Worker Displacement During the Transition: Experience from Slovenia

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ABSTRACT

Worker Displacement during the Transition:
Experience from Slovenia[*]

The transition to market in Slovenia created labor displacements that were on par or greater than that experienced in North America in the 1980s. A simple theoretical model suggests that factors which raise the probability of layoff should also increase the probability of a quit, predictions that are borne out in data. Probability of both layoffs and quits fell with worker tenure, firm profitability and expected severance costs. Individuals facing a higher probability of displacement accepted slower wage growth than otherwise comparable workers. The incentives to avoid displacement were strong – workers that actually were displaced faced a slow process of transiting out of unemployment with only one-third finding reemployment. Correcting for selection, real wage losses for displaced workers are comparable to those reported for displaced workers in North America.

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After years of stable employment, workers in transition economies were confronted with job loss on a massive scale. Experience in market economies shows that the costs of displacement take two forms. First, job losses generate unemployment and thus waste of resources. Second, upon reemployment, displaced workers experience earnings losses, both in the short- and the long-run, due to the destruction of firm specific human capital entailed by the job loss.

This paper illustrates the process of displacement in transition economies, utilizing an unusually rich data set on Slovenian workers. The paper examines factors which affect firm layoffs and quits, wage setting in the face of potential layoffs, and the effect of displacement on wages for workers who are successful in finding new jobs. Among our findings are that more skilled workers are less likely to be displaced but are more likely to quit. Workers appear to quit or accept lower relative wages to avoid higher probability of layoff. Upon displacement, the probability of reemployment is affected by measures of local labor market conditions, nonmarket production possibilities, and individual human capital. An amazing result is that reemployed displaced workers receive real wage gains as a result of displacement. The last surprising result is shown to be driven by nonrandom selection of reemployed workers from the pool of displaced workers. Correcting for selection, we find wage losses of experienced workers in Slovenia that are consistent with estimates obtained for the U.S.

1. INSTITUTIONAL BACKGROUND

As part of former Yugoslavia, the Slovenian economy was governed by a unique system known as worker self-management. In principle, self-management gave workers the right to participate in many aspects of firm decision making. In practice, worker participation was limited largely to determining relative pay within firms. The government intervened in many firm decisions including policies to limit wage inequality, avoid firm failures, and preserve jobs. Job security in Yugoslavia was constitutionally guaranteed. Workers could be fired only for breaching work discipline, refusing job reassignment, or in rare cases, firm bankruptcy. Annual displacements represented less than one percent of the labor force.

To limit wage inequality across firms, the central government set the wage bill for each firm based on firm size and occupational structure. In the least productive firms, the mandated wage bill

exceeded revenues. To allow the unprofitable firms to meet their payrolls and avoid bankruptcy — and to

maintain job and wage security — the Yugoslav government shifted income from profitable to

unprofitable firms through a series of selective taxes and subsidies.[1] Only profitable firms were taxed,

and only unprofitable firms were subsidized.

Layoff policy was first liberalized in October 1989.[2] Employers were given the right to lay off

workers deemed technologically redundant.[3] However, layoffs were very costly, requiring 24 months

advance notification and a substantial severance package. If the laid off worker did not retire, the firm

had to retrain and/or place the worker in another firm. Failing that, the firm had to pay a lump sum

severance package equal to 24 months of salary, or else provide a monthly stipend of at least the

minimum wage over a 24 month period.[4] Firms had to bear the full costs of these entitlements, although

some firms received partial reimbursement.

As shown at the top of Table 1, the initial liberalization of layoff policy had almost no effect

because of the prohibitive costs. Between 1989 and 1991, virtually all displacements were still

attributable to bankruptcies, as was the case before transition. Nevertheless, the number of displacements

rose sharply after 1988 due to increased numbers of firm bankruptcies following the abandonment of

interfirm transfers toward unsuccessful firms. After 1990, bankruptcies declined in relative importance as

a cause of layoffs. In February 1991, the mandated advance notification period was reduced from 24 to 6

months as was the duration of the mandated severance benefit. Then, in July 1991, the government

suspended the initiation of bankruptcy proceedings and introduced a program subsidizing employment in

financially distressed firms. Less expensive layoffs and reduced incidence of bankruptcies made layoffs

the dominant cause of displacements after 1991.

Once displaced, workers had the options of seeking employment elsewhere, exiting the formal

labor force by retiring or entering the gray economy, or remaining unemployed. High levels of

unemployment and pension benefits lowered incentives to seek employment in the formal sector.

Unemployment benefits averaged 70 percent for the first three months and 60 percent thereafter. Benefit

duration depended on the length of previous employment with an upper limit of two years, but benefits could be extended up to three additional years depending on need.

Pensions were also generous relative to average wages. Pensions were set at 85 percent of the real wages earned by the worker in the ten best years. Because real wages fell substantially in transition, pension income could easily rise above what the worker could earn in the labor market. In addition, pensions were fully indexed to inflation but wages were not. The relative return to retirement rose, particularly with hyperinflation in 1990. By 1992, employment for both men and women with over 35 years of experience had fallen to less than a third of their pretransition levels. For those with 30-34 years of experience, employment fell 28 percent for men and 42 percent for women (Orazem and Vodopivec, 1995).

2. DISPLACEMENT TRENDS IN SLOVENIA

As in other formerly socialist countries, the Slovenian transition resulted in sharp declines in output and employment. After a period of steady growth in the 1970s and stagnation during the 1980s, Slovenian GDP fell 18.6 percent during 1989-92. As shown in Table 1, after years of negligible unemployment, the unemployment rate soared to over 15 percent by 1993. Displacements became an important source of transitions out of employment after representing less than 0.1 percent of the labor force before 1989.

The empirical definition of displacement used in this study corresponds roughly to definitions used in the U.S. Survey of Displaced Workers (SDW). A worker at least twenty years old who lost a job either through layoff or plant closing and experienced a spell of unemployment was defined as displaced. The main differences in the displacement definition between Slovenia and the U.S. are that in Slovenia, the displaced are not required to have had three years of prior job experience, and that there is no requirement that the displaced experience an unemployment spell in the U.S.[5] Effective differences in these definitions are not large. The vast majority of displaced workers in Slovenia were coming from a system of virtually certain employment and therefore most would meet the three year experience

requirement. On the other hand, the vast majority of U.S. displaced workers do suffer some period of unemployment.

Using the definition of displacement, Table 1 shows that since 1991, 3-4 percent of Slovenian workers employed at the beginning of the year became displaced by year's end. Under transition, displacements have represented about 30 percent of all exits from employment and a 14-22 percent of inflows into unemployment. As noted before, bankruptcies were responsible for all displacements initially. Since the 1991 policy shift which suspended bankruptcies and lowered layoff costs, about 70 percent of displacements were layoffs.

To place these labor market disruptions into perspective, one can compare displacements in Slovenia with those experienced in the North American recession of the early 1980's. Table 2 reports the incidence of displacement for the three countries where the U.S. and Canadian data has been adjusted to more closely fit the definition of displacement used in Slovenia. Slovenian displacement was greater than that experienced during the steepest economic decline faced by the U.S. and Canada since World War II. More than 11 percent of the Slovenian workforce became displaced during the four-year period, five percentage points greater than in the U.S. and one percentage point greater than in Canada. Bankruptcies accounted for just over half of all displacements in the U.S. and Slovenia, but were less important in Canada.

The demographic characteristics of displaced workers in Slovenia do not differ greatly from those in North America. Slovenian displaced workers were more likely to be female, reflecting the higher female labor force participation rates in Slovenia. Relative to North America, Slovenian displaced workers were younger, perhaps because older workers avoided displacement by retiring. Slovenian displacements were more heavily concentrated in construction and blue-collar sectors. Nearly identical incidences of displacement were experienced in nondurable goods manufacturing across the three countries. The incidence of displacement in durable goods manufacturing was also nearly identical in the U.S. and Slovenia. The statistics in Table 2 suggest that the labor market shocks in Slovenia were on par or larger

than those experienced in severe recessions in the west. The remainder of the study explores how the Slovenian labor force responded to those shocks.

3. LABOR TURNOVER THEORY

In this section, we sketch out a simple variant of Lazear's (1995) model of firm reductions in force. The worker's aggregate value to the firm in present value is

(1) $\qquad q_F = q(H, h, Z) + \varepsilon_F = \pi_F + W_F + \varepsilon_F$

where H is the level of general human capital, h is firm-specific human capital, Z is a vector of firm attributes that influence worker productivity, and ε_F is a completely unanticipated productivity shock that is absorbed by the firm. As in Becker (1975) or Hashimoto (1981), we assume that the firm and the worker split the proceeds from h but that it is costly to renegotiate the contract to share the costs or benefits of the shock, ε_F. We also allow the firm and worker to split the proceeds from general training. Acemoglu and Pischke (1998) have shown that if there are asymmetries in information on worker productivity or other constraints on labor mobility, firms can extract returns to general training. Transition economies are highly likely to be characterized by such asymmetric information on worker productivity.

We assume that the firm and worker contract on expected output, q. The sharing rule is set by the parameter $0 < \alpha_1 < 1$. The firm will get $\pi_F = \alpha_F q + \varepsilon_F$ and the worker will get $W_F = (1 - \alpha_F)q$. The worker also has outside options, including earning wages in other firms $W_0(H) + \varepsilon_0$ and exiting the formal labor force to get government transfers or gray market earnings, $G(H) + \varepsilon_G$. The technology parameters ε_0 and ε_G are unobservable shifts in returns to working in other firms or exiting the labor force that are uncorrelated with H.

The firm and the worker must decide whether to remain together, in which case the firm will earn π_F and the worker W_F, or whether either or both should initiate a separation. The separations possibilities are

$$\begin{array}{lll} & \textit{Layoff if} & \alpha_F q + L_F < -\varepsilon_F \\ (2) & \textit{Quit, work elsewhere if} & (1-\alpha_F)q - W_0 + C_0 < \varepsilon_0 \\ & \textit{Quit, exit labor force if} & (1-\alpha_F)q - G + C_G < \varepsilon_G \end{array}$$

where $L_F(H)$ is the layoff cost borne by the firm and $C_0(H)$ and $C_G(H)$ are, respectively, the transition costs borne by the workers if they quit to work elsewhere or to exit the labor force. Because layoff costs are tied to previous earnings, we expect that $L_F' > 0$. Worker transition costs are typically assumed to decrease in H because information on alternative jobs is more readily available for skilled jobs and because more educated workers can process that information more efficiently, so that $C_{0H}' < 0$ and

$C_{GH}' < 0.$

The choices in (2) are not mutually exclusive in that all three inequality conditions could hold simultaneously. That would happen if, for example, the value generated by the match q is very small relative to expected or unexpected earnings in other sectors or relative to the magnitude of adverse productivity shocks in the firm. In those cases in which two or three transitions are predicted, we assume that the assignment into a given transition is random.[6]

If $\varepsilon_F, \varepsilon_0,$ and ε_G are drawn independently from an extreme value distribution, equation (2) can be estimated using multinomial logit. The reduced form for each equation will include elements of general human capital, H, firm-specific human capital, h, firm productivity factors, Z, and factors that affect transition costs. We discuss each of these in turn, using Kletzer's (1998) and Farber's (1999) reviews to lay out how these factors have affected the likelihood of displacement and other transitions out of employment in western economies.

General training raises the worker's value in both the firm and in other firms, and so its impact on quits is ambiguous. The effect on displacements is negative, both because it is more costly to lay off more educated workers and because the firm may be able to get additional returns from more educated workers. In the U.S., displacement rates are consistently highest for the least educated. In contrast, job quitters are more educated than job losers.

In theory, work experience should have effects on turnover that are similar to those of education. To the extent that work experience is positively associated with labor productivity and layoff costs, less experienced workers will be displaced first. Less experienced workers will also be more likely to quit, particularly as they have a longer period to recoup the cost of job changing. For the most part, empirical work is consistent with those presumptions, except that as workers qualify for pensions, the return to exit, G, increases and the probability of quitting increases. Changes in pension generosity that are not fully anticipated can have even larger effects on the propensity to quit and exit the labor force (Lumsdaine and Mitchell, 1999).

Job tenure has frequently been used as an indication of the quality of match capital or the stock of firm-specific human capital embodied in the worker. In equation (2), increases in h raise the value of the worker in the firm relative to all other options, and so the probability of all three transitions should decrease with rising firm tenure. Evidence on quit propensity and displacement probability strongly support those presumptions (Farber, 1999).

Past research indicates that probability of transition out of employment is also affected by minority status and gender. Minorities are more likely to be displaced and to quit, while women are more likely to quit but less likely to be displaced. At least some of these differences are related to industry and occupation. Minorities are atypically employed in more cyclical industries and occupations while women are concentrated more heavily in the more stable industries and occupations.

This discussion suggests that we estimate (2) using a sample of workers employed at a point in time and then monitor who transits through quits and displacements, using education, work experiences, job tenure, industry and demographic attributes as explanatory variables. Additionally, we would like to add measures that control for shocks to firm profitability and the cost of transitions out of employment.

4. DATA SOURCES

For our analysis of labor turnover, we merged official Slovenian unemployment and work history data sets. The latter covers a five percent sample of all post-1986 employment spells, unemployment spells, and time out of the labor force.[7] To include both bankruptcies and layoffs as sources of

displacement, we focused on exits from employment during June 30, 1991 and June 30, 1992. Possible transitions from employment were firm-initiated displacement; quits to alternate employment; or quits to unemployment or exit from the labor force. The alternative, "stayers", are those who remain with the same firm until June 30, 1992. Firm-initiated displacements were those who lost jobs due to layoff or bankruptcy. Quits which resulted in reemployment within 30 days were viewed as moving to alternate employment. Other quits were to extended unemployment or exits from the labor force. When there were multiple transitions within the year, only the first was included.

There are reasons to believe that the unemployment register data are of high quality. Those with as little as nine months of continuous employment were eligible for unemployment compensation as well as a range of other benefits, so most of those displaced from steady unemployment had an incentive to register.[8] Information on transition out of unemployment is also reliable. An unemployed worker who succeeded in finding a new job had to retrieve his "work booklet" from the employment office and bring it to his new employer, triggering a record for exit to a job.

There are differences between registered unemployed and unemployment as formally defined by the International Labor Organization (ILO). A comparison with the Slovenian labor force survey shows that only a subset of the registered unemployed is counted as unemployed by the survey, and vice versa. Between 1989 and 1991, about 80 percent of those found unemployed by the survey were registered as unemployed at an unemployment office. Most of the unregistered unemployed were school-leavers or short-term employees who would not qualify for unemployment compensation. On the other hand, the survey also shows that not all registered unemployed are unemployed as measured by the ILO standards. According to the survey, in 1990, 42 percent of registered unemployed were performing paid work at least one hour in the reference week, although until 1994, legislation allowed such irregular work without any reduction in unemployment compensation. There is also the possibility of employment in the gray economy (informal employment which avoids payment of taxes) while receiving unemployment benefits. For this study, it is important to emphasize that our unemployed will include some with irregular or gray economy earnings.

Estimating equation (2) also requires information on factors that would alter the cost of a layoff or quit across workers and firms. We also require elements of Z that would alter the relative value of the worker inside and outside a firm. The worker data included a firm identifier which allowed us to merge information from accounting data from the firm's tax records. The tax record included information on restructuring subsidies which lowered the cost of layoffs, L_F. Our measures of Z included information on firm profits, an indicator of worker productivity in the firm relative to that of similarly skilled workers elsewhere. Information on firm size affected mandated wages under the previous system which could affect the profitability of laying off or retaining workers. Private ownership and foreign ownership were expected to lead to more efficient firm management which could also affect projected future firm output or profitability.[9] The accounting data also included the firm's industry which can be used to control for differences in the magnitude of the decline in product demand associated with transition.

The worker's transition cost, C_0 and C_G, are primarily driven by measures of general human capital. However, we do know whether the worker was on a regular or fixed-term contract. The latter would provide an expected termination date for the match known at the time of employment, so the worker would have had plenty of time to plan for the transition.

This data set compares favorably to data used to study displacement in the U.S. It combines the advantages of detailed individual information, a strength of the U.S. Displaced Workers Survey (DW),[10] and the accuracy of official earnings records, a strength of studies based on quarterly U.S. Unemployment Insurance (UI) payment records.[11] At the same time, this data set avoids the recall bias of the DWS and the limited individual information of the UI records. To our knowledge, the Slovenia unemployment data is also uniquely able to measure firm profits, differential layoff costs, and the proximate cause of unemployment.

5. EMPIRICAL ANALYSIS OF TRANSITIONS OUT OF EMPLOYMENT

Merging the various sources of information resulted in a data set composed of firm and worker characteristics for 12,923 individuals employed on June 30, 1991. The sample size is smaller than the potential universe because only a subset of workers had information on job tenure and firm attributes that

were necessary to estimate equation (2). We apply a multinomial logit specification to the data and report the results in Table 3. The coefficients are converted into the implied marginal probability of transition associated with each regressor, relative to the baseline probability of transition reported at the top of the column.[12] Tests of significance of the associated coefficient are also included. We discuss each of the types of variables in turn.[13]

Specific human capital (h) should lower the probability of all transitions out of the firm, a prediction borne out by the results on job tenure. Those with the least tenure are most likely to quit or be displaced while those with 10+ years of tenure are the least likely to transit out of the firm. The one exception is that workers with more than 20 years of tenure are not less likely to exit the labor force, presumably reflecting the lower cost of transiting to pensions that were becoming more valuable in that time period.

General human capital (H) should lower the probability of displacement, but H has an ambiguous effect on quits according to equation (2). Our results show that the probability of displacement does decrease as years of education and work experience increase, although the individual coefficients are generally imprecisely estimated.

Education has interesting effects on quits. The most educated are the most likely to exit to move to other firms. Firms that tried to retain the artificially low wages for their most productive workers as a holdover of the old pay system risked losing their most educated workers to firms that adjusted their wages to the new market conditions. However, the least educated were more likely to exit the labor force, presumably because the pension and other government transfer options had the highest relative value for those with the lowest market value. Work experience had no systematic effect on movement to other firms, but probability of exiting the labor force was lowest for those with less than 20 years of experience. As workers qualified for pensions, probability of exiting the labor force rose tremendously. Note that pensions were indexed to inflation while real wages fell an average of 35 percent early in transition.

The effect of transition costs are most easily observed by looking at the response to restructuring subsidies. These subsidies increased both firm- and worker-initiated transitions. Relative to the baseline

probability, displacement was 51 percent more likely for workers in subsidized than in nonsubsidized firms. Workers were also more likely to quit firms that received restructuring assistance, presumably because they perceived a higher probability of layoff. Workers in firms receiving the subsidies were 43 percent more likely to switch firms and 21 percent more likely to exit the labor force. Workers on fixed term appointments were much more likely to be displaced. They were marginally more likely to quit, but the coefficients were not estimated precisely.

Elements of Z also affected transitions. Workers in the least profitable firms were nearly twice as likely to be displaced as comparable workers in normal profit firms. In contrast, workers in top quartile profit firms are 41 percent less likely to be displaced. Workers appear to have taken firm efficiency into account in making voluntary exits. Those in the least profitable firms were 51 percent more likely to switch firms, but firm profits do not significantly affect labor force exits. If private ownership or foreign ownership signal improved future firm profitability, they did not translate to changing patterns of turnover.

There are large differences in turnover across industries. Those in construction, services and finance faced the highest probability of displacement. Again, workers in these sectors were also more likely to quit. Turnover differences also exist between different sized firms. Workers in the smallest firms have higher probability of layoff or job switch but a lower probability of exiting the labor force.

One might think that transition would be accompanied by an increase in discriminatory treatment of women and ethnic minorities. However, women were not significantly more likely to be displaced or to quit, nor were non-Slovenes significantly more likely to be displaced. Non-Slovenians (most of them being Croats, Muslims, and Serbs) were apparently less likely to switch jobs, and much more likely to withdraw from the labor force.

For the most part, the transition patterns reported in Table 3 are similar to those found in established market economies for job tenure, education and work experience. The huge effects associated with qualifying for the state pension are similar to the large effects on labor supply found when there are unanticipated shocks to retirement income in western economies. From this, we can conclude that the

labor market in the early Slovenian transition appeared to be behaving similarly to more established labor markets.

We also note the interesting result that workers appeared to be responding to information on firm profitability in planning their voluntary transitions. In Table 3, all 13 factors that had significant effects on the probability of displacement had the same signed effect in at least one of the two quit equations and eight had the same sign in both quit equations. The implication is that workers noticed that they were atypically threatened with layoff and were seeking alternatives outside the firm.

Cost of Impending Displacement

A recent topic of considerable research in the U.S. has been to measure the cost of worker displacement. Papers by Hamermesh (1987); Topel (1991); Jacobson, LaLonde and Sullivan (1993a,b) Stevens (1997); and Kletzer and Fairlie (2003) used the samples of displaced workers to measure lost earnings from job loss. The value of using displaced workers, defined as workers who lost jobs from mass layoffs or plant closings, as opposed to all job losers, is that mass layoffs are less likely to be due to unobserved individual worker productivity. Consequently, wage changes for displaced workers will more accurately reflect the costs of exogenous job loss whereas other job losses may reflect revealed low worker productivity.

Jacobson et al. found large and significant wage losses for displaced workers in the three years before the displacement occurred. They argued that the predisplacement wage loss was part of the same process that led to displacement and further post-displacement wage loss. Before displacement, troubled firms attempted to avoid layoffs by holding back on wage increases or instituting wage cuts. Other studies (eg. Hamermesh; Kletzer and Fairlie) found no evidence of slower wage growth for displaced workers in the years before displacement.

The empirical model of labor transitions showed that workers appear to respond to an increased prospect of displacement by switching jobs or by withdrawing from the labor force. Displacement might also be prevented by accepting wage cuts, as found by Jacobson et al. Furthermore, we wish to establish whether potential wage differentials between the displaced and those not displaced occur because the

displaced are in different industries or regional labor markets than the continuously employed, or if there remain wage differences between displaced and nondisplaced workers within regional and industrial markets. These questions were investigated using a log wage equation

$$(3) \qquad \ln W_{t-1} = H_{t-1}\gamma_1 + H_{t-1}D_t\gamma_2 + Z_{t-1}\beta_1 + Z_{t-1}D_t\beta_2 + \varepsilon_{t-1}$$

which included a vector H_{t-1} including standard demographic characteristics and human capital variables and a vector Z_{t-1} including industry and regional controls as regressors. In addition, the regressors included a dummy variable, D_t, which took the value of one if the person was displaced later in the year. The displacement dummy was interacted with all the other variables. The coefficient γ_2 is used to test whether workers who were later displaced received lower returns to human capital and demographic attributes prior to the displacement.

The employment history data was employed since it provided information on both continuously employed and displaced workers. To this, we merged in wage and salary information from the Slovenian Pension and Invalid Fund. The Fund collects data on hours and earnings for all workers who are paying contributions to the Fund. Similar to other transitional economies, old-age insurance is mandatory so virtually all workers are covered. Hourly wages were computed as earnings divided by hours. Given that wages are computed over the employment spell, monthly dummy variables are used to construct "deflated" hourly wage, purged of the effects of changes in consumer prices over the spell.

To insure that we had sufficient numbers of displaced workers in each industry and region cell, we had to drop the use of tenure and firm accounting measures as regressors. Those measures were available for only a subset of the workers. Even using the full sample of 33,459 workers, we could not estimate a coefficient on the interaction of 35+ years of experience with the displacement dummy variable. The results are reported in Table 4.

Workers who experienced displacement later in 1990 were indeed paid less than otherwise identical workers. The wage decrement amounted to 12 percent for a Slovenian male in manufacturing holding a vocational degree with three to five years of experience. The wage decrement varied across

skill groups, with the largest percentage wage differentials received by university educated workers and for those with at least 10 years of job experience who were displaced later in the year. The pattern of the largest percentage wage reductions for the most skilled and experienced is in line with presumptions about the possibility of recontracting by workers and firms whose match capital exceeds the workers opportunity productivity elsewhere. On average, university trained employees had predisplacement wages 8 percent below those not displaced. Workers with 10 or more years experience had predisplacement wages about 6 percent lower than otherwise identical workers who were not eventually displaced.

The pre-displacement wage loss was three percent smaller than for men. There were no significant differences in predisplacement wage loss across ethnic groups. Though not reported, there were differences in the effects of pending displacement on wages across industries. Workers employed in services and finance and real estate had the largest predisplacement wage losses, while workers in construction actually received wage gains before being displaced.[14]

The main conclusion from this section is that despite accepting predisplacement wages that were significantly below the market norm, displacements did occur. The next section reviews evidence of what happened to the workers after displacement.

Postdisplacement Employment and Wages

Table 5 reports the labor market outcomes of displaced Slovenian workers. For purpose of comparison, statistics on U.S. and Canadian displaced workers are included. The North American data span 5 years whereas the Slovenian data span 3.7 years, but the outcome differences are too large to be caused solely by the time differences. Only one-third of the displaced Slovenian workers had found reemployment within the period, half the reemployment rate in the U.S. and Canada. Half of the Slovenian displaced were still unemployed at the end of the period, more than double the proportion unemployed in the other countries. The proportion dropping out of the labor force in Slovenia was nearly identical to that in North America.

For those who found work in Slovenia, the duration of search was only marginally longer than in the U.S. Median length of search was one-half week shorter in Slovenia. Successful searchers were less likely to find employment within five weeks, but 65 percent of reemployed Slovenians found employment within 26 weeks compared to 69 percent in the U.S. and 63 percent in Canada. While the shorter observation period in Slovenia will underestimate the importance of very long duration searches, it seems clear that the biggest differences in labor market outcomes between the countries is the much smaller proportion of reemployed in Slovenia, not in length of search for successful seekers.

Amazingly, displaced Slovenian workers who found new jobs received real wage gains averaging 16.5 percent. This may be evidence of a reversion to the mean, as the previous section showed that displaced workers were paid significantly less than their counterparts in firms that did not displace workers. Studies of displaced workers in the U.S. find that displaced workers receive lower wages when reemployed. Over 68 percent of Slovenia workers who found employment received postdisplacement wages above their previous wage. Only 31 percent took pay cuts, in contrast to 44 percent in the U.S. and 56 percent in Canada. The wage gains of reemployed displaced Slovenian workers are unlikely to be representative of expected wages for all displaced workers. The reemployed are presumably not randomly selected from the pool of displaced, so the wage results may be subject to considerable upward selection bias. In particular, if opportunity costs for accepting formal sector employment were high relative to market wages, only those with unusually good market opportunities would be induced to accept new employment.

Another complication faced by displaced workers seeking employment is the likelihood of changing occupation or industry. Studies of earnings following displacement in the U.S. suggest that workers suffer lower losses if they stay in the same industry.[15] Only half of the reemployed workers found employment in the same occupation. Unskilled workers were least likely to change occupations with 72 percent staying in the same occupation. Only 53 percent of the managers and professionals remained in the same broad occupation, while only 44 percent of administrative support and semi-skilled workers remained in the same occupation. Reemployed workers were both downwardly and upwardly

mobile. A large proportion (43 percent) of the successful semi-skilled job seekers found reemployment as unskilled workers. In contrast, 17 percent of successful professional job seekers and 7 percent of reemployed administrative support workers became managers. Reemployed workers also showed considerable mobility across industries. About one-third of the reemployed workers changed broad industry of employment. Half or more of the displaced from the trade, government and transportation industries found reemployment in a different industry.

The changes in employment status and wages of the displaced lead to two important conclusions: that only a highly select group became reemployed and that mobility across broad occupations and industries appears to be an important element in successful job search. These stylized facts lead to a further hypothesis: that displacements have led to a destruction of specific human capital on a massive scale. In Slovenia, about 83 percent of the displaced are not engaged in the same type of work (67 percent not employed and half of the reemployed in a different broad occupation). The next section quantifies the magnitude of the wage loss associated with this job loss.

Probability of Reemployment and Wage Loss

The surprising finding from Table 5 that average wages for reemployed displaced workers rose is conditional on reemployment status and holds no other individual attributes fixed. To generate comparative static estimates of wage changes from displacement, designate the difference in log wages between 1991 and 1990 as $\Delta \ln W$. Define H as a vector of human capital attributes and personal characteristics, R2 is a dummy variable indicating whether the worker is reemployed in the same two-digit industry and R4 is a dummy variable equal to one when the worker is reemployed in the same four-digit industry. In addition, let $\Delta \ln W_R$ be the log change in the reference wage, defined as the average change in log wages for continuously employed workers in the same education/industry/experience cell.

We estimate

(4) $(\Delta \ln W - \Delta \ln W_R) = H \gamma_1 + R2 \gamma_2 + R4 \gamma_3 + \varepsilon_W$

where the parameters are interpretable as the effect of the regressor on wage growth for displaced workers relative to those who were not displaced.[16]

The estimates of equation (4) will be conditional on observing pre- and post-displacement earnings. Therefore, we select out all displaced workers who fail to find or refuse a formal sector job by the end of 1991. Individuals who are not formally employed may have dropped out of the labor force, remained unemployed and seeking work, or they may be working in the gray economy. Reemployment in the formal sector is undoubtedly correlated with the observed attributes, H, as well as variables linked to incentives to search for or accept reemployment. Meyer's (1995) review of studies on unemployment benefits concluded that the timing of reemployment for workers who have lost their jobs is responsive to economic incentives. Therefore, estimation of (4) requires controlling for the selection of reemployed out of the pool of displaced workers.

Given a sample of unemployed individuals, and consistent with equation (2), let E represent the difference between the present value of accepting employment and remaining unemployed. In reduced form, E would be a function of general human capital and other personal characteristics, H; factors which reflect earnings opportunities while unemployed, G; and beliefs concerning returns to reemployment, W_0. A worker will be observed reemployed if $E > 0$.

The reduced form representation of E is

$$(5) \qquad E = H\theta_1 + G\theta_2 + W_0\theta_3 + \varepsilon_E$$

Assuming ε_W and ε_E are distributed bivariate normal, a correction for the presumed nonzero conditional mean in (4) is to estimate

$$(6) \qquad (\Delta \ln W - \Delta \ln W_R) = H\gamma_1 + R2\gamma_2 + R4\gamma_3 + \lambda \frac{f(E - \varepsilon_E)}{F(E - \varepsilon_E)} + \xi$$

where ξ is a random error with zero mean, f is the normal density function and F is the normal cumulative distribution function.

The subset of displaced who became reemployed in the employment history data set is too small to yield estimates of equation (5). Therefore, equation (5) was estimated using data from the universe of all displaced workers among the registered unemployed, for those workers for which we observe their predisplacement wage. There were 5,462 such displaced workers in 1990, 904 of whom were employed in the formal sector by the end of 1991.

Elements of G include presence of dependents, per capita farm land in the locality, and the level of the predisplacement wage. Dependents raise the value of remaining unemployed in two ways. First, dependents raise productivity in household production. Second, access to supplemental unemployment benefits depended on assessed need which reflected the number of dependents. Therefore, dependents raise the returns to remaining unemployed. Areas with more farm land would have more opportunities for irregular, gray economy or home production, raising earnings while unemployed. The level of unemployment benefit was a proportion of predisplacement wage. Of course, the predisplacement wage will also control for unobserved skills which have an ambiguous effect on incentives to exit unemployment.

Elements of W_0 include the predisplacement local unemployment rate and a Herfindahl index for industrial mix in the locality. Higher local unemployment rates serve as an index of the magnitude of the adverse labor demand shock in the locality. Higher Herfindahl indexes imply fewer choices of industries in which to search in the local labor market, a significant factor in job search since about half of the displaced workers who successfully found jobs switched industries. Those displaced in a local labor market with only one employer would not have alternate sectors in which to search. Higher predisplacement unemployment rates and higher Herfindahl indexes are expected to lower the arrival rate of jobs. Arrival rates have ambiguous effects on incentives to exit unemployment.

Table 6 reports the Probit equation for the probability of becoming reemployed. While the primary purpose of this estimate is to generate the selection correction for equation (6), the estimates have interest in their own right. Probability of reemployment drops as experience increases beyond 2.3 years. Therefore, experienced workers are less likely to be displaced, but once displaced, face more difficulty

finding (or are less likely to accept) formal sector employment.[17] The least and most educated groups are more likely to exit unemployment. Those with elementary and vocational degrees are the least likely to become reemployed.[18] What is particularly interesting is the performance of the local labor market and household production instruments. The local unemployment rate at the time of displacement, per capita farm land, and Herfindahl index of industry concentration significantly lower the probability of becoming reemployed. The presence of dependents also lowers the exit probability but is insignificant. Those with higher predisplacement wages are more likely to exit unemployment. Workers with elementary and vocational education are less likely to reemploy within a year, as are those with the most prior work experience.

The estimation of variants of equations (4) and (6) are reported in Table 7. Note first that the selectivity correction coefficient, λ, is highly significant. Since its exclusion biases the results, we concentrate on the results that correct for selectivity. They show that reemployment wage growth varies across workers with difference demographic and human capital characteristics. Greater experience is found to significantly reduce wage growth. The effect becomes statistically significant for those with 10 or more years of experience, whose wage growth is reduced by 11 percent. The wage loss for those with 25 to 30 years of experience is 36 percent. A plausible explanation is that experience – instead of tenure, for which we do not have information – captures the loss of specific human capital from displacement. The magnitude of the wage loss for experienced workers is comparable to that found by studies of displacement in the U.S.[19]

The results reveal no systematic relationship between wage growth and education. Both the least and the most educated experienced larger wage growth, but the differences from other education groups were insignificant. As an investment in general human skills, education did not appear to lose value from displacement.

Women's postdisplacement wage growth was larger than men's by 7 percent. Evidence from other studies is mixed. For example, Jacobson, LaLonde and Sullivan (1993) and Kletzer and Fairlie (2003) reported that men's short-term reemployment losses were larger than women's; Podgurski and

Swaim (1987) found the opposite. We also find that the wage growth of displaced Non-Slovenians exceeded that of Slovenes by 12.5 percent. In the light of growing ethnic tensions in the 1990s, this is a surprising result. Abraham and Vodopivec (1993) found significantly smaller transition rates from unemployment to employment for non-Slovenians in 1989 and 1991, but Orazem and Vodopivec (1995) found no evidence of wage discrimination against non-Slovenians either before or after transition began.

The results also show that reemployment in the same broad, two-digit industry is associated with faster wage growth, but remaining in the same four-digit (as well as the same two-digit) industry eliminates the gain. Evidence summarized by Hamermesh (1989) suggests the workers who change industries suffer greater wage losses.

The effect of selection on estimated wage growth is most dramatically demonstrated by the difference in the intercept terms in columns one and two of Table 7. The constant term changes from a positive value in the uncorrected equation to negative in the selectivity corrected equation. Since the constant term measures the average wage change for the baseline individual, it is clear that the earlier reported average wage gains by displaced workers is an outcome of the selection process. Corrected for selection, a reemployed baseline person (a Slovenian male with vocational education and three to five years of experience), faced a 70 percent reduction in real wages relative to reference wage growth in the economy. It should be clear why workers had an incentive to accept wage reductions in an attempt to avoid displacement.

In contrast, the estimated wage change conditional on reemployment implies a 13 percent wage gain relative to reference wages! The direction of the bias is positive – implying that the same unobserved factors which help the displaced find jobs also contribute to their higher wage growth.[20] The implication is that for workers not (yet) reemployed and thus excluded in the wage growth equation, we can expect wage growth below that which we find for our sample of reemployed workers.

6. CONCLUSION

Transition of former socialist economies produced a phenomenon previously unknown to these economies: displacement. Unusually rich administrative data sets covering both workers and firms

enabled us to study this phenomenon for Slovenia during 1987-1993. We described displacement trends as well as characteristics of workers displaced, and compared them to those in market economies during a major recession. We also analyzed determinants of displacement in a broader framework of labor turnover, as well as explored factors associated with postdisplacement wage losses. The major findings of the study are the following:

- Displacement in Slovenia during 1990-1993, amounting to 3 to 4 percent of labor force per year, exceeded displacement rates in North America during the recession of the early 1980s.

- Workers try to avoid displacement both by switching to another job or by exiting the labor force. In addition, there is evidence that wages are adjusted to moderate displacements. In the year before becoming displaced, displaced workers had lower wages than otherwise comparable workers who did not lose their jobs.

- Probability of displacements and quits decreases with job tenure.

- Women are no more likely to be displaced than men. Non-Slovenians are not more likely to be displaced than Slovenians. Women face smaller post-displacement wage losses than men, and non-Slovenians face equal wage losses.

- Firm characteristics matter. The smaller and the less profitable the firm, the larger the likelihood of displacement as well as of job-switching. Restructuring subsidies which lowered firm layoff costs increase both firm- and worker-initiated transitions.

- Only about one third of workers displaced during 1990 found a job by the end of 1991. Surprisingly, for over 68 percent of those finding reemployment, wage growth exceeded the median wage growth in the economy. The median gain for the reemployed was 16.5 percent. The group which did not reemploy seems to be paying a much larger toll: not only are workers staying unemployed much longer, but they face much lower reemployment wages.

- About half of the displaced workers who find new jobs change occupations, and about one third change broadly defined industry of employment.

- Greater job experience is associated with larger postdisplacement wage losses. The magnitude of these losses is consistent with reported wage losses from displacement in the U.S.

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Table 1: Inflow into Displacement, Slovenia, 1987-1993

	1987	1988	1989	1990	1991	1992	1993
Number of displaced workers during the							
calendar year (thousands)							
Total	0.7	0.5	1.6	10.1	22.9	24.6	28.8
Of which due to bankruptcy	0.7	0.5	1.6	10.1	19.2	6.7	9.7
Number of displaced workers							
as a percent of:							
Employment at the beginning of the year	0.1	0.1	0.2	1.2	2.8	3.2	4
Total exits from employment	3.2	1.8	5.5	21.6	31.1	29	29.5
Total inflow into unemployment	0.6	0.4	1.4	6.7	14	17.6	22.4
Number of workers displaced due to bankruptcy							
as a percent of:							
Employment at the beginning of the year	0.1	0.1	0.2	1.2	2.3	0.9	1.3
Total exits from employment	3.2	1.8	5.5	21.6	26.1	7.9	9.9
Total inflow into unemployment	0.6	0.4	1.4	6.7	11.7	4.8	7.5
Inflow into early retirement							
As percent of employment at the beginning of the year	1.4	1.8	1.8	3.6	2.4	1.2	n.a.
As percent of total exits from employment	10.2	14	13.9	20.9	12.1	6.8	n.a.
Unemployment rate in December	1.8	2.5	3.3	5.9	10.1	13.2	15.4

Sources: Annual Report of the Employment Office of Slovenia, various years; work histories of a random sample of Slovenian workers; and a data set on registered unemployed (see data section).

Table 2: Comparison of Displacement in
Transition with North American Recession of the Early 1980s

	Slovenia	U.S.	Canada
A. Scale of Displacement (a)			
Period	1990-93	1981-84	1981-84
Number of displaced workers (thousands)	86	6,340	998
Of which, due to bankruptcy (thousands)	46	3,320	359
Percent of displaced workers in total non-agricultural Employment	11.3	6.6	10.1
Percent of displaced workers due to bankruptcy in total displacement	53.5	52.4	36.0
B. Characteristics of Displaced Workers			
Period	Jan. 1989-Aug. 1992	1981-85	1981-84
Gender			
Men	58.4	64.7	68.7
Women	41.6	35.3	31.3
Age			
20 to 24 years	9.0	4.3	5.8
25 to 54 years	87.3	77.0	79.6
55 years and over	3.7	18.7	14.6
Lost job industry			
Construction	17.1	7.0	11.8
Manufacturing	51.4	50.5	34.2
Durable goods	35.1	33.3	15.9
Nondurable goods	16.3	17.3	18.3
Transportation and public utilities	1.9	8.1	6.1
Wholesale and retail trade	6.7	13.8	18.2
Finance and service industries	15.6	13.3	18.9
Public administration	3.2	1.1	1.6
Other industries	4.1	6.2	9.2
Lost job occupation			
Blue-collar	61.7	56.3	45.4
Other	38.3	43.7	54.6

Sources: Annual report of Employment Office of Slovenia, 1993, and own calculations, for Slovenia.
OECD, Employment Outlook, July 1990, for United States and Canada.
Notes: To enhance comparability, a definition similar to the Slovenian one is used for the U.S.
and Canada in panel A. The definition differs from the standard one introduced by the U.S.
authorities in dropping the requirement that the lost job should have been held for three years.

Table 3: Multinomial Logit Estimates of Equation (2), Indicating the Probability of Separation by Type by June 30, 1992 for Workers Employed on June 30, 1991, Probability of Separation by Type

	Displacement		Quit		Exit Labor Force		Sample Means
Baseline probability[a]	1.48	**	4.47	**	4.28	**	
Difference in probability associated with:							
Tenure (excluded group: 3 to 5 years of tenure)							
Less than 1 year of tenure	2.23	**	2.34	**	1.17	*	0.16
1 to 3 years of tenure	- 0.39		1.17		0.69		0.12
5 to 10 years of tenure	0.30		- 0.71		- 0.39		0.14
10 to 20 years of tenure	- 0.30		- 2.20	**	- 0.24		0.17
More than 20 years of tenure	- 1.04	**	- 2.57	**	0.42		0.06
Missing data on tenure	- 0.21		- 2.01	**	- 0.32		0.13
Education (excluded group: vocational education)							
Less than elementary education	0.82	*	- 2.84	**	1.41	*	0.15
Elementary education	0.12		- 1.17	*	0.45		0.47
High school education	- 0.05		- 0.40		- 0.26		0.12
University	- 0.12		2.10	**	- 1.27		0.09
Experience (excluded group: 3 to 5 years of experience)							
Less than 1 year of experience	0.83		- 1.26		0.75		0.11
1 to 3 years of experience	- 0.43		- 0.39		- 1.69	**	0.15
5 to 10 years of experience	0.14		- 0.65		- 1.46	*	0.16
10 to 15 years of experience	- 0.57	*	0.07		- 2.10	**	0.17
15 to 20 years of experience	- 0.24		- 0.48		- 2.33	**	0.13
20 to 25 years of experience	- 0.27		- 0.61		- 0.53		0.10
25 to 30 years of experience	- 0.34		- 1.32		12.29	**	0.05
More than 20 years of experience	- 1.48		- 1.97		24.99	**	0.01
Missing data on experience	0.12		- 0.50		- 0.62		0.06
Gender							
Female	0.21		- 0.60		- 0.38		0.41
Nationality							
Non-Slovenian	0.34		- 1.05		3.00	**	0.12
Nationality missing	- 0.56		- 2.79	**	12.56	**	0.08
Terms of Appointment							
Fixed-term appointment	4.34	**	0.19		0.83		0.06
Firm Characteristics							
In the top quartile by size	0.08		- 1.36	**	- 0.24		0.25
In the bottom quartile by size	0.74	**	1.65	**	- 1.21	**	0.25
In the top quartile by profitability	- 0.61	**	- 0.18		0.25		0.25
In the bottom quartile by profitability	1.34	**	2.29	**	0.11		0.25
Some private ownership	0.00		- 0.01	*	0.01		0.19
Some foreign ownership	- 0.01	*	- 0.06		0.02		0.01
Received restructuring subsidies	0.75	**	1.91	**	0.88	**	0.28
Industry (excluded: manufacturing)							
Agriculture	0.44		- 2.19	*	- 0.26		0.05
Construction	0.61	**	7.53	**	1.16	**	0.09
Transportation	- 0.55		- 2.14	*	1.68		0.05
Trade	0.16		3.87	**	1.08	*	0.14
Non-financial services	0.66	*	0.00		0.55		0.11
F.I.R.E.	1.87	**	3.25	**	3.02	**	0.06

Estimates are the predicted difference in transition probability relative to the baseline. They are derived from multinomial logit coefficients over a sample including 12,923 individuals, with 459 exiting to displacement, 484 exiting to another job, and 803 exiting the labor force. $\chi^2(108) = 928.9$; Pseudo $R^2 = .10$.

[a] A person with baseline characteristics is a Slovenian male, holding permanent appointment, aged 25 to 30, with a vocational education, 3 to 5 years of experience, 3 to 5 years of tenure with the current employer, working in a Medium-sized, socially owned, manufacturing firm of average profitability and no foreign ownership, which has not received restructuring subsidies.

* Coefficient significant at 5 percent.

** Coefficient significant at 1 percent.

Table 4: Effects of Pending Displacement in 1991 on Log Wages Earned in 1990
Estimated Using Equation (3)
(Dependent variable is ln (wage))

Variable	Estimates of parameters γ_1 and β_1 from equation (3)		Estimates of parameters γ_2 and β_2 from equation (3)[a]		Means of variables *100 (means for the subset of displaced in parentheses)
Intercept	7.984	**	-.122	**	100
	(628.5)		(4.15)		(16.3)
Education					
Uncompleted elementary	-.145	**	-.026		13.7
	(16.67)		(1.08)		(1.8)
Elementary	-.087	**	-.031		19.7
	(10.87)		(1.62)		(4.1)
High school	.236	**	-.035		23
	(31.15)		(1.88)		(3.9)
University (2 years)	.459	**	-.050		6.6
	(38.59)		(1.68)		(1.0)
University (4 years)	.610	**	-.082	**	6.6
	(49.97)		(2.87)		(1.2)
Experience					
1 to 3 years experience	-.169	**	.054		10.9
	(12.53)		(1.48)		(0.8)
5 to 10 years experience	-.060	**	-.036		5.8
	(4.68)		(1.23)		(3.0)
10 to 15 years experience	.126	**	-.062		16.6
	(9.78)		(2.13)	*	(3.1)
15 to 20 years experience	.195	**	-.061		17.2
	(15.17)		(2.12)	*	(3.1)
20 to 25 years experience	.219	**	-.042		17.5
	(16.31)		(1.38)		(2.1)
25 to 30 years experience	.261	**	-.074	*	12.6
	(18.90)		(2.31)		(1.7)
30 to 35 years experience	.312	**	-.078	*	10.6
	(20.51)		(2.24)		(1.2)
35 years of experience and above	.330	**	--		6.7
	(15.47)				(0.0)
Ethnicity					
Non Slovene	-.029	**	.014		14.5
	(3.61)		(.75)		(3.4)
Gender					
Female	-.160	**	.032	*	47.5
	(27.78)		(2.25)		(6.9)

N = 33459

$R^2 = 0.32$

Notes: t-statistics in parentheses. Included in the equation are also industry and regional dummies, as well as their interactions with displacement dummy.

[a] These coefficients are attached to the variables in column 1 interacted with a dummy variable, D_t indicating whether the worker was displaced in 1991

 * Coefficient significant at 5 percent.** Coefficient significant at 1 percent.

Table 5: Postdisplacement Status and Reemployment Wages of Displaced Workers,
Slovenia and North America (percentages)

	Slovenia Jan. 1989-Aug. 1992	United States 1981-85	Canada 1981-85
Labor force status at the end of the period (a)			
Employed	33.14	66.9	63.0
Men	34.13	70.9	66.5
Women	31.55	59.6	55.1
Unemployed	50.13	17.8	20.0
Men	48.58	18.6	21.5
Women	51.99	16.2	16.5
Not in the labour force	16.72	15.3	17.1
Men	17.06	10.5	11.9
Women	16.14	24.1	28.4
For those re-employed weeks without work			
Less than 5 weeks	20.9	33.5	25.7 (b)
5 to 26 weeks	44.4	35.3	36.8 (c)
27 to 52 weeks	19.8	18.3	25.4
Over 52 weeks	14.9	12.9	12.2
Number of weeks without work (median)	13.0	12.5 (d)	--
Wage in the new job			
Lower than previous wage	31.4 (e)	44.0	55.7
About equal or higher	68.6 (e)	56.0	44.3
Wage growth of the median reemployed worker (- if reduction)	16.5	-5 to -15 (Hamermesh, 1989) -25 (Jacobson et al, 1993)	--

Sources: See table 3.

(a) August 1992, for Slovenia; January 1986, for the U.S. and Canada.

(b) Less than 4 weeks.

(c) 4 to 13 weeks.

(d) Period out of work, including non-participation in the labor force and unemployment.

(e) Applies to workers displaced during 1990 who were reemployed by 1991. The ratio between the wage rate in the new and the old job is corrected by the median wage growth of non-displaced workers over the same period.

(f) Applies to workers displaced during 1990 who were reemployed by 1991. Wage growth of the median worker is corrected by the wage growth of the median non-displaced worker over the same period.

Table 6: Probit equation (5) predicting probability of reemployment by the end of 1991, conditional on displacement in 1990

	Parameter estimate (t-values in parentheses)		Mean (Standard deviation in parentheses)
Years of experience	0.0031		15.51
	(0.32)		(8.93)
Years of experience squared	-0.00069	**	320.3
	(2.47)		315.3
Education			
Elementary education	-0.27	**	0.25
	(3.36)		(0.43)
Vocational education	-0.26	**	0.27
	(3.15)		(0.44)
Middle school education	-0.14		0.24
	(1.57)		(0.43)
University (2 years)	0.01		0.06
	(0.05)		(0.24)
University (4 years)	0.15		0.07
	(1.24)		(0.26)
Gender			
Female	0.08		0.43
	(1.74)		(0.49)
Ethnicity			
Non-Slovenian	0.11		0.21
	(1.85)		(0.41)
Logarithm of wage prior to displacement	0.15	*	7.69
	(1.99)		(0.42)
Dependents in the family			
Dummy = 1 if yes	-0.08		0.54
	(1.52)		(0.50)
Per capita farming land of the commune of permanent residence	-0.32	**	0.30
	(2.72)		(0.25)
Regional unemployment rate in 1990	-0.45	**	5.04
	(3.13)		(1.47)
Herfindahl index of commune industry concentration	-0.69	*	0.25
(based on 2-digit industry classification)	(2.42)		(0.12)
Industry of displacement dummy (excluded: manufacturing)			
Construction	-0.63	**	0.08
	(-5.37)		(0.27)
Trade	-1.00	**	0.01
	(-3.01)		(0.11)
Non-financial services	-0.64	**	0.06
	(-4.78)		(0.24)
F.I.R.E.	-0.04		0.07
	(-0.41)		(0.25)
Education	0.16		0.01
	(0.56)		(0.07)
Government	0.34	**	0.10
	(4.23)		(0.29)
Number of observations	5462		5462

$\chi^2(35) = 923.4$;   Pseudo $R^2 = .19$

 * Coefficient significant at 5 percent.

** Coefficient significant at 1 percent.

Table 7: Estimates of Log Earnings Growth for Reemployed Workers Displaced in 1990, using Equation (6)

Variable a)	With Selectivity Correction b)	Without Selectivity Correction	Mean and, in parentheses, standard deviation
Intercept	-.691 *	.131 *	1
	(2.53)	(2.29)	(0)
Experience (excluded group: 3 to 5 years of experience)			
Less than 3 years of experience	-.018	-.024	.076
	(0.31)	(.39)	(.266)
5 to10 years of experience	-.086	-.089	.072
	(1.55)	(1.75)	(.258)
10 to 15 years of experience	-.111 *	-.095	.213
	(1.96)	(1.83)	(.410)
15 to 20 years of experience	-.169 **	-.126 *	.199
	(2.80)	(2.44)	(.399)
20 to 25 years of experience	-.278 **	-.199 **	.198
	(4.19)	(3.56)	(.399)
25 to 30 years of experience	-.364 **	-.224 **	.127
	(4.22)	(3.61)	(.333)
30 to 35 years of experience	-.238 *	-.043	.029
	(2.25)	(.51)	(.167)
Education (excluded group: vocational education)			
Less than elementary education	.092	.003	.115
	(1.76)	(.07)	(.319)
Elementary education	-.026	-.027	.227
	(.70)	(.66)	(.419)
High school education	.033	-.027	.250
	(.78)	(.72)	(.433)
University (2 years)	.069	-.060	.077
	(.95)	(1.13)	(.267)
University (4 years)	.131	-.064	.122
	(1.58)	(1.39)	(.327)
Gender			
Female	.068 *	.038	.463
	(2.43)	(1.43)	(.499)
Ethnicity			
Non-Slovenian	.125 **	.075 *	.237
	(3.19)	(2.11)	(.425)
Interindustry mobility			
Reemployed in the same 2-digit industry	.120 **	.113 **	.626
	(3.12)	(3.01)	(.484)
Reemployed in the same 4-digit industry	-.125 **	-.128 **	.454
	(3.97)	(3.68)	(.498)
Selectivity correction			
Lambda c)	.500 **	--	1.383
	(2.97)		(.287)
R²	.179	.166	
Number of observations	904	904	904

*   Coefficient significant at 5 percent level.
**   Coefficient significant at 1 percent level.

Included in the equation but not reported are regional dummies, dummies for predisplacement 2-digit industries, and
a)   semi-annual dummies for the period in which reemployment occurred.
b)   Corrected for heterogeneity of residuals.
c)   Inverse Mill's ratio estimated from the probit equation of reemployment reported in Table 8.

ENDNOTES

[1] Vodopivec (1994) describes the Yugoslav tax and transfer system. Similar systems were practiced in other Central European economies. See, for example, Kornai and Matits (1987) on Hungary, and Schaffer (1990) on Poland.

[2] See Pleskovic and Sachs (1994) for a general overview of Slovenia's transition policies.

[3] Criteria for identifying redundant workers are spelled out in the general collective bargaining agreement of August 1990. They are (in order of priority): work quality (productivity), qualifications, work experience, seniority, health, and social factors (number of dependents, whether it might be possible for the individual to work on a farm or become self-employed, and whether the individual is an owner or part-owner of a mixed or private firm). Therefore, decisions on redundancy incorporate information on a worker's household and market opportunity costs outside the firm as well as worker performance in the firm.

[4] This last option has been dubbed "paid vacation," because redundant workers have typically not worked. Vodopivec and Hribar-Milic (1993) found that 82 percent of displaced workers received paid vacations and 12 percent received lump sum severances. Less than one percent received training and placement in another firm.

[5] The differences are due to data availability. The requirement that the Slovenian workers experience a spell of unemployment is to distinguish the displaced from quits that coincide with plant closings. The Slovenian data includes total work experience but not whether the experience was continuous in the three years layoff or plant closing.

[6] Note that if the worker and firm can renegotiate all contracts to take into account realizations of ε_F, ε_0, and ε_G, then the only separations that occur would be mutually optimal, and the distinction between quits and layoffs disappears (McLaughlin, 1991; Orazem et al. 2004). Empirically, the model would then yield identical predictions for quits and layoffs.

[7] A detailed description of the data set is given in Abraham and Vodopivec, 1993.

[8] These benefits included training, access to night classes, cofinancing of internships, employment subsidies, child care subsidies, priority in queues for renting or buying apartments, eligibility for child allowances and voluntary old-age insurance, and even a lower likelihood that a spouse will be laid off (redundancy decisions took into account whether or not there were other unemployed in the household).

[9] Brown et al. (2004) showed that foreign privatizations in Hungary, Romania, Russia, and Ukraine had a significant positive effect on employment and wages, and that workers have fared less well in domestic privatizations.

[10] Papers which use the DWS include Seitchik and Zornitsky (1989), and Swaim and Podgursky (1987).

[11] See, for example, Jacobson, LaLonde and Sullivan (1993a, b).

[12] For example, workers with 1 year of job tenure had a probability of displacement that was 2.23 percentage points higher than the baseline probability of displacement of 1.48 for an otherwise identical worker who had 3-5 years of job tenure.

[13] We replicated the analysis using the full sample but dropping measures of job tenure and the firm accounting information. None of our substantive conclusions regarding the other variables were changed.

[14] One can only speculate as to why construction workers would get wage increases prior to becoming displaced. One possibility is that with pending privatization, wages could have been raised artificially to force the enterprise into bankruptcy. Workers could then purchase the firm assets at recessed share prices.

[15] See Jacobsen et al. (1993a,b), and Neal (1995). Parent (2000) comes to similar conclusions based his estimates of worker returns to job tenure.

[16] An alternative specification in which the change in reference wage was moved to the right hand side, effectively removing the constraint that the coefficient on the reference wage is one, was also attempted. Parameter estimates were not sensitive to the change in specification.

[17] The most experienced workers also face great difficulty finding reemployment in the U.S. as well (Chan and Stevens, 2001).

[18] For expositional purposes, the excluded group was switched to those with less than elementary degrees to show that no significant differences in exit probability existed between the least educated displaced workers and displaced university educated workers.

[19] Topel (1991) placed the cost of displacement for workers with 20 years of tenure at 40 percent wage loss. Jacobson, LaLonde and Sullivan (1993) and Stevens (1997) found wage losses averaging 25 percent across experience groups. Hamermesh's (1987) estimates show average wage losses of 28 percent for displaced workers with 11-20 years of seniority. Kletzer and Fairlie (2003) found wage losses about half as large for a sample of younger workers.

[20] Swaim and Podgurski (1987) show in the context of a job search model that positive selection can be interpreted as reemployed workers receiving higher wage offers than those who do not reemploy.