wages in Mexico; the authors conclude that the large increase in wages in privatized firms was due to increased worker productivity.

[16]Frydman *et al* (1999) use this technique to assess the impact of privatization on firm performance in Hungary, Poland and the Czech Republic.

in the privatized sector relative to the state sector is overestimated, and one cannot interpret the higher wages in privatized firms as showing that privatization improves workers' wages.

One approach to this problem is to find appropriate instrument(s) for employment in the privatized sector.[17] The instrument used is a measure of the speed with which privatization was implemented in each region of Russia: because the implementation of the privatization program was largely devolved to Russia's regions, the speed with which a state enterprise was privatized depended at least in part on the region in which the enterprise was located rather than on the relative merits of the firm itself.[18] As an example of the extreme divergence in the speed of privatization across regions, consider the statistics on the share of state enterprises converted to joint stock companies by June 1993, as a share of those slated for corporatization: the average share of enterprises corporatized across Russia was 49 percent of those planned by June 1993. Two of Russia's 89 regions had achieved 100 percent of planned corporatization, while no state enterprises at all had been corporatized in three regions. Only 2 percent of state enterprises had been converted into joint stock companies in Moscow (reflecting the slow pace of privatization in that city), while the surrounding area of Moscow *oblast* (region) had converted 61 percent of its state enterprises by June 1993 (Slider 1994). Given these differences, the speed of privatization across regions should be a suitable instrument because it is correlated with whether or not a worker is employed in a privatized firm, but is unlikely to be correlated with wages. Using this measure of speed as an instrument, the coefficient on the state joint stock company variable becomes statistically insignificant and implausible in magnitude (for example, in 1993 the coefficient is 2.43, with robust standard error 1.78). It appears that this is a weak instrument

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[17]Worker self-selection also likely affects the wage premium earned in the new private sector, but that issue is not explored in this paper.

[18]Blanchard (1997) also makes this point.

and that, given the lack of other instruments, one cannot draw any conclusions regarding the effect of selection bias on the privatized sector wage premium using IV techniques.

The wage differential between state and privatized enterprises may also be due to worker self-selection, with more highly skilled workers migrating from state to privatized firms in search of better opportunities. As noted above, this is unlikely to be the case in the early years of privatization, but may increasingly affect relative wages over time. However, it appears that the distribution of workers by skill is similar in state and privatized enterprises not only in 1993, but through 1998 as well. This is shown in Table 6, which presents the results of multinominal logit regressions that compare the probability of different types of workers being in state joint stock companies and in the private sector relative to the state sector. Worker characteristics in state joint stock companies appear to differ little from worker characteristics in state enterprises (top panel of Table 7): there appears to be almost no difference in the distribution of education, experience or gender between these two sectors, and this holds true for the entire 1993 through 1998 period. In contrast, workers in the private sector are younger, more educated and less likely to be women than are those in the state sector. The similarity of workers in the state and privatized sectors indicates that – at least based on observable characteristics – more skilled workers are not migrating to privatized firms, and that this effect is unlikely to account for the state-privatized sector wage differential.

Quantile regression estimates of the state-private sector wage differential

The similarity of workers in state and privatized firms is also apparent in an examination of quantile regressions, which allow one to track how the privatized or private sector premium changes across deciles of the wage distribution. The OLS estimates of the state-private sector wage differential give the mean penalty for state sector work in Russia. Is this penalty roughly

the same for all workers, regardless of their level of skill? This technique is implemented by estimating a log wage regression like those discussed above for the 1st through 9th quantiles and minimizing the sum of absolute deviations of the residuals; bootstrapped standard errors based on twenty repetitions are calculated in order to allow for possible heteroskedasticity of the residuals. Besides enabling the analyst to examine the effect of a variable across the wage distribution, quantile regressions are also advantageous because they are also less sensitive to outliers than are OLS regressions.

Figures 3 and 4 summarize the results of quantile regressions which were estimated using the VTsIOM surveys and which analyze the returns to employment in state joint stock companies relative to state enterprises and to private sector employment relative to state employment. All regressions include controls for education, experience, gender, wage arrears, industry and region as described in note *a* to Table 4. The striped areas in Figures 3 and 4 represent of ± one (bootstrapped) standard error around the coefficient estimate, which is given by the middle line between the two striped areas. For example, the coefficient on private sector employment (relative to state employment) in 1993 at the 1st quantile is 0.152, with a standard error of 0.029.

Turning first to the premium for private sector work illustrated in Figure 3, the most striking result is the monotonic increase in the return to private sector employment across the deciles of the wage distribution. While individuals in the 1st through 3rd deciles earned about a 16 percent premium for private sector work in 1993, individuals in the 9th decile earned a premium of 49 percent, even after including numerous controls for worker and firm characteristics. One interpretation of the increasing return to private sector work is that it reflects the greater unobserved heterogeneity of private sector workers (and firms) relative to state sector workers (and firms). For example, the private sector encompasses both less skilled workers in retail trade establishments and highly skilled individuals in the emerging financial services

sector, while the state sector encompasses few of such workers.

In contrast to the striking relationships shown in Figure 3, there is no such pattern of increasing returns across quantiles for workers employed in state joint stock companies (Figure 4). While there is a positive return to state joint stock company employment over state employment in 1993 and 1998, similar to the OLS regressions, the return varies little across quantiles. In subsequent years the effect is mostly statistically insignificant, and appears unrelated to the quantile of the wage distribution. This suggests either that workers and firms are relatively homogeneous in the state and privatized sectors relative to the private sector, and that this has changed little over time.

An alternative interpretation is that the returns to skills differ across the three sectors, resulting in the wage premia discussed above. This is clearly the case if one simply compares the state and private sector returns to skills (where the private sector includes state joint stock companies): both the VTsIOM surveys and the RLMS indicate that returns to education are higher in private sector firms than in state enterprises, and that returns to experience are substantially lower in the private sector (Table 7). Looking at returns to skills in privatized and state firms separately, the wage premia for education and experience are broadly similar in the two sectors, although the sample sizes for some of these regressions are too small to allow firm conclusions on this issue (results not shown).

Wage dispersion in the state and private sectors

A comparison of wage dispersion in the state and private sectors also suggests that the private sector is more heterogenous than the state sector: the dispersion in wages is substantially higher among private sector workers relative to both state sector and state joint stock company workers (Table 8). Comparing wage inequality between state enterprises and state joint stock

companies, the dispersion appears to be roughly similar across the two sectors in the years examined here. This again probably reflects the more homogenous workforce among these types of firms – although note that the level of inequality is still extremely high in both sectors – and also suggests that returns to skills are similar in the two sectors. The RLMS data also show higher inequality among private sector workers than in the state sector (Table 3), and both surveys show some convergence in this over time, with state sector inequality increasing and private sector inequality decreasing slightly over the 1990s. The similarity in wage dispersion between the state and privatized sectors indicates that privatization in and of itself has contributed little to rising wage inequality in Russia.

VII. Conclusion

The privatization process in Russia has been a highly politicized and controversial operation, and public support for the program has waned in recent years as new revelations about questionable practices appear with growing frequency in the media. But the true test of whether Russia's privatization program has succeeded or failed lies in the impact of privatization on firms. Privatization was intended to change state enterprises from inefficient firms dependent on subsidies and indifferent to consumer needs into restructured, competitive enterprises independent of the state in all senses. While evidence based on enterprise surveys indicates little change in firm behavior to date relative to state enterprises, this paper has shown that average wages in newly privatized firms are higher than in state enterprises in two of the four years examined here. However, this likely represents rent-sharing within insider-owned firms as managers buy the collusion of workers rather the results of restructuring and increased efficiency of privatized firms. Given that this conclusion is based on limited data, the issue remains a topic for further research.

References

Ash, Timonthy N. and Paul G. Hare, "Privatisation in the Russian Federation: Changing Enterprise Behaviour in the Transition Period," *Cambridge Journal of Economics* 1994, Vol. 18, pp. 619 - 634.

Barberis, Nicholas; Maxim Boycko; Andrei Shleifer and Natalia Tsukanova, "How Does Privatization Work? Evidence from the Russian Shops," *Journal of Political Economy* 1996, vol. 104, no. 4, pp. 764 - 790.

Blanchard, Olivier, *The Economics of Post-Communist Transition* (Oxford, UK: Oxford University Press), 1997.

Bornstein, Morris, "Russia's Mass Privatisation Programme," *Communist Economies & Economic Transformation*, 1994, Vol. 6, No. 4, pp. 419 - 457.

Boycko, Maxim; Andrei Shleifer and Robert Vishny, *Privatizing Russia* (Cambridge, MA and London, England: The MIT Press), 1995.

Earle, John S. and Saul Estrin, "Privatization, Competition and Budget Constraints: Disciplining Enterprises in Russia," Stockholm Institute of Transition Economics and East European Economies Working Paper No. 128, March 1998.

Earle, John, Saul Estrin, and Larisa Leshchenko, "Ownership Structures, Patterns of Control and Enterprise Behavior in Russia," in Simon Commander, Qimiao Fan and Mark Schaffer, eds., *Enterprise Restructuring and Economic Policy in Russia* (Washington, D.C.: Economic Development Institute, EDI Development Studies), 1996, 205 - 252.

Earle, John S. and Klara Sabirianova, "Understanding Wage Arrears in Russia," Stockholm School of Economics (SITE) Working Paper, April 1999.

Estrin, Saul and Mike Wright, "Corporate Governance in the Former Soviet Union: An Overview," *Journal of Comparative Economics*, 1999, Vol. 27, pp. 398 - 421.

Filatotchev, Igor, Trevor Buck, Irena Grosfeld, Judit Karsai and Mike Wright, "Buy-Outs in Hungary, Poland and Russia: Governance and Finance Issues," *Economics of Transition* Vol. 4 (1), May 1996, 67 - 88.

Filatotchev, Igor, Mike Wright and Michael Bleaney, "Privatization, Insider Control and Managerial Entrenchment in Russia," *Economics of Transition*, Vol. 7 (2), 1999, 481 - 504.

Flanagan, Robert J., "Wage Structures in the Transition of the Czech Economy," *IMF Staff Papers*, Vol. 24 (4) (December 1995), 836 - 854.

Frydman, Roman, Cheryl Gray, Marek Hessel and Andrzej Rapaczynski, "When Does Privatization Work? The Impact of Private Ownership on Corporate Performance in the

Transition Economies," *Quarterly Journal of Economics*, 114 (4), November 1999, 1153 - 91.

Frydman, Roman, Andrzej Rapaczynski, and John S. Earle et al, *The Privatization Process in Russia, Ukraine and the Baltic States* (Budapest, London and New York: Central European University Press, 1993).

Gimpelson, Vladimir and Douglas Lippoldt, "Private Sector Employment in Russia," *Economics of Transition* Vol. 7 (2), 1999, 505 - 533.

Goerke, Laszlo, "Privatization and Efficiency Wages," *Journal of Economics*, Vol. 67 (3), 1998, pp. 243 - 64.

Goskomstat of Russia, *Osnovnye Itogi Mikroperepisi Naseleniya 1994 g. (Basic Results of the 1994 Microcensus of the Population)* (Moscow, 1995).

Goskomstat of Russia, *Rossiiskii statisticheskii ezhegonik 1998 (Russian Statistical Yearbook 1998)* (Moscow, 1998).

Haskel, Jonathan and Stefan Szymanski, "Privatization, Liberalization, Wages and Employment: Theory and Evidence for the UK," *Economica* 1993 Vol. 60, pp. 161 - 82.

Hildreth, Andrew K. G. and Andrew J. Oswald, "Rent-Sharing and Wages: Evidence from Company and Establishment Panels, *Journal of Labor Economics*, Vol. 15 (2), April 1997, pp. 318 -37.

Layard, Richard and Andrea Richter, "How Much Unemployment Is Needed for Restructuring: The Russian Experience," *Economics of Transition*, Vol. 3 (1), March 1995, pp. 39 - 58.

La Porta, Rafael and Florencio López-de-Silanes, "The Benefits of Privatization: Evidence from Mexico," *Quarterly Journal of Economics*, Vol. 114 (4), November 1999, pp. 1193 - 1242.

Luke, Peter J. and Mark E. Schaffer, "Wage Determination in Russia: An Econometric Investigation," William Davidson Institute Working Paper No. 295, March 2000.

Megginson, William L. and Jeffry M. Netter, "From State to Market: A Survey of Empirical Studies on Privatization," unpublished paper, University of Oklahoma, December 1998.

Newell, Andrew and Mieczyslaw Socha, "Wage Distribution in Poland: The Roles of Privatization and International Trade, 1992 - 96," *Economics of Transition*, Vol. 6 (1), 1998, pp. 47 - 65.

Rose, Richard, "Evaluating Workplace Benefits: The Views of Russian Employees," in Centre for Co-operation with the Economies in Transition, OECD, *The Changing Social Benefits in Russian Enterprises* (Paris: OECD), 1996, 39 - 60.

Rutkowski, Jan, "High Skills Pay Off: The Changing Wage Structure During Economic Transition in Poland," *Economics of Transition*, Vol. 4 (1), 1996, 89 - 112.

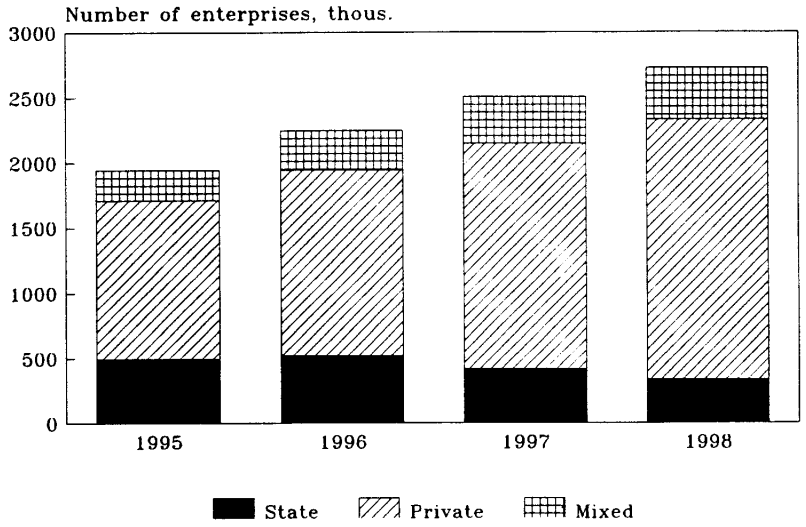
Shleifer, Andrei and Robert W. Vishny, "Politicians and Firms," *Quarterly Journal of Economics*, Vol. 109 (4), November 1994, pp. 995 - 1025.

Slider, Darrell, "Privatization in Russia's Regions," *Post-Soviet Affairs*, Vol. 10 (4), 1994, 367 - 396.

Tratch, Irina, Martin Rein and Andreas Wörgötter, "Social Asset Restructuring in Russian Enterprises: Results of a Survey in Selected Russian Regions," in Centre for Co-operation with the Economies in Transition, OECD, *The Changing Social Benefits in Russian Enterprises* (Paris: OECD), 1996 95 - 107.

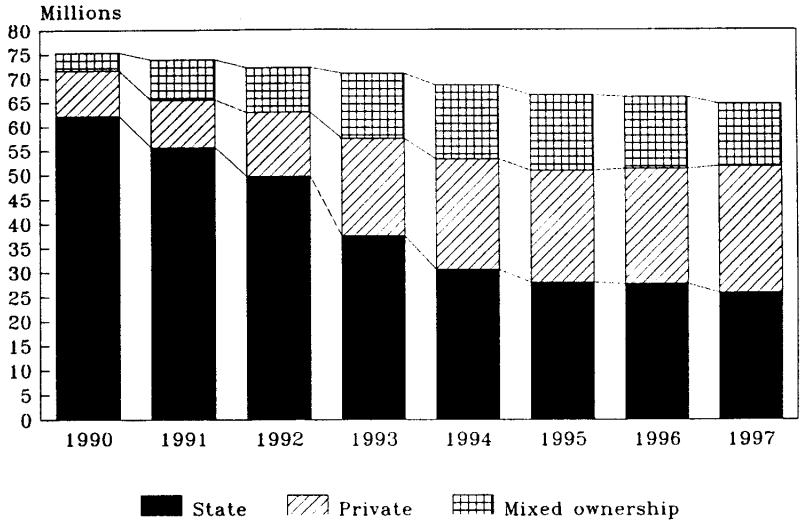
Večerník, Jiří, "Changing Earnings Distribution in the Czech Republic: Survey Evidence from 1988 - 1994," *Economics of Transition*, Vol. 3 (3), 1995, 355 - 371.

Figure 1. Number of enterprises by form of ownership, 1995 - 1998, at beginning of year



Source: Goskomstat, *Rossiiskii statisticheskii ezhegodnik 1998*, p. 341.

Figure 2. Employment by form of ownership, 1990 - 1997



Source: Goskomstat, *Rossiiskii statisticheksii ezhegodnik 1998*, p. 178.

Note: The category "state" includes municipal enterprises; "mixed" includes privatized enterprises in which the state retains a stake in the charter capital, and also includes social organizations and funds, joint ventures and enterprises owned by foreign individuals.

Table 1. Distribution of employed workers by type of firm ownership (percent of workers in each category)

	1993	1994	1997	1998
Survey data:[a]				
All workers:				
State enterprises	64.0	55.4	53.8	51.8
State joint stock companies	13.2	21.7	19.8	19.2
Private and other	22.8	22.9	26.4	29.1
Men				
State enterprises	57.2	48.5	46.4	42.4
State joint stock companies	13.8	23.5	22.4	23.4
Private and other	29.0	28.0	31.2	34.2
Women				
State enterprises	69.7	61.2	60.4	59.7
State joint stock companies	12.6	20.1	17.5	15.6
Private and other	17.7	18.7	22.1	24.8
Sample[b]				
Percent:				
State enterprises	64.5	56.5	54.5	52.4
State joint stock companies	13.3	21.2	17.2	18.1
Private and other	22.3	22.3	28.2	29.6
Number of observations:	8,914	4,939	2,172	2,659
State enterprises	5,746	2,788	1,185	1,393
State joint stock companies	1,182	1,049	374	480
Private and other	1,986	1,102	613	786
Official data:[c]				
All workers:				
State enterprises	53.0	44.7	40.1	na
Mixed ownership	17.6	21.1	18.3	na
Private and other	29.4	34.2	41.6	na

[a]"Other" includes collective farms; consumer cooperatives; enterprises purchased by workers; leased enterprises; non-state joint stock companies; enterprises with participation of foreign capital; social organizations and the self-employed.
[b]After elimination of observations with missing wages or other key variables.
[c]Source: Goskomstat, *Rossiiskii statisticheskii ezhegodnik 1998*, p. 178.

Table 2. Wages by type of ownership
(monthly wages deflated into consistent units within each survey;
VTsIOM data)

	1993	1994	1997	1998
Average wages:				
All workers	20,910	118,835	879,167	932,050
State enterprises	16,547	105,367	679,140	760,618
State joint stock cos.	19,301	106,278	838,414	913,267
Private and other	34,490	164,861	1,290,707	1,247,344
Wage ratios:				
State/state joint stock	0.857	0.991	0.810	0.833
State/private	0.480	0.639	0.526	0.610
Men:				
State/state joint stock	0.861	1.056	0.850	0.967
State/private	0.460	0.658	0.529	0.640
Women:				
State/state joint stock	0.913	1.002	0.833	0.818
State/private	0.640	0.726	0.608	0.682

Table 3. State/private sector wage differentials from the RLMS

	1994	1995	1996	1998
Percent of all workers:				
State	69.4	68.2	67.7	64.1
Private and other	30.6	31.8	32.3	35.9
Sample, percent:				
State	70.2	69.1	66.3	64.6
Private	29.8	30.9	33.7	35.4
Sample, number:	3,352	2,929	2,439	2,588
State	2,354	2,023	1,618	1,671
Private	998	906	821	917
State/private wages, monthly	0.774	0.714	0.763	0.776
Monthly hours, average	160.9	168.3	169.7	167.2
State	158.7	165.6	165.6	160.9
Private	166.0	174.4	177.6	178.7
Number reporting hours	3,075	2,622	2,146	2,329
State/private wages, hourly[a]	0.818	0.761	0.881	0.869
90-10 log wage diff.	2.475	2.465	2.386	2.465
State	2.368	2.303	2.303	2.485
Private	2.460	2.526	2.590	2.442
State sector coefficient in log wage regressions:[b]				
OLS, monthly wages	-0.136***	-0.152***	-0.067	-0.125***
	(0.043)	(0.046)	(0.049)	(0.037)
OLS, hourly wages	-0.099**	-0.109***	-0.004	-0.059
	(0.042)	(0.047)	(0.050)	(0.043)

[a]Calculated for workers reporting more than 20 hours worked in the previous month.
[b]Regression of log wages on five categorical education variables, potential experience (age - years of education - 7) and its square, a female dummy variable, a dummy variable for whether the worker reported experiencing wage arrears in the previous month, seven region dummy variables, and five firm-size variables (no industry controls). Standard errors are corrected for clustering within primary sampling units.
*** Significant at the 1 percent level or less.
** Significant at the 5 percent level or less.
* Significant at the 10 percent level or less.

Table 4. Coefficient on ownership variables in log wage regressions (OLS), VTsIOM surveys

	1993	1994	1997	1998
Coefficient on state sector variable, OLS wage equation[a]				
All	-0.218*** (0.037)	-0.122*** (0.037)	-0.145*** (0.053)	-0.215*** (0.056)
Men	-0.252*** (0.040)	-0.121*** (0.047)	-0.093 (0.06653)	-0.170** (0.056)
Women	-0.163*** (0.041)	-0.130*** (0.045)	-0.208*** (0.067)	-0.262*** (0.065)
Relative to the state sector: OLS wage equation[b]				
State joint stock	0.127*** (0.042)	0.007 (0.040)	0.051 (0.070)	0.167*** (0.048)
Private	0.286*** (0.043)	0.255*** (0.044)	0.215*** (0.065)	0.247*** (0.068)
N	8,914	4,939	2,172	2,659
Industrial enterprises only; excluding all private sector and other types of firm:[c]				
State joint stock	0.139*** (0.041)	-0.014 (0.045)	0.003 (0.042)	0.089** (0.039)
N	3,843	1,934	754	1,426

[a]The state sector is defined as state enterprises only (i.e., state joint stock companies coded as nonstate firms). Controls include six categorical education variables, potential experience and its square, female dummy variable (for "all" regression), a dummy variable for whether the worker reported experiencing wage arrears in the previous month, seven industry variables, five firm-size variables and twelve regional dummy variables. Standard errors are corrected for clustering within primary sampling units.
[b]Same controls as above.
[c]Same controls as in (a), except for industry controls.
*** Significant at the 1 percent level or less.
** Significant at the 5 percent level or less.
* Significant at the 10 percent level or less.

Table 5. Reasons for wage increases, 1993 VTsIOM surveys

Worker responses to the question: (percent)
If your wage from your primary job increased in the last two months, with what was this connected?

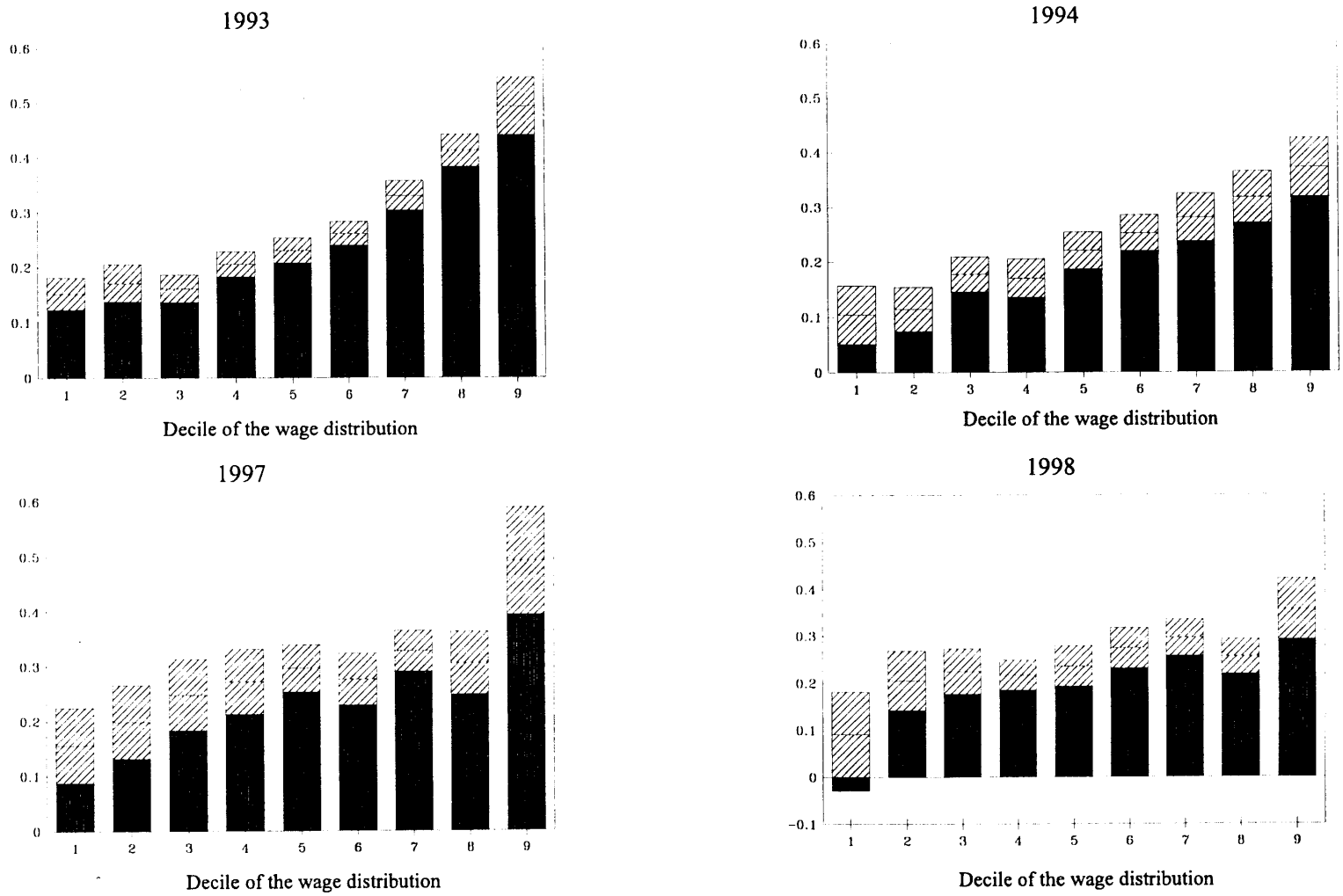
	Indexation, general increase in wages in the country, sector	I started to work more, earn more	Increased qualifications, advancement at work	Successful activities, growth of profits at enterprise	Started a new job	Don't know	N
State ent.	79.0%	3.2	3.1	4.1	1.1	9.5	4814
State joint stock	72.9	2.4	1.9	10.6	1.9	10.3	961
Private and other	54.5	8.4	2.3	19.2	5.2	10.5	1586

Table 6. Multinomial logit regressions for characteristics of workers in each sector (VTsIOM data)[a]

	1993	1994	1997	1998
Relative to state sector:				
State joint stock companies:				
Years of education	-0.034	-0.028	-0.024	-0.010
	(0.022)	(0.027)	(0.025)	(0.012)
Age	-0.007*	0.001	-0.007	0.005
	(0.004)	(0.005)	(0.007)	(0.006)
Female	0.0003	0.029	0.102	-0.425***
	(0.095)	(0.118)	(0.141)	(0.118)
Private sector:				
Years of education	0.078***	0.076**	0.069***	0.002
	(0.021)	(0.033)	(0.022)	(0.006)
Age	-0.022***	-0.025***	-0.029***	-0.029***
	(0.005)	(0.006)	(0.006)	(0.007)
Female	-0.668***	-0.468***	-0.470***	-0.421***
	(0.090)	(0.120)	(0.125)	(0.116)
N	8,914	4,939	2,172	2,659

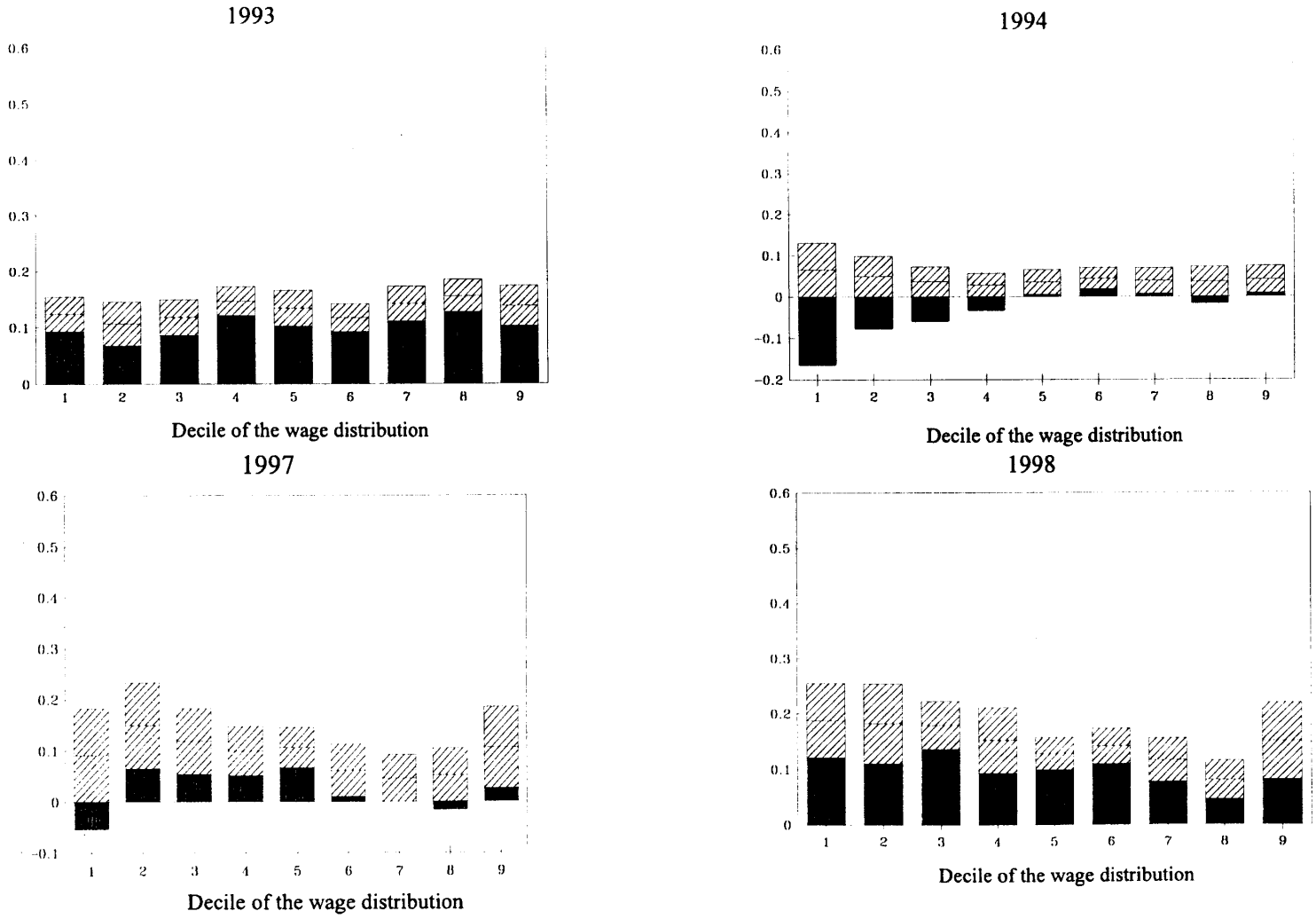
[a]Regressions also include seven industry dummies and eleven region dummies. Standard errors are corrected for clustering within primary sampling units.

Figure 3. Return to private sector employment over state sector employment by decile, 1993 - 1998



Note: shaded areas represent ± one standard error.

Figure 4. Return to state joint stock company employment over state sector employment by decile, 1993 - 1998



Note: shaded areas represent ± one standard error.

Table 7. Returns to skills by type of ownership
(OLS log wage regressions)[a]

	1993	1994	1995	1996	1997	1998
Years of education:						
VTsIOM, state:	0.066***	0.072***	na	na	0.032***	0.004***
	(0.006)	(0.010)			(0.009)	(0.001)
VTsIOM, private:	0.112***	0.095***	na	na	0.075***	0.003
	(0.011)	(0.013)			(0.010)	(0.003)
RLMS, state:	na	0.077***	0.065***	0.056***	na	0.089***
		(0.009)	(0.009)	(0.011)		(0.009)
RLMS, private:	na	0.080***	0.069***	0.087***	na	0.080***
		(0.010)	(0.014)	(0.014)		(0.010)
Years of pot. experience:						
VTsIOM, state:	0.025***	0.024***	na	na	0.023***	0.041***
	(0.004)	(0.005)			(0.007)	(0.005)
VTsIOM, private:	-0.007	-0.001	na	na	0.013	0.027***
	(0.007)	(0.006)			(0.010)	(0.0002)
RLMS, state:	na	0.037***	0.037***	0.026***	na	0.044***
		(0.007)	(0.007)	(0.006)		(0.009)
RLMS, private:	na	0.016**	0.007	-0.006	na	0.015**
		(0.008)	(0.010)	(0.009)		(0.007)
Number of observations:						
VTsIOM, state:	5,746	2,788	na	na	1,185	1393
VTsIOM, private:	3,168	2,158	na	na	987	1266
RLMS, state:	na	2,351	2,018	1,613	na	1,666
RLMS, private:	na	997	905	821	na	916

[a]Results shown are coefficients from human capital wage equations by state or nonstate sector, regressing the log of monthly wages on years of education, years of potential work experience (age - years of education - 7) and its square, a female dummy variable, and a dummy variable for whether or not the worker was affected by wage arrears. Regressions also include regional dummy variables.

Table 8. Wage dispersion by type of ownership
(difference in log monthly wages at various percentiles of the wage distribution)

	1993	1994	1997	1998
All workers:				
90-10	1.911	1.964	1.875	1.974
90-50	0.959	1.005	0.916	0.930
50-10	0.953	0.959	0.959	1.044
Std. dev.	0.795	0.778	0.802	0.805
N	8,914	4,939	2,172	2,659
State enterprises:				
90-10	1.777	1.766	1.776	1.886
90-50	0.841	0.892	0.860	0.892
50-10	0.937	0.874	0.916	0.994
Std. dev.	0.710	0.692	0.701	0.740
N	5,746	2,788	1,185	1393
State joint stock cos:				
90-10	1.773	2.017	1.667	1.746
90-50	0.841	0.950	0.786	0.765
50-10	0.932	1.067	0.881	0.981
Std. dev.	0.724	0.794	0.740	0.708
N	1,182	1,049	374	480
Private and other:				
90-10	2.475	2.359	2.303	2.079
90-50	1.338	1.253	1.139	1.088
50-10	1.137	1.107	1.163	0.992
Std. dev.	0.999	0.924	0.954	0.921
N	1,986	1,102	613	786

Appendix Table 1. Representativeness of VTsIOM surveys

	1993	1994	1997	1998	1994 Microcensus[a]
% male	39.5	39.8	41.9	40.8	45.9
% female	60.5	60.2	58.1	59.2	54.1
Population age 20+:					
20-29	19.8	20.1	20.0	19.2	18.7
30-39	24.6	25.7	21.4	20.6	22.9
40-49	21.7	21.8	21.5	22.2	18.4
50-59	15.2	14.6	15.8	15.9	16.1
60+	18.7	17.8	21.4	22.1	23.9
Education (age 15+):					
Higher	21.8	20.9	21.5	21.2	13.3
Incomp. higher	3.2	3.4	4.2	4.1	1.8
Sec. specialized	26.1	27.8	27.5	28.0	21.9
Secondary	27.6	28.5	26.5	27.3	28.5
Incomp. secondary	14.1	13.3	12.6	12.6	20.2
Primary or less	7.1	6.2	7.6	5.9	14.3
Regional distribution:					
North	3.4	4.7	5.6	4.9	4.1
Northwest	9.3	5.8	3.4	3.4	5.5
Central	26.7	20.4	30.9	30.5	20.2
Volga-Vyatsky	5.1	5.8	5.1	5.1	5.7
Central Chernozem	4.7	5.3	4.8	4.6	5.3
Povolzhsky	9.8	11.3	9.8	9.8	11.3
North Caucuses	10.1	11.3	10.2	9.8	11.8
Urals	11.3	14.6	12.1	12.1	13.8
West Siberia	9.0	10.1	7.9	8.8	10.2
East Siberia	6.0	5.8	5.6	5.4	6.2
Far East	4.6	5.0	4.7	5.3	5.3

[a]Source: Goskomstat 1995.