THE DYNAMICS OF US LABOR FORCE ATTACHMENT*

Stephen R.G. Jones

McMaster University

jonessrg@mcmaster.ca

W. Craig Riddell

University of British Columbia

criddell@interchange.ubc.ca

This revision: September 2000

* We are grateful to seminar participants in Amsterdam, Copenhagen, UCLA, Toronto and Statistics Canada, and discussants at the 2nd CILN Conference, the World Congress of EALE/SOLE, and the Annual Meetings of the Canadian Economics Association, for comments on earlier versions of this research. We thank Adrienne ten Cate, Sule Korkmaz, and Stéphanie Lluis for research assistance and the SSHRC and CILN for research funding.

The Dynamics of US Labor Force Attachment

ABSTRACT

We analyze the dynamics of labor force attachment in the US by studying patterns of transition behavior for individuals matched month-to-month using data from the new Current Population Survey. Specifically, we examine transition behavior for four labor market states: employment, unemployment, marginal attachment ("wanting work" but not searching), and non-attachment ("neither searching nor wanting work"). Our methods test whether various degrees of attachment among the non-employed are behaviorally distinct and illuminate the nature of dynamics among a broader set of labor market states than is usually examined. Results from the unconditional transition rates over time suggest that the breakdown of the non-employed into three categories is a useful approach that is supported by the data. These results are confirmed and enhanced by estimation of a number of multinomial models of labor market dynamics, and by estimation and testing within a duration modeling framework that allows for dependence. Moreover, these findings are consistent with earlier results found for longer time-periods using Canadian data, although the present work adds significantly to these results by showing that neither seasonality nor duration dependence issues confound this evidence.

Stephen R. G. Jones
Department of Economics
McMaster University
Hamilton, Ontario
CANADA L8S 4M4

jonessrg@mcmaster.ca

W. Craig Riddell
Department of Economics
University of British Columbia
Vancouver, BC
CANADA V6T 1Z1

criddell@interchange.ubc.ca

I. Introduction

This objective of this paper is to analyze the dynamics of labor force attachment in the US. More generally, the paper also seeks to address issues relating to the appropriate definition of unemployment and non-participation, definitions that have been partly a matter of tradition or custom and partly the subject of empirical analysis, although it is worth noting that such definitions do nonetheless differ internationally (e.g., between Canada and the US) and are on occasion revised even within a national economy.

Questions concerning the appropriate breakdown of non-employment time and how to model the dynamics of such non-employment spells are important for several reasons. First, to the extent that considerable attention is paid to magnitudes such as the unemployment and the labor force participation rates, their definition is fundamental.[1] Second, although it is usual in much economic analysis to interpret the unemployed as engaged in optimal job search behavior and non-participants as engaged in household production (at a corner solution with respect to market participation), some evidence suggests that the distinction between the two states may not in fact be clear cut. Hall (1970) and Clark & Summers (1979) argue that such a distinction may be difficult to sustain when, for example, multiple changes of classification occur within a single non-employment spell. Relatedly, Lucas & Rapping (1969) have queried the empirical content of the job search question that forms the basis of most unemployment

[1] While unemployment rates are usually measured following ILO guidelines, there is some variation internationally, e.g., in deciding what constitutes a sufficient degree of job search. The US follows a different policy regarding "passive" job search than does Canada, for example. There are also variations in the time frame of the availability for work question. In addition, there is more variation in the set of supplementary measures of unemployment reported in different countries. The set reported for Canada was revised (Statistics Canada 1999), following revisions to the Labour Force Survey effective 1997.

classifications, given that nothing is specified in that question about job characteristics (including particularly the wage). Third, the distinction between unemployment and non-participation may be harder to interpret in the context of recent flow-based models of labor markets (e.g., Hall 1983, Blanchard & Diamond 1992) where "waiting" for new openings to appear may be a better description of much optimal non-employment behavior than the active "job search" envisaged in an earlier generation of models. Empirically, agents who fail to find a match from the initial stock of vacancies and who wait for new openings to be generated may be classified as non-participants, even if they are behaviorally unemployed in the flow model of labor markets. Finally, the analysis of unemployment and non-participation durations, their cyclical behavior, and questions concerning potential true duration dependence in such spells, are all fundamentally affected by decisions about how to draw the distinction between the two non-employment states.

This paper begins an empirical investigation of these issues for the US, using recent data from matched surveys from the new CPS. It builds on our earlier work with Canadian data (Jones & Riddell, 1998, 1999a, 1999b), although at the outset we note that the US data has some important advantages for this set of questions, including detailed non-employment status for each survey month and a panel structure that goes beyond the matched pairs of surveys employed in our previous work. Finally, it is worthy noting that the degree of labor force attachment in the US, particularly the "marginal" attachment of persons who would usually be classified as out of the labor force, is significant, with people who report "wanting work" but who do not report active job search numbering about two-thirds the number of the unemployed, as conventionally measured. This number is large on a comparative international basis, the Canadian figure for marginal attachment being much lower, so there is a *prima facie* case for investigating the behavior of this group more closely.

II. Framework for analysis

The statistical framework we employ to assess whether two (or more) non-employment states are behaviorally distinct is based upon work by Flinn and Heckman (1983). Using the NLSY, they tested whether unemployment and out of the labor force were distinct states for white male high school graduates, work that was subsequently extended by Gönül (1992). In both papers, the analysis compared the behavior of those classified as unemployed (U) with those classified as non-participants (O). While informative for some groups, we suspect that for the population as a whole, the non-participant category contains many persons with essentially no current labor force attachment and we have little doubt that the behavior of many in this O group is distinct from that of the unemployed. Central questions of measurement and policy, such as whether unemployment should be defined based on some sort of reported job search, or a reported desire for work, are more likely concerned with subsets of the O and U categories, such as non-searchers who report that they desire work. To tackle such questions empirically requires data in which search behavior and the desire for work are identified.

The first part of the empirical analysis can be described in the context of a Markov model of transitions among labor force states, although we subsequently address a framework with potential state dependence. Initially at least, we address potential heterogeneity within the O category by envisaging four states: employment (E), unemployment (U), marginal attachment (M), and not-attached-to-the-labor force (N). The first two states correspond exactly to those measured in the CPS, while the latter two states represent a division of the non-participation group (O) into two components, M and N; note that O=M+N. Although there is a range of possible definitions of marginal attachment, our primary focus is on individuals who did not search for work but who reported that they desired work. The residual not-attached state (N) is hence made up of persons who *neither* searched for *nor* desired work.

We consider labor market dynamics represented by a 4×4 transition matrix P where the ij element p_{ij} is the probability of an individual being in state j in the next period given that the individual is in state i in the current period:

$$P = \begin{pmatrix} pEE & pEU & pEM & pEN \\ pUE & pUU & pUM & pUN \\ pME & pMU & pMM & pMN \\ pNE & pNU & pNM & pNN \end{pmatrix}$$

In this Markov context, marginal attachment and not attached would be behaviorally identical states if pME=pNE and pMU=pNU.[2] If true, such equalities would imply that the 4 state Markov model was equivalent to a 3 state model based on the conventional measures of labor force activity (E, U and O): the reported desire for work would then convey no information regarding labor force attachment beyond that provided by reported job search.

In contrast, it might be that the conventional job search requirement for unemployment is too narrow, and that the marginally attached are not behaviorally distinct from the unemployed, in which case pUE=pME and pUN=pMN. If these conditions hold, unemployment would more sensibly be measured based on a reported desire for work rather than on job search. The desire for work is then the key criterion and no additional information is conveyed by reported job search.

---

[2] If these equalities hold, so the two states are equivalent in terms of future behavior, then it follows that persons responding to a survey questionnaire might give any response to the question of which group they are in, and we do not have a theory of how they give these responses. That is, there is no equivalent set of conditions for flows into observationally equivalent states.

Finally, it may be that neither of these restrictive conditions is supported by the data, with the marginally attached representing a distinct group with behavior between that of the unemployed and the non attached. This may supply rationale for statistical agencies to report unemployment, marginal attachment and non-attachment on a regular basis.

In a non-Markov framework, the rate of transition from one state to another might depend not just on the current state but also on how long the individual has already spent in that state.[3] Indeed, much research attention has been directed towards the study of the "true" effects arising from such duration dependence, and towards the empirical separation of true dependence from the results of a process of sorting based on unobserved heterogeneity. While data limitations did not permit analysis of duration-related issues in earlier work, the present CPS data provides some durations (up to four months) that can in part address these questions. We tackle this empirically below.

III. Data Construction and Characteristics

This research employs a set of panels constructed from the new Current Population Survey. We match households from one month to the next and then employ a matching algorithm based on checks for legitimate changes (in some cases, no change) in race, age, sex and education to identify individuals within these matched households. This procedure is similar to that used in previous work (e.g., Card, 1996; Madrian and Lefgren 1999) with matched CPS data. The rotation group structure of the CPS has an individual in the sample for four consecutive months, then out of sample for eight months, then in

---

[3] Equivalently, of course, one can redefine the states so that they incorporate the history of the process, while staying within a Markov model. Unemployed (one month) would then be distinct from Unemployed (two months), for example, and the resulting Markov transition matrix would have only a limited set of feasible transitions. We address this interpretation empirically below.

again for a further four months. This means that one can generate panels of four consecutive months, together with a related panel for the same individuals for the same four months one calendar year later.

At the outset, though, it should be noted that the overlap of adjacent surveys implied by the rotation group structure alone considerably overstates the extent to which adjacent CPS files can be linked to create a panel. Non-response to each monthly survey (of the order of 6-7%), moving (which can be considerable, especially for younger age groups), and mortality can all reduce the matches from one month to the next, and coding error means that matched households may not translate into matched individuals. Two types of errors can arise: false negatives, when a merge is missed even though the same individual is in fact in the two surveys; and false positives, when a merge is erroneously made. Using the CPS question on whether the individual lived at the same address one year earlier as a means of assessing false positives, Madrian and Lefgren (1999) provide a detailed evaluation of alternative merge criteria for matched *annual* CPS files, assessing many combinations of age, sex, race and education as potential merge variables. For our present purposes, we follow the main conclusions of Madrian and Lefgren and we therefore use a change in sex, race, or any unreasonably large change in age as grounds for invalidating a match. Note, though, that our matches are month-on-month, rather than year-on-year, so less time elapses between these surveys for individuals to move. Appendix Table 1 provides illustrative statistics on the creation of the first of our many panels, that for January-April 1994, while Appendix Table 2 provides sample summary statistics for all the data and for the merged panels In this latter Table, neither demographics such as age and marital status nor labor market outcomes such as degree of marginal attachment differ significantly for the two groups. Overall, we are encouraged by the fact that the summary statistics are not too different for the panels than for the overall CPS, suggesting that sample selection concerns associated with the merge and match process may not be fundamental.

We note that the availability of these data for all starting months permits investigation of seasonality issues in these labor force dynamics, something that was not possible with the March-April

matches available in our earlier research with Canadian data. More importantly, we also note that this CPS panel structure goes far beyond the pairwise matching of two adjacent months that was employed in the earlier work, offering the potential for a richer picture of dynamics that includes duration dependence.

A second advantage of the new CPS, relative to both the CPS pre-1984 and many other datasets, is that information on marginal labor force attachment is available for each survey month.[4] For persons classified as not in the labor force, category O from the previous section, the marginal group (M) consists of individuals who answered "Yes" or "Maybe, it depends," to the question "Do you currently want a job, either full or part time?" and the balance of the O group comprises the non-attached (N). It may bear repeating that this question is subjective and not obviously linked to actual behavior, so one may harbor a legitimate skepticism as to whether responses are a good guide to future actions. Of course, the same can be said of the usual job search question that is used internationally to divide the U and O groupings, especially given the absence of any specifics in the question on wage, job type or working conditions. Our view at this stage is completely agnostic, looking to the empirical analysis to assess whether these responses in fact have useful content or not, rather than furthering a priori speculation.

We should also comment that, although we are able to generate panels for most four month periods since January 1994 through September 1998, there is a gap in the data in mid-1995. Technical factors associated with a change in the CPS geographic identifiers from the September 1995 public use file and associated confidentiality provisions meant that the BLS was obliged to change household identifiers after May 1995 so that the panels have a gap from May to September 1995.

Lastly, we reiterate that the size of the marginally attached group in the US is substantial. Using the March files annually from 1976-1996, and using only the outgoing rotation groups in the final three

---

[4] Such information has recently been available in Canada as well, starting with the 1997 Labour Force Survey. Jones & Riddell (1999b) is a preliminary analysis of the first two years of these Canadian data.

years of this sample so as to be comparable with the earlier years (when marginal attachment information was available only in survey months 4 and 8), we find that the average number of marginally attached lies between two thirds and three quarters of the number of the unemployed over this entire period. While some of this difference may be the result of a more strict definition of job search within the US (while excludes "passive" job search methods) than in Canada, exactly why the US figure is so large remains an important open question.

Overall, the matching of sets of four consecutive months together with the detailed questions available in the new CPS on degrees of labor force attachment make this dataset unique in its capacity to address the central questions of this research.

IV. Results

Transition Rates

We begin presentation of the results by examining the average month-to-month transition rates from the three non-employment states {U, M, N} into the four labor market states {E, U, M, N}. We label matched pairs of months by the origin month.

Table 1 first reports the average transition rates into employment for one sample month (January 1994) so give an indication of sample size and appropriate confidence intervals for the estimated hazards. Overall, the hazard pUE is 0.222 for this month (s.e. of 0.013), while the corresponding hazards out of the other two non-employment states are pME=0.087 (s.e. of .010) and pNE=.036 (s.e. of .002). That is, the average transition rates display clear gaps between each pair of hazards, consistent with our earlier work. The other parts of the first panel of Table 1 also give the breakdown of these hazards for men and for women. Men have slightly lower hazards from U but higher hazards from M than do women, although for both sexes the ranking of the three states is clear-cut. Finally, the second panel of the Table gives the

breakdown of unemployment into three groups: unemployed searchers, those of temporary layoff, and those with future job starts. The distinctive feature of these results is that individuals of temporary layoff (who are typically exempted from job search requirements to qualify as unemployed, provided they meet an availability for work criterion) have much higher transition rates into employment than do the searchers. Alternatively put, were we to exclude those on temporary layoff from the unemployed group in the first panel of the Table, focusing only on individuals without a strong current job attachment, the gap between pUE and pME would narrow. Finally, the figures for future job starts (who are also exempted from the job search requirement) are too small in one month to be useful, although some aggregation across months may be informative.

Given this introduction to the transition data for one sample month, Figure 1 then presents the three hazards into employment for each month for which we have data, and several features are apparent. First, the series are relatively stable month-to-month, suggesting that there is no overwhelming pattern of seasonality to contend with. This is especially true for the hazard for not-attached group, the largest of these three non-employment categories. Second, there is clear indication in every month that the ranking pUE > pME > pNE holds, with a striking separation between each pair of series. The hazard from unemployment ranges in the 0.2 to 0.35 interval, gradually improving over the January 1994 – September 1998 period, while that from not-attached is always below 0.05. The marginal group displays an intermediate hazard lying around 0.1 to 0.2 for the matched months. There is some indication that pME also rises over this five year period of economic prosperity. However, it should be noted that these data

do not place the marginal group as much closer to the unemployed than to the not-attached, a finding that characterized the earlier work with Canadian data (Jones & Riddell, 1999, p7).[5]

Figures 2-4 present the analogous empirical hazards into unemployment, marginal attachment, and not-attached, respectively. The hazards into unemployment are also fairly stable and display a similar clear separation in every month with pUU > pMU > pNU. For transitions into the marginal state—evidence that was not available in earlier work that did not have M and N separated as destination states—Figure 3 shows that monthly stability still obtains, with the ranking pMM > pUM > pNM. Interestingly, the on-diagonal element pMM is in the range 0.35 to 0.25, while the corresponding figure for pUU was closer to 0.5, showing the higher degree of instability in the Markovian dynamics associated with the marginal state. The marginal state is *not* then an absorbing state reached, say, after a period of fruitless unemployment, from which agents have a tough time exiting. Finally, Figure 4 graphs the series into the N state (also not previously available), with a clear and consistent ranking of the average transition rates given by pNN > pMN > pUN > pEN.

Overall, we conclude from this first look at the monthly rates of transition that the marginally attached group appear to exhibit different unconditional behavior than the non-attached, falling clearly between the U and N categories in each month. The marginal group also appears a relatively fluid one, with only a one-third probability of remaining in the same marginal group in the next month, and displaying in fact a greater chance of moving into not-attachment than of staying put.

---

[5] Recall the comment above, though, about the potential exclusion of those on temporary layoff from the unemployed figure. If this were done, as was the case in the Canadian work, pUE would be lower and hence somewhat closer to pME.

Breakdown of the Unemployed Group

We also report some information of these hazards for subsets of the unemployed group, following the breakdown used in the second panel of Table 1.[6] Figure 5 shows that the temporary layoff group has a higher hazard into employment than the job searcher group in every month for which data is available, consistent with the Table 1 findings. There may also be evidence that the future job start group has a higher hazard as well, but the noise in the series resulting from very small samples makes it hard to be confident about this conclusion.

Broken down by sex, these main findings for the three non-employment states hold for both men and women (Figures 6 and 7, respectively) and the differences between the sexes are perhaps surprisingly small. In addition, when we look at subsets of the unemployed (Figures 8 and 9), the same results on the

---

6 We have also looked into heterogeneity within the marginal group. The sub-categories are based on responses to the question concerning the reason for not searching and are made up of three groups: "discouraged workers," who report not searching because they believe no work is available; those not searching for "personal" reasons, based on child care, family responsibility or health problems; and those not searching for "other" reasons. The hazards into employment, not graphed here, display fairly slight differences by marginal sub-category, with the transition rates from "personal" being the lowest and with the discouraged worker group usually being intermediate between the other two. All three subsets remain marginally attached with a month-to-month probability of around 0.3, with little to separate the sub-categories in this case, and the discouraged worker group usually has the lowest hazard of the three into the not-attached state. Compared with our earlier Canadian results, these data show much less unconditional heterogeneity within the marginal group in the US, suggesting that, although the reason for not searching might be important in some cases, it does not carry the same significance as the question on a desire for work.

ranking of the temporary layoff group and the job searchers group hold for each sex for each month in our data.

Nonparametric Analysis of a Larger Dynamic Model

We next address in an exploratory and nonparametric manner the use of the panel nature of these CPS data for the study of labor market dynamics. Consider a Markov model of transitions where we expand the set of states to accommodate dependence. In place of state E, for example, we envisage four potential employment states, E1, E2, E3 and E4 according to whether the current status in employment was preceded by 0, 1, 2 or 3 periods also in employment. Analogously, U1-U4, M1-M4 and N1-N4 denote the path-dependent measures of the three non-employment states.

Given this, the four month rotation structure from the CPS yields a transition matrix with 12 origin states (according to whether the current month is the first, second or third month in each of four states) and with 16 destination states, so we refer to this framework as the 12x16 model. Of course, this transition matrix is relatively sparse, having many zero restrictions, since (for example) the only way to reach destination state E3 is to have been in state E2 in the preceding month, something that only occurs on the paths EEEX and XEEE, where X represents any non-employment state. Table 2 summarizes these various possibilities, while Table 3 then gives transition probabilities for the averages of all the 1994 panels. Note that we separate out all the various ways in which a path could be observed, so that we distinguish, for example, between EEXX, XEEX and XXEE when studying the E1 to E2 transition. In addition to potential rotation group bias issues, there is the important point that the first (and only the first) of these three possibilities is left-censored and could be the end of a very long, but unobserved, spell out of the sample window. Analogous results for the four other years for which we have data are reported in the Appendix Table 3.

Several features of these results in Table 3 bear comment. First, the quasi-diagonals for employment are quite flat, giving only slight indication of dependence. Both the similarity among the three separate entries in the E1 to E2 cell and the similarity of these entries to those for E2 to E3 and E3 to E4 support this conclusion, which we nonetheless find somewhat surprising.

Second, if we consider the quasi-diagonal blocks for the non-employment origin states, there is indication of the relative stability of these non-employment states. In unemployment, the tendency is for these diagonal elements to rise slightly, indicating an overall degree of positive duration dependence in these unconditional data. For the marginal group, this effect is stronger still, so that, although the one period transition rate pMM is only around 0.3 (compared with around 0.5 for pUU, for example), the hazard from M3 to M4 is nearly 0.6, close to the U3 to U4 rate of transition. Marginal attachment may be a relatively stable state for persons who have remained marginal for two or three months already. Lastly, the quasi-diagonals the not-attached state also display a tendency to rise with longer duration in the state.

Third, the pattern of transitions out of the marginal state show falling hazards into employment as duration in the marginal state lengthens (compare M1-E1 cell with M2-E1 cell, e.g.), and sharply falling flat rate of transition from M1, M2 or M3 into U1 or N1. Thus, as a spell of marginal attachment goes on, these hazards tend to decline, the counterpart of the rising probability of staying put in the marginal state.

Fourth, the unconditional pattern from the three unemployment origin states show signs of a falling hazard into all of E, M and N. The marginal group is not therefore exclusively a synonym for longer term unemployed who have stopped searching, but who still want a job

Fifth, the hazards out of the not-attached group tend to fall for all three other destination states as duration not-attached extends, with the probability of a transit from N1 to any of E1, U1 or M1 being roughly double the respectively probability of a transit from N3 to E1, U1 or M1. Not-attached is a stable state with a rising overall hazard associated with remaining in the state.

In addition, we also report these results broken down by sex in Tables 4 and 5. Both the pUE and pME hazards are higher for men than for women but overall the pattern of the results, and of the implied dependence in these states, does not vary in a qualitatively important way between the two sexes.

Pairwise Equivalence Tests

We next assess whether these results on the unconditional transition probabilities of moving from one state to another also hold conditionally. To do this, we estimate a multinomial logit model of the determinants of the hazards from one origin state to the four states {E, U, M, N} under consideration and, to test equivalence, we test whether or not we can pool two origin states. These estimates are purely based on pairs of adjacent months and do not yet exploit the panel structure of the CPS data. However, they correspond exactly to the tests that were feasible with our earlier Canadian data (Jones & Riddell 1999a) and hence are useful both as a starting point and for purposes of international comparison. In each case, covariates include three variables for region, sex, marital status, age and two variables for education. In addition, each unrestricted model includes a dummy variable that takes the value 1 for one of the origin states and 0 for the other, together with interaction variables that multiply this dummy variable with each of the covariates. Thus, the unrestricted model allows all coefficients to vary between the two origin states while the restricted model omits both the dummy and the interactions, forcing all coefficient to be equal for the two origin states.

Table 6 reports the resulting test statistics for the equivalence of unemployment (U) and marginal attachment (M). We conduct separate tests for each pair of months and report tests statistics in each case. Uniformly, the null of equivalence is decisively rejected, consistent with the unconditional evidence apparent from the Figures above. Table 7 reports the equivalent results for testing equivalence of marginal attachment (M) and non-attachment (N) and again we obtain the same decisive rejection in each case. Thus, these conditional results confirm the evidence from the graphs that these states appear to be distinct

insofar as they predict different subsequent labor market behavior. Information about the desire for work is important as a supplement to job search information and significantly separates the marginally attached from both the unemployed and the not-attached groups.

Duration Analysis of Spells in Various Labor Market States

Finally, we address these issues relating to dependence and the durations spent in various labor market states by estimating a hazard model for the determinants of transitions out of these states. This approach again follows the early work of Flinn & Heckman (1983). The covariates employed are the same as for the period-to-period multinomial models reported above, and hence control for region, age, sex, marital status and education. Left censored spells under the null of equivalence or the alternative of non-equivalence are dropped, since we have no way of determining when such spells might have started, while right censored spells are included appropriately in the risk set. We employ a proportional hazard framework without parameterizing the underlying baseline and we estimate the model separately for each dataset defined by the initial month of the survey. For each, we test the equivalence of M and N and (separately) the equivalence of U and M, assessing whether the hazard *into employment* differs significantly according to the two origin states. Controls are identical to the earlier multinomial models, allowing for variation by region, sex, marital status, age and education level.

The results of these tests are given in Tables 8 and 9. It is evident that the tests of equivalence are decisively rejected in every case. That is, these proportional hazard model results for the hazard into employment alone are quite consistent with the period-to-period multinomial results (into all the labor market states) discussed above. The three states, U, M and N, appear to be behaviorally distinct within this duration modeling framework, consistent with the graphs, the pairwise transition results, and the non-parametric evidence previously presented.

V. Conclusion

This paper has addressed the dynamics of labor force attachment in the US by studying patterns of transition behavior for individuals matched month-to-month using data from the new CPS. Such data have the potential to shed light on whether various degrees of attachment among the non-employed are behaviorally distinct, as well as to illuminate the nature of dynamics among a broader set of labor market states than is usually examined. Our results, both in terms of the raw, unconditional transition rates over time and in a variety of nonparametric and parametric models, suggest that the breakdown on the non-employed into three categories—unemployed, marginally attached ("wanting work" but not searching), and not-attached ("neither searching nor wanting work")—is a useful approach that is supported by the data. Moreover, these findings are consistent with earlier results found for longer time-periods using Canadian data, although the present work adds significantly to these results by showing that neither seasonality nor duration dependence issues confound this evidence.

In order to assess the robustness of these results further, we would like to extend this work in a number of directions. First, we plan to extend the duration models to allow for a variety of alternative specifications, rather than employing just the proportional hazard model as we have to date, and to examine the behavior of the duration model for the hazards into states other than employment. Second, we intend to explore the 4-8-4 nature of these matched CPS data by examining the longer term consequences of reporting one non-employment status rather than another, studying whether these states are behaviorally distinct in terms of realized outcomes one year later. Overall, though, the present results are encouragingly consistent with one another and line up well with our previous work that used Canadian data, suggesting that marginal attachment operates as a distinct labor market state that may be useful to measure, report and analyze on a regular basis.

REFERENCES

Abowd, J., and A. Zellner (1985): "Estimating Gross Labor Force Flows," *Journal of Business and Economic Statistics*, 3, 254-83.

Blanchard, O.J., and P. Diamond (1992): "The Flow Approach to Labor Markets," *American Economic Review (Papers & Proceedings)*, 82, 354-9.

Blau, D.M., and P.K. Robins (1986): "Labor Supply Response to Welfare Programs: A Dynamic Analysis," *Journal of Labor Economics*, 4, 82-104.

Bortnick, S.M., and M.H. Ports (1992): "Job Search Methods and Results: Tracking the Unemployed, 1991," *Monthly Labor Review*, 115, 29-35.

Bulow, J.L., and L.H. Summers (1986): "A Theory of Dual Labor Markets with Application to Industrial Policy, Discrimination, and Keynesian Unemployment," *Journal of Labor Economics*, 4, 376-414.

Burdett, K., N. Kiefer, D. Mortensen, and G. Neumann (1984): "Earnings, Unemployment, and the Allocation of Time over Time," *Review of Economic Studies*, 51, 559-78.

Card, D. (1996): "The Effect of Unions on the Structure of Wages," *Econometrica*, 64, 957-79.

Card, D., and W.C. Riddell (1993): "A Comparative Analysis of Unemployment in Canada and the United States," in *Small Differences That Matter: Labor Markets and Income Maintenance in Canada and the United States,* ed. by D. Card and R.B. Freeman. Chicago: University of Chicago Press and NBER, 149-89.

Clark, K., and L.H. Summers (1979): "Labor Market Dynamics and Unemployment: A Reconsideration," *Brookings Papers on Economic Activity*, 1979:1, 13-60.

Flinn, C.J., and J.J. Heckman (1983): "Are Unemployment and Out of the Labor Force Behaviorally Distinct Labor Force States?" *Journal of Labor Economics*, 1, 28-42.

Gönül, F. (1992): "New Evidence on Whether Unemployment and Out of the Labor Force are Distinct States," *Journal of Human Resources*, 27, 329-61.

Hall, R.E. (1970): "Why Is the Unemployment Rate So High at Full Employment?" *Brookings Papers on Economic Activity*, 1970:3, 369-402.

Hall, R.E. (1975): "The Rigidity of Wages and the Persistence of Unemployment," *Brookings Papers on Economic Activity*, 1975:2, 301-35.

Hall, R.E. (1983): "Is Unemployment a Macroeconomic Problem?" *American Economic Review (Papers & Proceedings)*, 73, 219-22.

Hausman, J.A., and F.M. Scott Morton, 1994, "Misclassification of a Dependent Variable in a Discrete Response Setting," MIT Department of Economics Working Paper 94-19.

Jones, S.R.G. (1987): "Screening Unemployment in a Dual Labor Market," *Economics Letters*, 25, 191-5.

Jones, S.R.G., and W.C. Riddell (1995): "The Measurement of Labor Force Dynamics with Longitudinal Data: The Labour Market Activity Survey Filter," *Journal of Labor Economics*, 13, 351-85.

Jones, S.R.G., and W.C. Riddell (1998): "Unemployment and Labor Force Attachment: A Multistate Analysis of Nonemployment," In *Topics in Labor Measuremen*t, J. Haltiwanger, M. Manser & R.Topel, eds., NBER Conference on Research in Income and Wealth Series, University of Chicago Press, 123-52.

Jones, S.R.G., and W.C. Riddell (1999a): "The Measurement of Unemployment: An Empirical Approach," *Econometrica*, 67, 147-62.

Jones, S.R.G., and W.C. Riddell (1999b): "Unemployment and Labour Force Attachment," Background paper prepared for Statistics Canada, September.

Juhn, C., K.M. Murphy, and R.H. Topel (1991): "Why Has the Natural Rate of Unemployment Increased Over Time?" *Brookings Papers on Economic Activity*, 1991:2, 75-126.

Lucas, R.E., Jr., and L.A. Rapping (1969): "Real Wages, Employment and Inflation," *Journal of Political Economy*, 77, 721-54.

McDonald, I.M., and R.M. Solow (1985): "Wages and Employment in a Segmented Labor Market," *Quarterly Journal of Economics*, 100, 1115-41.

Madrian B.C., and L.J. Lefgren (1999): "A Note on Longitudinally Matching Current Population Survey (CPS) Respondents," NBER Technical Working Paper No.247.

National Commission on Employment and Unemployment Statistics (1979): *Counting the Labor Force*. Washington: USGPO.

Nickell, S., and B. Bell (1995): "The Collapse in Demand for the Unskilled and Unemployment Across the OECD," *Oxford Review of Economic Policy*, 11, 40-62.

Norwood, J.L. (1988): "The Measurement of Unemployment," *American Economic Review (Papers & Proceedings)*, 78, 284-8.

Organization for Economic Cooperation and Development (1987): "On the Margin of the Labour Force: An Analysis of Discouraged Workers and other Non-Participants," *Employment Outlook*, September, 142-70.

Organization for Economic Cooperation and Development (1995): "Supplementary Measures of Labour Market Slack," *Employment Outlook*, July, 43-97.

Osberg, L. (1993): "Fishing in Different Pools: Job Search Strategies and Job-finding Success in the Early 1980s," *Journal of Labor Economics*, 11, 348-86.

Poterba, J.M., and L.H. Summers (1986): "Reporting Errors and Labor Market Dynamics," *Econometrica*, 54, 1319-38.

Poterba, J.M., and L.H. Summers (1995): "Unemployment Benefits and Labor Market Transitions," *Review of Economics and Statistics*, 77, 207-16.

President's Committee to Appraise Employment and Unemployment Statistics (1962): *Measuring Employment and Unemployment*. Washington: USGPO.

Statistics Canada (1999): *Labour Force Update: Supplementary Measures of Unemployment*. Ottawa: Catalogue no. 71-005-XPB, Summer.

Stein, R.L. (1967): "New Definitions for Employment and Unemployment," *Employment and Earnings*, 13, 3-27.

Tano, D.K. (1991): "Are Unemployment and Out of the Labor Force Behaviorally Distinct Labor Force States?" *Economics Letters*, 36, 113-7.

Van Den Berg, G.J. (1990): "Search Behaviour, Transitions to Nonparticipation and the Duration of Unemployment," *Economic Journal*, 100, 842-65.

Zagorsky, J.L. (1996): "The Effect of Definitional Differences on US and Canadian Unemployment Rates," *Canadian Business Economics*, 4,13-21.

TABLE 1 : TRANSITION RATES INTO EMPLOYMENT

January-February 1994

Variables	OVERALL				MEN				WOMEN			
	Obs	Mean	Std. Err.	Conf. Interval	Obs	Mean	Std. Err.	Conf. Interval	Obs	Mean	Std. Err.	Conf. Interval
E to E	13181	.962	.002	.958 - .965	6961	.967	.002	.963 - .971	6320	.956	.002	.951 - .961
U to E	920	.222	.013	.196 - .251	527	.216	.018	.182 - .254	393	.231	.021	.191 - .276
M to E	750	.087	.010	.067 - .109	301	.110	.018	.077 - .971	449	.071	.012	.049 - .099
NILF to E	7380	.036	.002	.032 - .041	2647	.042	.004	.035 - .051	4733	.033	.003	.028 - .039
Breakdown of the unemployment state												
Usearch to E	759	.194	.014	.166 - .224	416	.195	.019	.158 - .236	343	.192	.021	.152 - .238
TempLay to E	157	.357	.038	.282 - .437	110	.291	.043	.208 - .385	47	.511	.073	.361 - .659
FutJob to E	4	.5	.25	.067 - .932	1	1	0	-	3	.333	.272	.008 - .906

TABLE 2 : TRANSITION MATRIX

To From	E1	E2	E3	E4	U1	U2	U3	U4	M1	M2	M3	M4	N1	N2	N3	N4
E1	-	ee-- -ee- --ee	-	-	eu-- -eu- --eu	-	-	-	em-- -em- --em	-	-	-	en-- -en- --en	-	-	-
E2	-	-	eee- -eee	-	eeu- -eeu	-	-	-	eem- -eem	-	-	-	een- -een	-	-	-
E3	-	-	-	eeee	eeeu	-	-	-	eeem	-	-	-	eeen	-	-	-
U1	ue-- -ue- --ue	-	-	-	-	uu-- -uu- --uu	-	-	um-- -um- --um	-	-	-	un-- -un- --un	-	-	-
U2	uue- -uue	-	-	-	-	-	uuu- -uuu	-	uum- -uum	-	-	-	uun- -uun	-	-	-
U3	uuue	-	-	-	-	-	-	uuuu	uuum	-	-	-	uuun	-	-	-
M1	me-- -me- --me	-	-	-	mu-- -mu- --mu	-	-	-	-	mm— -mm- --mm	-	-	mn-- -mn- --mn	-	-	-
M2	mme- -mme	-	-	-	mmu- -mmu	-	-	-	-	-	mmm- -mmm	-	mmn- -mmn	-	-	-
M3	mmme	-	-	-	mmmu	-	-	-	-	-	-	mmmm	mmmn	-	-	-
N1	ne-- -ne- --ne	-	-	-	nu-- -nu- --nu	-	-	-	nm-- -nm- --nm	-	-	-	-	nn— -nn- --nn	-	-
N2	nne- -nne	-	-	-	nnu- -nnu	-	-	-	nnm- -nnm	-	-	-	-	-	nnn- -nnn	-
N3	nnne	-	-	-	nnnu	-	-	-	nnnm	-	-	-	-	-	-	nnnn

TABLE 3 : TRANSITION MATRIX
AVERAGE ACROSS ALL PANELS OF 1994

To From	E1	E2	E3	E4	U1	U2	U3	U4	M1	M2	M3	M4	N1	N2	N3	N4
E1	-	.9545 .9601 .9602	-	-	.0130 .0131 .0131	-	-	-	.0054 .0054 .0053	-	-	-	.0237 .0236 .0235	-	-	-
E2	-	-	.9702 .9705	-	.0070 .0041	-	-	-	.0024 .0015	-	-	-	.0098 .0058	-	-	-
E3	-	-	-	.9745	.0022	-	-	-	.0008	-	-	-	.0029	-	-	-
U1	.2692 .2737 .2751	-	-	-	-	.4806 .4829 .4913	-	-	.1108 .1103 .1097	-	-	-	.1355 .1361 .1361	-	-	-
U2	.1423 .1004	-	-	-	-	-	.5821 .5963	-	.0634 .0423	-	-	-	.0573 .0383	-	-	-
U3	.0483	-	-	-	-	-	-	.6425	.0202	-	-	-	.0166	-	-	-
M1	.1202 .1229 .1245	-	-	-	.1489 .1495 .1489	-	-	-	-	.3062 .3380 .3489	-	-	.4017 .3970 .3976	-	-	-
M2	.0442 .0353	-	-	-	.0876 .0678	-	-	-	-	-	.4479 .4823	-	.1976 .1404	-	-	-
M3	.0124	-	-	-	.0268	-	-	-	-	-	-	.5719	.0569	-	-	-
N1	.0376 .0374 .0376	-	-	-	.0141 .0141 .0141	-	-	-	.0306 .0303 .0302	-	-	-	-	.9145 .9190 .9211	-	-
N2	.0125 .0085	-	-	-	.0044 .0029	-	-	-	.0128 .0085	-	-	-	-	-	.9526 .9499	-
N3	.0035	-	-	-	.0011	-	-	-	.0039	-	-	-	-	-	-	.9625

TABLE 4 : TRANSITION MATRIX
AVERAGE ACROSS ALL PANELS OF 1994 (Men only)

To From	E1	E2	E3	E4	U1	U2	U3	U4	M1	M2	M3	M4	N1	N2	N3	N4
E1	- - -	.9610 .9647 .9649	- - -	- - -	.0144 .0143 .0142	- - -	- - -	- - -	.0048 .0048 .0048	- - -	- - -	- - -	.0175 .0175 .0175	- - -	- - -	- - -
E2	- - -	- - -	.9731 .9740 -	- - -	.0075 .0044 -	- - -	- - -	- - -	.0023 .0013 -	- - -	- - -	- - -	.0074 .0043 -	- - -	- - -	- - -
E3	- - -	- - -	- - -	.9777 - -	.0023 - -	- - -	- - -	- - -	.0007 - -	- - -	- - -	- - -	.0021 - -	- - -	- - -	- - -
U1	.2807 .2837 .2838	- - -	- - -	- - -	- - -	.5099 .5147 .5226	- - -	- - -	.0959 .0964 .0965	- - -	- - -	- - -	.1091 .1102 .1103	- - -	- - -	- - -
U2	.1506 .1038 -	- - -	- - -	- - -	- - -	- - -	.6054 .6218 -	- - -	.0572 .0375 -	- - -	- - -	- - -	.0451 .0303 -	- - -	- - -	- - -
U3	.0513 - -	- - -	- - -	- - -	- - -	- - -	- - -	.6569 - -	.0182 - -	- - -	- - -	- - -	.0127 - -	- - -	- - -	- - -
M1	.1379 .1402 .1418	- - -	- - -	- - -	.1736 .1726 .1721	- - -	- - -	- - -	- - -	.2987 .3212 .3415	- - -	- - -	.3704 .3687 .3697	- - -	- - -	- - -
M2	.0561 .0370 -	- - -	- - -	- - -	.0958 .0780 -	- - -	- - -	- - -	- - -	- - -	.4582 .4813 -	- - -	.1771 .1318 -	- - -	- - -	- - -
M3	.0140 - -	- - -	- - -	- - -	.0313 - -	- - -	- - -	- - -	- - -	- - -	- - -	.5607 - -	.0560 - -	- - -	- - -	- - -
N1	.0417 .0412 .0413	- - -	- - -	- - -	.0167 .0167 .0167	- - -	- - -	- - -	.0314 .0312 .0311	- - -	- - -	- - -	- - -	.9060 .9120 .9130	- - -	- - -
N2	.0139 .0091 -	- - -	- - -	- - -	.0048 .0033 -	- - -	- - -	- - -	.0133 .0090 -	- - -	- - -	- - -	- - -	- - -	.9480 .9461 -	- - -
N3	.0037 - -	- - -	- - -	- - -	.0012 - -	- - -	- - -	- - -	.0041 - -	- - -	- - -	- - -	- - -	- - -	- - -	.9602 - -

TABLE 5 : TRANSITION MATRIX
AVERAGE ACROSS ALL PANELS OF 1994 (Women only)

To From	E1	E2	E3	E4	U1	U2	U3	U4	M1	M2	M3	M4	N1	N2	N3	N4
E1	- - -	.9475 .9551 .9549	- - -	- - -	.0116 .0118 .0118	- - -	- - -	- - -	.0061 .0060 .0060	- - -	- - -	- - -	.0305 .0302 .0302	- - -	- - -	- - -
E2	- - -	- - -	.9671 .9666 -	- - -	.0065 .0038 -	- - -	- - -	- - -	.0027 .0016 -	- - -	- - -	- - -	.0125 .0075 -	- - -	- - -	- - -
E3	- - -	- - -	- - -	.9710 - -	.0021 - -	- - -	- - -	- - -	.0008 - -	- - -	- - -	- - -	.0038 - -	- - -	- - -	- - -
U1	.2564 .2627 .2657	- - -	- - -	- - -	- - -	.4486 .4469 .4555	- - -	- - -	.1275 .1255 .1240	- - -	- - -	- - -	.1647 .1646 .1639	- - -	- - -	- - -
U2	.1321 .0962 -	- - -	- - -	- - -	- - -	- - -	.5630 .6231 -	- - -	.0710 .0483 -	- - -	- - -	- - -	.0724 .0485 -	- - -	- - -	- - -
U3	.0444 - -	- - -	- - -	- - -	- - -	- - -	- - -	.6569 - -	.0229 - -	- - -	- - -	- - -	.0219 - -	- - -	- - -	- - -
M1	.1087 .1120 .1130	- - -	- - -	- - -	.1329 .1346 .1339	- - -	- - -	- - -	- - -	.3111 .3492 .3538	- - -	- - -	.4220 .4152 .4156	- - -	- - -	- - -
M2	.0369 .0343 -	- - -	- - -	- - -	.0827 .0617 -	- - -	- - -	- - -	- - -	- - -	.4416 .4829 -	- - -	.2100 .1455 -	- - -	- - -	- - -
M3	.0114 - -	- - -	- - -	- - -	.0241 - -	- - -	- - -	- - -	- - -	- - -	- - -	.5790 - -	.0575 - -	- - -	- - -	- - -
N1	.0354 .0354 .0355	- - -	- - -	- - -	.0127 .0127 .0126	- - -	- - -	- - -	.0301 .0298 .0299	- - -	- - -	- - -	- - -	.9192 .9230 .9253	- - -	- - -
N2	.0117 .0081 -	- - -	- - -	- - -	.0041 .0026 -	- - -	- - -	- - -	.0126 .0083 -	- - -	- - -	- - -	- - -	- - -	.9550 .9519 -	- - -
N3	.0034 - -	- - -	- - -	- - -	.0010 - -	- - -	- - -	- - -	.0038 - -	- - -	- - -	- - -	- - -	- - -	- - -	.9637 - -

TABLE 6 : MULTINOMIAL LOGIT RESULTS FOR TEST OF EQUIVALENCE OF UNEMPLOYMENT AND MARGINAL ATTACHMENT

Dataset	N	df	Chi^2	p-value
cps942	1670	27	494.88135	.000
cps943	1705	27	541.59772	.000
cps944	1669	27	388.69617	.000
cps945	1521	27	438.18491	.000
cps946	1528	27	312.02051	.000
cps947	1546	27	285.75217	.000
cps948	1485	27	341.66592	.000
cps949	1429	27	372.69257	.000
cps9410	1358	27	356.24347	.000
cps9411	1392	27	437.77628	.000
cps9412	1282	27	382.64529	.000
cps951	1200	27	293.72314	.000
cps952	1540	27	361.6767	.000
cps953	1374	27	471.17749	.000
cps9510	1151	27	265.39014	.000
cps9511	1009	27	280.99945	.000
cps9512	964	27	313.43643	.000
cps961	1007	27	278.60651	.000
cps962	1188	27	228.32236	.000
cps963	1187	27	364.69531	.000
cps964	1078	27	212.63298	.000
cps965	1121	27	274.19592	.000
cps966	1125	27	258.18811	.000
cps967	1164	27	287.93118	.000
cps968	1079	27	236.76974	.000
cps969	1182	27	287.02972	.000
cps9610	1099	27	322.34781	.000
cps9611	1025	27	293.64856	.000
cps9612	1001	27	321.49307	.000
cps971	1070	27	289.66406	.000
cps972	1115	27	311.80179	.000
cps973	1112	27	288.11371	.000
cps974	1025	27	270.18579	.000
cps975	1034	27	193.19601	.000
cps976	997	27	241.64421	.000
cps977	1126	27	212.42355	.000
cps978	987	27	238.41859	.000
cps979	1026	27	208.09834	.000
cps9710	915	27	220.20444	.000
cps9711	908	27	182.30614	.000
cps9712	881	27	271.75327	.000
cps981	911	27	183.95357	.000
cps982	1026	27	294.75253	.000
cps983	955	27	236.41891	.000
cps984	930	27	183.72342	.000
cps985	935	27	313.53592	.000
cps986	923	27	218.13338	.000
cps987	1022	27	161.77234	.000
cps988	892	27	242.67361	.000
cps989	946	27	216.61974	.000
cps9810	882	27	197.58553	.000

TABLE 7 : MULTINOMIAL LOGIT RESULTS FOR TEST OF EQUIVALENCE OF NOT-ATTACHED AND MARGINAL ATTACHMENT

Dataset	N	df	Chi^2	p-value
cps942	8130	27	747.7757	.000
cps943	7918	27	922.18921	.000
cps944	8107	27	841.43256	.000
cps945	8113	27	808.17987	.000
cps946	7659	27	472.42407	.000
cps947	7554	27	743.53583	.000
cps948	7493	27	757.98419	.000
cps949	7395	27	673.42975	.000
cps9410	7710	27	679.30786	.000
cps9411	7806	27	719.52393	.000
cps9412	7698	27	540.75897	.000
cps951	7955	27	640.97876	.000
cps952	8010	27	906.80072	.000
cps953	7753	27	712.7605	.000
cps9510	6839	27	601.09589	.000
cps9511	6318	27	465.31952	.000
cps9512	5728	27	511.29886	.000
cps961	6344	27	510.48407	.000
cps962	6563	27	653.54028	.000
cps963	6635	27	576.64655	.000
cps964	6137	27	522.63458	.000
cps965	6706	27	516.77234	.000
cps966	6475	27	431.19733	.000
cps967	6421	27	504.80322	.000
cps968	5764	27	393.66998	.000
cps969	6686	27	476.5871	.000
cps9610	6706	27	503.2316	.000
cps9611	6600	27	494.30466	.000
cps9612	5928	27	490.0217	.000
cps971	6686	27	475.57022	.000
cps972	6308	27	457.6665	.000
cps973	6430	27	472.64542	.000
cps974	5932	27	423.17102	.000
cps975	6542	27	401.84991	.000
cps976	6037	27	389.87115	.000
cps977	6269	27	421.08026	.000
cps978	5670	27	467.6543	.000
cps979	6571	27	457.16217	.000
cps9710	6159	27	488.44614	.000
cps9711	6554	27	611.5592	.000
cps9712	5907	27	450.49219	.000
cps981	6423	27	441.62381	.000
cps982	6141	27	555.04419	.000
cps983	6290	27	456.33173	.000
cps984	5900	27	385.34119	.000
cps985	6636	27	329.3309	.000
cps986	5939	27	396.88428	.000
cps987	5981	27	381.19601	.000
cps988	5549	27	408.47031	.000
cps989	6358	27	481.54898	.000
cps9810	6119	27	401.10156	.000

TABLE 8 : DURATION ANALYSIS FOR TEST OF EQUIVALENCE OF UNEMPLOYMENT AND MARGINAL ATTACHMENT

Dataset	N	df	chi2	p-value
Jan-94	1614	8	512.78979	.000
Feb-94	1772	8	688.14355	.000
Mar-94	1912	8	725.04199	.000
Apr-94	1837	8	832.42676	.000
May-94	1843	8	693.05029	.000
Jun-94	1709	8	776.08887	.000
Jul-94	1607	8	716.45361	.000
Aug-94	1540	8	518.17627	.000
Sep-94	1561	8	542.13818	.000
Oct-94	1805	8	539.61768	.000
Nov-94	1782	8	689.41016	.000
Dec-94	1771	8	687.73975	.000
Jan-95	1608	8	448.52026	.000
Feb-95	1635	8	559.65454	.000
Sep-95	1385	8	417.6897	.000
Oct-95	1347	8	372.6543	.000
Nov-95	1309	8	445.34497	.000
Dec-95	1420	8	573.33008	.000
Jan-96	1296	8	409.34961	.000
Feb-96	1379	8	506.21509	.000
Mar-96	1477	8	593.58789	.000
Apr-96	1605	8	772.896	.000
May-96	1441	8	624.21387	.000
Jun-96	1329	8	466.67773	.000
Jul-96	1273	8	472.98267	.000
Aug-96	1404	8	598.42847	.000
Sep-96	1232	8	359.01001	.000
Oct-96	1392	8	349.5437	.000
Nov-96	1302	8	462.50049	.000
Dec-96	1411	8	465.09766	.000
Jan-97	1279	8	414.53296	.000
Feb-97	1343	8	401.98096	.000
Mar-97	1400	8	446.01929	.000
Apr-97	1476	8	677.98877	.000
May-97	1257	8	595.46729	.000
Jun-97	1321	8	496.3457	.000
Jul-97	1123	8	478.33521	.000
Aug-97	1224	8	469.69946	.000
Sep-97	1110	8	422.11768	.000
Oct-97	1251	8	348.28662	.000
Nov-97	1197	8	422.0603	.000
Dec-97	1330	8	480.03174	.000
Jan-98	1171	8	440.00195	.000
Feb-98	1242	8	409.94458	.000
Mar-98	1210	8	465.93896	.000
Apr-98	1408	8	639.81689	.000
May-98	1261	8	554.31177	.000
Jun-98	1228	8	606.56738	.000
Jul-98	1179	8	469.29858	.000
Aug-98	1195	8	487.04028	.000
Sep-98	1101	8	392.94165	.000

TABLE 9 : DURATION ANALYSIS FOR TEST OF EQUIVALENCE OF NOT-ATTACHED AND MARGINAL ATTACHMENT

Dataset	N	df	Chi^2	p-value
Jan-94	1558	8	415.98242	.000
Feb-94	1585	8	539.97754	.000
Mar-94	1795	8	673.51563	.000
Apr-94	1709	8	586.22949	.000
May-94	1859	8	564.12598	.000
Jun-94	2130	8	682.71777	.000
Jul-94	1974	8	629.57617	.000
Aug-94	1822	8	470.49951	.000
Sep-94	1572	8	514.34009	.000
Oct-94	1739	8	569.01318	.000
Nov-94	1676	8	434.56323	.000
Dec-94	1585	8	496.02979	.000
Jan-95	1548	8	478.69849	.000
Feb-95	1471	8	471.4751	.000
Sep-95	1436	8	449.04639	.000
Oct-95	1328	8	305.21948	.000
Nov-95	1202	8	404.96826	.000
Dec-95	1302	8	439.46851	.000
Jan-96	1230	8	339.62134	.000
Feb-96	1199	8	429.45435	.000
Mar-96	1263	8	510.82617	.000
Apr-96	1503	8	586.43213	.000
May-96	1555	8	469.56348	.000
Jun-96	1710	8	531.83643	.000
Jul-96	1532	8	555.79492	.000
Aug-96	1493	8	439.53442	.000
Sep-96	1292	8	345.73389	.000
Oct-96	1321	8	347.85327	.000
Nov-96	1243	8	320.68555	.000
Dec-96	1373	8	470.22998	.000
Jan-97	1259	8	350.59106	.000
Feb-97	1180	8	403.8584	.000
Mar-97	1289	8	404.83862	.000
Apr-97	1435	8	441.77441	.000
May-97	1410	8	426.8606	.000
Jun-97	1629	8	501.0708	.000
Jul-97	1608	8	504.90771	.000
Aug-97	1454	8	389.82178	.000
Sep-97	1235	8	345.8457	.000
Oct-97	1303	8	345.85156	.000
Nov-97	1271	8	341.13208	.000
Dec-97	1253	8	434.69946	.000
Jan-98	1162	8	408.8772	.000
Feb-98	1194	8	358.76929	.000
Mar-98	1233	8	415.2998	.000
Apr-98	1429	8	469.11084	.000
May-98	1442	8	439.29541	.000
Jun-98	1680	8	511.88086	.000
Jul-98	1535	8	503.54443	.000
Aug-98	1557	8	463.11182	.000
Sep-98	1211	8	427.50024	.000

Figure 1
Transitions into employment

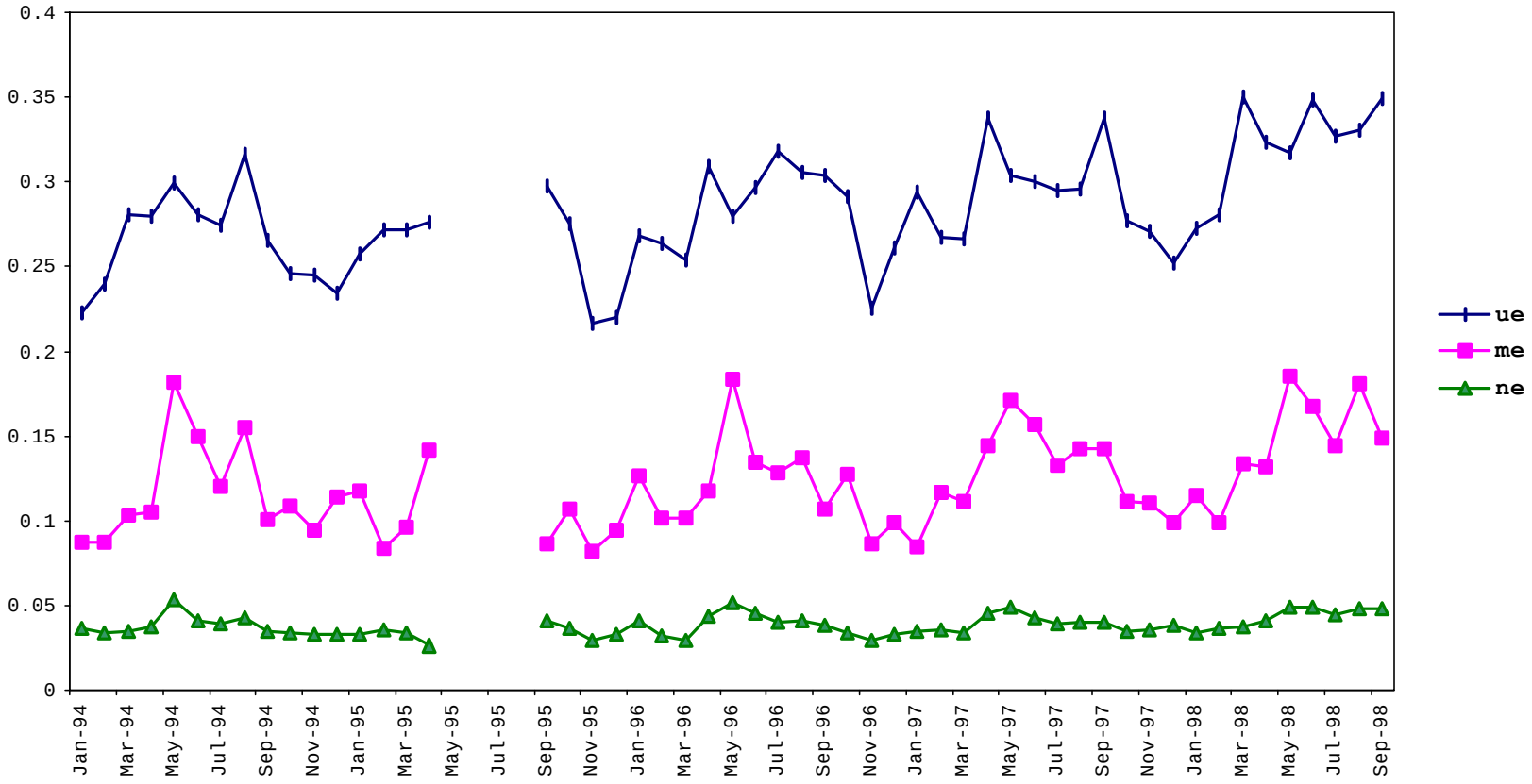


Figure 2
Transitions into unemployment

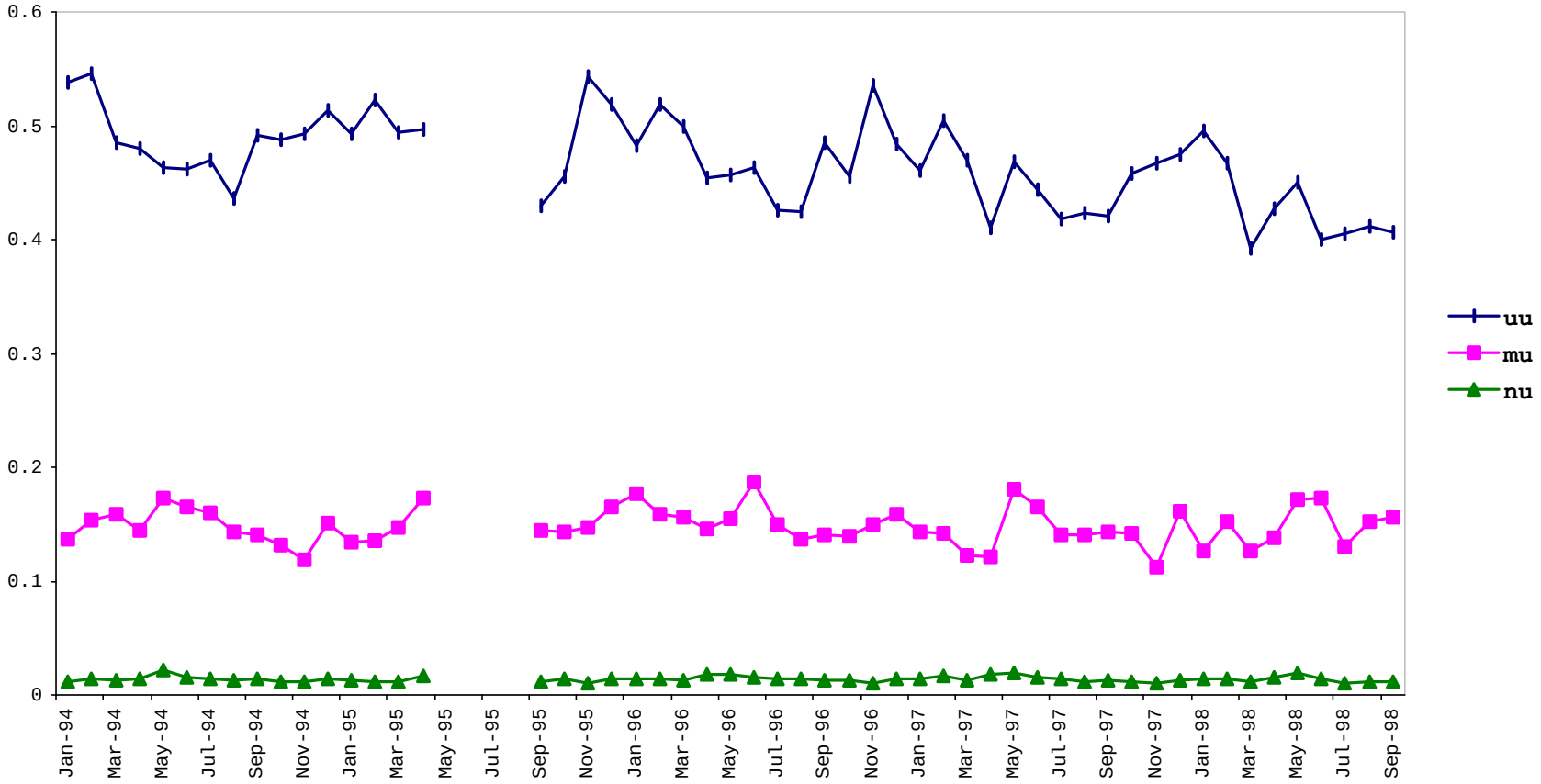


Figure 3
Transitions into marginal state

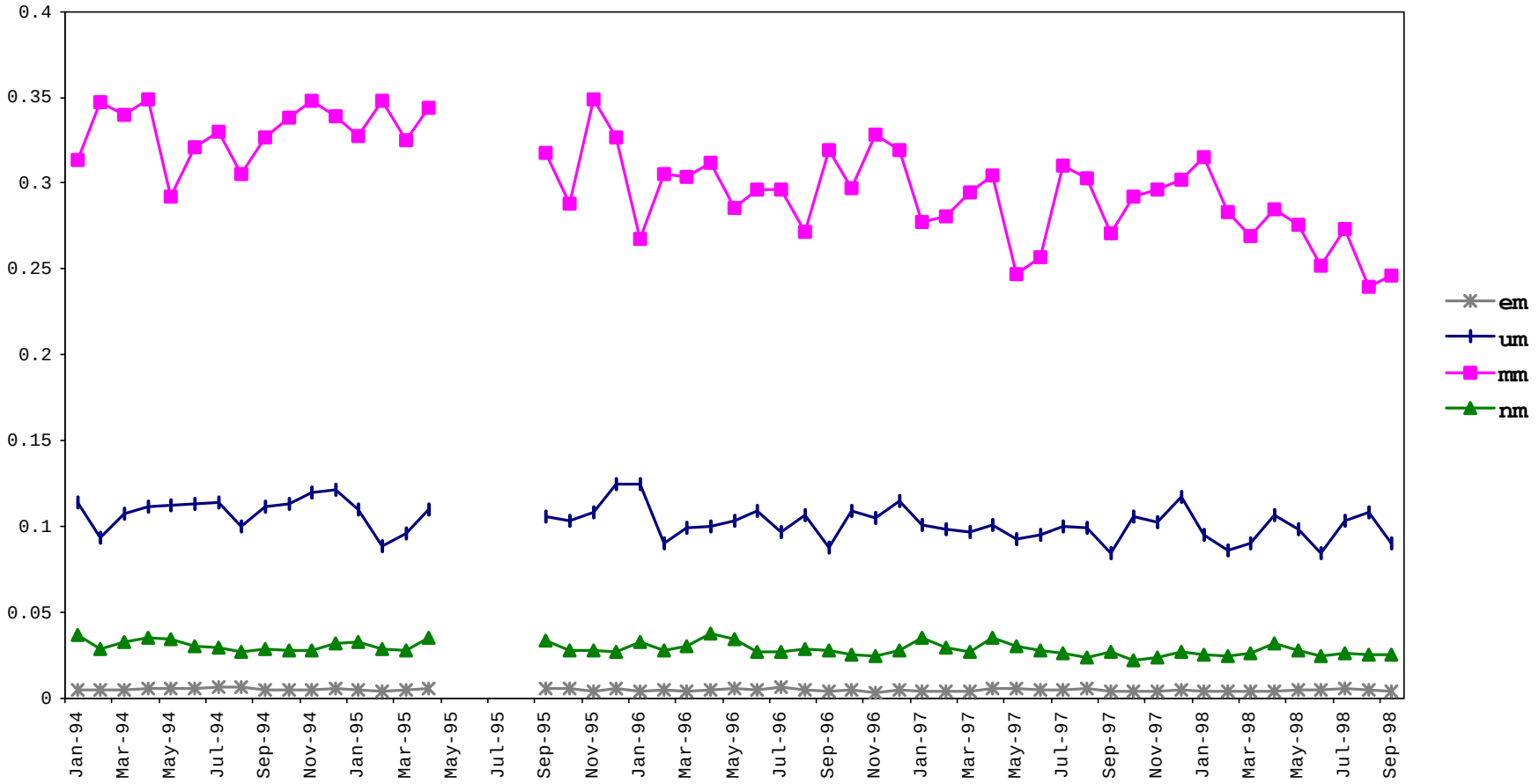


Figure 4
Transitions into not-in-labor-force

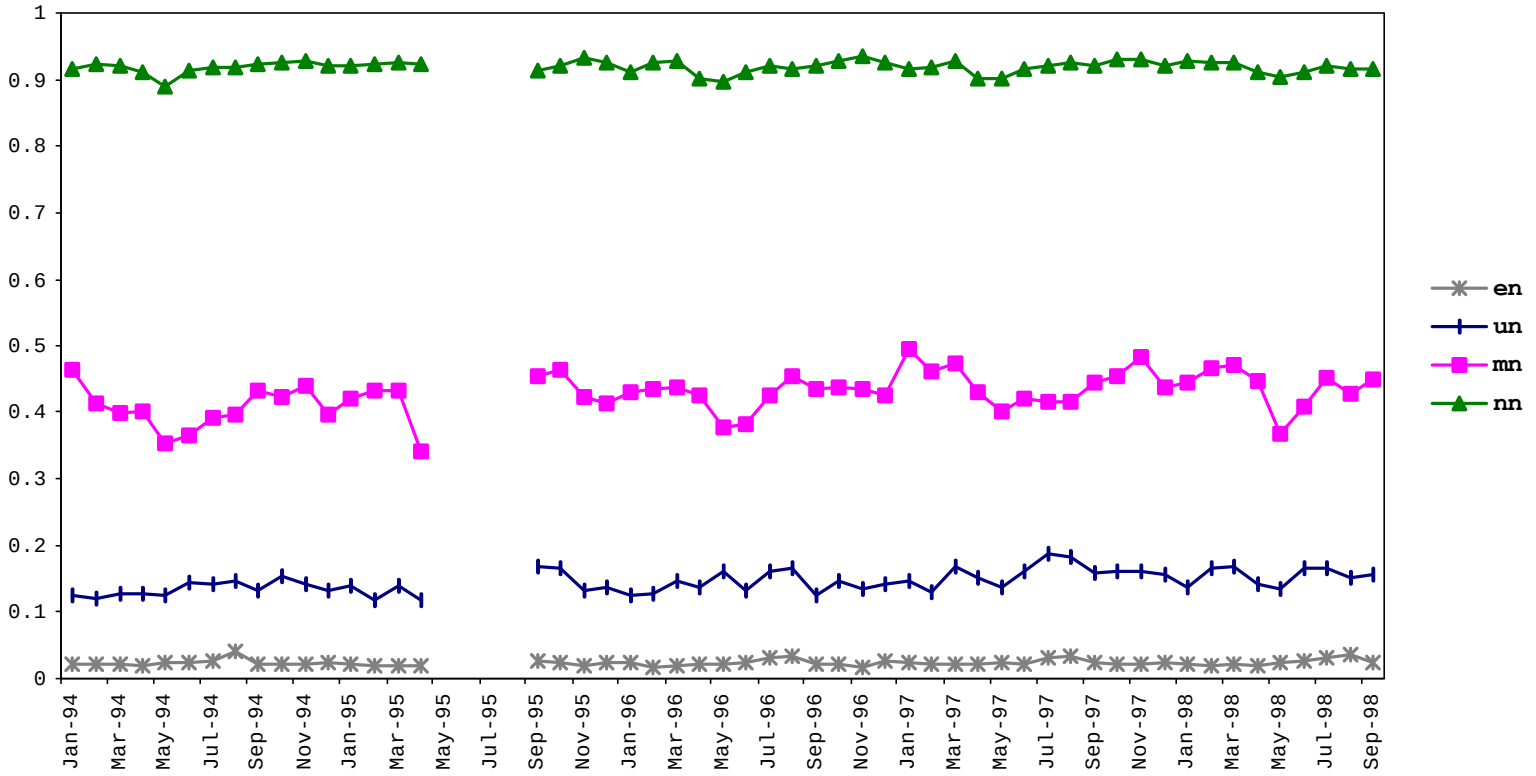


Figure 5
Transitions into employment
Breakdown of unemployed

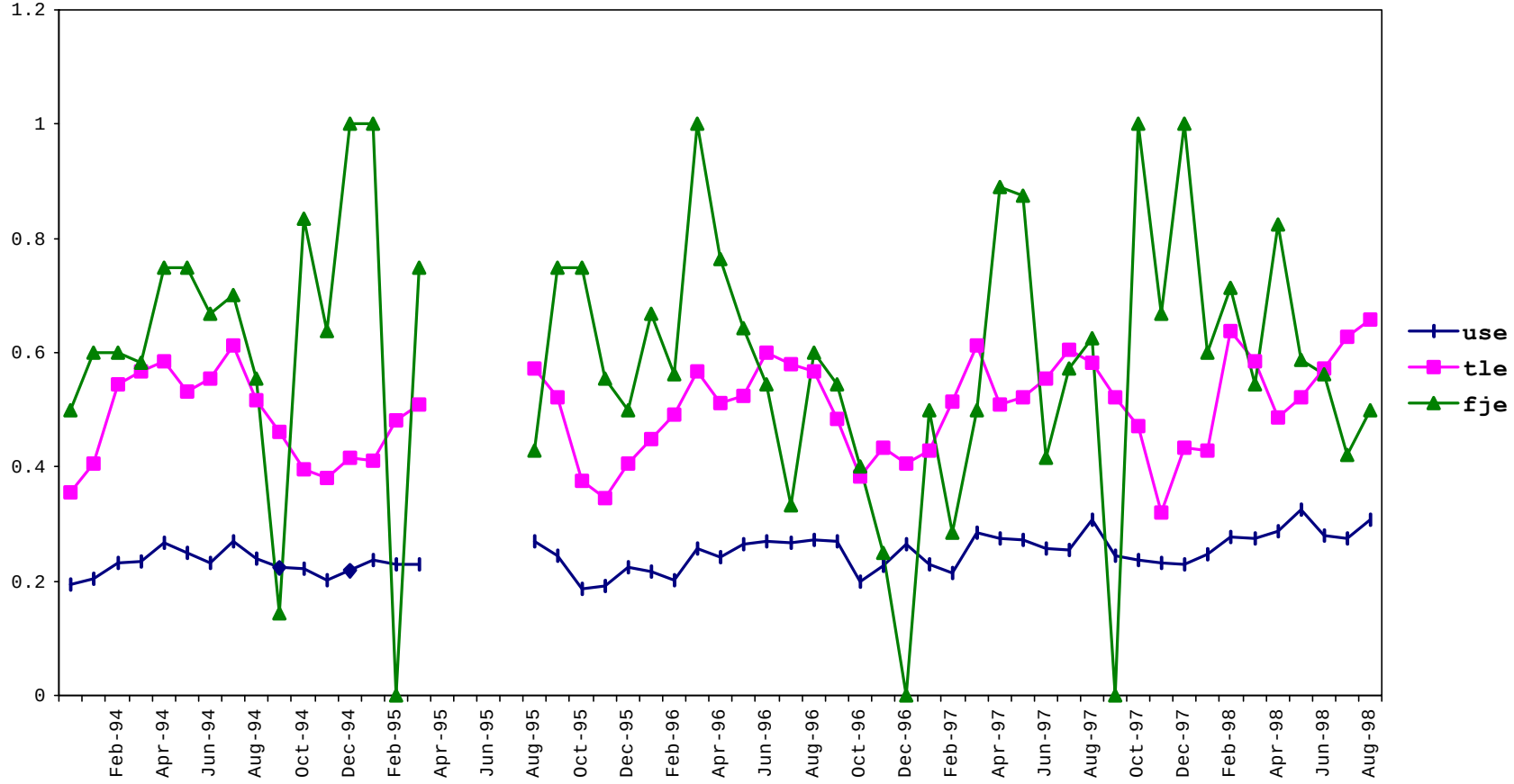


Figure 6
Transitions into employment
(Men only)

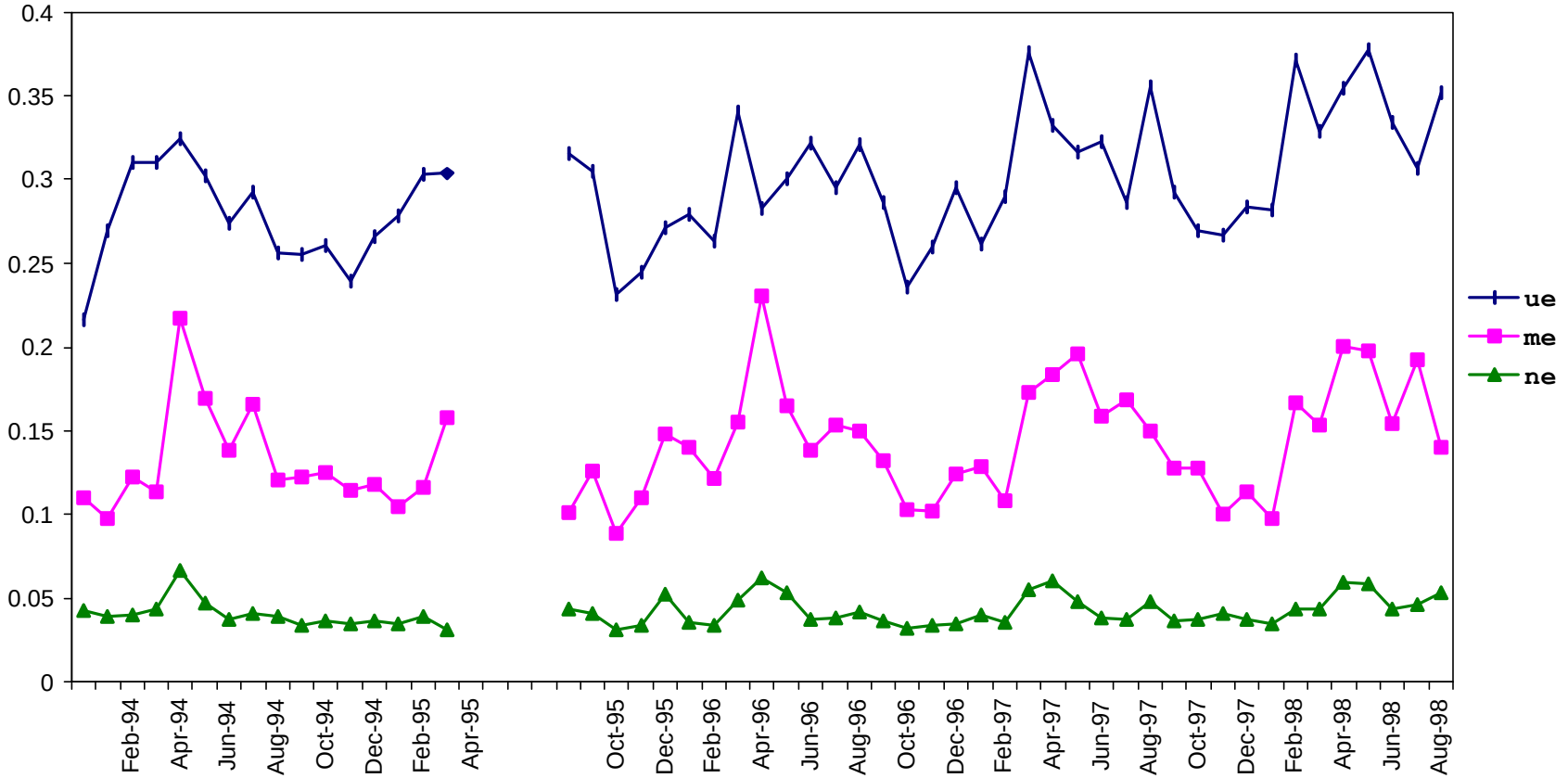


Figure 7
Transitions into employment
(Women only)

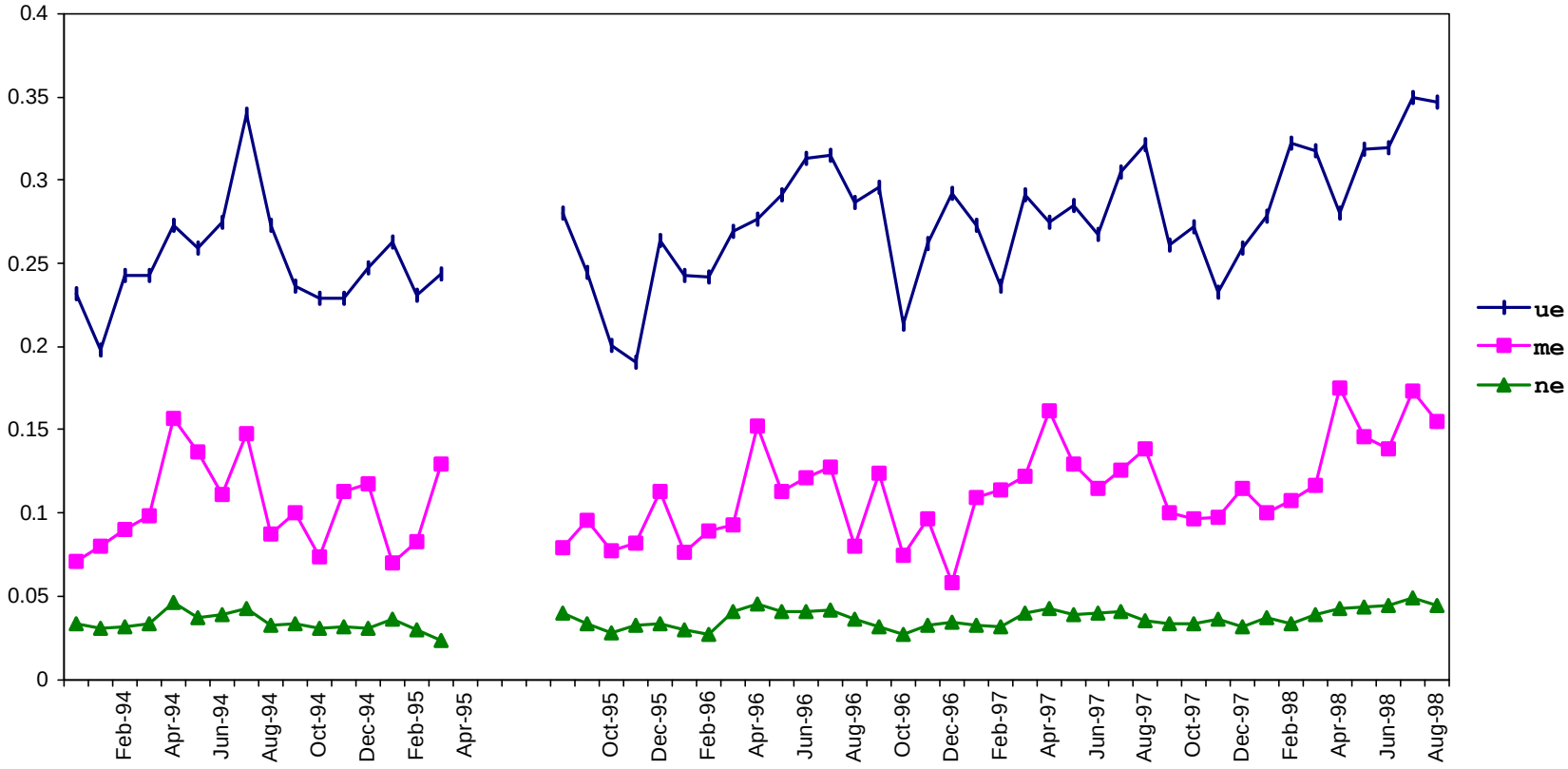


Figure 8
Transitions into employment
Breakdown of unemployed
(Men only)

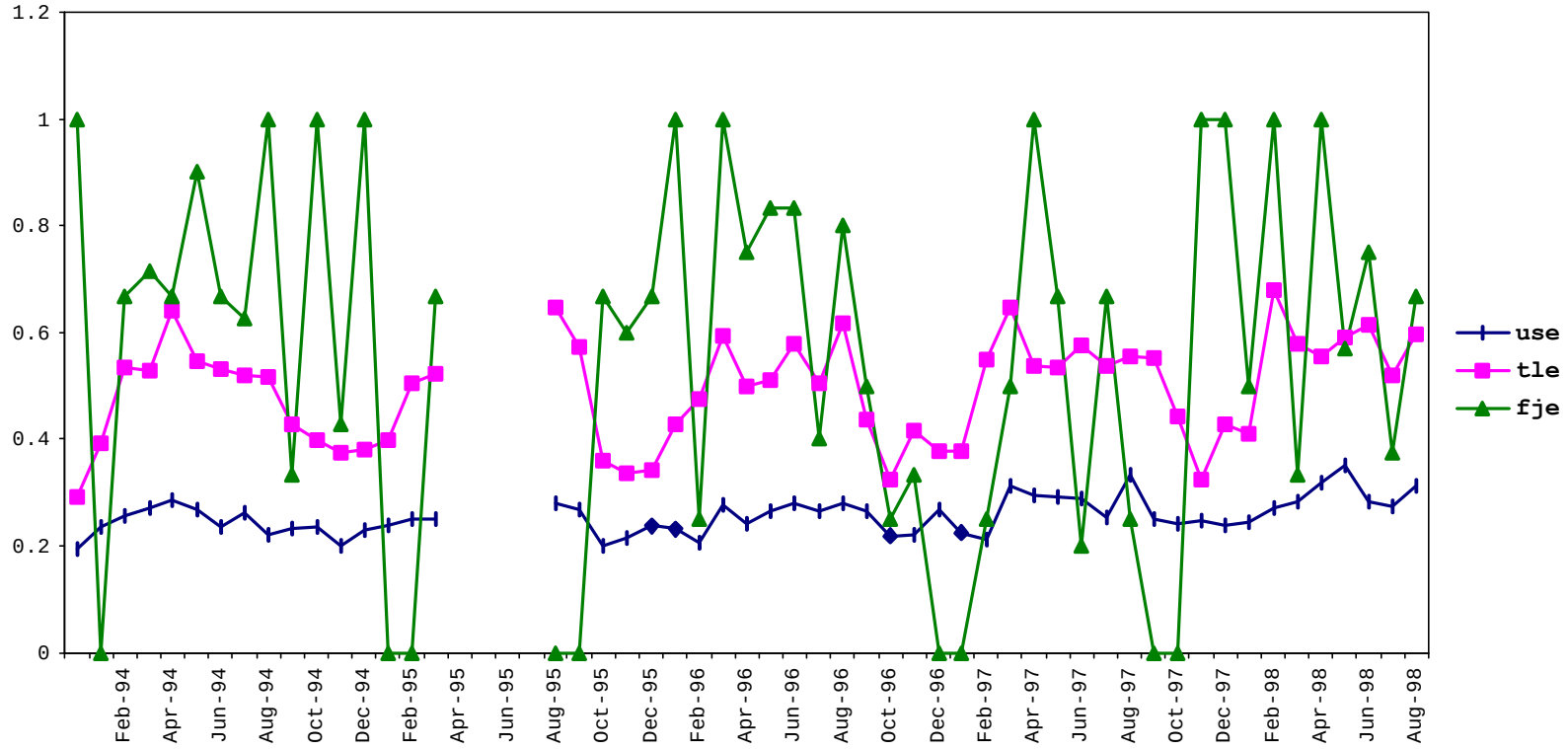
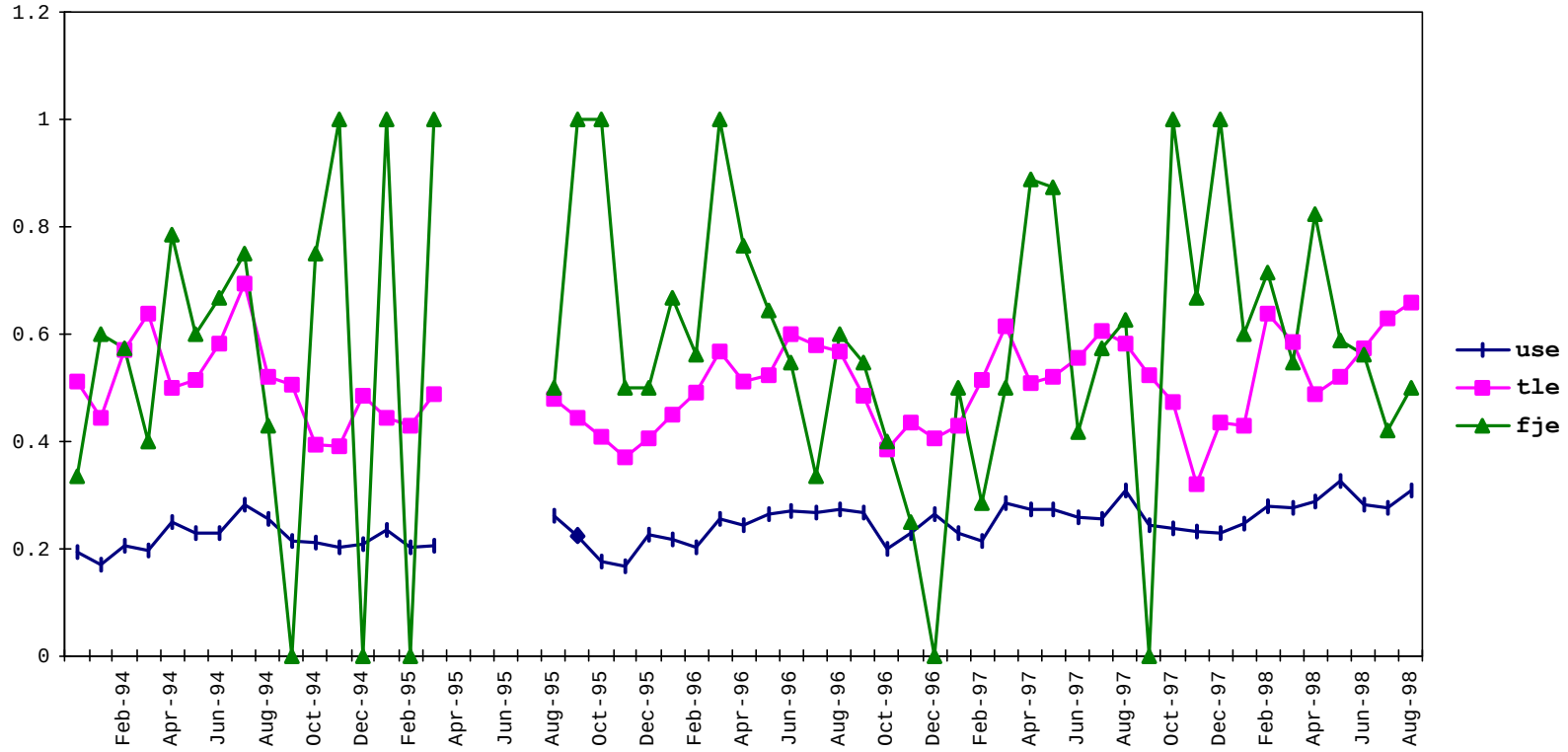


Figure 9
Transitions into employment
Breakdown of unemployed
(Women only)



APPENDIX

TABLE 1: NUMBER OF MATCHES DROPPED AFTER APPLICATION OF THE CRITERIA

Panel January to April 1994

1994 Panel A	Pairwise matches Jan-Feb	2 with 3-months Jan-Feb-Mar	3 with 4-months Jan-Feb-Mar-Ap
first data	19448	15605	14842
added data	19222	19126	19150
"Naïve" merge	17902	15064	14401
missing on sex	1618	0	0
sex	170	107	92
race	148	32	26
age M&L	234	68	57
education M&L	127	15	5
age 2	*276*	*73*	*65*
education 2	*176*	*13*	*7*
remaining	15605	14842	14221
remaining 2	*15514*	*14839*	*14211*

1994 Panel B	Pairwise matches Jan-Feb	2 with 3-months Jan-Feb-Mar	3 with 4-months Jan-Feb-Mar-Ap
first data	19637	16376	15634
added data	19616	19554	19638
"Naïve" merge	18610	15829	15283
missing on sex	1690	0	0
sex	161	83	56
race	71	29	35
age M&L	186	71	48
education M&L	126	12	5
age 2	*200*	*79*	*51*
education 2	*162*	*14*	*4*
remaining	16376	15634	15139
remaining 2	*16326*	*15624*	*15137*

APPENDIX

TABLE 2 : SUMMARY STATISTICS FOR UNMERGED AND MERGED DATA

January 1994

Variable	**Unmerged data** N=108177		**Merged data a** N=10737		**Merged data b** N=11495	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Age	43.6	18.6	43.7	18.4	44.4	18.7
Married	.567	.49	.593	.49	.587	.49
Male	.468	.50	.465	.50	.464	.50
White	.851	.35	.863	.34	.866	.34
Less than HS	.229	.42	.226	.42	.231	.42
HS	.334	.47	.326	.47	.320	.47
College or some College	.242	.43	.247	.43	.257	.44
University	.195	.40	.199	.40	.192	.39
Employed	.596	.49	.596	.49	.590	.49
Unemployed	.045	.21	.045	.21	.038	.17
Marg. Attached	.034	.18	.036	.19	.032	.17
Not in LF.	.325	.47	.323	.47	.340	.47
Unemployed (searching)	.370	.19	.367	.19	.317	.17
Unemployed (on temp. layoff)	.008	.009	.008	.09	.006	.08
Unemployed (fut. Job)	.0002	.013	.0001	.01	.0003	.02
Currently want a Job	.034	.18	.036	.19	.032	.17

APPENDIX

TABLE 3 : TRANSITION MATRIX

AVERAGE ACROSS ALL PANELS OF 1995

To From	E1	E2	E3	E4	U1	U2	U3	U4	M1	M2	M3	M4	N1	N2	N3	N4
E1	-	.9586 .9627 .9628	-	-	.0134 .0135 .0135	-	-	-	.0048 .0049 .0051	-	-	-	.0217 .0206 .0201	-	-	-
E2	-	-	.9722 .9726	-	.0083 .0062	-	-	-	.0027 .0022	-	-	-	.0098 .0073	-	-	-
E3	-	-	-	.9760	.0036	-	-	-	.0012	-	-	-	.0038	-	-	-
U1	.2493 .2526 .2470	-	-	-	-	.4871 .5054 .5102	-	-	.1066 .1057 .1096	-	-	-	.1448 .1344 .1333	-	-	-
U2	.1519 .1128	-	-	-	-	-	.6150 .6271	-	.0637 .0589	-	-	-	.0576 .0529	-	-	-
U3	.0578	-	-	-	-	-	-	.6866	.0286	-	-	-	.0283	-	-	-
M1	.0934 .0973 .1016	-	-	-	.1458 .1500 .1567	-	-	-	-	.3159 .3353 .3343	-	-	.4316 .4248 .4042	-	-	-
M2	.0387 .0377	-	-	-	.1023 .0912	-	-	-	-	-	.4538 .4724	-	.2609 .2026	-	-	-
M3	.0146	-	-	-	.0455	-	-	-	-	-	-	.5249	.1106	-	-	-
N1	.0336 .0334 .0319	-	-	-	.0124 .0123 .0126	-	-	-	.0289 .0282 .0293	-	-	-	-	.9213 .9257 .9271	-	-
N2	.0135 .0099	-	-	-	.0045 .0044	-	-	-	.0141 .0116	-	-	-	-	-	.9542 .9551	-
N3	.0044	-	-	-	.0019	-	-	-	.0060	-	-	-	-	-	-	.9658

APPENDIX

TABLE 3 : TRANSITION MATRIX (continued)

AVERAGE ACROSS ALL PANELS OF 1996

To From	E1	E2	E3	E4	U1	U2	U3	U4	M1	M2	M3	M4	N1	N2	N3	N4
E1	- .2823 .2821 .2834	.9567 .9620 .9623	-	-	.0124 .0124 .0125	-	-	-	.0046 .0046 .0047	-	-	-	.0231 .0233 .0231	-	-	-
E2	- .1466 .1037	- - -	.9713 .9718 -	-	.0066 .0040 -	-	-	-	.0021 .0013 .0006	-	-	-	.0098 .0057 .0028	-	-	-
E3	- .0520	- -	- -	.9758 -	.0021 -	-	-	-	.0006 .0192	-	-	-	.0028 .0182	-	-	-
U1	.2823 .2821 .2834	-	-	-	-	.4650 .4878 .4778	-	-	.1029 .1021 .1013	-	-	-	.1427 .1423 .1428	-	-	-
U2	.1466 .1037	-	-	-	-	-	.5930 .5852	-	.0562 .0410	-	-	-	.0591 .0419	-	-	-
U3	.0520	-	-	-	-	-	-	.6230	.0192	-	-	-	.0182	-	-	-
M1	.1224 .1231 .1253	-	-	-	.1532 .1542 .1545	-	-	-	-	.2750 .3130 .3257	-	-	.4232 .4190 .4155	-	-	-
M2	.0400 .0330	-	-	-	.0872 .0729	-	-	-	-	-	.4223 .4691	-	.2128 .1437	-	-	-
M3	.0080	-	-	-	.0290	-	-	-	-	-	-	.5479	.0621	-	-	-
N1	.0378 .0376 .0383	-	-	-	.0142 .0141 .0140	-	-	-	.0289 .0289 .0289	-	-	-	-	.9156 .9211 .9213	-	-
N2	.0122 .0085	-	-	-	.0051 .0034	-	-	-	.0125 .0080	-	-	-	-	-	.9518 .9496	-
N3	.0034	-	-	-	.0014	-	-	-	.0036	-	-	-	-	-	-	.9632

APPENDIX

TABLE 3 : TRANSITION MATRIX (continued)

AVERAGE ACROSS ALL PANELS OF 1997

To From	E1	E2	E3	E4	U1	U2	U3	U4	M1	M2	M3	M4	N1	N2	N3	N4
E1	- .2920 .2933 .2957	.9572 .9629 .9628	- .1511 .1039	-	.0112 .0113 .0114	- .4364 .4555 .4674	-	-	.0047 .0046 .0046	-	-	-	.0236 .0234 .0234	-	-	-
E2	-	-	.9718 .9721	-	.0060 .0036	-	-	-	.0021 .0014	-	-	-	.0100 .0058	-	-	-
E3	-	-	-	.9761	.0019	-	-	-	.0006	-	-	-	.0028	-	-	-
U1	-	-	-	-	-	-	.5619 .5804	-	.0992 .0990 .0991	-	-	-	.1590 .1583 .1584	-	-	-
U2	-	-	-	-	-	-	-	.6272	.0555 .0392	-	-	-	.0664 .0469	-	-	-
U3	.0503	-	-	-	-	-	-	-	.0177	-	-	-	.0210	-	-	-
M1	.1305 .1312 .1320	-	-	-	.1434 .1448 .1456	-	-	-	-	.2705 .2834 .3132	-	-	.4400 .4359 .4324	-	-	-
M2	.0458 .0377	-	-	-	.0801 .0608	-	-	-	-	-	.3920 .4563	-	.2296 .1576	-	-	-
M3	.0096	-	-	-	.0227	-	-	-	-	-	-	.5433	.0687	-	-	-
N1	.0390 .0391 .0394	-	-	-	.0138 .0137 .0136	-	-	-	.0274 .0270 .0270	-	-	-	-	.9180 .9208 .9219	-	-
N2	.0130 .0086	-	-	-	.0048 .0033	-	-	-	.0114 .0075	-	-	-	-	-	.9522 .9508	-
N3	.0035	-	-	-	.0013	-	-	-	.0033	-	-	-	-	-	-	.9644

APPENDIX

TABLE 3 : TRANSITION MATRIX (continued)

AVERAGE ACROSS ALL PANELS OF 1998

To From	E1	E2	E3	E4	U1	U2	U3	U4	M1	M2	M3	M4	N1	N2	N3	N4
E1	- 	.9564 .9616 .9616	- 	- 	.0111 .0110 .0110	- 	- 	- 	.0046 .0047 .0046	- 	- 	- 	.0251 .0250 .0252	- 	- 	-
E2	- 	- 	.9708 .9708	- 	.0060 .0037	- 	- 	- 	.0023 .0013	- 	- 	- 	.0111 .0070	- 	- 	-
E3	- 	- 	- 	.9750 	.0019 	- 	- 	- 	.0007 	- 	- 	- 	.0034 	- 	- 	-
U1	.3275 .3313 .3268	- 	- 	- 	- 	.4299 .4287 .4154	- 	- 	.0958 .0980 .0993	- 	- 	- 	.1371 .1591 .1559	- 	- 	-
U2	.1826 .1264	- 	- 	- 	- 	- 	.5090 .6236	- 	.0596 .0439	- 	- 	- 	.1283 .1219	- 	- 	-
U3	.0600 	- 	- 	- 	- 	- 	- 	.5817 	.0216 	- 	- 	- 	.1014 	- 	- 	-
M1	.1499 .1539 .1576	- 	- 	- 	.1492 .1497 .1513	- 	- 	- 	- 	.2571 .2809 .2730	- 	- 	.4338 .4303 .4243	- 	- 	-
M2	.0542 .0422	- 	- 	- 	.0986 .0743	- 	- 	- 	- 	- 	.3904 .3967	- 	.2291 .1817	- 	- 	-
M3	.0141 	- 	- 	- 	.0396 	- 	- 	- 	- 	- 	- 	.4518 	.0838 	- 	- 	-
N1	.0437 .0440 .0446	- 	- 	- 	.0136 .0133 .0135	- 	- 	- 	.0263 .0261 .0260	- 	- 	- 	- 	.9170 .9170 .9188	- 	-
N2	.0149 .0103	- 	- 	- 	.0052 .0037	- 	- 	- 	.0119 .0079	- 	- 	- 	- 	- 	.9500 .9477	-
N3	.0044 	- 	- 	- 	.0015 	- 	- 	- 	.0036 	- 	- 	- 	- 	- 	- 	.9604