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DEPARTMENT OF ECONOMICS

HAVE EMPLOYMENT RELATIONSHIPS IN THE UNITED STATES  
BECOME LESS STABLE?

BY

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## **Have Employment Relationships in the United States Become Less Stable?**

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## **Abstract**

### **Have Employment Relationships in the United States Become Less Stable?**

There has been considerable debate as to whether job stability has declined in the United States. This paper uses data from the Survey of Income and Program Participation (SIPP) to examine the incidence of labor market turnover between 1986 and 1993. Specifically, we calculate one- and two-year separation rates and then analyze turnover by the source of separation. We find that the incidence of job separations did not increase over the period under investigation, but appears to have declined somewhat. The only deviation from this overall trend occurs for workers between 56 and 65 years of age who experienced increased separation rates. When analyzing separations by reason, we find a decrease in voluntary inter-firm mobility from 1986 to 1992 with a slight upturn in 1993 and no clear pattern for involuntary separations. Therefore, we do not find conclusive evidence that employment relationships have become more unstable in the recent past.

**JEL Codes:** J60, J63.

**Keywords:** Employment Stability, Labor Turnover.

## **1. Introduction**

According to recent press reports, the stability of employment relationships in the U.S. has eroded considerably, especially for professional employees and for those working in large companies. In spite of the current expansionary period, reports of corporate downsizing and increased use of temporary workers suggest that stable employment relationships may be a thing of the past. Even the chairman of the Federal Reserve, Alan Greenspan, has invoked the perceived decline in employment stability as a possible explanation for the unlikely juxtaposition of tight labor markets and low inflation.

Despite the pessimism reflected in both media reports and public opinion polls, economic research to date has not been able to decisively document an erosion in employment stability. Data limitations and measurement problems impede empirical analysis of inter-firm mobility and as a result, there is little agreement concerning recent trends. For example, empirical research has relied on the use of synthetic cohorts, surveys with critical wording changes across years, lengthy recall periods, or panel data sets on select samples. Results from these studies are mixed, and are sensitive to corrections for differential response rates, issues of comparability across surveys, and potential recall bias.

In addition, few studies have been able to decompose turnover by the source of separation and in turn analyze the changes in these compositions over time. Declining stability and a heightened sense of insecurity among the workforce would be consistent with stable turnover rates if quit rates have decreased and the proportion of turnover initiated by layoffs and discharges has increased. Hence, breaking down job separations into its sources and measuring changes in these factors over time is necessary in evaluating recent trends and the validity of claims that the stability of employment has changed in the U.S. labor market.

In this paper, we analyze recent trends in the incidence and sources of labor market turnover with data particularly well-suited to studying changes in labor market dynamics. We use several panels of the Survey of Income and Program Participation (SIPP) to compare the incidence of labor market turnover between 1986 and 1993, a period for which previous research indicates potential declines in employment stability. The SIPP panels provide key employer identification codes that can be used to uncover the dissolution of employer-worker matches and to calculate separation probabilities that do not rely on synthetic cohorts. Moreover, the panels are large nationally representative surveys that have not experienced problematic wording changes over time and do not rely on lengthy recall periods for employment history questions. Most importantly, the SIPP provides information on the reason triggering separations and can be used to study temporal changes in voluntary and involuntary turnover.

We construct several measures of employment stability for the period 1986 to 1993. First, we calculate one- and two-year separation rates, defined as the probability of separating from a primary employer within one or two years of the initial month for which data is collected. Following Anderson and Meyer (1994), we further classify one-year separations as either permanent or temporary based on whether an individual that separates from their primary employer returns to the employer within twelve months. We find no evidence that overall separation rates have increased between 1986 and 1993. In fact, the data indicate a reduction in turnover over the period. When separations are classified by reason, we find a decrease in voluntary inter-firm mobility each year from 1990 to 1992 which is partly offset by an increase in 1993. Meanwhile, there appears to have been little change in involuntary mobility.

## 2. Review of Recent Research

The existing research on changes in employment stability has, broadly speaking, taken one of two approaches. The first approach uses changes over time in tenure distributions and retention rates (defined as the probability that a person with  $t$  years of tenure will remain with their employer for a stated amount of time) to make inferences about changes in employment stability. The results from these studies are mixed at best. Constructing synthetic cohorts from the same Current Population Survey (CPS) tenure supplements, Swinnerton and Wial (1995) and Diebold et. al. (1994, 1997) arrive at conflicting conclusions concerning changes in retention rates during the 1980s, with the former study finding evidence of decline in overall retention rates and the latter finding no changes overall and slight declines for young workers and for African-Americans. Diebold et. al. (1996) attribute these differences to the differential treatment of self-employed workers and the failure of Swinnerton and Wial to account for non-responses to the CPS tenure question. Moreover, in a study of changes in the tenure distribution, Farber (1995, 1997) finds that the prevalence of long-term jobs had not declined over the period from 1973 through 1993.

In work that extends the period of analysis into the 1990s, Neumark et al. (1997) find that overall retention rates declined modestly in the first half of the 1990s, while retention rates for high-tenure workers declined sharply and those of low-tenure workers increased. These results, however, are qualified by their sensitivity to the correction for wording changes in the tenure question across CPS samples. Studies using the Panel Study of Income Dynamics (PSID) by Rose (1995) and Marcotte (1997) show evidence of a decline in job stability. However using the same data, Diebold et al. (1997) and Polsky (1996) did not find such a decline. Both studies

attribute the decline found in earlier work to changes in the PSID variables used to measure job attachment.

The second approach looks directly at changes in the incidence and composition of workers that are displaced from their primary employers. Many of the worker-displacement studies find an increase in the incidence of firm-initiated separations. Using the CPS Displaced Worker Surveys, Farber (1993, 1996) finds that the incidence of involuntary job loss increase slightly in the 1990s compared to the 1980s. Much of this increase, however, is accounted for by an increase in respondents that answer that they were displaced for "some other reason", thus raising question concerning the source and nature of this observed change (Kletzer 1998). In an analysis of a sample from the PSID, Polsky (1996) and Boisjoly et al. (1997) find an increase in the proportion of separations that are involuntary, especially for older and higher-tenured workers. Using National Longitudinal Surveys, Monks and Pizer (1996) find an increase in the probability of job turnover during 1971 through 1990 that is accounted for by an increase in involuntary separations. In a study analyzing changes in the proportion of the unemployed that are permanently dismissed from previous job, however, Neumark and Polsky (1997) find no evidence of an increase in the incidence of overall involuntary separations.

The existing body of research suffers from several shortcomings which may, in part, be responsible for the apparent lack of consensus. First, data limitations caused by changes in question wording and survey design have made it difficult to compare stability measures over time. Moreover, conclusions concerning trends in stability are sensitive to corrections for these wording changes. Second, the existing research uses several alternative measures of employment stability, many relying on overall turnover or retention rates without regard to the causes of



turnover, and others focusing exclusively on the incidence of involuntary separations. Few studies have been able to compare overall changes in turnover and changes by reason within the same data set. Moreover, there is very little research on the co-movements of trends in voluntary and involuntary turnover. This is particularly important since declines in voluntary turnover coupled with increases in involuntary turnover may yield stable overall turnover rates. In addition, a less frequently mentioned shortcoming of existing research is the fact that the synthetic cohort studies are unable to control for observed personal characteristics since the cohort construction necessarily requires data aggregation. Below, we present results from a data source that directly addresses many of these shortcomings.

### **3. Data Description and Estimation Methodology**

The data for this project come from two sets of public release files put out by the Census Bureau that are compiled from the Survey of Income and Program Participation (SIPP). First, we use various years (from 1986 through 1993) of the SIPP Full Panel Research Files. The full panel files contain merged data from six to eight consecutive waves of interviews that are spaced four months apart. Within each wave, detailed demographic information and information concerning employment and participation in various public assistance programs are collected in each of the four months for a large sample of individuals. In addition, the full panels include panel weights that take into account sample attrition over the approximately two-and-a-half year periods. Second, we extract information from the individual wave files that are not included in the full panel. In particular, we extract variables giving the reasons for separating from an employer and a

union status variable from the individual files and then merge this information to that contained in the panels.

We identify job separation from a series of employer identification codes constructed from the interview control cards used by the SIPP surveyors. In the first-wave interview, the SIPP interviewers record the identity of the respondent's primary and secondary employers on an interview control card that is used in all subsequent interviews. Each employer is assigned a consecutively numbered employer identification value.<sup>1</sup> In subsequent interviews, if the respondent's primary or secondary employers match either the primary or secondary employers recorded in previous interviews, the employer identification variables will remain the same as the previously assigned values. When the worker changes employers, the new employer name is recorded on the control card and the next available employer identification number is assigned. If the worker is unemployed or has left the labor force, the employer identification code is set to zero. These employer identification codes are reported in the public-use files and are key to identifying employer-employee separations during the time period covered by the panel.

We define job separations relative to the respondent's primary employer as of the first month of the panel. If at any time between months 2 and 13 we find that neither of the primary or secondary employer identification codes match the employer identification code for the month-one primary employer, then we code the respondent as having separated from the primary employer within one year. Similarly, we code respondents as separating within two years if the

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<sup>1</sup>The survey question asking for the name of the employer for whom the worker worked during the 4 month period changed slightly after the 1986 panel. More specifically, the instructions for the interviewer in 1986 ask that the first employer id be assigned to the job with the most hours. In the more recent panels (1988-1993), the interviewer is not instructed which job should be entered first or second.

above condition holds for any of the months between month 2 and month 24<sup>2</sup>. For those respondents separating within one year, we further classify the separation as permanent or temporary based on whether the individual returns to the employer in the twelve months subsequent to the separation. The short lengths of the panels do not allow us to further classify the two-year separations as permanent and temporary.

We use the generated separation variables in two ways to analyze recent changes in the extent and incidence of turnover. First, we present nationally representative estimates of the various overall separations probabilities for each year by gender, race, educational attainment, age, and union status.<sup>3</sup> Next, we use simple linear-probability models to test for year-to-year changes in separation probabilities after controlling for possible shifts in the demographic composition of the workforce and cyclical variation in state unemployment rates.

After analyzing trends in overall separation probabilities, we turn to an analysis of the reasons behind separations. The reason-for-separating variable taken from the individual wave files codes separations as lay-offs, retirements, discharges, temporary jobs ending, quits to take another job, and quits for some other reason. We use this information to generate estimates of the composition of turnover by reason for the separations that occur within one year of the initial survey month. We restrict this analysis to one-year separations due to the fact that we can identify the permanency of the separation for these transitions only.

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<sup>2</sup>We define the two year separation rate over 23 months instead of 24 due to the constraint of the length of the 1986 and 1988 panels.

<sup>3</sup>We have also calculated separation rates over time and by reason for all years by industry and occupation. The separation rates are presented in the Appendix and the reasons for separation are available upon request.

We impose several restrictions on the samples drawn from the full panels. To begin, the sample is restricted to those individuals who completed interviews in all waves.<sup>4</sup> We further restrict the sample to civilian, non-family, wage and salary workers that are 18 to 65 years of age and are working full time (35 hours plus). These restrictions are quite standard and are meant to isolate that portion of the population that are prime age and have strong attachment to the labor force.

#### **4. Recent Trends in Overall Separation Rates**

Table 1 presents weighted one- and two-year separation rates for 1986, 1988, 1990, 1991, 1992, and 1993. The table provides calculations for workers overall and workers stratified by gender, race, education, age, and union status. We define separation rates relative to the workers primary job as of the beginning of the panel year. Before discussing changes in the separation rates over time, a brief discussion of the general patterns observed in all years is necessary.

Overall, approximately 20 percent of workers separate from their primary employers within one year while approximately 30 percent separate within two years. The one and two-year rates for women are larger than those for men in all years except for the 1992 one-year rates. While there are no consistent patterns by racial group, there are strong differences in turnover by education and age. Educational attainment has a strong negative association with both the one- and two-year separation rates, with an approximate 10 percentage point difference between the lowest education attainment group (less than 12 years) and the highest education group (16 years

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<sup>4</sup>If an individual is missed in one-wave, the employer identification code is set to zero even if the missing information is collected in subsequent waves. This restriction eliminates very few observations (approximately 150) in each panel.

plus) in all years for both separation rates. Separation rates consistently exhibit a strong U-shaped pattern across age groups with the highest figures for workers ages 18 to 25 (between .33 and .39 for the one-year rates and .46 and .53 for the two year rates), the lowest separation rates for workers ages 46 to 50 (.12 to .15 for the one-year rates and .18 to .23 for the two year rates), and rather high separation rates for workers 60 to 65 years of age (.23 to .34 for the one-year separation rates and .42 to .51 for the two-year rates). These patterns are consistent with previous research showing high turnover and job shopping early in one's work career (Topel & Ward 1992) and the high retirement rates for workers over sixty (Peracchi & Welch 1994). Finally, union workers are considerably less likely to separate from their employers than are non-union workers. This pattern is consistent with the argument that unions provide a voice for workers that is used to express dissatisfaction in lieu of the exit option (Freeman and Medoff 1984), and is also consistent with the existence of true union-wage effects (Card 1996, Hirsch and Schumaker 1998).

Turning to changes over time, both one- and two-year separation rates appear to have declined between 1986 and 1993 for most workers. Overall separation rates decline monotonically between 1986 and 1992 and then increase slightly between 1992 and 1993. Looking at the overall changes between 1986 and 1993, the one year separation rate declined by .031 (a change considerably larger than the standard errors for either year's estimate), while the two-year separation rates similarly declined by .036. Similar declines are observed for males, females, and whites, while separation rates for black workers increased slightly. With respect to educational attainment, there are slight but statistically insignificant increases in the one-year separation probabilities of workers that have not completed high school when comparing 1993 to

1986, while for all other educational attainment groups, the rates decline. Across age groups, there is some evidence that separation rates have increased for workers ages 56 to 65. The increases, however, are not monotonic over the period and vary considerably from year to year. Finally, there is pronounced drop in the separation rates for union and non-union workers, with a slightly larger decline for union workers.

Table 2 presents the one-year separations rates that are divided further into permanent and temporary separations. According to Table 2, the majority of separations in any given year is accounted for by permanent separations. The cross-group patterns observed for the one- and two-year rates are similar for both permanent and temporary separators. The temporal changes, however, are more pronounced for permanent separations. The table shows declines in permanent separations for most workers on the order of three percentage points, with slight increase for black workers and virtually no change for workers who have not completed high school. Again, the notable deviation from the general pattern occurs for workers 56 to 65 years of age, where there are considerable and statistically significant increases in the permanent one-year separation rates. For the most part, the proportion of workers that temporarily separate from their employers is stable over the period analyzed, with exceptions for workers over 55, where we observe significant declines in temporary separations.

While the patterns observed in Tables 1 and 2 provide little evidence of an upward trend in separation rates, compositional shifts in the workforce along variables listed in the tables may bias these results. For example, during the period analyzed the proportion of workers that are members of unions or that are covered by a collective bargaining contract declined. Since union members are less likely to separate from their employers, a decline in union density may mask an

even larger decrease in separation rates. On the other hand, to the extent that the overall workforce aged over the time period or if the mean education level increased, failure to account for such compositional shifts may mask a temporal increase in separation rates.

One advantage of using the SIPP panels to study changes in separation rates is the fact that one can test for significant changes in separation probabilities after controlling for observable personal characteristics. Table 3 presents linear probability regressions where the dependent variable is equal to one for individuals that separate from their employers and zero otherwise. We construct separation outcome dummies for overall one- and two-year separations and for permanent one-year separations. For each outcome, the table presents three specifications: (1) a baseline regression of the separation outcome on a complete set of year dummies omitting 1986, (2) a regression of the outcome on the year dummies and a set of standard demographic and human capital variables, and (3) a regression of the separation outcome on all variables in the second specification plus the unemployment rate in the year and state of residence of the respondent. The results from the first specification are directly comparable to the overall separation rates presented in Tables 1 and 2 while the results from the second specification provide estimates of temporal changes after accounting for compositional shifts in the work force. We include state unemployment rates in the final specification to isolate time trends net of any cyclical component of separation probabilities. State unemployment rates come from the Bureau of Labor Statistics (BLS) Geographic Profile of Employment and Unemployment. The BLS calculates these rates from the Current Population Survey. At the bottom of each column, we present F-statistics for tests of the joint significance of the year dummies.

In the specifications regressing the separation outcome on the year dummies only, the basic temporal pattern and magnitudes are similar across all three outcomes. The year dummy coefficients indicate that average separation rates are lower in all years relative to 1986, decrease monotonically between 1986 and 1992, and then increase slightly between 1992 and 1993. All of the year dummies are significant at one percent with the exception of 1988. Adding the demographic and human capital variables in the second specification does not fundamentally alter the basic pattern. For the two-year rates, the probability of separating decreases from 1988 to 1992 and then increases slightly between 1992 and 1993. The main difference from the specification not including the additional controls are smaller coefficients (less negative) and an insignificant effect in 1990 in addition to 1988. A similar pattern is observed in the second specification for the overall one-year separation model. For one-year permanent separations, the temporal pattern in the second specification strongly parallels that of the baseline regression. Here, however, the coefficients on the year dummies are quite close to those in the baseline regression and we still observe a significant difference for 1990. Finally, for all outcomes adding the state unemployment rate to the specification does not qualitatively alter the temporal patterns from that observed in the baselines regressions.

Concerning the demographic and human capital variables, the estimated effects are quite similar across outcomes and specifications. Age is a strong predictor for all of the separations probabilities with a strong negative coefficient on age and a strong and significant positive coefficient on age squared. A similar U-shaped pattern is observed for education. The coefficient estimates on the male dummy variables are negative though not significant in all specifications as are the coefficients on the dummy variable black. Married workers are



significantly less likely to separate than single workers and union workers are much less likely to separate than non-union workers, all else held equal. Finally, separation probabilities appear to be counter-cyclical, as is evident from the positive coefficients on the state unemployment rate. In all specifications, the unemployment rate is significant at one percent.

The regressions presented in Table 3 confirm the findings observed in the unadjusted estimates of separation rates presented in Tables 1 and 2. Over the period in question, we find little evidence of an increase in employment instability, measured in terms of overall separation rates. If there is any trend, it appears to be that the stability of worker-employer matches actually increased from 1986 to 1993. In our unadjusted calculations, however, we do observe increases in the separation probabilities of older workers (ages 56 to 65). To test the significance of these changes and their robustness to controlling for demographic and labor market variables, Table 4 presents regression results from models and specifications that parallel those presented in Table 3 where the sample is restricted to workers that are 56 to 65 years of age. While we do see significant increases in the various separation rates for older workers between 1986 and 1993, 1986 may be an outlier for this group of workers. If we restrict attention to the time period between 1988 and 1993, a pattern emerges that is similar to that observed in the estimation results using all workers. Generally speaking, separation probabilities decline from 1988 to 1992 and then increase between 1992 and 1993. This pattern is fairly consistent across outcomes and model specifications.

Hence, results from overall separation rates do not support the argument that employment has become more unstable in the recent past. Nonetheless, our aggregate measures of employment stability may be masking underlying shifts in the reasons for separation. For

example, if the probability of quitting has decreased and the probability of a layoff has increased, overall separation rates may either increase, stay constant, or decline. Hence, a more detailed analysis of the reasons that precipitate the dissolution of worker-employer matches is necessary in order to evaluate recent trends.

## **5. Separation Rates by Reason**

In addition to providing the employer identification codes necessary to detecting separations, the individual SIPP wave files (released separately from the full panel files) provide information on the reasons precipitating separations. In this section, we use data from the individual waves (appended to our data extracts from the full panel files) to present estimates of temporal changes in separations by reason. Possible reasons given for a separation include layoffs, retirements, discharges, temporary jobs ending, quits to take another job, and quits for some other reason. We apply the information contained in this additional variable towards two ends. First, we present estimates of changes over time in the probability of a given reason conditional on separating, as well as estimates of the unconditional probability of a separation occurring for one of the stated reasons. Second, we aggregate layoffs and discharges (involuntary separations) on the one hand, and quits to either take a job or for some other reason (voluntary separations) and test for changes over time after controlling for observable human capital and demographic characteristics and state/year-specific unemployment rates.

One shortcoming of the coding process for the reason-for-separation variable in the SIPP data is that the variable is coded only for workers that separate within waves. For workers that separate at the seams of the waves -- i.e., between the last and first months of consecutive waves -

- no information is collected. For the full panels used in this analysis, the explicit survey questions concerning whether or not a separation occurs and the associated reason for the separation misses nearly half of the separations that are indicated by changes in the employer identification codes.<sup>5</sup> Whether or not the information concerning the reason for a separation is useful depends on the extent to which the probability of being "seamed" is random. To account for any potential bias due to non-random seaming, we calculated alternative computations for the conditional separations rates by reason using sample weights that are adjusted for non-random seaming across observable demographic characteristics.<sup>6</sup> These results do not differ qualitatively from those using the unadjusted sample weights provided in the full panel files. Hence, here we simply present the unadjusted tabulations.<sup>7</sup> In addition, we further restrict the analysis to workers that

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<sup>5</sup>Seaming rates of approximately fifty percent are similar in magnitude to previous work conducted on job transitions using SIPP data. Ryscavage (1993) analyzes two different labor force variables ( (1) whether a worker held a wage or salary job and (2) labor force status) and found the percent of all transitions at the seam to be 54.9 percent and 40.2 percent, respectively, for the two variables in 1990. The proportions of separations that occur at the seams for the years in our study (1986, 1988, 1990, 1991, 1992, and 1993) are 44.0, 39.9, 43.2, 44.7, 48.1 and 45.3 percent.

<sup>6</sup>We compute the adjusted weights as follows. First, we estimate a probit equation where the dependent variable is equal to one if the person separates from their primary employer and is not seamed, is equal to zero if the person separates from their primary employer but is seamed, and is set to missing for all workers that do not separate. Our list of explanatory variables include age, age squared, and dummy variables for black, female and married. The estimated probit coefficients are then used to generate a probability of not-being seamed for each observation. Our adjusted sample weights take the reciprocal of this probability and then multiply it by the unadjusted sample weight.

<sup>7</sup>Calculations using the adjusted weights are available upon request.

separate permanently. Comparable calculations for overall one-year separation rates by reasons yield very similar results.<sup>8</sup>

Table 5 presents the distribution of separations by reason for all years conditional on separation and having a recorded reason. Before discussing changes over time, there are several interesting patterns across reasons and groups that deserve mention. For workers overall, the reasons most often given for a separation are “quit to take another job”, “quit for some other reason” and “laid off”. Defining workers that quit (for another job or other reason) as separating voluntarily, approximately 50 percent on average per year of workers who separate from their employers do so on their own initiative.

However, there are substantial differences in the internal composition of turnover across demographic groups. For example, over seventy percent of workers age 60 to 65 that separate from their primary employer report retiring, while the comparable figure is less than five percent for workers age 41 to 45. Meanwhile, around one quarter of workers between the ages of 26 to 30 report that they quit to take another job as their reason for separating from their employer. Layoffs and discharges account for a much smaller proportion of female separations than male separations while quitting for some other reason accounts for a relatively large proportion of female separations. In addition, black workers that separate from their employers are considerably less likely to have quit and more likely to have been laid off than white workers. The proportion of separations accounted for by layoffs and discharges is negatively associated with worker educational attainment while quitting is positively associated with education. Finally,

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<sup>8</sup>The distribution of overall separations by reason and temporary separations by reason are presented in the Appendix.

while there is no immediately discernable relationship between layoffs and age, older workers are less likely to quit than younger workers.

Concerning changes over time, while the proportion of separations accounted for by layoffs and quits varies with the business cycle (layoffs exhibit a counter cyclical pattern and quits a procyclical pattern) there does not appear to be a structural time trend in either category. While for some sub-groups listed in the table we do see something akin to an upward trend in the proportion of separations accounted for by layoffs (workers with 16+ years of schooling, workers ages 36 to 40, 56 to 60), within most of the defined categories there is little evidence of time trends. Similarly quit rates vary considerably from year to year for both quitting to take another job and quitting for other reasons, yet there is little evidence of a systematic decline in the proportion of separations accounted for by quits.

Since we only observe reasons for those observations that are not seamed, it is impossible to directly calculate unconditional quit and turnover rates for the sample. However, to the extent that seaming occurs randomly, one can calculate unconditional quit or layoff rates for any of the subgroups listed in the tables by simply multiplying the relevant figures in Table 5 by the corresponding separation rates in Table 2. These calculations permit one to detect changes in the composition of turnover over the 1986-1993 period and are presented in Table 6. The probability of being laid off fluctuated from year to year, but hovers around four percent from 1986 - 1993. Another employer-initiated reason for separation, being discharged or fired, also remained relatively stable around one percent over the period. Voluntary separations, however, defined as quitting to either take another job or for some other reason declined steadily between 1986 (.095) and 1992 (.064), but then increased in 1993 (.081). Hence, in both the conditional and

unconditional separations by reason we find little evidence of temporal changes in the composition of turnover that would indicate greater employment instability.

As a final test for changes over time, Table 7 presents linear probability models similar to those in Table 4, where the sample is restricted to observations where a permanent separation occurs and where we observe a reason for the separation. We estimate two sets of models: (1) models where the dependent variable indicates voluntary separations (equals one for workers that quit, zero otherwise), and (2) models where the dependent variables indicate involuntary separations (equals one if the worker is laid off or discharged and zero otherwise).<sup>9</sup> We present four specifications of each model: a regression on a full set of year dummies (omitting 1986), a regression on year dummies and the set of personal control variables, a regression with all previously mentioned variables plus state/year-specific unemployment rates, and a regression on the year dummies and the state unemployment rate only.

Starting with the voluntary turnover equations, in all specifications quitting accounts for a greater proportion of turnover in the low unemployment years of 1988 and 1990 and a lower proportion of turnover in the recession years of 1991 and 1992. Nonetheless, looking at the end point of the period studies, quitting accounts for a similar proportion of separation in 1993 and 1986, even after controlling for personal characteristics and state unemployment rates.

Concerning separations due to either layoffs or discharges, we see the near mirror image, with involuntary separations accounting for high proportions in recession years and low proportions in low-unemployment years. Again however, there are no statistically significant differences

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<sup>9</sup>Due to the seaming problem, we cannot estimate unconditional voluntary and voluntary separation models since we do not observe a reason for many of the observations where a separation takes place.

between the proportion of separations that are involuntary in 1986 and 1993. This result holds up across all specifications.

Concerning the coefficients on the other variables included in the specifications, the pattern strongly mirrors those found in Table 5. Quitting accounts for a lower proportion of separations for males relative to females while layoffs and discharges account for a higher proportion. Unionized and black workers are less likely to quit conditional on separating and are more likely to have been laid off. Finally, the state unemployment rate has a strong negative effect on voluntary mobility and a strong positive effect on involuntary mobility.

## **6. Conclusion**

Despite media reports and recent public opinion polls, we have been unable to find any evidence that employment relationships have become more unstable in the recent past. Looking at overall separation rates, we find that the propensity of workers to separate from their primary employers actually decreases between 1986 and 1993, with sizable decline from 1986 to 1992 and an increase that partially offsets this rise from 1992 to 1993. These results survive controls for basic demographic and human capital characteristics as well as controls for state/year specific unemployment rates. With respect to the changes in voluntary and involuntary separations, we find no increase in the proportion of separations accounted for by layoffs and discharges nor a decrease in the proportion of separations accounted for by quitting. In estimates of unconditional layoff and quit rates, we do observe some declines over the period in question for quits. The changes we do see, however, are small and do not support the hypothesis that the labor market has become less stable. While one may interpret the decline in the probability of quitting as a sign

of insecurity regarding outside job offers, it may also mean that workers are happier and more secure at their current jobs.

One final possible explanation that may be able to reconcile the divergence between our findings and popular sentiment would be if workers, in response to greater probability of layoff and discharge alter their behavior out of fear of job loss. For example, in response to a decrease in stability, workers may work longer hours, not ask for raises, and be careful not to shirk on the job. To the extent that this occurs, our measures of turnover may not capture such subtle changes in behavior.



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**Table 1**  
**Two-Year and One-Year Separation Probabilities**

Variables	Two-Year Separations						One-Year Separations					
	1986	1988	1990	1991	1992	1993	1986	1988	1990	1991	1992	1993
Unemployment Rate							7.0%	5.5%	5.5%	6.7%	7.4%	6.8%
All Workers	0.323 <i>0.006</i>	0.323 <i>0.005</i>	0.308 <i>0.004</i>	0.295 <i>0.005</i>	0.284 <i>0.004</i>	0.287 <i>0.004</i>	0.224 <i>0.005</i>	0.222 <i>0.005</i>	0.210 <i>0.003</i>	0.198 <i>0.004</i>	0.186 <i>0.003</i>	0.193 <i>0.004</i>
Sex												
Male	0.308 <i>0.007</i>	0.316 <i>0.007</i>	0.295 <i>0.005</i>	0.285 <i>0.006</i>	0.282 <i>0.005</i>	0.282 <i>0.005</i>	0.213 <i>0.006</i>	0.218 <i>0.006</i>	0.197 <i>0.005</i>	0.196 <i>0.005</i>	0.189 <i>0.005</i>	0.188 <i>0.005</i>
Female	0.345 <i>0.009</i>	0.334 <i>0.008</i>	0.324 <i>0.006</i>	0.309 <i>0.007</i>	0.286 <i>0.006</i>	0.293 <i>0.006</i>	0.239 <i>0.008</i>	0.228 <i>0.007</i>	0.226 <i>0.005</i>	0.200 <i>0.006</i>	0.183 <i>0.005</i>	0.199 <i>0.006</i>
Race												
White	0.329 <i>0.006</i>	0.325 <i>0.006</i>	0.306 <i>0.004</i>	0.297 <i>0.005</i>	0.286 <i>0.004</i>	0.289 <i>0.004</i>	0.227 <i>0.005</i>	0.224 <i>0.005</i>	0.206 <i>0.004</i>	0.198 <i>0.044</i>	0.186 <i>0.004</i>	0.194 <i>0.004</i>
Black	0.266 <i>0.019</i>	0.310 <i>0.018</i>	0.326 <i>0.012</i>	0.273 <i>0.015</i>	0.284 <i>0.013</i>	0.287 <i>0.014</i>	0.186 <i>0.017</i>	0.205 <i>0.016</i>	0.240 <i>0.011</i>	0.196 <i>0.014</i>	0.202 <i>0.012</i>	0.197 <i>0.013</i>
Educational Attainment												
<12	0.389 <i>0.015</i>	0.380 <i>0.015</i>	0.385 <i>0.012</i>	0.382 <i>0.015</i>	0.381 <i>0.013</i>	0.387 <i>0.014</i>	0.278 <i>0.014</i>	0.264 <i>0.013</i>	0.280 <i>0.011</i>	0.275 <i>0.014</i>	0.261 <i>0.012</i>	0.283 <i>0.012</i>
12 Years	0.326 <i>0.009</i>	0.326 <i>0.008</i>	0.316 <i>0.006</i>	0.297 <i>0.007</i>	0.282 <i>0.006</i>	0.296 <i>0.007</i>	0.230 <i>0.008</i>	0.231 <i>0.007</i>	0.218 <i>0.006</i>	0.200 <i>0.007</i>	0.189 <i>0.006</i>	0.201 <i>0.006</i>
13-15 Years	0.322 <i>0.012</i>	0.321 <i>0.011</i>	0.313 <i>0.008</i>	0.303 <i>0.010</i>	0.287 <i>0.008</i>	0.279 <i>0.009</i>	0.223 <i>0.011</i>	0.217 <i>0.010</i>	0.211 <i>0.007</i>	0.195 <i>0.008</i>	0.192 <i>0.007</i>	0.183 <i>0.007</i>
16+ Years	0.277 <i>0.011</i>	0.288 <i>0.010</i>	0.250 <i>0.007</i>	0.247 <i>0.008</i>	0.242 <i>0.007</i>	0.237 <i>0.007</i>	0.179 <i>0.009</i>	0.188 <i>0.009</i>	0.159 <i>0.006</i>	0.161 <i>0.007</i>	0.144 <i>0.006</i>	0.149 <i>0.006</i>
Age												
18-25	0.518 <i>0.015</i>	0.533 <i>0.014</i>	0.503 <i>0.011</i>	0.459 <i>0.014</i>	0.490 <i>0.013</i>	0.488 <i>0.014</i>	0.393 <i>0.014</i>	0.382 <i>0.014</i>	0.371 <i>0.011</i>	0.334 <i>0.014</i>	0.347 <i>0.012</i>	0.362 <i>0.013</i>
26-30	0.355 <i>0.014</i>	0.355 <i>0.013</i>	0.359 <i>0.010</i>	0.365 <i>0.012</i>	0.333 <i>0.011</i>	0.350 <i>0.012</i>	0.256 <i>0.013</i>	0.241 <i>0.012</i>	0.249 <i>0.009</i>	0.237 <i>0.011</i>	0.217 <i>0.010</i>	0.239 <i>0.010</i>
31-35	0.298 <i>0.014</i>	0.290 <i>0.013</i>	0.291 <i>0.010</i>	0.277 <i>0.011</i>	0.265 <i>0.009</i>	0.254 <i>0.010</i>	0.210 <i>0.012</i>	0.197 <i>0.011</i>	0.201 <i>0.009</i>	0.194 <i>0.010</i>	0.173 <i>0.008</i>	0.163 <i>0.008</i>
36-40	0.237 <i>0.013</i>	0.274 <i>0.013</i>	0.236 <i>0.009</i>	0.235 <i>0.011</i>	0.207 <i>0.009</i>	0.228 <i>0.009</i>	0.154 <i>0.011</i>	0.191 <i>0.011</i>	0.156 <i>0.008</i>	0.155 <i>0.009</i>	0.139 <i>0.008</i>	0.148 <i>0.008</i>
41-45	0.231 <i>0.015</i>	0.226 <i>0.014</i>	0.209 <i>0.010</i>	0.221 <i>0.011</i>	0.200 <i>0.009</i>	0.214 <i>0.010</i>	0.152 <i>0.013</i>	0.159 <i>0.012</i>	0.135 <i>0.008</i>	0.140 <i>0.009</i>	0.128 <i>0.008</i>	0.136 <i>0.008</i>
46-50	0.230 <i>0.017</i>	0.179 <i>0.014</i>	0.200 <i>0.011</i>	0.202 <i>0.013</i>	0.205 <i>0.011</i>	0.184 <i>0.011</i>	0.148 <i>0.014</i>	0.123 <i>0.012</i>	0.123 <i>0.009</i>	0.127 <i>0.011</i>	0.127 <i>0.009</i>	0.124 <i>0.009</i>
51-55	0.256 <i>0.019</i>	0.211 <i>0.017</i>	0.234 <i>0.013</i>	0.207 <i>0.015</i>	0.240 <i>0.014</i>	0.213 <i>0.013</i>	0.152 <i>0.015</i>	0.134 <i>0.014</i>	0.141 <i>0.011</i>	0.138 <i>0.012</i>	0.156 <i>0.011</i>	0.127 <i>0.010</i>
56-60	0.245 <i>0.020</i>	0.274 <i>0.021</i>	0.277 <i>0.016</i>	0.252 <i>0.019</i>	0.248 <i>0.016</i>	0.291 <i>0.017</i>	0.136 <i>0.016</i>	0.152 <i>0.017</i>	0.168 <i>0.014</i>	0.154 <i>0.016</i>	0.138 <i>0.013</i>	0.183 <i>0.015</i>
60-65	0.484 <i>0.034</i>	0.507 <i>0.032</i>	0.468 <i>0.027</i>	0.469 <i>0.032</i>	0.421 <i>0.026</i>	0.488 <i>0.029</i>	0.299 <i>0.031</i>	0.336 <i>0.030</i>	0.309 <i>0.025</i>	0.276 <i>0.028</i>	0.229 <i>0.022</i>	0.320 <i>0.027</i>
Union Status												
Nonunion	0.350 <i>0.006</i>	0.354 <i>0.006</i>	0.336 <i>0.004</i>	0.319 <i>0.005</i>	0.305 <i>0.005</i>	0.312 <i>0.005</i>	0.244 <i>0.006</i>	0.242 <i>0.005</i>	0.231 <i>0.004</i>	0.213 <i>0.005</i>	0.201 <i>0.004</i>	0.211 <i>0.004</i>
Union	0.226 <i>0.011</i>	0.207 <i>0.010</i>	0.190 <i>0.008</i>	0.194 <i>0.009</i>	0.192 <i>0.008</i>	0.178 <i>0.008</i>	0.151 <i>0.009</i>	0.146 <i>0.009</i>	0.122 <i>0.006</i>	0.133 <i>0.008</i>	0.122 <i>0.007</i>	0.115 <i>0.007</i>

Standard errors are reported in italics.

Separation rates are computed for FULL-TIME workers only.

PPMIS1-25=1 for 1990, 1991, 1992 and 1993, PPMIS1-24=1 for 1986 and 1988.



**Table 3**  
**Linear Probability Estimates of the Probability of Two-year Separations,**  
**One-Year Separations, and One-Year Permanent Separations**

Variable	Dependent Variable								
	Two-Year Separations 1=job separation within two years 0=same employer for two years			One-Year Separations 1=job separation within one year 0=same employer for one year			One-Year Permanent Separations 1=job separation within one year and do not return in next 12 months 0=do not permanently separate		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intercept	0.323 <i>0.005</i>	1.537 <i>0.032</i>	1.495 <i>0.034</i>	0.224 <i>0.004</i>	1.142 <i>0.028</i>	1.113 <i>0.030</i>	0.175 <i>0.004</i>	0.802 <i>0.025</i>	0.783 <i>0.027</i>
1988	-0.0001 <i>0.006</i>	-0.0004 <i>0.006</i>	0.008 <i>0.006</i>	-0.002 <i>0.006</i>	-0.002 <i>0.006</i>	0.004 <i>0.006</i>	-0.001 <i>0.005</i>	-0.001 <i>0.005</i>	0.002 <i>0.005</i>
1990	-0.015 <i>0.006</i>	-0.009 <i>0.006</i>	-0.0009 <i>0.006</i>	-0.014 <i>0.006</i>	-0.009 <i>0.005</i>	-0.003 <i>0.006</i>	-0.028 <i>0.005</i>	-0.025 <i>0.005</i>	-0.021 <i>0.005</i>
1991	-0.028 <i>0.006</i>	-0.019 <i>0.006</i>	-0.018 <i>0.006</i>	-0.026 <i>0.006</i>	-0.019 <i>0.005</i>	-0.018 <i>0.005</i>	-0.037 <i>0.005</i>	-0.033 <i>0.005</i>	-0.032 <i>0.005</i>
1992	-0.040 <i>0.006</i>	-0.027 <i>0.006</i>	-0.029 <i>0.006</i>	-0.038 <i>0.006</i>	-0.028 <i>0.005</i>	-0.029 <i>0.006</i>	-0.038 <i>0.005</i>	-0.031 <i>0.005</i>	-0.032 <i>0.005</i>
1993	-0.037 <i>0.006</i>	-0.021 <i>0.006</i>	-0.020 <i>0.006</i>	-0.031 <i>0.006</i>	-0.019 <i>0.005</i>	-0.018 <i>0.005</i>	-0.028 <i>0.005</i>	-0.020 <i>0.005</i>	-0.019 <i>0.005</i>
age		-0.049 <i>0.001</i>	-0.049 <i>0.001</i>		-0.036 <i>0.001</i>	-0.036 <i>0.001</i>		-0.028 <i>0.001</i>	-0.028 <i>0.001</i>
age <sup>2</sup>		0.001 <i>0.00001</i>	0.001 <i>0.00001</i>		0.0004 <i>0.00001</i>	0.0004 <i>0.00001</i>		0.0003 <i>0.00001</i>	0.0003 <i>0.00001</i>
highest grade		-0.019 <i>0.004</i>	-0.019 <i>0.004</i>		-0.015 <i>0.003</i>	-0.014 <i>0.003</i>		-0.0005 <i>0.0029</i>	-0.0002 <i>0.003</i>
highest grade <sup>2</sup>		0.0003 <i>0.0001</i>	0.0003 <i>0.0001</i>		0.0002 <i>0.0001</i>	0.0002 <i>0.0001</i>		-0.0002 <i>0.0001</i>	-0.0002 <i>0.0001</i>
male		-0.008 <i>0.004</i>	-0.008 <i>0.004</i>		-0.003 <i>0.003</i>	-0.003 <i>0.003</i>		-0.002 <i>0.003</i>	-0.002 <i>0.003</i>
union		-0.099 <i>0.005</i>	-0.100 <i>0.005</i>		-0.067 <i>0.004</i>	-0.067 <i>0.004</i>		-0.062 <i>0.004</i>	-0.062 <i>0.004</i>
black		-0.011 <i>0.006</i>	-0.011 <i>0.006</i>		-0.001 <i>0.005</i>	-0.002 <i>0.005</i>		-0.004 <i>0.005</i>	-0.004 <i>0.005</i>
married		-0.025 <i>0.004</i>	-0.026 <i>0.004</i>		-0.023 <i>0.003</i>	-0.023 <i>0.003</i>		-0.017 <i>0.003</i>	-0.017 <i>0.003</i>
state UR			0.549 <i>0.127</i>			0.381 <i>0.113</i>			0.258 <i>0.101</i>
R <sup>2</sup>	0.001	0.064	0.064	0.001	0.051	0.051	0.002	0.037	0.037
F-value*	15.47	6.77	9.53	16.15	7.98	9.95	23.99	17.25	18.38
N	63,334	63,334	63,334	63,334	63,334	63,334	63,334	63,334	63,334

Standard errors are reported in italics.

\* F-value tests joint significance of year dummies in all regressions.

**Table 4**  
**Linear Probability Estimates of the Probability of Two-year Separations,**  
**One-Year Separations, and One-Year Permanent Separations**  
**for Workers Older than 55**

Variable	Dependent Variable								
	Two-Year Separations 1=job separation within two years 0=same employer for two years			One-Year Separations 1=job separation within one year 0=same employer for one year			One-Year Permanent Separations 1=job separation with one year and do not return in next 12 months 0=do not permanently separate		
	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Intercept	0.325 <i>0.015</i>	6.406 <i>3.478</i>	6.383 <i>3.474</i>	0.190 <i>0.013</i>	8.921 <i>2.987</i>	8.898 <i>2.981</i>	0.145 <i>0.012</i>	7.246 <i>2.753</i>	7.227 <i>2.748</i>
1988	0.029 <i>0.022</i>	0.018 <i>0.021</i>	0.045 <i>0.022</i>	0.024 <i>0.018</i>	0.016 <i>0.018</i>	0.043 <i>0.019</i>	0.033 <i>0.017</i>	0.027 <i>0.017</i>	0.050 <i>0.017</i>
1990	0.011 <i>0.022</i>	0.009 <i>0.021</i>	0.035 <i>0.022</i>	0.021 <i>0.019</i>	0.021 <i>0.018</i>	0.046 <i>0.019</i>	0.023 <i>0.017</i>	0.021 <i>0.017</i>	0.043 <i>0.018</i>
1991	-0.0001 <i>0.022</i>	-0.001 <i>0.022</i>	0.002 <i>0.021</i>	0.004 <i>0.019</i>	0.005 <i>0.018</i>	0.007 <i>0.018</i>	0.013 <i>0.017</i>	0.013 <i>0.017</i>	0.016 <i>0.017</i>
1992	-0.022 <i>0.022</i>	-0.017 <i>0.021</i>	-0.027 <i>0.021</i>	-0.024 <i>0.019</i>	-0.020 <i>0.018</i>	-0.030 <i>0.018</i>	-0.011 <i>0.017</i>	-0.009 <i>0.017</i>	-0.017 <i>0.017</i>
1993	0.027 <i>0.022</i>	0.036 <i>0.022</i>	0.039 <i>0.022</i>	0.034 <i>0.019</i>	0.041 <i>0.019</i>	0.043 <i>0.019</i>	0.050 <i>0.017</i>	0.054 <i>0.017</i>	0.056 <i>0.017</i>
age		-0.242 <i>0.116</i>	-0.246 <i>0.116</i>		-0.316 <i>0.100</i>	-0.319 <i>0.100</i>		-0.264 <i>0.092</i>	-0.267 <i>0.092</i>
age <sup>2</sup>		0.002 <i>0.001</i>	0.002 <i>0.001</i>		0.003 <i>0.001</i>	0.003 <i>0.001</i>		0.002 <i>0.001</i>	0.002 <i>0.001</i>
highest grade		0.002 <i>0.009</i>	0.003 <i>0.009</i>		0.002 <i>0.008</i>	0.003 <i>0.008</i>		0.019 <i>0.008</i>	0.019 <i>0.007</i>
highest grade <sup>2</sup>		-0.0004 <i>0.0004</i>	-0.0005 <i>0.0004</i>		-0.0004 <i>0.0003</i>	-0.0004 <i>0.0003</i>		-0.0009 <i>0.0003</i>	-0.0009 <i>0.0003</i>
male		0.038 <i>0.014</i>	0.038 <i>0.014</i>		0.032 <i>0.012</i>	0.032 <i>0.012</i>		0.035 <i>0.011</i>	0.035 <i>0.011</i>
union		0.017 <i>0.014</i>	0.014 <i>0.014</i>		0.013 <i>0.012</i>	0.010 <i>0.012</i>		0.020 <i>0.011</i>	0.017 <i>0.011</i>
black		-0.045 <i>0.022</i>	-0.045 <i>0.022</i>		-0.027 <i>0.019</i>	-0.027 <i>0.019</i>		-0.016 <i>0.017</i>	-0.017 <i>0.017</i>
married		0.003 <i>0.015</i>	0.003 <i>0.015</i>		0.004 <i>0.013</i>	0.004 <i>0.013</i>		0.003 <i>0.012</i>	0.003 <i>0.012</i>
state UR			1.775 <i>0.448</i>			1.754 <i>0.385</i>			1.475 <i>0.355</i>
R <sup>2</sup>	0.001	0.056	0.058	0.002	0.034	0.038	0.003	0.034	0.037
F-value*	1.45	1.36	2.82	2.42	2.39	4.58	3.21	3.25	5.14
N	5,342	5,342	5,342	5,342	5,342	5,342	5,342	5,342	5,342

Standard errors reported in italics.

\* F-value tests joint significance of year dummies in all regressions.







**Table 7**  
**Linear Probability Estimates of the Probability of Quitting or Involuntary Separation**  
(Conditional on Permanent Separation and Providing a Reason)

Variable	Dependent Variable							
	Voluntary Separation (Quit)				Involuntary Separation (Layoff or Discharged)			
	1=if give reason for separation as quit 0=if give some other reason for separation				1=if give reason as laid off or discharged 0=if give some other reason for separation			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	0.549 <i>0.017</i>	0.621 <i>0.116</i>	0.836 <i>0.120</i>	0.806 <i>0.038</i>	0.324 <i>0.016</i>	-0.416 <i>0.114</i>	-0.646 <i>0.118</i>	0.089 <i>0.036</i>
1988	0.081 <i>0.023</i>	0.088 <i>0.021</i>	0.043 <i>0.022</i>	0.024 <i>0.024</i>	-0.079 <i>0.021</i>	-0.080 <i>0.021</i>	-0.031 <i>0.022</i>	-0.027 <i>0.023</i>
1990	0.012 <i>0.024</i>	0.014 <i>0.022</i>	-0.032 <i>0.023</i>	-0.046 <i>0.025</i>	0.005 <i>0.022</i>	0.006 <i>0.022</i>	0.054 <i>0.023</i>	0.058 <i>0.023</i>
1991	-0.065 <i>0.024</i>	-0.055 <i>0.023</i>	-0.067 <i>0.023</i>	-0.080 <i>0.024</i>	0.084 <i>0.023</i>	0.077 <i>0.022</i>	0.089 <i>0.022</i>	0.097 <i>0.023</i>
1992	-0.080 <i>0.025</i>	-0.061 <i>0.023</i>	-0.052 <i>0.023</i>	-0.069 <i>0.025</i>	0.065 <i>0.024</i>	0.054 <i>0.023</i>	0.045 <i>0.023</i>	0.055 <i>0.024</i>
1993	0.001 <i>0.024</i>	0.019 <i>0.023</i>	0.009 <i>0.022</i>	-0.012 <i>0.024</i>	0.008 <i>0.023</i>	-0.001 <i>0.022</i>	0.010 <i>0.022</i>	0.020 <i>0.023</i>
age		0.001 <i>0.004</i>	0.001 <i>0.004</i>			0.046 <i>0.004</i>	0.046 <i>0.003</i>	
age <sup>2</sup>		-0.0002 <i>0.00004</i>	-0.0002 <i>0.00004</i>			-0.001 <i>0.00004</i>	-0.001 <i>0.00004</i>	
highest grade		-0.00001 <i>0.015</i>	-0.002 <i>0.015</i>			0.011 <i>0.014</i>	0.013 <i>0.014</i>	
highest grade <sup>2</sup>		0.0009 <i>0.0006</i>	0.0009 <i>0.0006</i>			-0.002 <i>0.0006</i>	-0.002 <i>0.0006</i>	
male		-0.132 <i>0.013</i>	-0.129 <i>0.013</i>			0.118 <i>0.013</i>	0.116 <i>0.013</i>	
union		-0.156 <i>0.013</i>	-0.155 <i>0.021</i>			0.087 <i>0.020</i>	0.086 <i>0.020</i>	
black		-0.125 <i>0.023</i>	-0.122 <i>0.023</i>			0.075 <i>0.022</i>	0.072 <i>0.022</i>	
married		0.065 <i>0.014</i>	0.066 <i>0.014</i>			-0.084 <i>0.014</i>	-0.085 <i>0.014</i>	
state UR			-2.877 <i>0.454</i>	-3.646 <i>0.489</i>			3.071 <i>0.447</i>	3.335 <i>0.463</i>
R <sup>2</sup>	0.012	0.155	0.162	0.023	0.013	0.086	0.095	0.023
F-value	11.94	12.57	6.82	5.75	13.35	12.81	8.02	8.02
N	5,040	5,040	5,040	5,040	5,040	5,040	5,040	5,040

Standard errors reported in italics.

\* F-value tests joint significance of year dummies in all regressions.

**Appendix - Table 1**  
**Two-Year and One-Year Separation Probabilities by One-Digit**  
**Industry and Occupation Codes**

Variables	Two-Year Separations						One-Year Separations					
	1986	1988	1990	1991	1992	1993	1986	1988	1990	1991	1992	1993
All Workers	0.323	0.323	0.308	0.295	0.284	0.287	0.224	0.222	0.210	0.198	0.186	0.193
	<i>0.006</i>	<i>0.005</i>	<i>0.004</i>	<i>0.005</i>	<i>0.004</i>	<i>0.004</i>	<i>0.005</i>	<i>0.005</i>	<i>0.003</i>	<i>0.004</i>	<i>0.003</i>	<i>0.004</i>
Industry												
Agriculture	0.443	0.430	0.496	0.480	0.427	0.436	0.367	0.353	0.400	0.343	0.308	0.287
							<i>0.040</i>	<i>0.043</i>	<i>0.037</i>	<i>0.054</i>	<i>0.037</i>	<i>0.041</i>
Mining	0.434	0.331	0.165	0.248	0.307	0.236	0.354	0.303	0.083	0.202	0.144	0.172
							<i>0.057</i>	<i>0.057</i>	<i>0.028</i>	<i>0.005</i>	<i>0.034</i>	<i>0.038</i>
Construction	0.479	0.515	0.479	0.479	0.451	0.457	0.351	0.364	0.353	0.346	0.336	0.332
							<i>0.024</i>	<i>0.022</i>	<i>0.017</i>	<i>0.021</i>	<i>0.019</i>	<i>0.019</i>
Manufacturing	0.301	0.259	0.269	0.249	0.247	0.245	0.207	0.165	0.171	0.166	0.158	0.166
							<i>0.009</i>	<i>0.008</i>	<i>0.007</i>	<i>0.008</i>	<i>0.007</i>	<i>0.007</i>
Trans./Comm.	0.200	0.253	0.211	0.224	0.185	0.238	0.131	0.178	0.149	0.160	0.119	0.146
							<i>0.014</i>	<i>0.015</i>	<i>0.010</i>	<i>0.013</i>	<i>0.010</i>	<i>0.012</i>
Wholesale Trade	0.364	0.369	0.322	0.309	0.276	0.295	0.222	0.234	0.198	0.194	0.185	0.202
							<i>0.023</i>	<i>0.022</i>	<i>0.016</i>	<i>0.019</i>	<i>0.016</i>	<i>0.016</i>
Retail Trade	0.432	0.446	0.403	0.394	0.386	0.404	0.311	0.327	0.290	0.264	0.261	0.281
							<i>0.016</i>	<i>0.015</i>	<i>0.011</i>	<i>0.013</i>	<i>0.011</i>	<i>0.012</i>
FIRE	0.325	0.317	0.308	0.319	0.286	0.263	0.199	0.210	0.196	0.204	0.165	0.166
							<i>0.018</i>	<i>0.017</i>	<i>0.013</i>	<i>0.016</i>	<i>0.012</i>	<i>0.013</i>
Services	0.321	0.319	0.324	0.293	0.290	0.287	0.225	0.216	0.224	0.193	0.191	0.190
							<i>0.009</i>	<i>0.009</i>	<i>0.006</i>	<i>0.007</i>	<i>0.006</i>	<i>0.006</i>
Public Sector	0.124	0.208	0.155	0.148	0.151	0.146	0.069	0.148	0.095	0.094	0.087	0.093
							<i>0.013</i>	<i>0.016</i>	<i>0.010</i>	<i>0.012</i>	<i>0.010</i>	<i>0.009</i>
Occupation												
Managerial	0.266	0.262	0.260	0.249	0.242	0.237	0.164	0.168	0.166	0.163	0.143	0.150
Sales and Admin.	0.326	0.344	0.306	0.300	0.280	0.277	0.227	0.238	0.208	0.192	0.177	0.184
Service	0.367	0.364	0.363	0.329	0.327	0.319	0.264	0.265	0.260	0.229	0.237	0.221
Farming/Forestry	0.395	0.386	0.463	0.428	0.395	0.454	0.305	0.315	0.353	0.298	0.286	0.297
Precision Craft	0.338	0.355	0.302	0.314	0.305	0.333	0.234	0.237	0.201	0.205	0.213	0.218
Operators	0.363	0.331	0.347	0.324	0.316	0.319	0.269	0.235	0.249	0.236	0.222	0.231

**Appendix - Table 2**  
**One-Year Separation Probabilities for All, Permanent, and Temporary Separations**  
**by One-Digit Industry and Occupation Codes**

Variables	All Separations						Permanent Separations						Temporary Separations					
	1986	1988	1990	1991	1992	1993	1986	1988	1990	1991	1992	1993	1986	1988	1990	1991	1992	1993
All Workers	0.224	0.222	0.210	0.198	0.186	0.193	0.174	0.174	0.146	0.138	0.137	0.147	0.049	0.049	0.063	0.060	0.049	0.046
	<i>0.005</i>	<i>0.005</i>	<i>0.003</i>	<i>0.004</i>	<i>0.003</i>	<i>0.004</i>	<i>0.004</i>	<i>0.004</i>	<i>0.003</i>	<i>0.004</i>	<i>0.003</i>	<i>0.003</i>	<i>0.003</i>	<i>0.002</i>	<i>0.002</i>	<i>0.002</i>	<i>0.002</i>	<i>0.002</i>
Industry																		
Agriculture	0.367	0.353	0.400	0.343	0.308	0.287	0.259	0.282	0.279	0.155	0.155	0.215	0.108	0.071	0.121	0.188	0.153	0.071
	<i>0.040</i>	<i>0.043</i>	<i>0.037</i>	<i>0.054</i>	<i>0.037</i>	<i>0.041</i>	<i>0.036</i>	<i>0.040</i>	<i>0.034</i>	<i>0.033</i>	<i>0.029</i>	<i>0.037</i>	<i>0.026</i>	<i>0.023</i>	<i>0.025</i>	<i>0.036</i>	<i>0.029</i>	<i>0.023</i>
Mining	0.354	0.303	0.083	0.202	0.144	0.172	0.298	0.217	0.071	0.115	0.127	0.120	0.056	0.087	0.012	0.087	0.016	0.052
	<i>0.057</i>	<i>0.057</i>	<i>0.028</i>	<i>0.005</i>	<i>0.034</i>	<i>0.038</i>	<i>0.054</i>	<i>0.051</i>	<i>0.026</i>	<i>0.038</i>	<i>0.032</i>	<i>0.032</i>	<i>0.027</i>	<i>0.035</i>	<i>0.011</i>	<i>0.034</i>	<i>0.012</i>	<i>0.022</i>
Construction	0.351	0.364	0.353	0.346	0.336	0.332	0.250	0.270	0.243	0.209	0.212	0.223	0.101	0.094	0.110	0.137	0.125	0.109
	<i>0.024</i>	<i>0.022</i>	<i>0.017</i>	<i>0.021</i>	<i>0.019</i>	<i>0.019</i>	<i>0.022</i>	<i>0.020</i>	<i>0.016</i>	<i>0.018</i>	<i>0.016</i>	<i>0.017</i>	<i>0.015</i>	<i>0.013</i>	<i>0.011</i>	<i>0.015</i>	<i>0.013</i>	<i>0.013</i>
Manufacturing	0.207	0.165	0.171	0.166	0.158	0.166	0.159	0.133	0.112	0.111	0.118	0.124	0.047	0.032	0.059	0.054	0.040	0.042
	<i>0.009</i>	<i>0.008</i>	<i>0.007</i>	<i>0.008</i>	<i>0.007</i>	<i>0.007</i>	<i>0.008</i>	<i>0.008</i>	<i>0.005</i>	<i>0.007</i>	<i>0.006</i>	<i>0.006</i>	<i>0.005</i>	<i>0.004</i>	<i>0.004</i>	<i>0.005</i>	<i>0.004</i>	<i>0.004</i>
Trans./Comm.	0.131	0.178	0.149	0.160	0.119	0.146	0.107	0.139	0.102	0.116	0.078	0.109	0.024	0.040	0.047	0.044	0.041	0.037
	<i>0.014</i>	<i>0.015</i>	<i>0.010</i>	<i>0.013</i>	<i>0.010</i>	<i>0.012</i>	<i>0.013</i>	<i>0.014</i>	<i>0.009</i>	<i>0.011</i>	<i>0.008</i>	<i>0.011</i>	<i>0.007</i>	<i>0.008</i>	<i>0.006</i>	<i>0.007</i>	<i>0.006</i>	<i>0.006</i>
Wholesale Trade	0.222	0.234	0.198	0.194	0.185	0.202	0.171	0.191	0.146	0.112	0.126	0.151	0.051	0.043	0.052	0.082	0.059	0.051
	<i>0.023</i>	<i>0.022</i>	<i>0.016</i>	<i>0.019</i>	<i>0.016</i>	<i>0.016</i>	<i>0.021</i>	<i>0.020</i>	<i>0.014</i>	<i>0.015</i>	<i>0.013</i>	<i>0.015</i>	<i>0.012</i>	<i>0.011</i>	<i>0.009</i>	<i>0.013</i>	<i>0.009</i>	<i>0.009</i>
Retail Trade	0.311	0.327	0.290	0.264	0.261	0.281	0.259	0.260	0.216	0.200	0.203	0.220	0.051	0.068	0.074	0.064	0.059	0.061
	<i>0.016</i>	<i>0.015</i>	<i>0.011</i>	<i>0.013</i>	<i>0.011</i>	<i>0.012</i>	<i>0.015</i>	<i>0.014</i>	<i>0.010</i>	<i>0.012</i>	<i>0.010</i>	<i>0.011</i>	<i>0.008</i>	<i>0.008</i>	<i>0.007</i>	<i>0.007</i>	<i>0.006</i>	<i>0.006</i>
FIRE	0.199	0.210	0.196	0.204	0.165	0.166	0.161	0.169	0.156	0.155	0.139	0.134	0.038	0.042	0.041	0.049	0.026	0.032
	<i>0.018</i>	<i>0.017</i>	<i>0.013</i>	<i>0.016</i>	<i>0.012</i>	<i>0.013</i>	<i>0.016</i>	<i>0.015</i>	<i>0.012</i>	<i>0.014</i>	<i>0.011</i>	<i>0.012</i>	<i>0.008</i>	<i>0.008</i>	<i>0.006</i>	<i>0.008</i>	<i>0.005</i>	<i>0.006</i>
Services	0.225	0.216	0.224	0.193	0.191	0.190	0.175	0.164	0.152	0.139	0.143	0.147	0.050	0.052	0.072	0.054	0.048	0.042
	<i>0.009</i>	<i>0.009</i>	<i>0.006</i>	<i>0.007</i>	<i>0.006</i>	<i>0.006</i>	<i>0.008</i>	<i>0.008</i>	<i>0.006</i>	<i>0.006</i>	<i>0.005</i>	<i>0.006</i>	<i>0.005</i>	<i>0.005</i>	<i>0.004</i>	<i>0.004</i>	<i>0.003</i>	<i>0.003</i>
Public Sector	0.069	0.148	0.095	0.094	0.087	0.093	0.049	0.120	0.068	0.070	0.064	0.074	0.019	0.029	0.027	0.023	0.023	0.019
	<i>0.013</i>	<i>0.016</i>	<i>0.010</i>	<i>0.012</i>	<i>0.010</i>	<i>0.009</i>	<i>0.011</i>	<i>0.014</i>	<i>0.009</i>	<i>0.011</i>	<i>0.009</i>	<i>0.008</i>	<i>0.007</i>	<i>0.007</i>	<i>0.005</i>	<i>0.006</i>	<i>0.005</i>	<i>0.004</i>
Occupation																		
Managerial	0.164	0.168	0.166	0.163	0.143	0.150	0.132	0.133	0.118	0.118	0.110	0.121	0.032	0.035	0.048	0.045	0.033	0.029
Sales and Admin.	0.227	0.238	0.208	0.192	0.177	0.184	0.188	0.193	0.152	0.136	0.135	0.147	0.039	0.045	0.056	0.056	0.043	0.037
Service	0.264	0.265	0.260	0.229	0.237	0.221	0.207	0.195	0.183	0.182	0.181	0.174	0.057	0.070	0.078	0.047	0.055	0.047
Farming/Forestry	0.305	0.315	0.353	0.298	0.286	0.297	0.212	0.252	0.234	0.136	0.129	0.202	0.093	0.063	0.119	0.162	0.157	0.095
Precision Craft	0.234	0.237	0.201	0.205	0.213	0.218	0.182	0.194	0.146	0.135	0.153	0.161	0.052	0.043	0.055	0.071	0.060	0.057
Operators	0.269	0.235	0.249	0.236	0.222	0.231	0.189	0.168	0.153	0.152	0.152	0.155	0.081	0.067	0.095	0.084	0.070	0.077



