Journal of Comparative Economics **27,** 595–617 (1999)
Article ID jcec.1999.1616, available online at http://www.idealibrary.com on IDEAL®

Grime and Punishment: Job Insecurity and Wage Arrears in the Russian Federation[1]

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Received January 27, 1998; revised August 16, 1999

Lehmann, Hartmut, Wadsworth, Jonathan, and Acquisti, Alessandro—Grime and Punishment: Job Insecurity and Wage Arrears in the Russian Federation

Using information from two complementary household survey data sets, we show that the dominant form of labor market adjustment in the Russian transition process has been the delayed receipt of wages. More than half the work force is experiencing some form of disruption of their pay. Wage arrears are found across the private, state, and budgetary

[1] The authors would thank Sarah Ashwin, Vladimir Gimpelson, Evgenyiy Gontmakher, Tatyana Gorbachëva, Barry Ickes, Douglas Lippoldt, Mark Schaffer, Viktor Starodubrovskiy, Ruslan Yemtsov, and participants at the conferences "Labor Markets in Transition," University of Michigan, October 1997, and "Economic Transition in CEE and Russia, Theory and Empirical Evidence," EERC (Russia), Moscow, December 1997 and at seminar presentations at the Catholic University of Leuven, the London School of Economics, and Trinity College, Dublin, for many important comments. John Bonin and two anonymous referees were particularly helpful in their comments on earlier drafts. The usual caveat applies. Lehmann and Wadsworth are grateful to the European Commission (Tacis-Ace Project T94-1073-R) and Acquisti, graduate student at UC Berkeley, to the Banca Nazionale del Lavoro (grant under the program "Borsa di Studio BNL per il perfezionamento all'estero nelle discipline economiche") for financial support.

0147-5967/99 $30.00

sectors. Workers in the metropolitan center are less affected by delayed and incomplete wage payments than are workers in the provinces. There is less evidence that individual characteristics contribute much toward the incidence of wage arrears, but the persistence of arrears is concentrated on a subset of the working population. We show that workers can only exercise the exit option of a job quit from a firm not paying wages in full or on time if the outside labor market is sufficiently dynamic. *J. Comp. Econ.*, December 1999, **27**(4), pp. 595–617. Heriot-Watt University, Edinburgh EH14 4AS, United Kingdom, IZA, Bonn, Germany, and WDI, Ann Arbor, Michigan; Centre for Economic Performance, London School of Economics, London WC2AE 2AE, England, and Royal Holloway College, University of London, Egham, TW20 1TQ, England; School of Information Management and Systems, University of California, 102 South Hall, Berkeley, California 94720-4600.

Journal of Economic Literature Classification Numbers: J6, J30, P20.

1. INTRODUCTION

All these new ideas, reforms, theories, have penetrated even to us in the provinces, but to see the whole picture and see it clearly, one must be in the capital.

—Dostoevesky, *Crime and Punishment*, 1866

Six years into transition, the Russian labor market is still in turmoil. Dramatic falls in output and continued uncertainty surrounding the transition process had led to a series of conflicts over enterprise funds among the tax authorities, the banks, and the work force, as well as between enterprises and their regional governments and between the regions and the center. These conflicts have been exacerbated by liquidity crises at the federal level. Against this background of uncertainty and negative output shocks, aggregate employment levels remain relatively higher than might be expected. It may be that employment has not fallen much because firms have adjusted to contractions in sales and growing liquidity constraints in other ways.[2] Adjustments on the intensive, rather than the extensive, margin, such as involuntary unpaid leaves of absence, a reduction in hours worked, or the increased use of temporary contract work, are all possible explanations. Moreover, some managers may tell their workers not to report for work without making them redundant. In so doing, the enterprise avoids both salary and redundancy payments.

Another option for firms coping with the effects of transition is price, rather than quantity, adjustment. Firms could adjust their cost schedules by not paying wages. Alfandari and Schaffer (1996) argue that wage arrears are used by management in some firms to extract tax concessions from the government. Clarke (1998) suggests that implicit or explicit agreements between the federal government and the banks regarding the seizure of enterprise bank deposits in

[2] It is of course possible that unreported activities reduce the gap between measured and actual output. See Johnson et al. (1997) for some evidence on the extent of the unofficial economy in Russia. Nevertheless, activities in the unofficial economy can only account partially for the disparate reductions in measured output and employment.

order to meet federal tax and debt liabilities have left many firms with little cash to pay wages, irrespective of the firms' profitability. A lack of credit facilities in the banking sector then exacerbates this cash flow problem.

Wage arrears could also be viewed as loans from workers with few outside opportunities to firms in genuine distress. If a firm is dominated by insiders with vested interests in the continued existence of the enterprise, such loans will be more likely. If the firm is in distress, the workers' only outlet under existing law is to sue the firm for bankruptcy. A form of implicit contract may arise, whereby the worker trades wage arrears for continued employment. This could be supported by the continued existence of fringe payments that may be unavailable if the worker left the firm. Real wage cuts, over and above those already taking place, may not achieve the same level of commitment from the work force.

Compounding all this is the role of the central government in paying off its debts by delaying payment for state orders and refusing to release funds for the payment of wages in the budgetary sector, i.e., health, education, and public administration. Consequently there may be large regional variation in the incidence of arrears, depending on the industrial structure, the extent of transformation, and the regional government's response to shocks and its relationship with the center. Certain types of workers could also be disproportionately affected. Issues of whether firms discriminate against certain workers in their application of wage arrears,[3] whether patronage is an important element or whether firms use efficiency wage type considerations to retain the most productive members of their workforce, have not yet been examined.

This paper attempts to help fill that gap. Standing (1996) presents establishment-level evidence of large regional variations in the proportion of firms that experienced significant wage arrears. However, these data are only qualitative. In a paper subsequent to ours, Earle and Sabirianova (1999) pool individual and enterprise data to identify firm-level effects on wage arrears. Our paper provides evidence from two household survey data sets with which we can analyze wage arrears across regions, industries, firm types, and individuals. The first is a supplement to the March 1996 and November 1997 Russian Labor Force Survey (RLFS), conducted in initially five and then four representative regions of the Russian Federation. The second is the Russian Longitudinal Monitoring Survey (RLMS), a smaller but nationally sampled longitudinal survey of individuals, covering many of the same issues as the RLFS supplement and following its sample population over the period from 1994 to 1996.[4] Desai and Idson (1998) use the RLMS to focus on the household characteristics of those in arrears and

[3] Layard and Richter (1995) give a cross-tabulation of the extent of 1994 wage arrears using the All-Russian Center for Public Opinion Research (or VCIOM, its Russian acronym) survey of individuals, while Gordon (1997), using VCIOM data, shows the overall rising incidence of wage arrears between 1992 and 1996.

[4] The supplement was developed by the authors, Evgeniy Gontmakher, Ingrid Leiprecht, Douglas

the likelihood that this induces bartering among those affected. We extend their analysis by introducing more establishment characteristics, and we exploit the panel nature of the RLMS to examine individual dynamics and the persistence of wage arrears.

While the problem of wage arrears may stem from the economic position of the firm and the institutional structure during transition, we contend that responses by individuals can shed light on some areas that would otherwise be difficult to obtain from an analysis of firms alone. Using these two complementary data sets, we examine which individuals and which sectors are most affected by arrears and begin to build up a picture of the evolution of some of these trends across time.

2. DATA

The initial analysis is based on the March 1996 and November 1997 rounds of the Russian Labor Force Survey (RLFS), conducted by the national and regional offices of Goskomstat. The basic survey asks standard questions about employment, job searches, and related issues of a random sample of households in all regions of the Russian Federation. A supplement, tailored to our research, was added to the original survey in five Russian regions. The five regions, Moscow City, Moscow Oblast, Chuvash Republic, Chelyabinsk, and Krasnoyarski Krai, were selected as representative of the diffuse labor market types throughout the Russian Federation. More than 17,000 households were interviewed in these regions, leading to around 25,000 individual records on the population of working age. Responses by military/security personnel are limited and thus are excluded from the analysis. Some of the variables analyzed, for example, the decomposition of ownership into new private and privatized firms, and information on the form of wage arrears could only be ascertained from questions in the RLFS supplement.

Our second data source is the second phase of the Russian Longitudinal Monitor Survey (RLMS), a longitudinal panel of around 4000 households across the Russian Federation conducted in the Fall of each year between 1994 and 1996. The data contain a set of demographic and establishment characteristics, not always the same as those in the RLFS, together with information on the labor market activities of its sample. Despite its relatively small size, the main advantage of this source is that it can track individuals and the incidence of wage arrears over time and control for any unobserved individual heterogeneity that may have an effect on the probability of experiencing wage arrears. For example, if patronage is an important determinant of arrears, then this will be unobserved,

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Lippoldt, Viktor Starodubrovskiy, and Ruslan Yemtsov as part of the TACIS-Ace project T94-1073-R. For a full description of the supplement, see Lehmann et al. (1998).

but failure to account for this may bias the results. As with the RLFS, we restrict our sample to employees of working age and exclude the military.[5] The survey design does not follow individuals if they move, but it does sample new occupants of the same address in order to try to keep the panel balanced. We therefore treat each wave as a separate cross section in the initial exploration of the data and then match individuals across waves in order to analyze issues related to persistence and mobility. There are around 10,000 observations in each wave, of which around 4000 are at work in any wave.

The survey questions dealing with wage arrears are complementary across the two surveys. Both ask questions of the form, "Does your place of work owe you any money?" The RLFS supplement then asks for the month in which workers were last paid, together with the type of payment made by the firm, ranging from complete and on time to late and incomplete. The RLMS asks simply, "How much money have they not paid you in total?" It then asks the number of months since the worker was paid last. Respondents in both surveys are asked to state the amount of money received from their employers after tax in the past month. There is no distinction made between basic wages and bonuses. These wage responses are then deflated by a national price deflator indexed to 100 at January 1996.[6] There is no indication whether wage arrears are estimated before or after tax. With no information on how and when arrears accumulated, the total amount of arrears is deflated by the inflation rate at the time of interview.

3. JOB INSECURITY AND WAGE ARREARS

How have the employment policies of firms adjusted to these uncertain times? One possibility is that workers may be placed on temporary contracts or short-time work by firms in trouble. The incidence of contract working and the pattern of hours worked are outlined in Table 1 using RLFS data.

The vast majority of those at work have a permanent contract (row 1).[7] However, fixed-term contracts are more prevalent among the stock of workers with new jobs, as measured by those with job tenure of 12 months or less (row 2). Around 1 in 9 new jobs are temporary. Since new jobs are at the margin of adjustment, it may be that a higher incidence of temporary work among new jobs is an indication of greater insecurity in the labor market to come. These numbers are, however, still low by some Western standards.[8] Probit estimates of the incidence of permanent contracts for those in new jobs show that workers over

[5] The RLMS is ambiguous on the nature of self-employment, referring instead to the extent of self-ownership in the enterprise where the individual works. We exclude only those who say they own between 51 and 100% of the enterprise.

[6] There are no population weights in either data set.

[7] More than 90% of those on fixed-term contracts would have preferred to have a permanent contract.

[8] Gregg and Wadsworth (2000) show that around one in six new jobs are temporary in Britain.

TABLE 1

Percentage Distribution of Job Types and Hours Worked by Region

Contract		Moscow	Moscow Oblast	Krasnoyarsk	Chuvash Republic	Chelyabinsk
Percentage with permanent job	1996	97.6	97.4	96.8	98.1	98.5
	1997	98.3	n/a	97.2	97.7	98.4
Percentage with permanent job in new jobs	1996	84.3	86.9	86.9	91.7	93.6
	1997	89.5	n/a	83.8	91.7	92.7
Percentage with part-time job	1996	2.9	3.0	5.0	4.1	2.8
	1997	0.9	n/a	3.5	1.5	3.9
Percentage working fewer hours	1996	4.8	5.3	5.9	10.8	7.1
	1997	1.9	n/a	5.2	8.2	5.0
Percentage working same hours	1996	92.2	91.9	87.3	87.5	91.0
	1997	96.3	n/a	91.7	89.8	91.5
Percentage with second jobs	1996	2.7	1.5	2.7	1.0	2.2
	1997	0.9	n/a	1.1	1.1	2.2

Source. RLFS.

Note. New jobs include all those with job tenure of 12 months or less. Part-time jobs, hours, and second jobs are calculated as a percentage of all employees.

55 years of age and those working either voluntarily or involuntarily less than 30 hours a week have substantially lower probabilities of having a permanent contract. There is also a higher incidence of temporary work in the metropolitan area than in the provinces, and new jobs are less likely to be permanent in the new private sector.[9]

Job insecurity may also be expressed by the chances of job separations. Using the same RLMS data, Lehmann and Wadsworth (1999) establish that separations are higher at any job tenure in Russia than they are in Poland and Britain. However, the RLMS data do not distinguish between voluntary quits and layoffs. Complementary firm-level data from the four regions in the November 1997 RLFS show that, in large and medium enterprises, the share of layoffs in separations varied from 5% in the Chuvash Republic to 9% in Krasnoyarsk while the share of voluntary quits was lowest in Krasnoyarsk, with 72%, and highest in the Chuvash Republic, with 92%. On the basis of these data, layoffs seem to constitute only a small part of separations.[10]

When asked about employment, respondents may think that this refers to the enterprise where they deposit their labor book, whether they actually work there

[9] These results are available from the authors on request or may be found in Lehmann et al. (1998).

[10] The high quit shares are somewhat dubious as firms might force workers to quit voluntarily to avoid responsibility for severance pay. Small changes in net employment in Russia in the face of large total separations can also be explained by simultaneous large hirings (Foley, 1997a).

or not. Nearly all those who have deposited their labor book with an enterprise will have a permanent contract. For this reason, it is useful to see how many hours those who claim to have a permanent contract actually worked in their primary employment and to compare these with the usual hours worked. Table 1 shows that the vast majority of individuals worked the same hours as usual. Around two-thirds of those not working normal hours worked fewer, rather than more, hours than usual. Nearly half of those who worked less were on zero hours. This suggests that about 3% of the sample were on leave. About half of this group, or 1.5% of the total sample of employed workers, had not received a wage in the month of interview and were presumably on unpaid leave during the reference week.[11] There is some variation in fewer hours worked at the regional level, with a spread of around 5 percentage points between the Chuvash Republic, where we observe the highest value, and Moscow City, where less than 5% of workers worked fewer than normal hours. Despite these regional variations, it appears that in both 1996 and 1997 most employees had a permanent contract and a full workload.

According to the RLMS, around 9% of the employed were on unpaid leave in 1994. The median duration for this group was 30 days, while the mean duration amounted to 43 days. In both 1995 and 1996, the median duration of unpaid leave was again 30 days, with somewhat higher values for the mean duration than in 1994 (53 and 50 days, respectively). The incidence, on the other hand, fell in 1995 to 6% and rose to 7.5% in 1996. Few workers are employed part-time. Around 3% of the RLFS sample of employees work part-time. Part-time work does not seem to be the route by which enterprises maintain employment levels. Nor do many workers seem to hold a second job. No more than 3% of employees admit to being engaged in additional work.

This evidence does not suggest that there is insecurity on the intensive margin for most of the employed workforce. Given the moderate fall of employment relative to output during the first years of transition[12] this seems remarkable. One possible explanation is that there has been wage flexibility instead (Layard and Richter, 1995). At the end of 1995, average real wages had fallen, according to Goskomstat (1996b), to around 34% of the level observed before transition began (January 1992). Another price adjustment mechanism open to enterprises is the delay of wage payments to workers. In March 1996, wage arrears for the entire economy averaged one month's wage bill (Goskomstat, 1996b). There is little doubt that the problem has worsened since them. Goskomstat figures put the

[11] The fractions of persons on zero hours and on unpaid leave are reported for March 1996 and are not shown in Table 1. We get this low incidence of unpaid leave in our RLFS sample because the two relatively dynamic labor markets of Moscow City and Moscow Oblast dominate the sample.

[12] According to Goskomstat (1996a), employment fell between the beginning of 1992 and the end of 1995 by about 7%, while GDP fell by around 40%. Production in medium and large enterprises shrank by 60% over the same period (Russian European Centre for Economic Policy, 1995).

TABLE 2

Percentage Distribution of Wage Arrears by Region

Wages paid		Moscow	Moscow Oblast	Krasnoyarsk	Chuvash Republic	Chelyabinsk
In full, on time	1996	76.8	71.8	34.7	42.5	33.7
	1997	87.3	n/a	34.3	35.8	40.0
In full, not on time	1996	2.5	2.6	3.5	1.7	2.8
	1997	0.9	n/a	4.6	3.4	4.0
Incomplete, on time	1996	15.3	19.4	39.6	41.7	39.9
	1997	8.4	n/a	22.4	26.7	23.4
Incomplete, not on time	1996	5.4	6.2	22.1	14.2	23.5
	1997	3.4	n/a	38.7	34.0	32.6

Source. RLFS.

aggregate stock of arrears at the beginning of 1997 at around 50 trillion rubles, some 138% of the monthly wage bill (Russian European Center for Economic Policy, 1997).

The number of workers affected by arrears is huge. According to the RLMS, the wages of six out of ten workers were in arrears across the whole country in 1996, up from 40% in 1994. Moreover, according to RLFS data in Table 2, there is a substantial variation in the incidence of arrears across regions. In Moscow City, more than three-quarters of all employees received a complete wage on time, while in Chelyabinsk, Krasnoyarsk, and the Chuvash Republic only around one-third did so.[13] Outside Moscow, the typical form of arrears appears to have changed over time as the arrears problem worsened. In 1996, the modal form of arrears was to pay an incomplete salary, but on time. By late 1997, according to the RLFS, the modal arrears payment was incomplete and late. Moreover, of those with wages in arrears, the 1997 RLFS indicates that just under half those living outside Moscow were also paid some of their arrears in-kind, with products made by their firms.[14] On the basis of these figures it is hard to maintain the hypothesis that wage arrears are not a major problem in many parts of the Russian Federation.

One explanation for the divergent performance of regions could simply be that, as a result of political lobbying, workers in the budgetary sector receive complete

[13] For the eight regions identified in the RLMS, the incidence of arrears in 1996 was 31.7% for Metropolitan, 69.1% for North West, 49.3% for Central, 66.3% for Volga, 65.6% for Caucasus, 65.7% for Urals, 65.7% for Western Siberia, and 67.9% for East.

[14] The percentage figures are 1.3 for Moscow, 44.7 for Krasnoyarsk, 35.9 for Chelyabinsk, and 59.7 for Chuvashy. Of those not in arrears, only 3% were paid in-kind, although this rises to 10% outside Moscow.

TABLE 3

Wage Arrears by Region, Ownership, and Sector

	Year	Moscow	Moscow Oblast	Krasnoyarsk	Chuvash	Chelyabinsk
Privatized	1996	25.7	31.2	67.9	48.9	75.7
	1997	14.0	n/a	78.2	72.7	67.8
De novo private	1996	10.4	23.2	41.8	36.4	59.9
	1997	4.0	n/a	38.9	64.3	33.3
Budgetary sector	1996	20.7	20.8	63.6	50.7	58.1
	1997	12.6	n/a	68.0	51.8	51.0
State firms in production	1996	37.7	37.3	76.4	68.8	74.1
	1997	21.4	n/a	71.0	84.2	85.2

Source. RLFS.

wages without delay in the center but not in the provinces.[15] The data do not support this hypothesis, as the middle panel of Table 3 shows. If anything, workers in the budgetary sector in the provinces have a lower incidence of wage arrears compared to privatized firms. The worst offenders are not government agencies but state firms.[16] In March 1996, the budgetary sector accounted for 35% of employment and 30% of all those with wages in arrears in our sample. In no region is this ranking reversed. This must imply that, in March 1996, differential regional transfers of government funds were not the main reason for regional divergence in wage arrears.[17]

The incidence of arrears is lower in the new private sector. This could be consistent with the idea that wage arrears are a means of attracting tax concessions in the state and privatized sectors. However, in the regions outside Moscow, the incidence of arrears in new private sector firms is much higher. This suggests that the regional environment can influence the behavior of all firms irrespective of ownership. If most firms withhold pay, the lack of a decent outside option for workers makes it easier for other firms to do likewise.

The industrial composition of the regions could also be important. Certain industries were hit harder by the transformation process, and the legacy of planning has left some regions with a disproportionate share of industries in

[15] In March 1996, around 42% of all employees worked in the budgetary sector. Those in state-owned firms in other services, transport, distribution and trade, health and education, and finance are considered to be in the budgetary sector.

[16] The production sector comprises agriculture, manufacturing, construction, and energy.

[17] Note that the possibility that the federal government made greater efforts to pay wages in the budgetary sector before the 1996 election looks unlikely given the greater rise in the incidence of arrears among other firm types between 1996 and 1997.

TABLE 4

Wage Arrears by Industry

	Percentage of workers with wages in arrears		Employment share, 1996
	1994	1996	
Agriculture	68.6	80.6	10.8
Manufacturing	43.4	67.4	22.7
Construction	50.4	69.1	5.9
Energy	36.2	57.4	8.6
Transport	36.5	51.5	8.4
Distribution/trade	23.9	31.3	8.2
Finance	17.5	19.6	1.4
Health/education	35.2	67.7	20.4
Other services	35.4	51.3	13.5

Source. RLMS.

distress. As Table 4 demonstrates, there are indeed certain industrial sectors that are particularly bad offenders. According to the RLMS in 1996, just 40% of employees in the energy sector, 20% of those in agriculture, and 33% of those in manufacturing received a complete wage on time. For workers in distribution/trade and finance, wage arrears do not seem to pose as much of a problem. Only 31% and 20% of workers in these sectors had wages in arrears in 1996.

We next estimate probit regressions of the incidence of wage arrears using RLMS data. We present the results from simple pooling of each cross section across the three waves alongside random effects estimates, which account for unobserved heterogeneity by taking account of the fact that the same worker could appear up to three times in the sample.[18] The regressions include region, industry, firm type, and individual worker controls. The marginal effects in Table 5 represent the impact of each variable on the probability of having wages in arrears, holding other factors constant as percentage point deviations from the

[18] This assumes that this heterogeneity is time invariant but unique to the individual so that the error term comprises

$$v_{it} = a_i + u_{it} \qquad i = 1, 2. . .N;\ t = 1, 2. . .T,$$

where a_i is the random effect, with $a_i \sim N(0, \sigma_a^2)$ independently of u_{it}. Each disturbance term thus has variance $\mathrm{Var}(v_{it}) = \mathrm{Var}(\sigma_a^2 + \sigma_u^2)$, and the correlation between error terms for the same individual is given by

$$\mathrm{Corr}(a_i + u_{it}, a_i + u_{is}) = \rho = \sigma_a^2/(\sigma_a^2 + \sigma_u^2).$$

The parameters of the likelihood function, which constitute this model, are estimated using the iterative techniques in the Stata statistical package. The simple pooled probit model is equivalent to assuming that $\rho = 0$. See Greene (1997) for a discussion of random effects probit estimators.

TABLE 5

Probit and Random Effects Probit Estimates of Wage Arrears

Variable	Sample mean	Probit		Random effects probit estimate
		Estimate	Marginal effects	
Female	0.517	−0.065 (0.028)*	−0.026	−0.085 (0.045)
Children	0.633	0.049 (0.027)	0.019	0.057 (0.043)
Age				
16–19	0.013	−0.299 (0.116)*	−0.116	−0.389 (0.164)*
20–24	0.092	−0.083 (0.048)	−0.033	−0.081 (0.071)
25–34	0.250	−0.003 (0.033)	−0.001	−0.019 (0.051)
35–44				
45–54	0.205	0.002 (0.036)	0.001	−0.010 (0.056)
>55	0.125	−0.114 (0.043)*	−0.045	−0.128 (0.069)
Education				
High school only				
Higher education	0.212	−0.082 (0.047)	−0.032	−0.115 (0.070)
Technical school	0.239	0.061 (0.039)	0.024	0.069 (0.057)
Trade school	0.155	−0.028 (0.041)	−0.011	−0.055 (0.059)
Technical quals.	0.082	−0.011 (0.050)	−0.004	0.001 (0.069)
Any professional course	0.127	0.118 (0.044)*	0.047	0.142 (0.061)*
Occupation				
Operatives, unskilled, manual				
Managers	0.020	−0.338 (0.095)*	−0.131	−0.410 (0.133)*
Professions	0.181	−0.022 (0.049)	−0.009	−0.019 (0.071)
Technicians	0.154	−0.147 (0.044)*	−0.058	−0.183 (0.063)*
Clerical	0.067	−0.288 (0.054)*	−0.112	−0.367 (0.079)*
Personal services	0.072	−0.209 (0.057)*	−0.082	−0.292 (0.082)*
Agricultural worker	0.005	−0.498 (0.178)*	−0.187	−0.707 (0.248)*
Craft	0.181	−0.007 (0.036)	−0.003	−0.004 (0.052)
Employer size				
0–9	0.073	−0.257 (0.061)*	−0.101	−0.395 (0.087)*
10–49	0.201	−0.241 (0.046)*	−0.095	−0.371 (0.068)*
50–99	0.099	−0.190 (0.053)*	−0.075	−0.265 (0.076)*
100–499	0.206	−0.107 (0.044)*	−0.042	−0.128 (0.064)*
500–999	0.056	−0.122 (0.059)*	−0.048	−0.156 (0.084)
>1000				
Length of employment				
0–5 months	0.101	−0.376 (0.057)*	−0.146	−0.513 (0.081)*
6–11 months	0.064	−0.310 (0.061)*	−0.121	−0.410 (0.087)*
12–23 months	0.107	−0.242 (0.054)*	−0.095	−0.339 (0.077)*
3–5 years	0.198	−0.169 (0.047)*	−0.067	−0.213 (0.069)*
6–10 years	0.147	−0.066 (0.049)	−0.026	−0.099 (0.072)
11–20 years	0.181	−0.023 (0.045)	−0.009	0.006 (0.067)

TABLE 5—*Continued*

Variable	Sample mean	Probit		
		Estimate	Marginal effects	Random effects probit estimate
>20 years				
Ownership				
State				
Private	0.252	−0.079 (0.032)*	−0.032	−0.092 (0.042)*
Foreign stake	0.036	−0.046 (0.066)	−0.018	−0.035 (0.088)
Share in firm	0.213	−0.101 (0.050)*	−0.043	−0.104 (0.069)
Share <5%	0.145	0.111 (0.056)*	0.044	0.135 (0.076)
Region				
Urals				
North, North–West	0.078	0.192 (0.053)*	0.076	0.247 (0.084)*
Central and central black-earth	0.178	−0.208 (0.041)*	−0.082	−0.286 (0.066)*
Volga	0.170	0.117 (0.041)*	0.046	0.148 (0.067)*
North Caucasus	0.119	−0.132 (0.046)*	−0.052	−0.190 (0.075)*
Moscow/St. Petersburg	0.100	−0.410 (0.051)*	−0.158	−0.602 (0.081)*
Western Siberia	0.100	0.072 (0.047)	0.029	0.077 (0.077)
East Siberia and Far East	0.102	0.227 (0.048)*	0.090	0.294 (0.076)*
Location				
Urban				
Rural	0.220	0.489 (0.036)*	0.193	0.694 (0.057)*
Industry				
Agriculture				
Manufacturing	0.209	0.326 (0.055)*	0.129	0.427 (0.079)*
Construction	0.062	0.172 (0.054)*	0.069	0.214 (0.078)*
Energy	0.069	−0.189 (0.051)*	−0.074	−0.242 (0.076)*
Transport	0.079	−0.279 (0.049)*	−0.109	−0.335 (0.073)*
Retail	0.077	−0.434 (0.059)*	−0.167	−0.491 (0.084)*
Finance	0.013	−0.807 (0.138)*	−0.282	−0.943 (0.185)*
Health	0.172	−0.057 (0.043)	−0.023	−0.079 (0.064)
Other services	0.126	−0.187 (0.044)*	−0.074	−0.219 (0.065)*
Constant		0.707 (0.073)*		0.951 (0.111)*
	chi2(55) = 1682.95		chi2(55) = 1194.5	
	Log L = −7746.7		Log L = −7416.9	
	Pseudo R^2 = 0.115		ρ = 0.475 (0.018)*	

Source. RLMS.

Note. Regressions also include two wave dummies and missing dummies for non-response in education, job tenure, occupation, and industry. Default categories are in italics. Standard errors in brackets. Number of observations, 12,657. Mean of dependent variable, 0.472.

* Significant at the 5% level.

sample mean.[19] The size and statistical significance of the coefficient estimates show that industry, region, and enterprise characteristics rather than individual characteristics are the main determinants of wage arrears. Workers in the largest enterprises have the highest probability of experiencing wage arrears. Private ownership reduces the incidence of wage arrears by around three percentage points, other things equal. The ranking of industries in the incidence of workers with wages in arrears observed in Table 4 is maintained with the addition of other controls. Workers in manufacturing are some 13 percentage points more likely to experience wage arrears than workers in agriculture, who are in turn some 28 percentage points more likely to experience wage arrears than workers in the finance sector. All occupational groups have a lower incidence of wage arrears compared to the default group of unskilled manual workers. The gap is larger and significant for managers and clerical workers.

The regressions include share ownership and job tenure dummies as potential measures of insider power and the likelihood of the work force accepting arrears. The share ownership dummies indicate whether the individual worker has a stake in a firm and whether that stake is under 5%. The coefficients are equal and opposite in sign, so that for two-thirds of workers with a stake in their firms, i.e., for those with a share less than 5%, there is no protection from experiencing wage arrears. Ownership reduces the chance of arrears, but a small share in the firm raises the likelihood of arrears, other things equal. The impact of job tenure is large and highly significant. Workers with longer tenures have higher probabilities of experiencing wage arrears. These results negate the idea that ownership facilitates arrears over and above the effect of long tenure. An interaction of ownership with job tenure was insignificant and is not reported.

Of the demographic factors, women are around 2.5 percentage points less likely to experience wage arrears. The youngest workers are some 12 points less likely to be in arrears than the default 35–44-year-old category, although the differences between other age groups are smaller and less significant. Education seems to have little impact, with the exception of professional training, which seems to increase the chances of being in arrears by some 4.5 percentage points.

With the demographic and skill composition of the workforce, ownership, and industrial structure controlled for, the regression still points to the importance of regional location for the incidence of wage arrears. The marginal effects indicate a regional spread of 25 percentage points between Moscow or St. Petersburg and the East. There is, in addition, a significant positive rural effect on arrears of around 19 points. This may suggest that enterprises and workers living distant from the main administrative centers find it harder to plead their case.

The estimated effects do not change much between the simple pooling and the

[19] The marginal effect of x_i on the probability of observing wages in arrears, P, is given by $dP/dx_i = \beta_i \phi(XB)$, where $\phi(\cdot)$ is the standard normal density function, X is the vector of characteristics, including x_i, and B the vector of probit coefficients.

random effects model. The firm/industry-level effects continue to dominate, which tends to negate the idea that discrimination across individuals in the same plant is widespread. Nevertheless, the probability of experiencing arrears does vary widely across the population. Taking the coefficients together, we estimate that an unskilled, male worker aged 35 to 44 living in the Volga region and working in a manufacturing enterprise of over 1000 workers for more than 10 years has an arrears probability of 95%. In contrast, a 25-year old woman graduate working in a finance company that employs less than 10 workers in the metropolitan area has a 5% chance of suffering wage arrears.

Separate probit regressions by industry and by region, based on RLFS data, confirm the previous results.[20] Within each industry, demographic characteristics play a lesser role in the determination of wage arrears than do characteristics related to the establishment. Regional location is the strongest contributing factor of arrears in all industries. The regressions by region, on the other hand, confirm that industry affiliation and firm characteristics dominate the determination of wage arrears in each region. Workers in an industry that on average has a low incidence of wage arrears experience lower risk in wage arrears in all regions. Workers in the metropolitan center will experience wage arrears if they work in a poorly performing industry.

4. PERSISTENCE OF WAGE ARREARS AND WORKER MOBILITY

One as yet unresolved issue is how long wage arrears persist and whether the same individuals are affected over time. If wage arrears were shared equally across the population, there would be less cause for concern than if arrears were concentrated on the same individuals. To address this issue, we simply count the number of times individuals are observed with wages in arrears across the three waves of the RLMS, restricting our sample to those continuously employed.[21] While we cannot observe the start of the arrears process, we can observe inflows and outflows, together with the cumulation of arrears. Table 6 shows that, over the three-year observation period, a combination of rising inflow rate and falling outflow rate contributed to a rising stock of arrears in the population. The average real level of arrears grew by around 40%, and the amount owed rises monotonically according to the number of years the individual is observed in arrears.

[20] The results are available from the authors upon request or may be found in Lehmann et al. (1998).

[21] The RLMS indicates that, according to a probit estimate, those with wages in arrears were some 5 percentage points more likely to have separated from employment one year later than those with wages not in arrears. Those who drop out of the sample are some 7 points less likely to have wages in arrears, other things equal. Around 30% cannot be matched across successive waves, and around 10% leave employment within a year. These two effects therefore work in opposite directions, but the overall effect on estimates of persistence of confining the sample to those continuously in employment is more likely to cause overestimation of the degree of persistence.

TABLE 6

Persistence of Wage Arrears

	1994	1995	1996
No. times in arrears			
0	60.7	36.4	27.9
1	39.3 [2 and 12 months]	33.5	27.5
2		30.1 [2 and 8 months]	22.4
3			22.1 [4 and 12 months]
Median arrears (000 Rs)			
1	539	378	593
2		559	848
3			1082
Average median	539	485	832
Ratio of arrears relative to previous monthly earnings			
At 10th arrears percentile		0.26	0.57
At 50th arrears percentile		0.98	2.00
At 90th arrears percentile		2.98	6.90
Percentage of workers entering or leaving arrears over the year			
Arrears outflow		31	17
Arrears inflow		28	44

Source. RLMS.

Note. Median arrears duration and 95th percentile of duration distribution are in brackets in the first panel.

Note that these are, usually, multiple incidences of arrears and not just one continuous period of non-payment. To check this we examine the length of time since last paid for each worker with wages in arrears in each wave. The figures in brackets give median duration and 95th percentile of duration distribution of arrears. The figures indicate that 95% of those with wages in arrears said they had been last paid less than 12 months before. The median delay is two months in 1994, rising to four months in 1996. This is consistent with the increased share of delayed payments observed in Table 2.

Arrears are also distributed unequally. By 1996, one quarter of the sample working population had been in arrears in each of the three waves, while another quarter had yet to experience any arrears. The median level of arrears does not rise proportionately between new entrants and those in arrears previously, as the second panel in Table 6 shows. This suggests that those in arrears have some of their debt paid off during the year. The median size of arrears relative to previous

wages also grows from around one month's salary to two month's salary from 1995 to 1996 (panel 3, Table 6).

In order to identify the characteristics of those persistently in arrears, Table 7 presents the results of ordered probit estimates of the probability that an individual, in wave 3, would have been observed in arrears 0, 1, 2, or 3 times. This approach avoids the problem of introducing lagged dependent variables into a regression, which could otherwise deliver inconsistent estimates. The sample is confined to those in employment in all three waves. The ordered probit results mirror the simple binary probit estimates. Unskilled, male workers between 35 and 44 years of age living in the regions furthest from the metropolitan areas and working in large scale enterprises for 10 years or more are most at risk from multiple wage arrears. In addition, in order to distinguish between the extensive and intensive nature of arrears, we present Tobit estimates of the amount of arrears for all workers in employment in 1996. Those not in arrears are censored at zero. We estimate the determinants of the total stock of arrears for each worker, indexed for inflation. The Tobit estimates follow the same basic pattern regarding the incidence and persistence of arrears. The level of arrears is reduced significantly by the presence of foreign ownership in the establishment. Few of the personal characteristics retain any statistical significance. Firm size, job tenure, and region dominate.

Finally, there is the question, "why, if firms don't pay wages on time, do workers not simply move elsewhere?" This may be due to the condition that search unemployment is not a valid outside option in all but the most dynamic labor markets. Unemployment benefits are not available to job quits, and when they are paid,[22] they are not large relative to average wages. Moreover, alternative employment is perhaps available only in the most dynamic regions, typically Moscow and St. Petersburg, and the claim on arrears may be loosened once a worker leaves an establishment. Quits will be encouraged by a dynamic outside labor market (push effects) but discouraged by the need or ability to recoup arrears, magnified when inflation is low (pull effects).

To capture these effects, we measure mobility conditional on arrears over the course of a year using the RLMS panel. We identify three possible labor market transitions, a move from an existing firm to employment with a new establishment, a move from employment to unemployment, and a move from employment to inactivity.[23] Of those moving out of employment, around one-third say that they are actively seeking new work and one-quarter say that they are retired. The rest are scattered among other home production activities. We then run a

[22] Clarke (1998) notes that unemployment benefit arrears are now a feature in many regions.

[23] The RLMS cannot distinguish between job quits and layoffs. We believe that job-to-job moves will be dominated by quits, as in most Western countries. Also recall the low layoff shares cited in Section 3.

TABLE 7

Ordered Probit and Tobit Estimates of Incidence of Wage Arrears

Variable	Ordered probit estimate	Tobit estimate
Female	−0.093 (0.053)	−452.8 (93.4)*
Children	0.052 (0.052)	169.5 (92.5)
Age		
16–19	−0.899 (0.692)	−531.2 (703.4)
20–24	−0.165 (0.114)	−268.2 (156.3)
25–34	0.022 (0.061)	3.7 (105.6)
35–44		
45–54	0.002 (0.066)	24.9 (118.3)
>55	−0.127 (0.081)	95.7 (143.8)
Education		
High school only		
Higher education	−0.083 (0.088)	−274.9 (153.3)
Technical	0.023 (0.072)	−27.8 (125.0)
Trade school	0.030 (0.079)	−80.0 (136.0)
PTU	−0.162 (0.094)	−194.3 (167.2)
Any professional course	0.154 (0.083)	87.9 (144.5)
Occupation		
Operatives, unskilled manual		
Managers	−0.351 (0.266)	807.4 (501.4)
Professions	−0.004 (0.090)	296.4 (155.5)
Technicians	−0.054 (0.081)	113.5 (138.6)
Clerical	−0.249 (0.098)*	−349.5 (178.9)
Personal serv.	−0.014 (0.118)	25.9 (193.4)
Agricutural worker	−0.643 (0.296)*	−323.3 (591.1)
Craft	0.077 (0.069)	195.1 (119.4)
Employer Size		
0–9	−0.336 (0.121)*	−1148.5 (201.7)*
10–49	−0.303 (0.087)*	−960.6 (149.4)*
50–99	−0.259 (0.097)*	−635.1 (168.0)*
100–499	−0.129 (0.081)	−306.3 (140.2)*
500–999	−0.152 (0.110)	−596.2 (201.5)*
>1000		
Length of employment		
0–5 months	−0.170 (0.128)	−1011.9 (195.6)*
6–11 months	−0.058 (0.145)	−660.9 (203.8)*
12–23 months	−0.103 (0.104)	−548.2 (174.8)*
3–5 years	−0.196 (0.083)*	−440.3 (149.3)*
6–10 years	−0.078 (0.086)	−173.8 (157.4)
11–20 years	−0.059 (0.081)	−145.4 (148.2)
>20 years		
Ownership		
State		
Private	−0.053 (0.057)	163.2 (94.3)
Foreign stake	−0.073 (0.129)	−521.8 (222.2)*

TABLE 7—*Continued*

Variable	Ordered probit estimate	Tobit estimate
Region		
Urals		
North, North–West	0.251 (0.097)*	978.4 (166.5)*
Central and central black-earth	−0.217 (0.075)*	−721.1 (134.5)*
Volga	0.178 (0.074)*	−263.9 (135.7)*
North Caucasus	−0.112 (0.089)	−236.2 (150.5)
Moscow/St. Petersburg	−0.349 (0.100)*	−1165.3 (175.7)*
Western Siberia	0.199 (0.092)*	69.7 (155.6)
East Siberia and Far East	0.286 (0.096)*	596.2 (155.7)*
Location		
Urban		
Rural	0.676 (0.068)*	428.6 (115.5)*
Industry		
Agriculture		
Manufacturing	0.329 (0.103)*	138.3 (181.1)
Construction	0.120 (0.107)	757.1 (185.2)*
Energy	−0.198 (0.092)*	673.6 (159.7)*
Transport	−0.216 (0.097)*	−294.0 (172.2)
Retail	−0.710 (0.122)*	−843.6 (214.1)*
Finance	−1.136 (0.236)*	−891.2 (453.6)
Health	−0.022 (0.088)	194.5 (133.3)
Other services	−0.294 (0.089)*	−174.9 (148.2)
Constant		1144.6 (227.5)*
Mu (1)	−1.073 (0.129)*	
Mu (2)	−0.295 (0.128)*	
Mu (3)	0.432 (0.128)*	
		Sigma: 2055.39 (34.98)*
	$N = 2493$	$N = 3499$
	Chi2(51) = 555.9	chi2(51) = 604.5
	Log $L = -3176.1$	Log $L = -18546.1$
	Pseudo $R^2 = 0.081$	Pseudo $R^2 = 0.016$

Source. RLMS.

Note. Regressions also include two wave dummies and missing dummies for non-response in education, job tenure, occupation, and industry. Default categories are in italics. Robust standard errors are in brackets.

* Significant at the 5% level.

multinomial logit regression on the determinants of these discrete events in Table 8, including a variable to capture whether the worker had wages in arrears one year earlier. The base category is the sample of workers who remain with the same firm over the year. The reported coefficients are marginal effects relative to the sample mean transition probability. The arrears variable is significant and positive for job-to-job moves and also for moves from employment to unem-

TABLE 8

Multinomial Logit Estimates of Effects of Wage Arrears on Mobility

Variable	Job-to-job marginal effects	Job to unemp. marginal effects	Job to inactivity marginal effects
Arrears	0.012 (0.006)*	0.008 (0.004)*	0.011 (0.005)*
Arrears*Moscow/St. Peter.	0.047 (0.018)*	0.012 (0.015)	0.018 (0.010)
Ownership			
State			
Private	0.001 (0.007)	0.015 (0.004)*	0.008 (0.006)
Foreign	0.025 (0.013)*	−0.019 (0.013)	−0.007 (0.015)
Region			
Urals			
North, North–West	−0.020 (0.012)	−0.005 (0.008)	0.004 (0.011)
Central and central black-earth	−0.015 (0.009)	−0.002 (0.006)	0.003 (0.008)
Volga	−0.024 (0.009)*	−0.014 (0.007)*	0.012 (0.008)
North Caucasus	−0.023 (0.011)*	0.006 (0.006)	0.019 (0.009)*
Moscow/St. Petersburg	−0.014 (0.013)	−0.010 (0.010)	0.006 (0.011)
Western Siberia	−0.031 (0.012)*	−0.007 (0.008)	0.010 (0.010)
East Siberia and Far East	−0.004 (0.011)	−0.009 (0.008)	0.008 (0.009)
Location			
Urban			
Rural	−0.030 (0.009)*	−0.001 (0.005)	0.018 (0.006)*
Constant	−0.169 (0.020)*	−0.099 (0.014)*	−0.126 (0.016)*
Log *L*	−3647.4		
Pseudo R^2	0.108		
Chi^2 (153)	947.4		

Source. RLMS.

Note. Regression includes controls for age, education, gender, marital status, job tenure, establishment size, industry, and occupation. Default categories are in italics. Sample mean transition rates: job-to-job, 0.075; work-to-unemployment, 0.042; work-to-inactivity, 0.062. Sample size, 6,246.

* Statistically significant at the 5% level.

ployment or inactivity. The magnitude of these effects is, however, small. Those in arrears are around one percentage point more likely to move job-to-job compared with the mean transition probability of 7.5%. The push influence is not quite offset by the inducement to stay and retain employment and/or wages in arrears.

We then interact the arrears dummy with the dummy for the metropolitan areas of Moscow and St. Petersburg. This interaction term is highly significant in the job-to-job move equation, but not for the moves out of employment. In the metropolitan areas, those in arrears are an additional 4.7 points, or around 75%, more likely than other workers to be found in a new job one year later. Thus the exit option to a new job is valid only in a relatively prosperous labor market.

Quits may induce firms to pay wages, but this strategy can only work if there are viable outside opportunities. Indeed the RLMS data set indicates that job-to-job movers who were initially in arrears are some 10 percentage points less likely to be in arrears in the new firm compared with other job-to-job movers. A relatively healthy labor market facilitates job-to-job moves by those in arrears.

5. IMPLICATIONS AND CONCLUSIONS

In the context of the relatively small falls in employment since the beginning of reform, the evidence on job security in Russia is quite compelling. On the quantity side, Russian workers face relatively secure job prospects. The overwhelming majority of employees have permanent contracts and work full-time. It is also clear that temporary layoffs and unpaid leave affect only a small percentage of the work force. In addition, short-term work seems not to be the way by which Russian firms maintain employment levels. Despite major demand shocks that have put many Russian enterprises in great financial difficulty, firms seem to try to hold on to their employees.

Instead, adjustment to negative demand shocks seems to occur through price rather than quantity changes. Real wages fell steeply from the beginning of the reforms until 1996. The new adjustment factor is now undoubtedly the systematic withholding of wage payments from workers, and this is now the dominant form of insecurity for many Russian workers. Moreover, wage arrears are a major problem for certain industrial branches of the economy and provincial regions. In agriculture, manufacturing, construction, and health and education less than one-third of all employees received their wages in full in 1996. In the capital of the Russian Federation, late or incomplete wage payments affected just 13% of employees in November 1997. In contrast, in many provincial regions like Chelyabinsk, the Chuvash Republic, and Krasnoyarsk, nearly two-thirds of all workers had to be content with such payments.

The data sets at our disposal do not allow us to distinguish the various hypotheses offered as to why firms withhold wages. However, we have provided evidence that allows us to offer some observations. A cynical interpretation of the large regional divergence in wage arrears observed here could be that, historically, rebellion and revolution in Russia have been successful only if carried in the central, urban agglomerations. Therefore, confining the problem of wage arrears to the provinces might allow transition to proceed more smoothly. Our evidence seems to point in this direction, as regional location is a key determinant of wage arrears, independent of industry and ownership. However, a closer look at the evidence establishes that the central government is not responsible directly for the high levels and large regional variation of wage arrears. Instead, our evidence implies that the presence or absence of a worker's outside options in a local labor market might best explain this variation. A dynamic local labor

market can mitigate the arrears problem by providing a valid outside option with which workers can exercise the quit threat. The reform stance of regional governments, in turn, might be a crucial ingredient in the process of generating such a dynamic environment. The Moscow regional government, for its part, has helped generate such an environment, through its reform programs and access to the central government, that allow firms to survive and even prosper.[24]

The large regional variation in the incidence of wage arrears and the fact that many workers in new private firms in the provinces are affected by arrears seem to provide evidence counter to the argument that firms use wage arrears as an instrument to extract tax concessions from the government. Firm characteristics dominate individual characteristics throughout our study. As a result, there is polarization in the incidence of arrears across the working population. Some people seem never to suffer from wage arrears while others do so continuously. This may be due to the uneven incidence of wage arrears across sectors rather than to some kind of extreme efficiency wage strategy pursued by firms. Observable individual characteristics do not drive the arrears problem, and controls for unobserved heterogeneity, perhaps capturing discrimination or patronage, do not alter these findings.

There is an argument that workers may tolerate wage arrears in their primary employment because most of them hold multiple jobs, with income sources in secondary and tertiary employment being much more important than the income source from primary employment. Our evidence does not support this. Employees who face wage arrears exercise their quit option in the metropolitan center only. They do not exercise this option in the provincial regions not because they do not care about primary employment but because they have no outside jobs to move to. Nor does it appear that workers may be taking advantage of fringe benefits that would not be available if they left the firm. Evidence from the four regions in the 1997 RLFS indicates that only health insurance and holiday pay appear to be cited by workers as additional benefits provided by their firms.[25] However, payments in-kind are given to around a quarter of the work force with wage arrears outside Moscow.

[24] Shleifer (1997) provides evidence on how entrepreneurs differ in their perception of the reform stance of their respective regional government. Entrepreneurs in Moscow see their regional government as reform-friendly and supportive of private business activities, while provincial entrepreneurs complain about an administrative environment that is hostile to private business.

[25] Foley (1997b) shows that arrears increase the probability of taking a second job. The author also establishes that, according to the RLMS, multiple job holding grew in the years 1992 to 1996, but only for from 5.6 to 10.1% of prime-age workers. A much larger fraction of the work force is affected by wage arrears. Foley shows, in addition, that the likelihood of taking a second job is significantly higher for men, urban residents, and workers with higher education, i.e., for those persons who are best positioned in the labor market.

Evidence provided by the International Labor Organization (ILO) indicates that wage arrears are also a problem in Ukraine and other countries of the former Soviet Union. Yet they appear to be less of an issue in the transition economies of Eastern and Central Europe. For example, Lehmann (1998) shows that, in Hungary, even firms in deep financial trouble consider payment of wages as the first call on funds. Perhaps, a weak legal environment in Russia and the other CIS countries makes it more difficult to enforce contracts and this explains the difference. Our evidence lends support to the notion that wage arrears are an important problem, affecting nearly two-thirds of the working population and averaging around twice the average monthly wage. This is the most apparent manifestation of insecurity currently observed in the Russian labor market.

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