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THE REALLOCATION OF WORKERS AND JOBS IN RUSSIAN INDUSTRY: NEW EVIDENCE ON MEASURES AND DETERMINANTS

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ABSTRACT

Gross job and worker flows in Russian industry are studied using panel data from a recent survey of 530 firms selected through national probability sampling. The data permit an examination of several important measurement issues—including the timing and definition of employment, the roles of split-ups and mergers, and the relative magnitudes of rehiring and new hiring and of quits and layoffs—and they contain a rich set of firm characteristics that may affect job and worker turnover. The results imply that job destruction and worker separation rates in industrial firms rose in the early 1990s, as did job flows as a fraction of worker flows and layoffs as a fraction of separations. By contrast, job creation and worker hiring rates were flat until 1999, the former low and the latter surprisingly high. Heterogeneity in individual firm behavior increased throughout. New firms and old enterprises that have been reorganized display much larger flows compared with unreorganized enterprises. Unions appear to reduce worker flows, but the structure of neither product nor labor markets shows a significant impact. Private ownership has ambiguous effects: insider ownership, particularly by managers, is associated with higher worker flows and excess job reallocation, while outsider ownership, particularly by blockholders, is associated with lower flow rates. A measure of adjustment costs constructed from the worktime necessary to hire and train a new employee is strongly related to variables usually associated with adjustment costs, including worker wage, education, firm size, capital intensity, and labor productivity, but only weakly to job and worker turnover. Little evidence is found that firms' employment adjustments have become more sensitive to adjustment costs during the transition, but worker and manager ownership are associated with more sensitivity than are other types of ownership.

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1. INTRODUCTION

Dynamic labor markets—the continual shifting of jobs and workers across firms and sectors of the economy—are characteristic of well-functioning market economies, and they are vital in the postsocialist transition. Recent research on the United States and other developed countries has emphasized the large rates of job and worker flows, suggesting continual reallocation in labor markets (see e.g., Davis and Haltiwanger 1992, 1999; Anderson and Meyer 1994; Burgess, Lane, and Stevens 2000, 2001). The importance of such flows in the transition economies is heightened by the Soviet inheritance of misallocation and poorly functioning institutions, suggesting both that massive labor reallocation is required and that the process faces substantial barriers.

How effectively has the Russian labor market facilitated this labor reallocation process? Some scholars would answer that it has worked like a "neoclassical economist's dream" (Layard and Richter 1994). In addition to the much faster fall in real wages compared with employment, one of the pieces of evidence adduced for this view is the high worker flows reported in official State Statistical Committee (Goskomstat) data, which has been interpreted as suggesting that rapid labor reallocation is underway. Undermining this interpretation is the fact that worker flows were already high in the 1980s, which was presumably not a period of rapid reallocation. There are some indications, moreover, that the worker flows are not associated with high job or intersectoral flows, which are more commonly identified with restructuring (Clarke 1999; Gimpelson and Lippoldt 1997, 2001; Kapeliushnikov 1997a,b; 2001). On the other hand, studies using micro data on firms suggest that job flows have risen substantially since the 1980s (Brown and Earle 2002), and that adjustment speeds and wage elasticities of labor demand are not abnormally low (Aukutsionek, Filatochev, and Kapeliushnikov 2000; Shakhnovich and Yudashkina 2001; Konings and Lehmann 2002). Moreover, studies of individual data find that worker mobility

has increased, as job tenure has fallen (Lehmann and Wadsworth 2000), occupation-switching has increased (Sabirianova 2002), and the rates of job mobility, hirings, and separations have all jumped—in ways that appear to reflect patterns of large-scale structural change (Earle and Sabirianova 2002b).

This paper contributes to this still small but growing literature on Russian labor market flexibility by analyzing new survey data with annual information on both job and worker flows for the period 1990–1999. The basic database was constructed from a survey of 530 industrial firms, selected through national probability sampling in 32 Russian *oblasts*, with a probability proportional to employment size. The data permit us to estimate annual rates of both job flows and worker flows for a consistent set of firms, to relate these flows to detailed information on firm characteristics, and to address a number of measurement issues that have arisen in discussions of job and worker flows, but which have remained unresolved. For instance, we are able to compare the magnitude of job flows measured by the change in employment from beginning to the end of the year (the standard in U.S. studies, such as Davis and Haltiwanger 1992, 1999), with the magnitude obtained when the change in the annual average level of employment is used instead (as in studies of administrative data in Russia, such as by Acquisti and Lehmann 2000 or Brown and Earle 2002), and we can compare the job flow rates implied by the survey data with those from the administrative reporting, both calculated by the same methodology. The data also allow us to measure employment changes associated with changes in firm boundaries (such as split-ups, spin-offs, mergers, and acquisitions) and to measure some types of flows that are less commonly studied: rehiring of former employees, and the division of total separations between quits and layoffs.

When the analysis focuses on job flows, a disadvantage of our survey data is a smaller number of observations than in administrative reports. Not only is the sample size smaller, but questions of representativeness also arise: although the firms in our database constitute a

probability sample, there are issues of both stratification and nonresponse. These potential problems do not seem, however, to have created substantial deviations in our sample from the officially reported composition of Russian industry by industry, region, and size. Moreover, the aggregate job flows and worker flows implied by our data correspond rather closely with the published tabulations of Goskomstat and previous researchers, as we discuss below.

In addition to permitting measurement of detailed worker flows and capturing a rich set of firm-level determinants of both job and worker flows, our survey data have other advantages over registry and tax data. The latter, it should be remembered, are themselves frequently neither universal nor representative due to systematic exclusion of some categories, inconsistent inclusion of others, and missing values in some or all economic variables for those included. One important omission from the registries analyzed in an earlier job flow study by Brown and Earle (2002), for instance, concerns small firms and new private startups. Our survey data, on the other hand, include such firms on a representative basis. Survey data also do not suffer from the problems with longitudinal linkages that usually beset registry and tax data.[1] Even when the identification codes in such data are not changing arbitrarily (and they usually are in such data), the meaning of job and worker flow data can be contaminated by spin-offs and other changes in firm boundaries. Our survey data contain information on these events and we can adjust our measures of labor flows to take them into account.

In this paper, our first use of these data is to compute a number of alternative measures of the magnitudes of job and worker flows, considering all of these measurement issues. For each type of job and worker flow, we document the evolution in the magnitude and the heterogeneity of these reallocation measures. In broad terms and where comparable, our survey data results largely corroborate the findings of other researchers using other

[1] See Davis, Haltiwanger, and Schuh (1996) and Davis and Haltiwanger (1998) for discussions of these measurement issues.

administrative and survey data sets (see especially Gimpelson and Lippoldt 2001; Kapeliushnikov 2001; Brown and Earle 2002).

The paper then investigates a number of possible determinants of labor flows, again exploiting the survey data's inclusion of some measures that are usually unavailable. In the Western literature on job flows, attention has focused on firm age, product market competition, and a set of firm characteristics usually motivated by their presumed association with adjustment costs: size, average wage, labor productivity, and capital and energy intensity. Each of these factors takes on added meaning and requires special attention to measurement issues in the transition context.

With respect to firm age, the question of how job and worker flows evolve over the firm's life cycle acquires particular importance due to the critical role played by new private firms in economic transition.[2] Our survey questionnaire contained detailed questions on the origins and evolution of firms, information that we exploit in distinguishing genuinely new private entities from spin-offs and other reorganized parts of the inherited set of state assets. We analyze the employment behavior of these groups of firms compared with that of the former socialist enterprises.

Firm characteristics that reflect governance and decision-making of managers are especially interesting in the transition context, due to the inheritance of central planning, soft budget constraints, and resource misallocation. Product market competition, for instance, could not play much of a role before liberalization policies opened up price-setting, market entry, advertising and other instruments of competition. To approach this issue empirically, we draw on previous work, measuring product market concentration from the Goskomstat

[2] For research on the United States, see Dunne, Roberts, and Samuelson (1989a,b) and Davis and Haltiwanger (1992, 1999). In the transition context, Kornai (1990), Murrell (1992), and others have argued that the development of the new private sector is critical to growth.

industrial registry, which contains the universe of large and medium-sized industrial firms in Russia, and adjusting this measure for the geographic dispersion of production (Brown and Earle 2001). We also consider another type of market pressure, namely from the local labor market. In addition to the possibility that operating in a concentrated labor market may provide firms with rents that cushion their adjustments, analogously to the product market, labor flows may also be influenced by the extent to which workers have outside options. For this purpose, we construct measures of local labor market competition, again drawing on the industrial registry data. A related factor, one that is particularly important to consider in the transition context, is corporate governance, with the main policy levers being privatization and institutional development. In Russia, the privatization program resulted in high levels of worker and manager ownership, as well as some outsider and continued state ownership. Our data contain detailed information on the privatization process and ownership outcomes that permit us to construct precise measures of the ownership structure and its evolution. An additional factor seldom available in other studies is the extent of union membership, which we exploit together with the other governance and competition factors in our empirical analysis.

Finally, the role of adjustment costs also acquires special interest, first, due to the likelihood that these were comparatively uninfluential on behavior during the Soviet period, as planners and managers strove to achieve output goals and job flows were much lower (as shown by Brown and Earle 2002), and second, because of the large magnitude of restructuring required. For this purpose, we employ our own measure of one-time hiring and training costs, derived from direct questions on our firm survey. Our measure is strongly correlated with a number of variables—including size, average wage, labor productivity, capital intensity, and workers' education—that are often considered to be associated with adjustment costs and sometimes used as proxies for them.

We investigate the relationship of these factors with several measures of job and worker flows: job reallocation, excess job reallocation, worker turnover, and excess worker churning (one minus the fraction of all worker turnover accounted for by job reallocation). In reporting the results, regression methods are useful to provide compact presentations of results, to control for other firm characteristics, and to display the evolution of the relationships over time. We also investigate the hypothesis that the degree to which adjustment costs affect the labor flows may be a function of firm age, ownership, market competition, and unionization, thus including interaction terms for these variables in our regressions.

The paper is structured as follows. Section 2 describes our data and measurement procedures, including the empirical strategy for distinguishing true time effects from spurious differences associated with sample changes in the survey data, and for computing the effects of covariates on excess job reallocation. Section 3 contains the basic results for the magnitudes and heterogeneity of job and worker flows over the 1990–1999 period. Section 4 reports the relationship between the flows and firm and environmental characteristics including age, ownership, unionization, product and labor market concentration, and adjustment costs. Section 5 focuses on the effects of firm ownership, unionization, and market competition on the responsiveness of firms to adjustment costs. Section 6 concludes with a summary of the results.

2. DATA AND MEASUREMENT PROCEDURES

The survey data that we study in this paper permit us to measure both job flows and worker flows, to study some aspects of the flows that have not previously been addressed, and to examine the relationship of the flows with detailed covariates that may be potential determinants of labor market behavior. The quality of the data is dependent on the design of

the questionnaire and sample, and on the implementation of the fieldwork and data entry and cleaning; thus, a short discussion of these topics is in order (more detail can be found in Biletsky et al. 2002). The survey questionnaire focused on quantitative questions rather than managerial opinions, and financial and employment variables were specified in the standard terminology of Russian accounting, making use of the precise line numbers of Goskomstat forms wherever possible; the questionnaire was developed over several years and underwent several stages of pilot-testing.[3] Selection of firms for interviews was based on a national probability sample, as described further below. The survey fieldwork was not contracted out to a single organization, but instead made use of a regional network of interviewers, who were trained and monitored by the participating researchers themselves. The data collection relied on several face-to-face interviews with company officials (the general director, personnel director, and accountant, in each case specified on particular sections of the questionnaire), as well as follow-up interviews in person or over the telephone to clarify ambiguities and inconsistencies. The information on the questionnaires was double-entered, and assiduously checked and cleaned. Finally, the survey data were linked to other data sources (Goskomstat Industrial Registries and Balance Sheets) to supplement and further check the provided information.[4]

In analyzing these data to quantify annual rates of job creation, destruction, reallocation, and excess reallocation, we follow the methodology developed by Davis and Haltiwanger (1992, 1999); in particular, identifying job creation with employment increases and job destruction with employment declines at a business unit. Unlike most

[3] The designs of the Goskomstat forms were occasionally changed during this period, thus for each variable the survey questionnaire specified the appropriate line number on the form for each year in which the information was requested.

[4] The survey data do not capture exit and there is little entry in this sector, so our analysis is restricted to continuing firms. In related work, Kapeliushnikov (1997a, p. 35) suggests that this omission likely leads to a proportionately greater understatement of job creation than of job destruction. The behavior of continuing new private firms (started-up after 1986) is studied below, however.

research on job flows, our survey data are able to distinguish employment changes due to changes in firm boundaries (such as split-ups, spin-offs, mergers, and acquisitions) and other employment changes associated with a constant entity. A detailed history of such boundary changes was included on the questionnaire, and we use this information to adjust most of the flows that we analyze. The survey data also contain measures of employment at the end of each year (the point-in-time measure, as in Davis and Haltiwanger 1992, 1999) as well as an annual average (the measure available in most administrative data sets, used for instance by Acquisti and Lehmann 2000; and Brown and Earle 2002), and we examine whether these alternative measures have different implications for the observed job flow behavior.

The concepts of hiring and separations in this paper are also standard, similar, for example, to those used by Anderson and Meyer (1994), Hamermesh, Hassink, and van Ours (1996), and Burgess, Lane, and Stevens (2000, 2001), and they have been applied in Russia by Kapeliushnikov (1997a, 2001).[5] In addition, our data permit us to distinguish rehiring of former employees from new hires and voluntary quits from layoffs. Data on rehiring are not collected by the Goskomstat, nor have they been systematically collected in other nationwide surveys of Russian worker flows.[6] The U.S. turnover statistics (see e.g., Bureau of Labor Statistics 1979) include a category of "recalls," which differ from our definition by involving the employer taking the initiative to recall the former employee and by requiring a separation of at least seven consecutive days; our definition places neither of these constraints. Concerning types of separations, the definition of voluntary quits in our questionnaire follows the Goskomstat's, including all of the following categories of separations: appointment to a

[5] The definition of the business unit in these papers is the firm, while Davis and Haltiwanger's (1992, 1999) unit is the establishment. Our data, like practically all administrative and survey data in Eastern Europe and the former Soviet Union of which we are aware, pertain to legal entities. Some anecdotal evidence suggests that multi-establishment firms are less common in the transition economies than in the United States, so that the effect of this difference in type of data may not be large, but it is nevertheless a caveat in making comparisons across studies.

[6] Kabalina (1998) presents case studies of 16 enterprises in four Russian regions, and Yakubovich (2002) analyzes data on 90 organizations in the city of Samara.

competitively filled position, move to another region, transfer of spouse to another region or abroad, illness or disability, acceptance to an educational institution, voluntary retirement, and voluntary quit of pregnant women or women with children under age 14. The survey definition of firm-initiated layoffs again follows the Goskomstat, referring to layoffs in connection with a reduction in the number of employees. This definition is more closely linked to the practice in household surveys in defining the reason for unemployment than to the distinction between employer-initiated separations that are "without prejudice" to the individual employee, and those that are not. The latter category of disciplinary discharges is probably the largest component in separations classified as neither quits nor layoffs.

While our measurement concepts follow the broader literature and standard practices, the fact that our data are based on a sample survey rather than a universe, or near-universe, presents some challenges when estimating job and worker flow rates, however.[7] First is the difficulty in obtaining a representative random sample. Second, because of missing values and differences in firm age, the sample changes over time, which could influence the measured trends. Third, a question arises concerning the statistical precision of our survey-based estimates.

As explained in Biletsky et al. (2002), our interview sample was obtained through national probability sampling, based on all industrial employers of the employee respondents to a nationwide household survey, the Russian Longitudinal Monitoring Survey. The sampling for the latter survey involved very careful regional stratification across 32 Russian *oblasts*, with the probability of selection proportional to population (except for Moscow and St. Petersburg, which were taken as self-representing), and with a random selection of

[7] Studies of worker flows seldom use universal data. Anderson and Meyer (1994) study eight states with data in which small firms are underrepresented; Burgess, Lane, and Stevens (2000, 2001) study data on firms with five or more employees in the state of Maryland; and Hamermesh, Hassink, and van Ours (1996) analyze sample survey data in the Netherlands; on the other hand, all of these studies include firms in the service sector. The panels in these data sets are usually quite short.

addresses for interviewing within the geographical sampling units. Thus, conditional on the same regional stratification procedure, the firms in our survey sample constitute a national probability sample of industrial employers, with selection probability proportional to employment size. Unlike most surveys of firms, our procedure did not permit the replacement of nonresponding firms with other observations, and interviewers therefore worked hard to include every firm on their sample lists. As a result of this procedure, the response rate was approximately two-thirds, or 530 firms, which is quite large for a firm survey. The regional and sectoral shares match those in the official statistics reasonably well, as shown in Biletsky et al. (2002). Response rates did not differ between firms included in the Goskomstat Industrial Registry and smaller firms that were not included, so there appears to be no problem with size-related bias either.

We address the issues of changing sample over time and statistical precision of the estimation by using regression analysis to calculate the flow rates. The dependent variables in these regressions are as follows. Job creation is the net employment change for growing firms and zero otherwise. Job destruction is the absolute value of the net employment change for contracting firms and zero otherwise. Job reallocation is the absolute value of net employment change. Excess job reallocation is twice the lesser (in absolute value) of job creation or job destruction. All of these job flows are converted into rates by dividing by average employment over the year (usually computed as the mean of beginning and end of year employment levels).[8] The accession (separation) rate is the sum of accessions (separations) divided by the average of beginning- and end-year employment. The worker flow rate is the sum of the accession and separation rates. The excess worker churning

[8] This method of scaling is consistent with Davis and Haltiwanger (1992, 1999). When we investigate the alternative measure of job flows based on average-year employment at the beginning of Section 3, we scale the flows by the average of employment across the two years.

(hereafter, churning) rate is the firm's worker flow rate minus the absolute value of its net employment change.

To control for sample changes over time, firm fixed effects are included in the regressions, as are year dummies. The rate for a particular year is simply the coefficient on the year dummy, while the standard error indicates the precision of the estimate. The regressions are unweighted because of the nature of our probability sampling (proportional to employment size). To control for changes in firm boundaries associated with expansions (mergers and acquisitions) or contractions (split-ups and spin-offs), we include a dummy for each of these types of changes. The detailed accounting for such reorganizations in our survey data is a significant advantage over administrative and most other sources, where information on these changes is usually unavailable.

Following Davis and Haltiwanger (1999), and in order to present the results more compactly, examine the robustness of the relationships when controlling for other factors, and assess the statistical significance of our findings, we report regressions where the absolute value of employment growth (job reallocation) is the dependent variable and firm characteristics are included as independent variables. We also estimate such regressions with worker flows and churning as dependent variables. A special procedure is necessary to handle the nonlinearity in excess job reallocation, in which case we calculate coefficients from simulations of the impact of a change in each independent variable on the predicted excess reallocation rate, where all other variables are permitted to take their true values.[9] For ownership, unionization, and age (new versus old), we present calculations for the change in the independent variable of interest from 0 to 1, while for product and labor market

[9] This procedure differs from that followed by Davis and Haltiwanger (1999), who condition their estimation on the median values of all other variables.

concentration and adjustment cost, we present results for a one standard deviation change around the mean.[10]

Taking the example of firm age, predicted excess reallocation for new firms (*NF*) is estimated using Equation (1), where $\hat{e}_{iNF}$ is predicted excess reallocation for new firms, $\hat{r}_{iNF}$ is predicted reallocation, a is a constant, b_{NF} is the coefficient for new firms, g is a vector of coefficients on the other independent variables, X_i is a matrix of firm i's true values for the other independent variables, and $\hat{g}_{iNF}$ is predicted employment growth:

$$\hat{e}_{iNF} = \hat{r}_{iNF}(a + b_{NF} + gX_i) - abs(\hat{g}_{iNF}(a + b_{NF} + gX_i)). \quad (1)$$

Then, using analogous notation (with old firms labelled *OF*), we estimate predicted excess reallocation for old firms as follows:

$$\hat{e}_{iOF} = \hat{r}_{iOF}(a + gX_i) - abs(\hat{g}_{iOF}(a + gX_i)). \quad (2)$$

The only difference in Equation (2) compared with Equation (1) is that b_{NF}, the coefficient on the new firm dummy, drops out of the old firm equation. The excess reallocation coefficient associated with *NF* may then be calculated as the difference of the mean predicted excess reallocation between across all n firms:

$$\frac{\partial e}{\partial NF} = \frac{\sum_{i=1}^{N}(\hat{e}_{iNF} - \hat{e}_{iOF})}{n}, \quad (3)$$

which represents the marginal effect of being a new firm on excess job reallocation.

3. JOB AND WORKER FLOW RATES

The analysis starts by considering three basic measurement issues in analyzing job flows. The first concerns the temporal measure of employment. Studies of job flows in the

[10] We adopted these particular specifications merely for convenience in interpreting the results: the ownership and unionization variables frequently take on a value of 0 or 1, and the age variables are dummies, while product and labor market concentration and adjustment cost are continuous variables and they are never 0.

U.S. economy have typically used data on "point-in-time" measures of employment, with annual employment growth computed from the difference between employment at the end of one year and employment at the end of the previous year (for instance, Davis and Haltiwanger 1992, 1999). Administrative reporting in Russia and many other transition economies, however, typically includes only the annual average level of employment (for instance, in the data used by Acquisti and Lehmann 2000; and Brown and Earle 2002). Does this make a difference for the magnitudes of measured job flows? Our survey data include employment measured at the end of the year as well as the annual average, so we may compare the results.

The second issue concerns the magnitudes of employment changes associated with reorganizations of firm boundaries, such as spin-offs and acquisitions. Most studies of firm-level employment behavior assume that the observations under study remain roughly constant during the observation period, and legal changes involving the ownership of assets are usually assumed away. The construction of the longitudinal research database (LRD) in the United States paid close attention to such issues, but limitations of data have prevented most other researchers from doing so.[11] How large are the employment changes associated with such reorganizations, and how much of total employment changes do they account for?

Finally, we examine the relationship between estimates from our survey and those from the administrative source, the registry. The registry data, which were used in Brown and Earle's (2002) study of job flows, exclude most firms with fewer than 100 employees, thus they are not universal. But the contribution of small firms to aggregate job flows is likely to be small, in which case the registry might provide a good approximation for the aggregate flows, perhaps one that is slightly understated if small firms are more volatile. Thus, the magnitude of flows in the registry provides a useful check on our survey data.

[11] Again, the administrative data sets analyzed by Acquisti and Lehmann (2000) and Brown and Earle (2002) do not permit the employment implications of boundary changes to be studied. Davis, Haltiwanger, and Schuh (1996) contains a detailed description of such measurement issues in the LRD.

Starting with the last issue first, a comparison of the survey and registry data can only be carried out with respect to job flows computed on the basis of average annual employment (since this is the only concept in the registry), and our computations of these flows using the regression methodology described in Section 2, above, are reported in the first four columns of Table 1. In fact, with only a few exceptions, the estimates of registry and survey-based job creation and job destruction rates tend to be quite close. The averages across all years, in the bottom row of the table, show only slightly higher rates in the survey data compared with the registry. Given that the survey includes smaller firms not included in the registry, the tendency for job flow rates to be higher in the survey is consistent with greater volatility of small firms, but the differences introduced by their inclusion are only slight.

Columns 5 and 6 of Table 1 contain the analogous calculations of job creation and destruction rates using the end-of-year employment data in the survey. Interestingly, these figures tend to be slightly lower than either the registry or survey average-year flow rates, with an average of 2.42 for creation and 9.22 for destruction. The differences with the average-year measures in 1998 and 1999 can be explained by the timing of the crisis of late 1998 and the recovery in 1999. The slight magnitude of the differences suggests that the use of average-year data in much of the research on job flows in transition economies may not distort the results so much as to jeopardize comparisons across countries and data sets.[12] For consistency with the standard definitions of job flows and with our analysis of worker flows, however, the rest of the analysis uses end-of-year employment as the basis for the calculations.

The final measurement issue concerns employment changes associated with

[12] Another difference between these series is that the average-year figures (in both the registry and the survey) pertain to "industrial production personnel," excluding employees in the firm's "nonindustrial" divisions, whose primary function is to provide fringe benefits to workers. The end-year figures include both of these categories within all "listed" employees. For both employment definitions, workers on external contracts and multiple job-holders (usually part-time workers) who are listed at another firm are excluded.

reorganizations that increase employment (mergers and acquisitions) and those that decrease it (split-ups and spin-offs). The last five columns of Table 1 contain the job flow estimates adjusted for. The differences between the adjusted job creation and destruction rates and the unadjusted figures are very small, suggesting only a slightly higher creation and slightly lower destruction rate. The fact that all of the measures in Table 1 provide such a consistent picture of job flows may provide some reassurance that for practical purposes, the potential problems associated with the usual firm-level data sets can be neglected. On the other hand, while the aggregates are quite similar, this might be due to larger differences at the firm level that are mutually canceling in the aggregate. Therefore, we present the rest of the job flows analysis in this paper with respect to end-of-year employment where the changes have been adjusted for reorganizations.

Regardless of the measure in Table 1, the magnitudes of job creation and destruction are largely consistent with the findings of most other researchers using other data sets, for instance by Kapeliushnikov (2001) using the Russian Economic Barometer mail survey, and Brown and Earle (2002) using the industrial registries.[13] The job creation rate is very low across all years until 1999, when it increases substantially as industry begins to recover. Destruction increases sharply at the beginning of the transition, remaining high until declining abruptly in 1999 (in the calculations using the end-year measure of employment). Compared to the behavior of U.S. labor markets, the Russian destruction rate is in a similar range, slightly on the high side, but the creation rate is low. Consistent with these patterns, the job reallocation rate increases substantially in the early 1990s, and net change is always negative,

[13] Kapeliushnikov's (2001) estimates of both creation and destruction are slightly smaller than any of those reported in Table 1 in the years 1996–1999. This difference is surprising in light of the fact that his annual estimates are not based on annual employment differences but rather on six-month flows, the doubling of which should lead to an overstatement of the annual flows if employment is at all volatile. Anderson and Meyer (1994), Davis and Haltiwanger (1992, 1999), and others have shown that temporal aggregation of job flows is not straightforward. Note that neither Kapeliushnikov (2001) nor Brown and Earle (2002) adjust for the changing samples over their respective observation periods.

even in 1999, a year when industrial output increases by eight percent (Goskomstat 2000). Excess reallocation mirrors the creation rate, low until jumping in 1999.[14]

Turning to worker flows, we again begin with a comparison of our survey-based estimates of the accession and separation rates with the official Goskomstat statistics derived from the reporting of medium and large enterprises. As shown in the first four columns of Table 2, the survey figures are very close to the official statistics, again suggesting that the survey does a good job in reproducing standard empirical regularities. Kapeliushnikov's (1997a, 2001) estimates, however, tend to be somewhat lower than those either reported by the Goskomstat or calculated from our survey.

The numbers in Table 2 suggest that despite low job reallocation rates, the labor market was quite active even during the Soviet period. Moving into the transition period, the survey confirms the observations of previous researchers (for example, Gimpelson and Lippoldt 1997, 2001 and Kapeliushnikov 1997a, 1997b, 2001) of a high and remarkably steady accession rate. Even in 1994, when net employment dropped by more than 10 percent, the accession rate was 19.24 percent. Separations show more of a change across time, steadily increasing through 1994, then leveling off; they fall little during the 1999 recovery.

Table 2 also shows total worker flows, churning (worker flows less the absolute value of employment change), and the percentage of worker flows accounted for by churning. Total worker flows show an increasing trend over the period—they are nine percentage points higher in 1999 than in 1990. The churning rate is quite high and shows little trend over time. The last column shows that job flows account for a substantially larger share of worker flows during the transition than previously. While only about 40 percent of separations represent job destruction and only about 11 percent of accessions represent job creation, the overall

[14] While the job reallocation rates in Table 1 are lower than those for Poland in 1990–1991 reported by Konings, Lehmann, and Schaffer (1996), the excess reallocation rates are significantly higher than the Polish rates in all the Russian estimates in Table 1, as well as in Kapeliushnikov (2001).

ratio of job flows to all worker flows in Russian industry in the middle and late 1990s is about 30–35 percent, which is within the general range suggested by Davis and Haltiwanger (1999) with respect to the U.S. manufacturing sector. Even larger ratios might be expected in association with the massive restructuring in a transition economy, and indeed Konings, Lehmann, and Schaffer (1996) found somewhat higher ratios for Poland in 1990 and 1991. Nevertheless, the rise in the absolute level and the relative importance of job flows do suggest increased dynamism of Russian labor markets compared to their behavior under socialism.[15] The ratio declines in 1999, however, a year in which much less job destruction and more job-switching occurs.

One of the explanations sometimes offered for the high Russian accession and churning rates is the possibility that workers leave temporarily and then are later rehired, similar to the practice of temporary layoffs in the United States. Anderson and Meyer (1994), for instance, show that temporary separations account for about 20–30 percent of all separations in the eight U.S. states in their study.[16] In Russia, however, there has been rather little evidence on the extent of this practice. Kabalina (1998) reports the rates at 15 enterprises, with a median of 10 percent of hiring accounted for by rehiring, and Yakubovich (2002) reports that 16.6 percent of new hires were rehires in his study of 90 organizations. To further investigate the possibility, our survey asked each firm's personnel office to estimate the number of workers hired each year who had been previous employees of the firm. Table 3 shows that rehiring rates are negligible in our sample, with the mean never reaching more than about 2 percent of employment or 10.5 percent of accessions, so the data provide little

[15] The results are somewhat at variance with Kapeliushnikov (2001), who reports job and worker flows starting only in 1993. His churning series shows a big drop in 1994 (as does ours, but after an even bigger drop in 1992), and then a large rise in 1995 to 0.75, a level similar to Anderson and Meyer (1994, p. 224) for the United States.
[16] This study also shows that temporary separations (unlike permanent separations) tend to be counter-cyclical, thus these figures, which were estimated for the time period 1979–1982, may be high for cyclical reasons.

support for the hypothesis that the accession rates in Russia are somehow inflated by substantial temporary separations and rehiring.[17]

The data also permit us to investigate whether the massive downsizing occurred primarily through firm-initiated layoffs or attrition. Consistent with previous studies (e.g., Commander, McHale, and Yemtsov 1995; Gimpelson and Lippoldt 2001; Kapeliushnikov 2001), Table 3 confirms that voluntary quits are a substantial and quite stable proportion of separations, ranging from 60–68 percent during our sample period.[18] Very rare prior to the transition, firm-initiated layoffs increase significantly, but they never reach more than 14.7 percent of separations. Thus, downsizing has been accomplished mainly via attrition. A possible reason for this may be that encouraging workers to quit, which avoids severance payments, has been relatively easy for Russian firms. High inflation has facilitated the reduction of real wages. Managers have also taken advantage of the absence of labor contract enforcement by paying wages in-kind and delaying payment for substantial periods (Lehmann, Wadsworth, and Acquisti 1999; Earle and Sabirianova 2002b).

Next we analyze the heterogeneity in these flows. The large fall in aggregate employment could have been accomplished through relatively equal contractions by each firm, or instead some firms could have declined a lot while others expanded. As Davis and Haltiwanger (1992, 1999) have documented extensively, in the U.S. economy, a substantial fraction of firms contract in expansion periods, and many expand in recessions. Table 4 provides a first look at heterogeneity by displaying the employment growth distribution for our sample. Heterogeneity was quite low during the Soviet period, but it jumped already in 1992, the first year of the market reforms, and became increasingly heterogeneous through

[17] Unpaid administrative leaves are not included in this analysis, nor are such leaves included in the Goskomstat data on worker flows, as in these cases no separation in the employment relationship occurs. Aside from this legal difference, however, unpaid leaves have some similarities to the practice of temporary layoffs in the United States when workers have some expectation of recall by the former employer.

[18] The definitions of the types of separations are given in Section 2.

1997. Remarkably, more than 20 percent of firms were expanding, even in years when aggregate employment declined by 10 percent.

Another measure of the heterogeneity of flows is the standard deviations of the residuals from the regressions used to calculate the flows. Presented in Table 5 for each year separately, these residuals show that the variation in job creation is much smaller than in job destruction. Heterogeneity in job creation increases substantially in the later years, especially 1999, while job destruction heterogeneity remains fairly constant. Net employment change variation follows the same pattern as job creation. Unlike job creation and destruction, accessions and separations are nearly equally heterogeneous. There is little trend in any of the worker flow components until 1999, when accession and churning heterogeneity nearly double. The worker flow standard deviations are a much smaller relative to the flow rates than is the case for job flows, suggesting greater heterogeneity of job flows. The gap narrowed in 1999, however, as worker flow heterogeneity grew by 73 percent.

4. LABOR FLOWS AND FIRM CHARACTERISTICS

The considerable heterogeneity in job and worker flows across firms motivates questions on how the differences are related to various firm and environmental characteristics. Table 6 provides summary statistics for a set of variables of interest. We first analyze our categories of firm age and their relationship to job and worker flows, because these categories are time-invariant; next we turn to the time-varying factors.

While the analysis of firm life cycles and the disproportionate share of labor flows accounted for by start-up firms and recent entrants has been a focus of attention in studies of the U.S. economy, the role of firm age takes on special importance in transition. In particular, new firms are frequently suggested to be more dynamic than other firms and more likely to be profit-maximizers (e.g., Kornai 1990; Murrell 1992). How to define "new" is not entirely

clear, however, given the ambiguities associated with spin-offs and other reorganizations of existing assets. Some previous surveys have simply asked managers directly, but our experience suggests that managers perceive this question as ambiguous and subjective. Our survey questionnaire delved more deeply into this issue, eliciting detailed histories of firm origins and reorganizations. We use this information to classify firms into three groups: old firms (those in continuous existence since before 1986), reorganized firms (those with a predecessor that existed prior to 1986 having undergone a major reorganization since then), and new firms (those with no predecessor existing in 1986).[19]

Because the categorization of firms is time-invariant, firm fixed effects are omitted from the regression results presented in Table 7. These show that job creation, net employment change, and excess job reallocation are much higher and destruction much lower in new firms than the other two types, and each of these differences is highly statistically significant. Job reallocation is higher in new firms as well, but that difference is significant only at the 10 percent level. Though new firms are hiring at a much more rapid rate, they are just as active as the other two categories regarding separations. Total worker flows and churning are higher in new firms, but the differences are not highly statistically significant.

Job flows in reorganized firms are somewhat higher than in old firms, but the differences are not statistically significant. All of the worker flows are much higher in reorganized firms, however, and these differences are highly significant. In sum, these results suggest that firm origin matters, and not only new versus old firms, the focus of previous studies, but also the distinction between those categories and reorganized firms.

[19] We define a major reorganization as a merger, a split-up, or a case where the firm has been spun off from a parent company; in all these situations, the change affects both the assets of the firm and its legal registration. Not included are acquisitions and cases where the firm has sold or spun off some assets, nor are simple changes of legal form, name, ownership, or other reasons for reregistration. Concerning predecessors, managers were asked a series of questions about the existence of the current firm, or any parts or predecessors of it, in 1986.

New firms have accounted for a large proportion of job creation in several Eastern European transition economies.[20] Table 8 provides evidence on this issue for Russia. Old firms make up nearly two-thirds of industrial employment at the time of the survey (1999–2000), while new firms account for only 6.3 percent, suggesting that the new sector has not grown nearly as fast as in Eastern European economies. New firms have created (destroyed) a much higher (lower) percentage of jobs relative to their proportion of employment, however.[21]

The worker flow differences are less stark. New firms' share of accessions is higher, while their separations share is about the same as their share of employment. Reorganized firms' shares of both job and worker flows (except job creation) are slightly higher than their share of employment, while old firms' shares are all lower except for destruction.

Turning to time-varying factors, a variable of considerable interest in transition economies is firm ownership. Interest in ownership issues stems from the importance of privatization policy design as a set of policy levers for influencing restructuring, including the reallocation of jobs and workers. Our survey instrument permits us to construct a detailed ownership structure time series for each firm, including information on the types and concentration of ownership. Throughout, we examine the voting shareholding of particular types of owners, for which we consider some alternative categorizations. A first is simply state versus private ownership. It is frequently hypothesized that the state may act to preserve employment. It may prefer low worker turnover as well if dislocated workers are a stronger political force than workers who gained employment. By contrast, private owners should be more interested in profitability, which could be consistent with either high or low flows

[20] See e.g., Jurajda and Terrell (2000) for the Czech Republic, and Haltiwanger and Vodopivec (2002) for Estonia.

[21] Note once again, however, that our sample does not account for exit. If new firms exit at a higher rate than old firms, it is ambiguous whether the total amount of job destruction is higher or lower in new than in old firms.

depending on the individual firm's circumstances. So one might expect higher flows on average in private firms.

Concerning different types of private owners, particular attention must be paid to employees, as the insiders were big beneficiaries of the privatization process. Workers and managers may behave differently as owners, however. Workers are presumably interested in keeping their jobs, and ownership may give workers additional influence to block employment reductions. Workers may also be more reluctant to leave a job in a firm where they have influence in exchange for a job in one where they do not. Over time, however, the proportion of workers who are owners is likely to decline as worker-owners are replaced with workers without shares. Once only a small fraction of workers own shares, it becomes in the worker-owners' interest to reduce employment when consistent with profit maximization, as the newer workers without ownership are likely to bear the costs of the reduction, while the longer-tenured worker-owners benefit. And the workers without shares will not feel any extra attachment to the firm, so a higher proportion of the workforce will have a higher propensity to quit over time. If this is the case, then one would expect flows to be initially at least as low as for state firms, but over time average flows should be higher than for state firms.

Managers are usually assumed to have a preference for larger firms, as size raises their status. The effect of increasing managerial ownership is ambiguous—more control rights could help managers to achieve their status objective, but higher cash flow rights could instead align the manager's incentives with profit maximization, which may be inconsistent with the size goal. Presumably, managers also prefer to keep their jobs, and in pursuit of that goal some managers tried to accumulate shares as an antitakeover defense. It is not clear, however, how accumulating shares is related to worker turnover. If the manager can buy more of the outgoing worker shares than outsiders, then the manager may prefer high turnover, but otherwise not.

Outside owners should be interested in maximizing profit.[22] Depending on the circumstances in the firm, profit maximization could be associated with either high or low flows. Workers may feel less certain about the future direction of the firm when it is outsider-owned, so they may be more apt to search for other employment opportunities. Outsiders may also have a desire to replace workers with people of their own choosing. So compared to the state and possibly to insiders, one would expect higher flows on average.

It may matter whether the outside owners are dispersed individuals or concentrated legal entities or foreign investors. The concentrated groups are more likely to be able to exert control. If the outsiders do not exert control, then insiders will be free to pursue their employment preservation objective, which will not be tempered by their own ownership. In such a scenario, flows may be lower than under insider ownership. But if the outsider owners are concentrated, profit-maximizing objectives should dominate. Foreign owners could have an additional effect, either by scaring off xenophobic workers (increasing turnover), or by retaining more of them because workers anticipate that foreign-owned firms will have better prospects.

Another governance-type variable that may affect labor flows is the trade union density (the proportion of the firm's employees who are members). Unions have been relatively little studied in this context, but it seems likely that union objectives could include the level of employment, for instance to enhance the power and prestige of union leaders; this effect should work to reduce job reallocation.[23] They may also be interested in preserving their members' jobs as well, in which case both job reallocation and worker turnover should be lower in firms with high proportions of union membership. Another possibility is that unions' objectives are most closely aligned with their senior members, which has been taken

[22] Legal entities may wish to siphon off profits ("tunneling," in the *mot de jour*) from the firm of study to their own firm, but even then the legal entity should wish to minimize personnel costs.
[23] Pencavel (1991) contains a detailed discussion of the objectives of unions.

to imply that unionized firms' adjustments to negative shocks may tend to favor layoffs over wage and hours cuts (Medoff 1979). A final possibility is that Russian trade unions are either insufficiently independent or too weak to have an impact on any of the conditions of employment (Gimpelson and Lippoldt 2001). In this case, we would expect to find no relationship between unionization and labor flows.

A further set of variables that may affect job and worker turnover involves the market environment. Market competition is frequently argued to push firms toward profit maximization. We measure both product and labor market competition in our data (as described in Section 2). With more competition of either sort, workers will have more outside opportunities (in the sector or in the region), putting upward pressure on worker turnover.

A final variable that we study is adjustment costs, defined as the sum of costs associated with hiring and initial training (we are unable to measure expected firing costs).[24] The basic idea here is that if market reforms are working, then firms should take adjustment costs into account in their personnel policies. On the other hand, adjustment costs are likely to be positively associated with worker skills, which, if general, would imply more outside opportunities and higher mobility. But profit-maximizing firms should also take this into account in setting wages.

A priori, one might have doubts about rough estimates of adjustment costs by personnel managers. Thus, before using these estimates we investigate how correlated they are with other variables related to adjustment costs. In Table 9, we regress the adjustment cost estimates on the proportion of the workforce in five different worker education

[24] Our survey instrument requested information from the personnel office on the length of time spent on hiring and training a new production worker of the type most commonly hired by the firm; this variable is intended as a direct measure of the "quasi-fixed" costs of labor first introduced by Oi (1962), although he used the wage rates for various occupational groups as proxies. Unfortunately, we do not have data on termination, layoff, or recall categories of hiring costs; on the tools and materials, unfilled requisitions, and intrawork transfers categories of training costs; nor on unemployment compensation. See the data appendix for a detailed description of the adjustment cost variable.

categories, industrial sectors, and four variables used in other job flows studies as proxies for adjustment costs, namely average employment, capital intensity, average wage, and labor productivity. The coefficients on these standard proxy variables are all positive, though only the average employment and capital intensity coefficients are statistically significant. In three of the four regressions, the coefficients on the education categories increase monotonically with the level, as would be expected. The adjustment cost measure also varies significantly by sector in ways that are consistent with the complexity and specificity of technology. The results thus provide some support for analyzing the relationships of labor flows with the survey adjustment cost measure.

The regressions underlying the results reported in Tables 10–12 include time effects and firm fixed effects in additional to all variables of interest, with the ownership variables in three different levels of aggregation. The results in Table 10 show higher job reallocation, worker flows, and churning in firms with a higher private share, but these results are statistically insignificant; the calculated effect on excess job reallocation is negative but very small in magnitude.

Unionization (union density, or percentage of employees who are members) is negatively associated with each of the flows, however, and the worker flow and churning rate coefficients are large and statistically significant. The smaller coefficient on job reallocation suggests that unions put more emphasis on trying to preserve as many of their members' jobs as possible than on trying to maintain a particular employment level.[25] These results are

[25] Unionization could be endogenous, for instance if employees are more likely to become union members when employment conditions are less stable. This would impart an upward bias to the unionization coefficients in the employment adjustment equations, but the coefficients in the worker turnover regressions are negative and statistically significant, so our qualitative conclusions would be unaffected. Note also that our inclusion of firm fixed effects implies that this argument applies only to deviations from a firm's sample mean.

somewhat surprising in light of the conventional wisdom, which holds that Russian unions are largely ineffectual (e.g., Gimpelson and Lippoldt 2001), although they do support Clarke's(1997) contention that unions have actively supported employment adjustments.

Concerning the market structure factors, product market concentration is positively related to job reallocation, and it is slightly positively related to excess job reallocation.[26] Product and labor market concentration exhibit no relationship with worker flows or churning. Labor market concentration is slightly negatively associated with excess job flows, consistent with the notion that adjustments of employment levels are more sluggish when outside opportunities for workers are poorer.

Disaggregating private ownership, Table 11 shows a stronger tendency toward job reallocation, worker flows, and churning associated with insider relative to outsider shareholding. From Table 12, it is clear that these effects result from the largest tendency toward adjustment associated with managerial ownership, and the smallest tendency with blockholder ownership (both domestic and foreign, but especially the latter).

Table 13 introduces the adjustment cost variable into the equations, dropping firm fixed effects, adding industry effects (10 sectors) and age categories, and otherwise keeping the other variables from the regressions in Table 10. The results provide little evidence that firms with high adjustment costs have engaged in more labor hoarding than other firms. While the coefficients in the worker flow and churning rate regressions are estimated to be negative, they are statistically insignificant, while the coefficient in the job reallocation equation is actually positive and significant.[27]

The trends over time in the responsiveness of the job and worker turnover variables are shown in Table 14. The trend for job reallocation is zero, but for excess job reallocation it

[26] This could be the result of reverse causality. Industries downsizing faster are likely to experience a greater increase in concentration, since concentration tends to be negatively related to market size.

[27] It should be noted that our adjustment cost measure refers to gross costs of adjustment rather than only to net costs. Nonetheless, downsizing and increasing employment levels both entail some gross costs.

is actually in a positive direction. The coefficients for worker flows and churning are becoming more negative over time, consistent with increasing sensitivity to adjustment costs, but they are not statistically significant.

5. FIRM CHARACTERISTICS AND SENSITIVITY TO ADJUSTMENT COSTS

Though the average firm appears to have become only slightly more sensitive to adjustment costs, some types of firms may have become more sensitive than others. To investigate this issue, the final empirical exercise in this paper was to add interactions between adjustment costs and the other variables of interest. This is a more clear-cut test profit-maximizing orientation than the above examination of differences in average flow levels, since the optimal turnover level of each firm depends on adjustment costs.

Table 15 displays the results when using total private share. Private share and union membership are related to higher sensitivity to adjustment costs regarding excess job reallocation, worker flows and churning. The coefficients on the relationships with worker flows and churning are insignificant, however. Product and labor market concentration are related to lower sensitivity to adjustment costs for excess job reallocation, as expected, but they are unrelated to adjustment cost sensitivity regarding worker flows and churning.

Insider owners show much more sensitivity to adjustment costs for worker flows and churning than the state, while outsiders show much less (see Table 16). Both private categories show more sensitivity regarding excess job reallocation.

Among insiders, both workers and managers exhibit significant sensitivity to adjustment costs regarding excess job reallocation, worker flows and churning, as shown in Table 17. Dispersed outsiders show greater sensitivity as well, while domestic and foreign blockholders actually show significantly less sensitivity to adjustment costs, with the

exception that domestic blockholders show greater sensitivity regarding excess job reallocation than the state.

Table 18 shows that reorganized firms show somewhat greater sensitivity to adjustment costs for worker flows and churning, but old firms show greater sensitivity regarding excess job reallocation than either new or reorganized firms.

6. CONCLUSION

This paper documents job and worker flows in Russia throughout the 1990s, using survey data from a probability sample of industrial enterprises. In addition to being generated by a very careful collection process, these data have a number of unusual advantages. First, the data contain a number of alternative ways of calculating job flows, including the use of end-year and annual average employment figures. Second, the data permit both job and worker flows to be measured using a common sample and methodology. Third, the data allow estimation of some relatively understudied types of flows, including those associated with several types of reorganizations of firm boundaries, rehiring versus new hires, and quits and layoffs. Finally, the data include a rich set of covariates that may condition job and worker flows and some of which have been the subject of considerable discussion in research on the economics of transition.

Concerning the alternative ways of calculating job flows, we find that the broad picture is little affected by the several adjustments we are able to make to the survey data. This result provides some support for analyses of other data sets in which such adjustments have not been possible. Our survey data are also quite consistent with official statistics and usually with other researchers' analyses—where these are comparable.

The analysis implies that labor flows in the Russian industrial sector have increased in magnitude, particularly job destruction and separations. Job flows as a proportion of worker

flows increased during most of the period, suggesting that worker turnover was increasingly associated with inter-firm restructuring. Layoffs have risen slightly as a fraction of all separations. Little rehiring has occurred, suggesting that the high churning rate is not due to recalls. The flows associated with reorganization of firm boundaries have been relatively small. The heterogeneity of labor flows rose considerably, however, especially for job creation and each of the components of worker flows, which may be taken as a sign of movement toward a market economy.

Concerning firm characteristics that may account for some of this heterogeneity, we find that new firms account for a much larger share of job creation relative to their share in industry, but they still represent a tiny fraction of industrial employment. Significant differences are found in some, but not all, mean flow rates across firm age categories.

Little evidence is found that firms have become more sensitive to adjustment costs on average, but some categories of firms are significantly more sensitive than others. Managerial and dispersed outsider ownership are associated with significantly more worker turnover and churning, while concentrated domestic and foreign ownership are associated with lower turnover. Worker and managerial ownership are both associated with greater sensitivity to adjustment costs, while individual outsider and foreign ownership are associated with less.

There are few significant results regarding product and labor market competition, but they do appear to enhance sensitivity to adjustment costs vis-à-vis excess job reallocation. Unionization is associated with significantly lower worker flows and churning, however, suggesting that unions were influential on personnel decisions. This finding is inconsistent with the standard view of Russian industrial relations wherein trade unions are dominated by firm managers.

All of these results should be viewed in the context of the existing literature on Russian labor markets and in conjunction with some important caveats. While we find a

significant increase in most measures of job and worker reallocation, most of the increases are due to higher job destruction and worker separations. This result may be unsurprising in light of the fact that our data pertain only to the industrial sector, which primarily comprises old enterprises inherited from the Soviet period and which face grave problems in restructuring, downsizing, and surviving. If we had instead been able to study data from the service sector, we might have observed quite different phenomena. While it has been the premise of this paper that industrial restructuring through labor reallocation is a subject worthy of special attention, an extension of the analysis to growing sectors such as services would be valuable for further research.

DATA APPENDIX

Accession rate is the number of accessions in a given year as a percentage of the average of beginning- and end-year employment.

Adjust is the natural log of the sum of hiring time plus training time for employees of the production worker profession most frequently hired by the firm. Hiring time is the number of person-days spent by the firm's personnel office to arrange advertisements, interview candidates, and process paperwork to hire a replacement (excluding the time waiting for candidates to appear at the personnel office or waiting time to start the job). Training time is the average of the number of days necessary to train an employee who did not previously do similar work and the number of days necessary to train an employee who did previously do similar work. Training time includes formal training (theory and instruction) at the firm and the time spent by the instructors to train the worker on the job. These data are estimates provided by each firm's personnel office.

Average employment is the log of the average number of employees in production divisions in 1998.

Average wage is the log of the ratio of the total wage bill for employees in production divisions to the average number of employees in production divisions in 1998.

Capital intensity is the log of the ratio of average capital stock in millions of rubles to the average number of employees in production divisions in 1998.

Churning rate is the worker flow rate minus the job reallocation rate.

Dispersed outsider share is the proportion of voting shares owned by investors not employed by the firm with less than a five percent stake as of July 1 of a given year (except for 1999, where it is January 1). See private share below for more details.

Domestic blockholder share is the proportion of voting shares owned by domestic investors with at least a five percent stake as of July 1 of a given year (except for 1999, where it is January 1). See private share below for more details.

Employment is the number of registered employees in industrial production divisions of the firm. It is measured at the beginning and end of each year.

Excess job reallocation is the job reallocation rate minus the absolute value of the net employment change.

Foreign blockholder share is the proportion of voting shares owned by foreign investors with at least a five percent stake as of July 1 of a given year (except for 1999, where it is January 1). See private share below for more details.

Job creation rate is the employment gain as a percentage of the average of beginning- and end-year employment in an expanding firm, and zero otherwise. Note that in the first four

columns of Table 1, average-year employment is the basis for the calculations rather than beginning- and end-year employment.

Job destruction rate is the employment loss as a percentage of the average of beginning- and end-year employment in a contracting firm, and zero otherwise. Note that in the first four columns of Table 1, average-year employment is the basis for the calculations rather than beginning- and end-year employment.

Job reallocation rate is the sum of the job creation and job destruction rates.

Labor concentration is a Herfindahl-Hirschman Index of municipal industrial employment concentration, calculated using annual Goskomstat industrial registries. 1992 values are used for 1990 and 1991, since the numbers are unavailable for those years.

Labor productivity is the log of the ratio of the value of output in millions of rubles divided by the average number of employees in production divisions in 1998.

Layoff rate is the number of firm-initiated separations in a given year as a percentage of the average of beginning- and end-year employment. These are separations where the firm does not intend to refill the position, i.e., they are for the purpose of downsizing. They do not include firm-initiated separations for disciplinary reasons.

Manager share is the proportion of voting shares owned by managers of the firm as of July 1 of a given year (except for 1999, where it is January 1). See private share below for more details.

Net employment change is the change in the number of employees divided by average employment (the average of beginning- and end-year employment).

New firm is a firm founded after 1986 without a predecessor existing in 1986.

Old firm is a firm founded in 1986 or earlier.

Private share is the proportion of voting shares owned by private individuals or legal entities as of July 1 of a given year (except for 1999, where it is January 1). The survey measured the ownership structure for all shares at the firm's founding date (for new firms and those that had undergone a major reorganization), July 1, 1994, and January 1, 1999; the nonvoting share ownership structure was measured as of the latter two dates. Date of majority privatization and entry dates for most blockholders (entities with at least five percent of the shares) were also collected. For firms privatized prior to July 1, 1994, ownership is assumed to have remained constant between the privatization date and July 1, 1994. For the years between July 1, 1994 and the entry of a new blockholder (if any), and between that time and January 1, 1999, the ownership structure is calculated through linear interpolations.

Product concentration is product market concentration, calculated as the regional Herfindahl-Hirschman Index multiplied by region share plus the national Herfindahl-Hirschman Index multiplied by one minus region share, where region share is the proportion of regions (oblasts) with at least one enterprise in the five-digit OKONKh industry in that year. This index was calculated for each year using annual Goskomstat industrial registries.

Quit rate is the number of voluntary separations in a given year as a percentage of the average of beginning- and end-year employment.

Rehiring rate is the number of accessions in a given year of persons who were former employees of the firm as a percentage of the average of beginning- and end-year employment.

Reorganized firm is a firm founded after 1986 with a predecessor existing in 1986. The firm underwent a major reorganization requiring it to reregister (i.e., a split-up, spin-off, or a merger).

Separation rate is the number of separations in a given year as a percentage of the average of beginning- and end-year employment.

Union is the proportion of employees who are a member of a trade union at the end of the year. This was measured in 1990, 1994, and 1998. A linear interpolation was performed in the intervening years. The 1999 proportion is assumed to be the same as in 1998.

Worker flow rate is the sum of the accession and separation rates.

Worker share is the proportion of voting shares owned by non-managerial employees of the firm as of July 1 of a given year (except for 1999, where it is January 1). See private share above for more details.

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Table 1 Alternative Measures of Job Flows, 1990–99

	Registry average-year creation rate	Registry average-year destruction rate	Survey average-year creation rate	Survey average-year destruction rate	End-year creation rate	End-year destruction rate	End-year creation rate (reorganization-free)	End-year destruction rate (reorganization-free)	End-year reallocation rate (reorganization-free)	End-year net change (reorganization-free)	End-year excess reallocation (reorganization-free)
1990	2.24	5.35	2.85	7.58	1.97	3.66	2.04	3.63	5.68	-1.59	3.95
	(0.12)	(0.24)	(0.52)	(0.82)	(0.54)	(0.91)	(0.56)	(0.86)	(0.93)	(1.12)	(1.08)
1991	3.85	5.98	3.63	8.19	2.92	3.29	2.96	3.33	6.29	-0.36	5.79
	(0.11)	(0.24)	(0.48)	(0.76)	(0.51)	(0.86)	(0.53)	(0.82)	(0.89)	(1.07)	(1.02)
1992	2.62	7.17	3.36	7.87	2.68	8.20	2.87	8.12	10.99	-5.24	5.02
	(0.08)	(0.16)	(0.43)	(0.67)	(0.49)	(0.81)	(0.50)	(0.77)	(0.83)	(1.00)	(0.97)
1993	2.10	12.45	2.77	11.96	2.97	7.84	2.79	7.85	10.65	-5.06	5.77
	(0.09)	(0.21)	(0.42)	(0.66)	(0.47)	(0.78)	(0.48)	(0.74)	(0.80)	(0.96)	(0.93)
1994	2.93	10.33	3.12	10.09	1.95	11.98	2.20	11.79	14.00	-9.59	3.53
	(0.16)	(0.17)	(0.42)	(0.66)	(0.44)	(0.73)	(0.45)	(0.70)	(0.75)	(0.90)	(0.87)
1995	3.84	9.23	2.70	10.35	2.14	9.39	2.19	9.24	11.44	-7.05	3.94
	(0.24)	(0.20)	(0.42)	(0.65)	(0.42)	(0.70)	(0.43)	(0.66)	(0.72)	(0.86)	(0.83)
1996	1.61	14.41	1.56	13.72	1.84	11.70	1.77	11.32	13.09	-9.54	3.33
	(0.12)	(0.40)	(0.42)	(0.66)	(0.41)	(0.69)	(0.42)	(0.65)	(0.70)	(0.84)	(0.82)
1997	2.19	10.90	2.67	11.02	2.50	11.34	2.83	11.14	13.97	-8.30	4.81
	(0.13)	(0.28)	(0.43)	(0.67)	(0.40)	(0.66)	(0.41)	(0.63)	(0.68)	(0.82)	(0.79)
1998	2.87	9.95	4.57	8.12	1.94	11.65	2.02	10.76	12.79	-8.74	3.82
	(0.17)	(0.39)	(0.46)	(0.71)	(0.39)	(0.65)	(0.40)	(0.62)	(0.67)	(0.80)	(0.78)
1999	3.58	8.03	4.62	10.64	5.13	5.98	5.06	5.94	11.00	-0.88	9.80
	(0.19)	(0.13)	(0.52)	(0.82)	(0.74)	(1.23)	(0.76)	(1.17)	(1.26)	(1.52)	(1.46)
Pooled	2.72	9.57	3.11	10.10	2.42	9.22	2.51	8.98	11.48	-6.80	4.61
	(0.02)	(0.00)	(0.14)	(0.22)	(0.14)	(0.24)	(0.15)	(0.23)	(0.25)	(0.30)	(0.29)

Notes: These are coefficients on the respective year dummies from regressions also containing firm fixed effects. Standard errors are in parentheses. The average year rates are for the rates across year *t* and *t*+1.

Table 2 Worker Flows, 1990–99

	Goskomstat accession rate	Goskomstat separation rate	Survey accession rate	Survey separation rate	Accession rate (reorganiza-tion-free)	Separation rate (reorganiza-tion-free)	Worker flow rate (reorganiza-tion-free)	Churning rate (reorganiza-tion-free)	Churning flows/ worker flows (reorganiza-tion-free)
1990			20.93	22.62	21.03	22.62	43.65	37.97	82.41
			(0.96)	(1.03)	(0.97)	(1.00)	(1.61)	(1.44)	(1.49)
1991			21.34	21.72	21.28	21.64	42.93	36.64	80.25
			(0.91)	(0.97)	(0.92)	(0.95)	(1.54)	(1.38)	(1.43)
1992	22.9	26.9	21.05	26.57	21.10	26.35	47.45	36.46	70.20
			(0.86)	(0.92)	(0.87)	(0.90)	(1.45)	(1.29)	(1.34)
1993	20.1	28.8	21.88	26.75	21.58	26.64	48.22	37.58	72.52
			(0.82)	(0.88)	(0.83)	(0.85)	(1.38)	(1.23)	(1.28)
1994	18.2	32.0	19.25	29.28	19.24	28.84	48.08	34.08	64.46
			(0.77)	(0.82)	(0.78)	(0.81)	(1.31)	(1.16)	(1.21)
1995	21.1	28.4	20.57	27.83	20.75	27.80	48.55	37.11	69.91
			(0.74)	(0.79)	(0.75)	(0.77)	(1.24)	(1.11)	(1.15)
1996	16.9	27.0	17.57	27.43	17.45	26.99	44.44	31.35	64.80
			(0.72)	(0.77)	(0.73)	(0.75)	(1.22)	(1.09)	(1.12)
1997	19.2	26.8	19.82	28.66	20.11	28.41	48.52	34.55	66.95
			(0.70)	(0.75)	(0.71)	(0.73)	(1.18)	(1.05)	(1.09)
1998	19.8	27.7	19.75	29.46	19.80	28.54	48.34	35.56	69.31
			(0.69)	(0.74)	(0.70)	(0.72)	(1.16)	(1.03)	(1.07)
1999	27.4	27.0	25.77	26.61	25.65	26.53	52.17	41.18	75.26
			(1.30)	(1.39)	(1.31)	(1.35)	(2.19)	(1.95)	(2.02)
Pooled			20.35	27.15	20.37	26.84	47.21	35.73	70.46
			(0.25)	(0.27)	(0.25)	(0.26)	(0.42)	(0.38)	(0.40)

Notes: The time period is from the beginning to end of the year. These are coefficients on the respective year dummies from regressions also containing firm fixed effects. Standard errors are in parentheses.

Table 3 Accession and Separation Breakdown

	Accession rate	Rehiring rate	Rehires/ accessions	Separation rate	Quit rate	Quits/ separations	Layoff rate	Layoff/ separations
1990	20.64	1.10	6.04	22.32	13.02	60.64	0.33	3.87
	(0.92)	(0.40)	(0.94)	(0.94)	(0.70)	(1.29)	(0.42)	(1.38)
1991	20.60	1.05	5.95	21.47	12.55	61.11	0.66	5.62
	(0.89)	(0.39)	(0.92)	(0.91)	(0.67)	(1.23)	(0.40)	(1.27)
1992	20.91	1.19	6.82	26.57	16.50	64.40	1.13	6.63
	(0.86)	(0.37)	(0.89)	(0.88)	(0.64)	(1.19)	(0.38)	(1.18)
1993	20.89	1.10	5.81	26.51	17.88	66.77	1.25	6.69
	(0.81)	(0.36)	(0.85)	(0.84)	(0.61)	(1.13)	(0.37)	(1.06)
1994	18.58	1.25	7.01	28.57	19.05	67.12	2.05	9.10
	(0.75)	(0.32)	(0.76)	(0.77)	(0.56)	(1.04)	(0.34)	(0.94)
1995	20.38	1.51	8.64	27.25	18.36	66.40	2.50	10.62
	(0.71)	(0.30)	(0.70)	(0.73)	(0.54)	(0.99)	(0.32)	(0.82)
1996	17.05	1.13	8.50	27.22	17.84	65.00	3.07	13.37
	(0.70)	(0.29)	(0.69)	(0.72)	(0.53)	(0.98)	(0.32)	(0.81)
1997	19.11	1.87	7.96	27.22	17.17	64.39	3.90	14.71
	(0.68)	(0.28)	(0.66)	(0.70)	(0.51)	(0.93)	(0.30)	(0.77)
1998	19.08	1.22	9.10	28.15	18.58	67.18	3.57	12.75
	(0.67)	(0.27)	(0.63)	(0.69)	(0.50)	(0.92)	(0.30)	(0.75)
1999	25.77	1.71	10.47	25.99	19.44	67.52	1.27	11.09
	(1.28)	(0.48)	(1.19)	(1.31)	(0.98)	(1.87)	(0.58)	(1.53)
Pooled	19.81	1.33	7.79	26.51	17.26	65.23	2.27	10.64
	(0.24)	(0.10)	(0.24)	(0.25)	(0.19)	(0.34)	(0.11)	(0.30)

Notes: The time period is from the beginning to end of the year. These are coefficients on the respective year dummies from regressions also containing firm fixed effects. Standard errors are in parentheses. Firms undergoing a reorganization in the particular year are not included.

Table 4 Distribution of Year-by-Year Employment Growth Rates

	5%	10%	25%	50%	75%	90%	95%	Mean	Standard deviation
1990	-12.6	-8.5	-5.0	-1.7	0.7	4.1	7.2	-2.5	10.0
1991	-13.8	-10.7	-6.4	-1.4	2.0	6.2	9.7	-1.4	9.5
1992	-30.8	-25.6	-11.9	-4.4	2.4	8.2	14.5	-5.9	13.9
1993	-29.2	-20.5	-12.7	-4.0	1.3	7.1	11.6	-5.6	15.4
1994	-34.0	-28.8	-18.7	-8.0	0.0	4.7	12.3	-9.6	16.2
1995	-32.5	-23.4	-14.9	-5.0	1.3	6.4	11.0	-7.2	14.8
1996	-37.2	-29.1	-17.9	-6.6	0.0	6.0	10.7	-9.5	15.5
1997	-42.5	-29.6	-14.8	-5.4	0.0	8.1	14.1	-7.8	23.8
1998	-40.8	-29.0	-15.2	-5.2	0.6	7.2	12.8	-8.1	19.4
1999	-21.9	-16.9	-4.1	0.0	10.0	20.0	27.0	1.6	21.2
Average	-32.9	-25.1	-13.1	-4.0	1.1	7.2	12.9	-6.5	17.2

Table 5 Job and Worker Flow Heterogeneity

	Creation rate	Destruc-tion rate	Realloca-tion rate	Net change	Accession rate	Separation rate	Worker flow rate	Churning rate	Churning flows/ worker flows
1990	3.74	9.77	9.58	11.27	9.70	13.52	20.66	18.23	16.73
1991	5.44	7.58	8.49	10.11	9.87	9.59	16.63	15.55	15.73
1992	5.32	9.80	9.97	12.21	9.66	10.57	16.15	15.27	19.17
1993	7.14	8.97	10.57	12.30	10.96	10.79	17.94	16.25	16.31
1994	6.09	9.91	10.17	12.94	10.32	10.97	16.93	16.12	17.53
1995	4.90	9.76	9.84	11.90	10.13	10.55	16.92	15.70	18.42
1996	4.58	11.15	10.81	13.18	8.77	12.02	16.40	14.57	18.96
1997	9.91	11.66	14.09	16.42	14.98	13.03	22.78	17.82	19.34
1998	8.03	13.39	14.43	16.72	12.62	14.31	21.17	19.18	20.19
1999	10.97	11.17	12.83	18.04	22.40	18.12	36.54	32.95	18.86
Pooled	6.93	10.95	11.71	14.10	12.03	12.46	20.03	17.89	19.11

Notes: The time period is from the beginning to end of the year. These are the standard deviations of the residuals from the reorganization-free end-year rate regressions in Table 1.

Table 6 Firm Characteristics

	Mean	Standard deviation	Conditional mean
Private share	0.561	0.454	0.881
Insider share	0.370	0.378	0.613
Worker share	0.262	0.309	0.475
Manager share	0.090	0.174	0.165
Outsider share	0.189	0.281	0.432
Dispersed outsider share	0.056	0.126	0.186
Domestic blockholder share	0.119	0.236	0.378
Foreign blockholder share	0.013	0.077	0.222
Union membership	0.837	0.276	0.877
Product market concentration	0.303	0.184	
Labor market concentration	0.338	0.348	
New firm (dummy)	0.035		
Reorganized firm (dummy)	0.266		
Adjustment cost*	68.10	82.00	

Note: *This variable is not logged here, but it is in the regressions.

Table 7 Old vs. New Job and Worker Flows

	Creation rate	Destruc-tion rate	Realloca-tion rate	Net change	Excess realloca-tion	Accession rate	Separation rate	Worker flow rate	Churning rate	Churning flows/ worker flows
Old	2.01	8.90	10.91	-6.89	4.01	18.45	25.34	43.80	32.89	69.90
	(0.19)	(0.42)	(0.42)	(0.51)	(0.39)	(0.88)	(0.89)	(1.69)	(1.62)	(1.31)
Reorganized	2.70	9.67	12.37	-6.97	5.40	24.02***	30.99***	55.00***	42.63***	74.01*
	(0.40)	(0.82)	(0.88)	(0.94)	(0.80)	(1.73)	(1.69)	(3.29)	(3.18)	(1.85)
New	11.51***	4.26***	15.77*	7.25***	8.53	33.88***	26.63	60.51*	44.73	57.77
	(2.61)	(0.92)	(2.78)	(2.74)	(1.84)	(5.66)	(4.69)	(10.02)	(8.95)	(8.17)

Note: *, **, and *** indicate that the coefficients are statistically significantly different from old firms at the 10%, 5%, and 1% levels, respectively.

Table 8 Percentage of Total of Job and Worker Flows by Firm Age Categories

	Creation	Destruction	Reallocation	Accessions	Separations	Worker flows	Employment share
Old	45.8	64.6	60.0	56.1	60.0	58.3	64.1
Reorganized	28.4	32.4	31.4	33.7	33.8	33.8	29.6
New	25.9	3.1	8.6	10.2	6.2	8.0	6.3

Notes: The flow percentages are based on the coefficients from the regressions in Table 7 and the employment shares in the last column of this table. The employment shares are the percentages of firms in the survey in these age categories.

Table 9 Adjustment Cost Regressions

Average employment	0.137			
	(3.20)			
Capital intensity		0.127		
		(2.57)		
Average wage			0.063	
			(0.80)	
Labor productivity				0.071
				(1.22)
University	1.619	0.727	1.357	1.327
	(2.06)	(0.95)	(1.84)	(1.79)
Special technical	0.783	0.857	0.997	1.109
	(1.01)	(1.21)	(1.47)	(1.65)
Professional technical	0.323	0.662	0.725	0.770
	(0.45)	(1.05)	(1.16)	(1.25)
Secondary	0.263	0.080	0.334	0.365
	(0.37)	(0.12)	(0.52)	(0.58)
Electricity	0.437	0.456	0.592	0.525
	(1.34)	(1.43)	(1.99)	(1.60)
Fuel	0.444	0.678	0.857	0.800
	(1.15)	(1.56)	(1.93)	(1.77)
Ferrous metallurgy	0.328	0.420	0.552	0.536
	(0.68)	(0.99)	(1.31)	(1.29)
Non-ferrous metallurgy	0.865	0.712	0.862	0.883
	(2.75)	(1.65)	(2.57)	(2.65)
Chemical	0.179	0.359	0.509	0.519
	(0.52)	(1.10)	(1.66)	(1.70)
Machine-building	0.408	0.618	0.726	0.738
	(1.44)	(2.27)	(2.81)	(2.86)
Pulp and paper	-0.110	0.126	0.194	0.294
	(-0.35)	(0.44)	(0.67)	(1.00)
Construction materials	-0.564	-0.822	-0.707	-0.722
	(-1.71)	(-2.35)	(-2.13)	(-2.15)
Light industry	0.616	0.745	0.765	0.802
	(2.05)	(2.60)	(2.79)	(2.90)
Food processing	-0.187	-0.239	-0.181	-0.221
	(-0.61)	(-0.80)	(-0.63)	(-0.74)
Adjusted R^2	0.200	0.212	0.206	0.207
N	309	310	339	339

Notes: These are OLS regressions for 1998, where adjustment costs is the dependent variable. Less than secondary is the omitted education category, and other industries is the omitted industry category. *T*- statistics are in parentheses.

Table 10 Determinants of Job and Worker Flows

	Job reallocation	Excess job reallocation	Worker flow rate	Churning rate
Private share	0.007	-0.008	0.025	0.018
	(0.56)		(1.11)	(0.85)
Union	-0.010	-0.018	-0.194	-0.184
	(-0.43)		(-4.65)	(-4.71)
Product concentration	0.072	0.001	0.015	-0.058
	(2.57)		(0.30)	(-1.25)
Labor concentration	0.052	-0.004	0.045	-0.007
	(1.09)		(0.54)	(-0.09)
R^2	0.022		0.033	0.032
N	2174		2174	2174

Notes: These are coefficients from regressions also containing firm fixed effects and year dummies. *T*-statistics are in parentheses.

Table 11 Insider and Outsider Ownership

	Job reallocation	Excess job reallocation	Worker flow rate	Churning rate
Insider share	0.022	-0.001	0.071	0.049
	(1.53)		(2.76)	(2.01)
Outsider share	-0.024	-0.022	-0.056	-0.032
	(-1.17)		(-1.57)	(-0.96)
R^2	0.029		0.041	0.036
N	2162		2162	2162

Notes: These are coefficients from regressions also containing the other variables in Table 10 (except private share). *T*-statistics are in parentheses.

Table 12 Disaggregated Private Ownership

	Job reallocation	Excess job reallocation	Worker flow rate	Churning rate
Worker share	0.016 (0.85)	-0.024	0.032 (0.98)	0.016 (0.52)
Manager share	0.052 (1.39)	0.076	0.162 (2.52)	0.110 (1.82)
Dispersed outsider share	-0.031 (-0.80)	-0.052	0.125 (1.88)	0.156 (2.49)
Domestic blockholder share	-0.028 (-1.07)	0.003	-0.101 (-2.28)	-0.073 (-1.76)
Foreign blockholder share	-0.055 (-0.55)	-0.209	-0.413 (-2.43)	-0.359 (-2.24)
R^2	0.030		0.049	0.038
N	2011		2011	2011

Notes: These are coefficients from regressions also containing the other variables in Table 10 (except Private Share). *T*-statistics are in parentheses.

Table 13 Job and Worker Flows by Firm Age and Adjustment Cost

	Job reallocation	Excess job reallocation	Worker flow rate	Churning rate
New	-0.000	0.030	0.133	0.134
	(-0.01)		(0.93)	(1.15)
Reorganized	0.013	0.012	0.069	0.056
	(1.26)		(2.01)	(1.64)
Adjustment cost	0.010	0.005	-0.011	-0.021
	(2.43)		(-0.60)	(-1.23)
R^2	0.077		0.129	0.131
N	1890		1890	1890

Notes: These are coefficients from OLS regressions also containing all other variables from Table 10 above and 10 industrial sector dummies. *T*-statistics, corrected for firm clustering, are in parentheses.

Table 14 Job and Worker Flow Sensitivity to Adjustment Cost over Time

	Job reallocation	Excess job reallocation	Worker flow rate	Churning rate
Adjust × Time	0.000 (0.01)	0.053	-0.002 (-1.30)	-0.003 (-1.41)

Notes: These are coefficients from regressions also containing firm fixed effects and year dummies. *T*-statistics are in parentheses.

Table 15 Interactions with Adjustment Cost

	Job reallocation	Excess job reallocation	Worker flow rate	Churning rate
Private share	0.002 (0.06)	-0.009	0.107 (1.61)	0.105 (1.66)
Private share × Adjust	0.000 (0.03)	-0.015	-0.022 (-1.32)	-0.022 (-1.41)
Union	-0.025 (-0.32)	-0.024	-0.033 (-0.23)	-0.008 (-0.06)
Union × Adjust	0.006 (0.26)	-0.009	-0.046 (-1.16)	-0.052 (-1.37)
Product concentration	-0.078 (-0.66)	0.001	-0.094 (-0.44)	-0.017 (-0.08)
Prod. conc. × Adjust	0.035 (1.16)	0.005	0.021 (0.39)	-0.014 (-0.26)
Labor concentration	0.107 (0.46)	0.002	0.436 (1.02)	0.328 (0.81)
Labor conc. × Adjust	-0.013 (-0.21)	0.029	-0.110 (-0.92)	-0.096 (-0.85)
R^2	0.023		0.036	0.039
N	1909		1909	1909

Note: *T*-statistics are in parentheses.

Table 16 Job and Worker Flows and Interactions with Adjustment Cost (Insider and Outsider Ownership)

	Job reallocation	Excess job reallocation	Worker flow rate	Churning rate
Insider share	0.024	-0.004	0.399	0.375
	(0.49)		(4.51)	(4.45)
Insider share × Adjust	-0.001	-0.007	-0.087	-0.085
	(-0.12)		(-3.86)	(-3.99)
Outsider share	-0.053	-0.015	-0.539	-0.486
	(-0.68)		(-3.78)	(-3.57)
Outsider share × Adjust	0.008	-0.028	0.123	0.115
	(0.38)		(3.39)	(3.35)
R^2	0.027		0.042	0.044
N	1903		1903	1903

Notes: These are coefficients from regressions also containing all other variables in the regressions in Table 15. *T*-statistics are in parentheses.

Table 17 Job and Worker Flows and Interactions with Adjustment Cost (Disaggregated Ownership)

	Job reallocation	Excess job reallocation	Worker flow rate	Churning rate
Worker share	0.033 (0.44)	-0.026	0.275 (2.08)	0.241 (1.92)
Worker × Adjust	-0.007 (-0.37)	-0.004	-0.068 (-2.07)	-0.061 (-1.96)
Manager share	0.029 (0.20)	0.072	0.888 (3.37)	0.859 (3.43)
Manager × Adjust	0.010 (0.25)	-0.013	-0.186 (-2.80)	-0.195 (-3.10)
Dispersed outsider	-0.296 (-1.80)	-0.059	0.558 (1.92)	0.854 (3.10)
Dispersed × Adjust	0.074 (1.81)	-0.012	-0.106 (-1.47)	-0.180 (-2.63)
Domestic blockholder	0.060 (0.55)	-0.001	-1.198 (-6.25)	-1.258 (-6.90)
Domestic blockholder × Adjust	-0.024 (-0.86)	-0.027	0.291 (5.90)	0.315 (6.72)
Foreign blockholder	-0.345 (-0.56)	-0.567	-3.150 (-2.92)	-2.806 (-2.73)
Foreign blockholder × Adjust	0.061 (0.46)	0.323	0.543 (2.32)	0.482 (2.17)
R^2	0.031		0.037	0.030
N	1787		1787	1787

Notes: These are coefficients from regressions also containing all other variables in the regressions in Table 15. T-statistics are in parentheses.

Table 18 Job and Worker Flows and Interactions with Adjustment Cost by Firm Age

	Job reallocation	Excess job reallocation	Worker flow rate	Churning rate
New firm	-0.039 (-0.54)	0.032	0.013 (0.05)	0.052 (0.21)
New × Adjust	0.011 (0.51)	0.020	0.038 (0.39)	0.027 (0.32)
Reorganized firm	-0.005 (-0.15)	0.012	0.301 (1.79)	0.306 (1.86)
Reorganized × Adjust	0.005 (0.52)	0.002	-0.063 (-1.56)	-0.068 (-1.71)
R^2	0.080		0.151	0.152
N	1890		1890	1890

Notes: These are coefficients from OLS regressions also containing the variables in Table 15. *T*-statistics, correcting for firm clustering, are in parentheses.