The Dynamics of Immigrant Welfare and Labor Market Behavior*

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Abstract

This paper analyzes transitions into and out of 3 different labor market states, social assistance, unemployment and employment. We estimate a dynamic multinomial logit model, controlling for endogenous initial condition and unobserved heterogeneity, using a large representative Swedish panel data set, LINDA, for the years 1990 to 1996. The unadjusted data indicates that immigrants are more likely to receive both social assistance and unemployment compensation than natives. Immigrants are less likely to remain employed in consecutive years than natives and are more likely to stay on welfare and to receive unemployment insurance in a year, given participation in the previous year. The empirical results suggest that refugee immigrants display a greater degree of "structural" state dependence than natives. Further, immigrants from non-refugee countries display a similar degree of "structural" state dependence as natives. The high welfare participation rates among refugee immigrants seem to be due to the existence of a "welfare trap", while participation among natives and non-refugee immigrants is largely due to permanent unobserved characteristics. These results suggest that welfare reforms will have differential effects on refugee immigrants and natives.

JEL Codes: I30, I38, J15, J18, J61
Keywords: Welfare, labor market behavior, transition, immigration, state dependence.

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1. Introduction

The increase in immigration experienced by many Western countries in the last decade has led to raised concerns regarding immigrant over utilization in welfare programs. In fact, this concern has incited some countries to restrict access to some government transfer programs for immigrants. In the U.S. for example, The Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) of 1996, denies non-citizens who arrived after 1996 the right to receive most types of public assistance. In Germany, immigrants without permanent residency may lose the right to stay in the country or may be denied residency extensions if they depend on social assistance. Although the country studied in this paper, Sweden, does not treat immigrants differently from natives with respect to social assistance, immigration is central to the welfare debate. By the mid-1990's immigrants in Sweden accounted for nearly half of the country's expenditure on social assistance. This is quite remarkable since immigrants represent approximately an 11 percent minority of the population. In addition, given that real expenditures on the social assistance program in Sweden increased by 170 percent between 1983 and 1996 and that the share of immigrants in the population during the same period increased from 7.6 percent to 10.8 percent, it is clear that understanding immigrants' welfare utilization is essential in explaining the expenditure trend.

One important reason for the increase in welfare participation, and the consequent growth in expenditures, is the rise in the unemployment rate in the 1990's in Sweden. Figure 1 shows the unemployment rate for the labor force and for foreign citizens. The official unemployment rate grew from 1.7 percent in 1990 to slightly more than 8 percent in 1996. For immigrants, the labor market deteriorated even more. In 1990, approximately 4 percent of foreign citizens were unemployed. This had increased to 23 percent by 1996. The increase in welfare expenditures in Sweden in the 1990's can partly be explained by the large inflows of immigrants who arrived during this period who were not eligible for unemployment insurance and therefore had to rely on social assistance for their subsistence.

The poor immigrant employment situation in the last decade is not specific to Sweden. Immigrants in most European OECD countries experience substantially higher

unemployment rates relative to natives (SOPEMI 2000). Furthermore, like Sweden, France, Germany, the Netherlands and the United Kingdom received large numbers of asylum seekers during the 1990s. The inflow of new refugee immigrants is likely to have put an increased pressure on immigrant public assistance expenditure and increasing efforts have been taken to integrate immigrants effectively into the respective labor markets (SOPEMI 2000).

Several studies have examined differences in welfare participation between immigrants and natives (see for instance Baker and Benjamin, 1995; Borjas and Hilton, 1996; Hansen and Lofstrom, 2003 and Riphahn, 1998 for Canada, the U.S., Sweden and Germany respectively). However, to our knowledge, no study has analyzed transitions across labor market states of immigrants, mainly due to a lack of representative panel data with sufficiently large number of immigrants. Understanding the dynamic processes underlying the observed utilization of government transfer programs is essential. Questions regarding an existence of a "welfare trap" and if it matters differently for immigrants and natives are important policy issues. If, for example, observed serial persistence in welfare utilization is due to permanent unobserved heterogeneity, e.g. individuals have time invariant unobserved preferences for welfare participation, the observed dependence is "spurious" and policies directed at getting people off welfare are less likely to be successful. On the other hand, if the persistence is due to "structural" dependence, in the sense that previous participation directly affects current probability of participation, i.e. a "welfare trap" exists, changes in benefit rules are more likely to meet their objectives of utilization reduction. It is also possible that there exist differences in state dependence of transfer program participation between immigrants and natives. This paper aims to investigate this possibility and, if differences exist, to quantify the differences.

In this paper we confine the analysis to transitions into and out of three states: welfare, unemployment and employment. Our goal is to answer the following questions: Do the probabilities of transitions differ between natives and immigrants? Is there a "welfare trap" in Sweden and, if so, is this state dependence different for immigrants and natives?

To answer these questions we estimate dynamic multinomial logit models, controlling for both endogenous initial condition and unobserved heterogeneity, taking advantage of a recently collected large representative longitudinal data set, Longitudinal Individual Data (LINDA). This data set contains information on more than 300,000 individuals annually for the period 1990 to 1996. The data is collected from administrative records which imply essentially no attrition and equally important, accurately reported welfare status.

The data show that immigrants are less likely to remain employed in consecutive years than natives and are more likely to stay on welfare, or to receive unemployment insurance, given participation in the previous year. The empirical results suggest that refugee immigrants display a greater degree of "structural" state dependence in welfare than natives and immigrants from non-refugee countries. Further, immigrants from non-refugee countries also display a large degree of "structural" unemployment state dependence. Overall, the source of state dependence is found to be more spurious among natives than immigrants. This indicate that the high welfare participation rates among refugee immigrants, in particular, is due to the existence of a "welfare trap", while participation among natives and non-refugee immigrants is largely due to permanent unobserved characteristics. Furthermore, the results imply that changes in welfare program parameters will have differential effects on refugee immigrants and natives and that the success of, for example, labor market training programs will differ across groups.

The paper is organized in the following way. In section 2 we give background information about immigration, the social assistance program and unemployment insurance in Sweden. Section 3 describes the data and variables while Section 4 depicts trends and differences, between immigrants and natives, in government transfer program participation and transitions. In Section 5 we provide a discussion of state dependence and in Section 6 we present the model and empirical specification. We discuss the results in Section 7 and conclude in Section 8.

2. Immigration and Welfare Programs in Sweden

Immigration into Sweden

The inflow of immigrants to Sweden has undergone a number of changes during the last six decades. Figure 2 shows annual immigration to Sweden from 1940 to 1998, both in terms of the level of the immigrant inflow and inflow expressed as the proportion of the total population in the corresponding year. Overall, annual immigration has amounted to about 0.4 percent of the population, but notably higher during the 1990's. Naturally, the large inflow of immigrants has also changed the composition of the population in Sweden.

The reasons people immigrate to Sweden have changed substantially during the post-war period. In principle, we can distinguish between three categories of immigrants, based on the reasons for immigration: economic migrants (e.g. due to the recruitment of labor), tied movers (i.e. family ties) and refugees. In the late 1940's, a large fraction of the immigrants arrived in Sweden as refugees, mainly from the Nordic countries. However, in the period from 1950 to 1970, most of the immigrants were recruited by the Swedish industry or migrated because of family ties. From 1970 and onwards, the proportion of immigrants arriving as refugees has increased significantly, from less than 10 percent of the immigrant inflow in 1970 to about 70 percent in the early 1990's. In 1994, this proportion dropped from 70 percent to about 50 percent, mostly due to the improved conditions in the Balkan countries. Since the 1980's, roughly 1/3 of refugee immigrants migrated from former Yugoslavia and approximately 1/4 from Iran and Iraq. Overall, about one half of immigrants in Sweden today come from Europe, of these, 40 percent are Nordic citizens.

Social Assistance in Sweden

The Swedish welfare system is well known internationally for the high degree of income security that it provides for its citizens. Recently, this generous system has been the target of a number of reforms, mainly due to the recession that hit Sweden, and many other countries, in the early 1990's.

As an ultimate safety net, people in Sweden are covered by social assistance (SA). As with unemployment insurance, the eligibility rules and benefit levels are the same for immigrants and natives. In order to be eligible for SA, all other welfare programs, such as unemployment compensation, housing allowance (bostadsbidrag), child allowance (barnbidrag), maintenance allowance (underhållsbidrag) and various pensions, must be exhausted first. The benefit levels vary, both across family types and regions, but are intended to cover expenses essential for a "decent" standard of living. To be eligible for SA benefits, a family must have income and assets below certain specified benefits levels, known as norms. The norms were, until 1998, determined in each of the 288 municipalities in Sweden. However, as of the 1st of January 1998, the regional variations in the norms were replaced by a national norm in order to reduce the inequality aspect of having differentiated benefit levels.[1] The norms serve as guidelines for the social worker who decides the actual size of the benefits. SA benefits are paid according to a schedule that sets a guarantee amount for a family of a given size. These benefits are reduced at a 100 percent reduction rate as the family's income rises.

Unemployment Insurance in Sweden

The Swedish unemployment insurance system consists of two parts: unemployment benefits (Arbetslöshetskassa, UB) and unemployment assistance (Kontant arbetsmarknadsstöd, UA). In 1990, the coverage was slightly less than 80 percent of the labor force, with roughly 70 percent covered by UB and 10 percent by UA. To be entitled to compensation from UB, an unemployed worker must have paid membership fees to the UB fund for the last 12 months and he must have been working for at least 75 days preceding the current unemployment spell. These conditions imply that many of the new entrants in the labor market, such as young workers and immigrants, are not entitled to compensation from UB. There is a time limit on UB and entitled workers can receive benefits for a maximum of 300 working days. Compared to non-Scandinavian countries,

[1] According to the national norm in 1998, a single person would receive 2,884 SEK per month in SA while a couple with two children would receive about 7,500 SEK per month (depending on the age of the children). These amounts are intended to cover expenses for so called necessary consumption, such as food, basic clothing, leisure, health, newspapers, telephone and fees for TV, and partially for housing. Additional

the benefit levels are quite generous with replacement rates varying between 75 and 90 percent during the 1990's.[2]

Workers who are not eligible for receiving UB may be entitled to compensation from UA. There exists a similar work requirement for receiving UA as for receiving UB, but there is no "membership" requirement. However, UA is substantially less generous than UB, both in terms of benefit duration and compensation levels.[3]

3. Data

Description of the Data and Sampling Procedures

The data used in this paper is taken from a recently created Swedish longitudinal data set, Longitudinal Individual Data (LINDA). LINDA is a register-based data set and it consists of a large panel of individuals, and their household members, which are representative for the population from 1960 to 1996. LINDA is a joint endeavor between the Department of Economics at Uppsala University, The National Social Insurance Board (RFV), Statistics Sweden, and the Ministries of Finance and Labor. The main administrator of the data set is Statistics Sweden. For a more detailed description of the data used here, including the sampling structure, see Edin and Fredriksson (2000). LINDA contains a 3 percent representative random sample of the Swedish population, corresponding to approximately 300,000 individuals for the period studied here. The sampled population consists of all individuals, including children and elderly persons, who lived in Sweden during a particular year. The sampling procedure used in constructing the panel data set ensures that each cross-section is representative for the population in each year. Attached to LINDA is a non-overlapping representative random sample of immigrants containing the same variables, and created in the same fashion, as the general sample. The immigrant sample consists of 20 percent of all individuals born

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assistance for housing is also available, known as "bostadsbidrag". In 1998, the exchange rate was roughly 8 SEK per U.S. Dollar.

[2] Until 1993, the UB replacement rate was 90 percent of earnings up to a maximum level determined by the government. In July 1993, the replacement rate was reduced to 80 percent and in January 1996, it was further reduced to 75 percent. The replacement rate was raised back to 80 percent in September of 1997.

[3] Under the UA program, an unemployed worker receives approximately 200 SEK/day, corresponding to roughly 30 percent of average earnings, and the maximum benefit period is 150 working days.

abroad. We merged this sample with the general population sample. This generates a sample of the Swedish population where immigrants are over-represented, which can be adjusted for by using appropriate methods.

The sample used in this study consists of information from LINDA for the years 1990-1996.[4] We excluded all women, men younger than 18 years or older than 65 years, students and retired individuals. A person is defined to be an immigrant if he was born abroad, and a refugee immigrant if he was born in a refugee country, as defined by the Swedish Immigration Board, or in a sub-Saharan country. [5] If the person is an immigrant or a refugee, we have information about the year of arrival in Sweden.[6] In the subsequent analysis, we include all immigrants who have been in Sweden for at least two years. The reason for this sample selection is that the great majority of refugee immigrants receive welfare upon arrival to Sweden automatically. The immigration board then assists the refugee immigrants in various activities, including language training, in order to ease them into the labor market. A typical "integration" period lasts for 1-2 years. During this time, the immigrant is extremely limited in choices of labor market states. Including these immigrants may therefore overstate the state dependence in welfare use among immigrants. To ensure that our results are not driven by this exclusion restriction, we estimated the models reported below including the most recent immigrants. The welfare dependence among refugee immigrants increases somewhat, as expected, but the conclusions regarding state dependence and its sources remain the same. [7]

[4] We lack information about welfare use prior to 1990.

[5] The countries defined by the Swedish Immigration Board as refugee countries: Ethiopia, Afghanistan, Bulgaria, Bangladesh, Bosnia, Chile, Sri Lanka, Cuba, Iraq, Iran, India, Yugoslavia, China, Croatia, Lebanon, Moldavia, Peru, Pakistan, Poland, Russia, Soviet Union, Romania Somalia, Syria, Togo, Turkey, Ukraine, Uganda and Vietnam.

[6] All immigrant households included in LINDA, whether defined as refugees or not, have obtained residence permits. This means, for instance, that asylum seekers who have not yet obtained a residence permit are not included in LINDA. Furthermore, the data does not allow us to identify the exact year of arrival for immigrants who arrived in 1968 or earlier.

[7] The possibility of non-random return migration is another reason to define the immigrant sample in this way. Edin et al (2000) find that that return migration among refugees is low, less than 10 percent within 5 years since arrival, and if an immigrant is to leave Sweden, it is most likely to take place within the first few years after arrival. By excluding the most recent immigrants we may decrease the potential effects of return migration on our estimates. We also find it comforting that the results do not change very much between the samples with and without the years since migration restriction.

Variable Definitions

To answer the questions regarding the existence of a "welfare trap" in Sweden, we estimate a dynamic multinomial model controlling for both unobserved individual heterogeneity and initial conditions. We distinguish between three mutually exclusive labor market states for every year: being employed, receiving unemployment benefits and receiving social assistance.

Since LINDA lacks information about individuals' time allocation, we need to rely on the income sources to classify individuals into different labor market states. Specifically, if the sampled person in the household earned more than the "basic amount", 36,200 in 1996 Swedish kronor (SEK), or roughly $4,000 using current exchange rates, in income from employment, and at the same time did not receive any welfare benefits (either social assistance or unemployment benefits), we defined the person as being employed that year.[8] Persons who received more than one-half of a "basic amount", SEK 18,100, in unemployment benefits during the year, but did not receive any social assistance were defined as being unemployed. Finally, persons belong to the third state (receiving welfare) if they received social assistance for at least one month during the year.[9]

Previous research has found greater sensitivity in public assistance participation to local labor market conditions among immigrants than natives in the U.S. (Lofstrom and Bean, 2002). To address this issue, local labor market variables are assigned to each individual in each year based on the individual's region of residence. The information is obtained from three sources. Data on average county earnings growth are obtained using LINDA while data on local unemployment rates, at the county level, were acquired from Statistics Sweden's labor force surveys. To address any long-term effects of the economic conditions when joining the labor force, we incorporate annual growth in gross domestic product and the annual unemployment rate at time of labor market entry. For immigrants, year of labor market entry is identical to time of arrival in Sweden, while we

[8] The seemingly arbitrary value of annual earnings chosen to indicate employment, 36,200 SEK, refers to the so called "basic amount". Statistics Sweden defines individuals as employed during a year if they earned this amount.

[9] Since we need to rely on the income sources to classify individuals into different labor market states, in any given year, approximately three percent of our sample does not satisfy the criteria for the above three states. These individuals were excluded in the subsequent analysis.

use years of education plus seven to define the age when a native enters the labor market. The data is obtained from Statistics Sweden.

The Swedish municipalities provide data on social assistance benefit guidelines, also known as norms. The municipality, in which the individual resides, as well as the family composition, such as marital status, age and number of children determines the norms, which establishes the benefit level. We were able to assign a social assistance norm to each person in the sample in 1994 and in 1996. Unfortunately, we have not been able to obtain similar information for the other years. Nevertheless, the municipal generosity rankings between the two years appear constant, indicating stability across municipality benefit levels over time. To resolve the missing municipal information issue, we assign the 1994 norms to all years prior to 1995 and the 1996 norms to the years 1995 and 1996.

4. Welfare and Labor Market Behavior

Sweden experienced an increase in immigration in the 1990's. During this period the economy was also entrenched in a severe recession, with a trough around 1993-94 which only moderately leveled off by 1996. Table 1 shows welfare participation rates, as well as our measures for unemployment and employment rates, separately by year for the four groups; natives, Nordic immigrants, non-refugee immigrants and refugee immigrants.

Immigrants participated to a greater extent in both the social assistance and unemployment compensation programs than natives did throughout the period studied here. Furthermore, Nordic and other non-refugee immigrants utilized these programs less than refugees. The table also shows that there is a greater difference between immigrant and native welfare utilization than in the immigrant-native difference in participation in the unemployment insurance programs. For example, the average welfare participation rate for refugee immigrants during the 1990-96 period was roughly six times higher than the average utilization rates for natives. The average UI participation rate was "only" around twice as high for refugees, relative to natives. The discrepancy in the relative

utilization rates in the programs between immigrants and natives is at least partially due to UI ineligibility for, in particular recent, refugee immigrants.

There are substantial differences in the dynamic welfare and labor market behavior between immigrants and natives. Table 2 shows transition probability matrices separately for the four groups. This table reveals several interesting relationships and patterns. First, we examine the issue of state dependence in the raw data. For all four groups, the most stable state is employment. However, employment is less stable for immigrants, especially refugee immigrants, than it is for natives. The probability a native stays employed for two consecutive years is 0.94 while the corresponding probability is 0.86 for immigrants from refugee countries. Welfare also appears to be a relatively stable state for this immigrant group. The probability of remaining in welfare the next is approximately 0.79. There are only small differences between the four groups in the probabilities of collecting UI in consecutive years, between 0.71 and 0.73.

Table 2 also indicates that immigrants are considerably less likely to move out-of welfare and into employment than natives. An immigrant from a refugee country is on average almost less than half as likely to move off welfare and into employment compared to a native born Swede, probabilities of 0.19 and 0.1 respectively. All groups are more likely to move into employment from unemployment than welfare. However, the differences in the unemployment to employment transition probabilities between immigrants and natives are less than the immigrant-native differences in transition probabilities between welfare and employment.

Conditional on being employed in a given year, it also appears that immigrants are more likely to collect either welfare or UI than natives are in the next year. Table 2 shows that about 1 percent of natives move from employment to welfare in consecutive years. The equivalent transition probability for refugee immigrants is close to 0.05, while it is around 0.03 for both non-refugee and Nordic immigrants. All immigrant groups are also more likely to move from employment to unemployment than natives. Approximately 5 percent of natives go from employment to unemployment in a given year while roughly 6 percent of the immigrants from non-refugee and the Nordic countries experience the same transition. Among refugees, slightly less than 10 percent collect UI the year after being employed.

Given the differences in transition probabilities between immigrants and natives, we would also expect the distribution of the number of welfare and labor market spells to differ across groups. Table 3 shows the distribution of these spells for the balanced panel, a sub-sample consisting of men who were observed for the whole period 1990-96.[10] This means that the figures shown in Table 3 are calculated based on a sample that does not include any immigrants who arrived after 1990. Approximately 92 percent of natives did not utilize social assistance at all during the period 1990-96, while only about 2/3 of refugee immigrants experienced no welfare participation spell. Approximately 6.5 percent of refugee immigrants collected welfare for each of the seven years. The respective figure for natives is substantially lower, 0.7 percent. Nordic and non-refugee immigrants appear to have quite similar distributions in both welfare and unemployment spells and are generally utilizing both social assistance and UI less frequently than immigrants from refugee countries.

One of the objectives of this paper is to study the determinants of the transitions between welfare, unemployment and employment, and if there are any differences in these determinants between immigrants and natives. However, before we analyze the observed disparity in the behavior of immigrants and natives, we want to examine differences in the observable characteristics between individuals who stay in a particular state and the ones who change states.

Table 4 shows mean characteristics by previous year's state. In general, it appears that any movements out of welfare into employment are associated with higher educational attainment, being married and having more children. Individuals who move from welfare to employment also seem to live in areas with relatively low unemployment and, surprisingly, a relatively strong decline in earnings growth as well as higher benefit levels. Transitions from unemployment into employment are associated with higher education, being married and having more children. Unlike transitions from welfare to employment, moving from unemployment to employment is positively correlated with economic growth in the county. Regarding transitions from employment to welfare, it

[10] Note that in this case it is inappropriate to use an unbalanced panel since this would underestimate the number of spells. This is a problem, in particular, for refugee immigrants since many arrived during the period analyzed and consequently cannot have as many spells as individuals who were observed the entire period 1990-1996.

appears to be associated with lower levels of schooling, being single, having more children and living in a major city. The only general relationship for state dependency appears to be age, namely, older individuals seem to be less likely to move out of previous year's state.

The descriptive statistics indicates that immigrants are more likely to utilize both welfare and unemployment compensation than natives. Immigrants from refugee countries participate in these transfer programs to a greater extent than Nordic and non-refugee immigrants and there appear to be very small differences between Nordic and non-refugee immigrants. Furthermore, immigrants are less likely to remain employed in consecutive years than natives and more likely to stay on welfare and to receive unemployment insurance in a year, given participation in the previous year. The data also indicates that immigrants have a more difficult time moving into employment than natives. The immigrant-native difference in transition probabilities is particularly great concerning moves from welfare into employment for refugee immigrants.

Some of the above discussed differences between immigrants and natives may be due to differences in schooling levels, age, marital status, family composition, geographic location, economic growth and unemployment rate at time of labor market entry, differences in benefit levels and differences in the local labor market conditions. We next discuss potential sources of the observed state dependence and then we present an empirical model that takes the above observable characteristics into account, as well as unobserved heterogeneity and initial conditions.

5. State Dependence: Structural v. Spurious

The empirical strategy utilized in this paper allows us to estimate to what extent the observed state dependence is "structural" and "spurious". However, before empirically analyzing the data, we address what the potential sources are for the different types of serial persistence. The goal of this section is to first define the forms of state dependence and to examine alternative sources of structural and spurious serial persistence respectively. Policy implications of the form of state dependence are discussed in the results section below.

Economist have often observed that individuals who were employed, unemployed or collected social assistance in the previous period are more likely to be observed in those particular event states in the future than person who did not experience those specific events (e.g. Blank, 1989; Chay and Hyslop, 1998; Engberg, Gottschalk and Wolf, 1990; Hyslop, 1999). The source of this observed serial persistence is not clear and may be due to two distinctive explanations. Following Heckman (1981), we define the state dependence to be "structural" or "true" if past experience, i.e. what state the individual was observed in the previous period, has a real effect on the probability of observing the individual in a given current state. According to this definition, past experience has an actual behavioral effect. However, the observed serial persistence may alternatively be due to time invariant, and unobservable, differences across individuals. Under this assumption, the state dependence is termed "spurious" since the persistence is not due to the previous experience of an event.

The notion that previous participation directly affects current probability of participation is consistent with the concept of a "welfare trap" and can consequently be labeled structural, or true, state dependence. Possible explanations for the existence of a welfare trap are *human capital depreciation*, (in which the stock of human capital is depreciated during the period an individual is not active in the work force) or *signaling* (potential employers believe that a person who has been unemployed or on welfare is not as productive as an identical applicant who has not experienced these events). In either of these cases, wage offers are lowered by participation in the social assistance program and hence, the labor supply decision is affected, holding preferences constant. However, preferences themselves, and consequently the reservation wage, may be affected by participation in a welfare or unemployment compensation program. Nonetheless, if state dependence is structural, policies aimed to reduce participation in social assistance through changes in benefit rules are likely to reduce participation. The main mechanism to lower welfare dependence is through lower entry rates into the program, but exit probabilities are also likely to be affected.

The relationship between observed past and current states may instead be due to time invariant individual differences to experiencing the event, and hence termed spurious. Clearly, some of the differences across individuals are due to observable

characteristics, such as age, nativity, education, marital status and number of children, and can easily be controlled for in a model estimating these state propensities. The empirical methodology applied here also allows us to purge the data from time invariant unobserved individual heterogeneity and hence gives us an estimate of spurious state dependence. An important point is that the source is unobserved and permanent, at least in the sense of spanning the whole period analyzed. Potential explanations for the source of spurious state dependence are *labor market discrimination* and differences in time invariant *preferences* (with respect to leisure and/or so-called stigma effects associated with participation in the transfer program).[11] Although our empirical approach does not allow us to separate between these two potential sources, the results presented below will allow us to assess how these two distinct explanations contribute differently to the observed state dependence for immigrants and natives.

6. Model and Empirical Specification

To analyze transitions into and out of different labor market states, we estimate a dynamic multinomial logit model with random effects. We assume that the dynamic structure can be approximated by a first-order Markov model. The usage of longitudinal data allows us to control for unobserved heterogeneity and to distinguish between "structural" and "spurious" state dependence.

The model can be described as follows. Assume that individuals (indexed by *i, i=1,2,…,n*) who belong to one of four nativity groups (indexed by *m*, natives (*m=1)*, Nordic immigrants (*m=2)*, Non-refugee immigrants *(m=3)*, and Refugee immigrants *(m=4)*) choose between the following three mutually exclusive states *k* at time *t* (*t=2,3,…,T_i*): being employed ($k_t=1$), receiving welfare ($k_t=2$), and receiving unemployment benefits ($k_t=3$). Let the value, for individual *i*, from nativity group *m,* of choice *k* at time *t* (V_{imkt}) be specified as:

[11] It is also possible that long-term illness or disability is another source of spurious state dependence. This is due to the fact that the data does not permit identification of this state and that we observe individuals from 1990 to 1996 and hence, time invariant, or permanent, refers to no changes over this period.

$$V_{imkt} = \beta^1_{mk} + \mathbf{X}_{imt}\beta^2_{mk} + \mathbf{L}_{imt}\beta^3_{mk} + \mathbf{Z}_{imt}\beta^4_{mk} + \varepsilon_{imkt}$$

where $\mathbf{X}_{imt}$ is a vector of observable characteristics, including time dummies, age, educational attainment, family composition, years since migration and the economic conditions at the time of entry in the labor market. The vector $\mathbf{L}_{imt}$ describes the local labor market where the individual resides. It includes information on the unemployment rate and average earnings growth, as well as welfare benefit levels. Benefit levels are available at the municipal level (Sweden has close to 300 municipalities), while the other variables are available only at the county level (between 1990 and 1996, there were 24 counties in Sweden). $\mathbf{Z}_{imt}$ is a vector of dummy variables indicating the previous labor market state occupied by the individual. We follow Heckman (1981) and Cameron and Heckman (2001) and assume that ε_{imkt} is characterized by a factor structure as follows;

$$\varepsilon_{imkt} = \mu_{mk}\eta_i + \nu_{imkt}$$

where η_i represents an unobserved individual specific and time-invariant effect and μ_{mk} is a factor loading parameter. The second term, ν_{imkt}, represents a white-noise error term and is assumed to be serially uncorrelated, independent of $\mathbf{X}_{imt}$, $\mathbf{L}_{imt}$, and $\mathbf{Z}_{imt}$, and to follow a Type I extreme value distribution.[12] We also assume that η_i is independent of ν_{imkt} and of $\mathbf{X}_{imt}$, $\mathbf{L}_{imt}$, and $\mathbf{Z}_{imt}$.

The assumption that ν_{imkt} follows a Type I extreme value distribution may seem restrictive and more flexible assumptions such as joint normality are possible. However, as shown by McFadden and Train (2000), any probability structure of discrete choices can be captured using Type I extreme value errors in combination with a non-parametric specification of the unobserved heterogeneity, such as the one used in this paper. That is, the Type I extreme value distribution assumption by itself is not restrictive.

The vectors β^l_{mk} *l=1,2,3,4* contain parameters to be estimated, and for identification purposes, we normalize β^l_{m1} *l=1,2,,3,4* and μ_{m1} to zero. Given the

distribution assumptions of ν_{imkt}, the probability of observing individual *i,* who belongs to nativity group *m*, in state *k* at time *t (t>1)*, conditional on $\mathbf{X}_{imt}$, $\mathbf{L}_{imt}$, $\mathbf{Z}_{imt}$ and η_i, can be written as:

$$P_{imt}(k_t \mid \eta_i) = \frac{\exp(\beta^1_{mk} + \mathbf{X}_{imt}\beta^2_{mk} + \mathbf{L}_{imt}\beta^3_{mk} + \mathbf{Z}_{imt}\beta^4_{mk} + \mu_{mk}\eta_i)}{\sum_{s=1}^{3}\exp(\beta^1_{mk} + \mathbf{X}_{imt}\beta^2_{ms} + \mathbf{L}_{imt}\beta^3_{ms} + \mathbf{Z}_{imt}\beta^4_{ms} + \mu_{ms}\eta_i)}$$

Because the state in which a person is initially observed is likely to be endogenous, we adopt a procedure similar to that suggested by Heckman (1981). For the initial period the individual is observed (*t=1*), we estimate a static multinomial logit model including $\mathbf{X}_{im1}$ and $\mathbf{L}_{im1}$ as control variables. This procedure approximates the initial conditions for the model, and Heckman (1981) reports that this approximation, in a binary choice model, performs well and that the procedure leads to only a small asymptotic bias.[13] Let the value, for individual *i*, from immigrant group *m,* of option *k* at the initial time period (*t=1)* be specified as:

$$V_{imk1} = \theta^1_{mk} + \mathbf{X}_{im1}\theta^2_{mk} + \mathbf{L}_{im1}\theta^3_{mk} + \varepsilon_{imk1}$$

where,

$$\varepsilon_{imk1} = \alpha_{mk}\eta_i + \nu_{imk1}$$

[12] Note however that the permanent factor, η, allows for a particular form of serial correlation in ε.

[13] A simple and naïve approach would be to assume that the initial conditions are exogenous (uncorrelated with the unobserved individual-specific effects). However, this is a very strong assumption and unlikely to hold. Alternatively, we could assume that the stochastic process that generates the observed participation sequences is in equilibrium at the beginning of the sample period (see Card and Sullivan, 1988). As pointed out by Chay and Hyslop, 1998, this assumption is unlikely to hold when the observable covariates are time-varying and important determinants of participation. Finally, the random effects assumption could be relaxed in favor of a fixed effects estimator. In this framework, the unobserved individual-specific effects can be absorbed with a conditioning statement which would circumvent the initial conditions problem (see Arellano and Honore, 2000, and Honore and Kyriazidou, 2000). However, in dynamic models with observable characteristics, the necessary conditioning statement is somewhat restrictive as it requires exogenous characteristics to be stationary in the final two periods. This implies, among other things, that time dummies and local labor market conditions are ruled out.

and where θ_{mk}^{l} *l=1,2,3* are parameters to be estimated. As earlier, we assume that ν_{imk1} follows a Type I extreme value distribution, and we normalize θ_{1}^{l} *l=1,2,3* and α_{m1} to zero.

The probability of observing individual *i,* who belongs to nativity group *m*, in state *k* in the first time period, conditional on $\mathbf{X}_{imt}$, $\mathbf{L}_{imt}$, $\mathbf{Z}_{imt}$ and η_i, can be written as:

$$P_{im1}(k_1 \mid \eta_i) = \frac{\exp(\theta_{mk}^{1} + \mathbf{X}_{im1}\theta_{mk}^{2} + \mathbf{L}_{im1}\theta_{mk}^{3} + \alpha_{mk}\eta_i)}{\sum_{s=1}^{3}\exp(\theta_{ms}^{1} + \mathbf{X}_{im1}\theta_{ms}^{2} + \mathbf{L}_{im1}\theta_{ms}^{3} + \alpha_{ms}\eta_i)}$$

The presence of the unobserved individual specific effects, η_i, in the option value equations allows for a particular correlation between the stochastic terms ε_{imkt} and ε_{imk1} and lets us relax the assumption that the initial conditions are exogenous. However, the parameters μ_{mk} and α_{mk} are not identified without further normalizations. We can normalize the first two moments of η_i, E(η_i)=0 and Var(η_i)=1, or we can leave the mean and variance unrestricted and instead impose normalizations on β_{mk}^{1}, θ_{mk}^{1}, μ_{mk} and α_{mk}.[14] We choose the former alternative, and given these normalizations, the model can be estimated with maximum likelihood techniques. The likelihood contribution for individual *i*, with observed states $k_1, k_2, \ldots, k_T$, given observed characteristics and unobserved heterogeneity, can be written as:

$$L_{im}(\eta_i) = \prod_{t=1}^{T} P_{imt}(k_t \mid \eta_i)$$

However, as η_i is not observed, we have to integrate out this term from the above likelihood to obtain the unconditional likelihood function. To do this, we need to specify a distribution for η_i. We follow Heckman and Singer (1984), and assume that the probability distribution of η_i can be approximated by a discrete distribution with a finite

number (*J*) of support points. In this case, integration is replaced by a summation over the number of supports for the distribution of η_i. Associated with each support point is a probability, π_j, where $\sum_{j=1}^{J} \pi_j = 1$ and $\pi_j \geq 0$. To be specific, we assume that there are *J* types of individuals and that each individual is endowed with a particular realization of η_i, η_i^j. This implies that the unconditional contribution to the log-likelihood function for individual *i* is given by:

$$\log L_{im} = \log \sum_{j=1}^{J} \pi_j L_{im}(\eta_i^j)$$

We experimented with different values for *J*, and found that a model with *J=2* fitted the data quite well.[15] This low dimensionality has been found in many studies of mixture models (e.g. Cameron and Heckman (2001), Ham and Lalonde (1996), and Eberwein, Ham and Lalonde (1997)).

7. Empirical Results

In this section, we report results from maximizing the likelihood function above. The magnitudes of the estimated coefficients provide little information about the size of the effects of the observable characteristics, due to the non-linear nature of the model. Therefore, instead of discussing the coefficient estimates, which are reported in Tables A1-A4 in the Appendix, we will focus our presentation on the transition probabilities and source of observed state dependence. The predicted transition probabilities are evaluated at the corresponding sample means and are based on the estimates reported in Tables A1-A4.

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[14] Cameron and Heckman (2001) choose to normalize the mean and the variance whereas Ham and Lalonde (1996) and Eberwein, Ham and Lalonde (1997) normalize β_{mk}^1, θ_{mk}^1, μ_{mk} and α_{mk}.

[15] In a recent paper, Chay and Hyslop, 1998, estimate dynamic models of welfare use and labor force participation and find that the results regarding state dependence are not very sensitive to different distributional assumptions with respect to the unobserved heterogeneity.

In Table 5 we present the predicted transition matrices separately for natives, Nordic immigrants, non-refugee immigrants and refugee immigrants. The entries in the top panel (Panel A) refer to a restricted specification that ignores the issue of unobserved heterogeneity and endogenous initial conditions (presented as Model 1 in Tables A1-A4). In the lower panel of Table 6 (Panel B), we present results based on estimates from a general model that attempts to control for these matters (presented as Model 2 in Tables A1-A4).

The entries in Panel A show that natives display significantly lower state dependence in welfare than immigrants whereas the persistency in unemployment is similar for both natives and immigrants. Moreover, the lower welfare participation rates among natives compared to immigrants, as shown in Table 1, are due to both lower inflow rates and higher outflow rates. As expected, when controls for endogenous initial conditions and unobserved heterogeneity are incorporated in the model, we find a substantial reduction in the estimated state dependences for all groups. [16] The estimated decline in welfare persistence moving from Panel A to Panel B is greatest for natives. The probability that a native will remain in the welfare state in two consecutive years decreased from 0.52 in Model 1 to approximately 0.16 in Model 2. For immigrants from refugee countries, the probability of collecting welfare in two consecutive years changes from about 0.76 to almost 0.30 when initial conditions and unobserved heterogeneity are controlled for. There are also large differences in the estimated unemployment state stability between immigrants and natives in Panel A and B. We next turn to examining these changes.

The transition probabilities reported in Table 5 can be used to decompose the estimated state dependence into structural and spurious state dependence. The results from this decomposition are presented in Table 6. For natives, we find that approximately 31 percent of the observed welfare persistence is "structural" and hence 69 percent is "spurious" and due to unobserved heterogeneity. A similar result is obtained for Nordic immigrants, for whom about 63 percent of the welfare persistence can be labeled "spurious". This suggests that the majority of the observed serial persistence among

[16] A similar reduction in serial persistence when unobserved heterogeneity is incorporated is reported in Chay and Hyslop (1998).

natives and Nordic immigrants is due to time invariant heterogeneity. For non-refugee immigrants we find that roughly half of the observed welfare persistence is "structural" while for refugee immigrants about 77 percent is "structural" and consequently only 23 percent of the welfare persistence is "spurious". These results are essential in analyzing the issue of a "welfare trap". Our findings indicate that such a trap does exist and that it is largest for refugee immigrants and smallest for natives. The reported standard errors, obtained using a parametric bootstrap, imply that the differences in structural versus spurious state dependence are significant at conventional levels of significance. We will now turn to a discussion of plausible reasons for the differences.

The finding that welfare dependence among natives is mostly spurious, while it is mostly structural among refugee immigrants, suggests two possible explanations; labor market discrimination and differences in preferences. This appears to imply that native welfare recipients have stronger preferences for welfare participation than refugee recipients, since it is hard to argue that native born Swedes would face more discrimination than refugee immigrants. One implication of this is that a change in the welfare benefit structure is not likely to lower participation as significantly among natives as among refugees. It also suggests that immigrants from refugee countries may be more susceptible to changes in the welfare programs and in work opportunities. Policies directed at getting people off welfare, such as training programs, are more likely to be successful among the refugee population than among the native population.

The results also help explain why we observe higher welfare participation rates among refugee immigrants than other groups, even after several years in the country (Hansen and Lofstrom, 2003). The current policy in Sweden implies a division of the integration process of refugee immigrants into two periods. Before integration into the labor market starts, an introductory period takes place in which the immigrant participates in Swedish language courses. During this period, refugees are introduced and supported by welfare. Given the finding that the observed state dependence among refugees is mainly structural (i.e. the probability of welfare receipt in the previous period directly affects current welfare participation) and the policy of initial support of refugees through welfare, we would expect higher welfare participation for a period of time.

It may be the case that some of the difference in welfare utilization and serial persistence in welfare use between natives and, in particular, refugee immigrants is due to differences in observed characteristics. For example, in the data we find that immigrants in Sweden are less likely to be high school graduates and slightly more likely to have a university degree than natives. Thus, a larger fraction of immigrants than natives has less than a high school degree. To test if this difference, as well as differences in other characteristics, can explain the difference in welfare utilization and serial persistence in welfare use, we calculated predicted transition matrices for all immigrants groups using the mean characteristics of the native population. The results are presented in Table 7 and show that differences in observed characteristics can explain only a very small fraction of the observed difference in welfare use. The fraction of the welfare state dependence that is attributed to structural reasons remains largely unchanged for the non-refugee and Nordic immigrant groups but declines by slightly less than 10 percent for refugee immigrants. This suggests that the differences in welfare use between natives and immigrants are mainly due to differences in unobserved characteristics, including differences in labor market preferences.

In an attempt to explore the robustness of our results, we re-estimated the two models presented above, with and without controls for unobserved heterogeneity, using a different definition of the welfare state. In the above analysis, a person belongs to the welfare state if he received social assistance for at least one month during the year. This definition is arguably ad-hoc, and to verify that our results are not driven by our method of defining the welfare state, we estimated models where persons belong to the welfare state if they received social assistance for at least *three* months during the year. Moreover, from the results above we see that refugees are significantly different from natives and other immigrant groups in their labor market behavior. As a considerable fraction of refugee immigrants arrived in Sweden in the 1990s, our results may, to some extent, be determined by the composition of our refugee sample. To test this, we re-estimated the models above on a sub-sample that excludes all refugee immigrants that arrived in Sweden during the 1990s.

The results from the sensitivity analysis are found in Tables 8 and 9. These tables show the proportion of state dependence that is attributed to structural and spurious

reasons. When we use the alternative definition of the welfare state, see Table 8, we find that the proportions of the state dependence in welfare that is spurious are close to what we reported in Table 6 for all groups. The largest difference is found for Nordic immigrants, 44 percent using the alternative definition and 37 percent when using the original definition.

Using the sub-sample that excludes all refugee immigrants who arrived in Sweden during the 1990's, shown in Table 9, we find that the proportion of the state dependence in welfare that is spurious among refugee immigrants is very similar to that reported in Table 6. Thus, it appears that the result of a significantly larger structural state dependence and existence of a welfare trap among refugee immigrants is not due to a compositional change in the immigrant population stemming from the large inflow of refugee immigrants in the 1990's. Overall, our results appear quite robust towards how we define the labor market states and they also appear to be insensitive towards the composition of our refugee sample.

8. Summary and Conclusions

This paper analyzes transitions into and out of 3 different labor market states, social assistance, unemployment and employment, in Sweden. We use data from a large representative Swedish panel data set, LINDA, for the years 1990 to 1996, to investigate if there are differences in transition probabilities between immigrants and natives. The unadjusted data indicates that immigrants are more likely to receive both social assistance and unemployment compensation than natives are. Furthermore, immigrants appear to be less likely to remain employed in consecutive years than natives and more likely to stay on welfare and to receive unemployment insurance in a year, given participation in the previous year. The raw data also suggest that immigrants have a more difficult time moving into employment than natives. We find evidence of substantial differences between immigrants from refugee countries and natives, but smaller differences between non-refugee and Nordic immigrants and natives. Also, there seem to be relatively small differences between non-refugee immigrants and Nordic immigrants in terms of both transfer program participation and changes across welfare and labor market states.

Central to the welfare debate is the issue of an existence of a "welfare trap". If welfare utilization has an addictive effect, and current program participation directly impacts future probability of program utilization, high participation rates may be, at least partially, remedied by changes in welfare program parameters, including benefit levels. The success of welfare reform is more questionable if instead observed serial persistence is due to "spurious" state dependence. In this case, permanent unobserved heterogeneity across individuals is the source of the state dependence. To separate between these sources of state dependence we estimate several dynamic multinomial logit models, including a model that controls for both endogenous initial condition and unobserved heterogeneity. The model also allows us to investigate differences in state dependence between immigrants and natives.

The empirical results suggest that immigrants display a greater degree of state dependence than natives. Furthermore, transfer program participation persistence appears to be less among immigrants from Nordic and non-refugee countries than among other immigrants. Our results also indicate that the source of the state dependence differ across immigrants and natives. In particular, refugee immigrant welfare utilization persistence stems to a greater extent from the "addictive" incentive effects of welfare participation, or the existence of a "welfare trap", than it does among natives. Consequently, state dependence among natives appears to be due to unobserved heterogeneity, possibly in welfare preferences, to a greater extent than it is among immigrants from refugee countries. This implies that the composition of the immigrant and the native welfare population is different. A possible explanation for the differences across groups, particularly the welfare state dependence differences between refugee immigrants and the other nativity groups, is the country selection process is different for refugees. It is quite likely that refugee immigrants have not had the comfort of choosing their new country based on specific source country characteristics such as welfare programs.

These results suggest that changes in government transfer program eligibility levels and rules will have differential effects on immigrants and natives. Programs aimed at assisting labor market entry or re-entry are more likely to be successful among the refugee immigrant population than among the native population. The results also imply that changes in the welfare program, such as a lowering of benefits levels, are likely to

reduce participation to a greater extent among immigrants from refugee countries than among natives.

References

Amemiya, Takeshi, *Advanced Econometrics*, Harvard University Press, Cambridge, 1985.

Arellano, Manuel and Honore, Bo, "Panel Data Models: Some Recent Developments," in *Handbook of Econometrics, Vol. 5*, eds. Heckman, J. and E. Leamer, North-Holland, 2001, 3229-3296.

Bauer, Thomas, Lofstrom, Magnus and Zimmermann, Klaus F., "Immigration Policy, Assimilation of Immigrants, and Natives' Sentiments towards Immigrants: Evidence from 12 OECD Countries," *Swedish Economic Policy Review*, 7(2), 2000, 11-53.

Blank, Rebecca M. "Analyzing the Length of Welfare Spells," *Journal of Public Economics*, 39(3), 1989, 245-273.

Blank, Rebecca M. and Ruggles, Patricia, "When Do Women Use Aid to Families with Dependent Children and Food Stamps? The Dynamics of Eligibility versus Participation," *Journal of Human Resources,* 31(1), 1996, 57-89.

Borjas, George J, *Heaven's Door – Immigration Policy and the American Economy*, Princeton University Press, Princeton, 1999.

Borjas, George J. and Hilton, Lynette, "Immigration and the Welfare State: Immigrant Participation in means-tested Entitlement Programs", *Quarterly Journal of Economics* 111(2), 1996, 575-604.

Cameron, Stephen and Heckman, James, "The Dynamics of Educational Attainment for Black, Hispanic, and White Males," *Journal of Political Economy,* 109(3), 2001, 455-499.

Card, David and Sullivan, Daniel, "Measuring the Effect of Subsidized Training Programs on Movements In and Out of Employment," *Econometrica*, 56(3), 1988, 497-530.

Chay, Kenneth Y and Hyslop, Dean. "Identification and Estimation of Dynamic Binary Response Panel Data Models: Empirical Evidence using Alternative Approaches," Center for Labor Economics, UC Berkeley, WP No 5, October 1998.

Eberwein, Curtis, Ham, John and Lalond, Robert, "The Impact of Being Offered and Receiving Classroom Training on the Employment Histories of Disadvantaged Women: Evidence from Experimental Data," *Review of Economic Studies*, 64(4), 1997, 655-682.

Edin, Per-Anders, LaLonde, Robert J. and Aslund, Olof, "Emigration of Immigrants and Measures of Immigrant Assimilation: Evidence from Sweden," *Swedish Economic Policy Review*, 7(2), 2000, 163-204.

Edin, Per-Anders and Fredriksson, Peter, "LINDA-Longitudinal Individual Data for Sweden," Working Paper, Uppsala University, Department of Economics, 2000.

Engberg, John, Peter Gottschalk and Douglas A. Wolf "A Random-Effects Logit Model of Work-Welfare Transitions," *Journal of Econometrics*, 43(1), 1990, 63-75.

Fitzgerald, John "Welfare Durations and the Marriage Market: Evidence from the Survey of Income and Program Participation," *Journal of Human Resources,* 26(3), 1991, 545-561.

Ham, John and Lalonde, Robert, "The Effect of Sample Selection and Initial Conditions in Duration Models: Evidence from Experimental Data on Training," *Econometrica*, 64(1), 1996, 175-205.

Hansen, Jorgen and Lofstrom, Magnus "Immigrant Assimilation and Welfare Participation: Do Immigrants Assimilate Into or Out-of Welfare?" *Journal of Human Resources,* forthcoming, 38(1), 2003.

Heckman, James "The Incidental Parameters Problem and the Problem of Initial Conditions in Estimating a Discrete Time-Discrete Data Stochastic Process," in *Structural Analysis of Discrete Data with Econometric Applications*, eds. Manski, C. and D. McFadden, MIT Press, London, 1981,114-179.

Heckman, James and Singer, Burton "A Method for Minimizing the Impact of Distributional Assumption in Econometric Models for Duration Data," *Econometrica*, March, 1984, 271-320.

Honore, Bo and Kyriazidou, Ekaterini, "Panel Data Discrete Choice Models with Lagged Dependent Variables," *Econometrica*, 68(4), 2000, 839-874.

Hoynes, Hilary W. "Local Labor Markets and Welfare Spells: Do Demand Conditions Matter?," *Review of Economics and Statistics,* 82(3), 2000, 351-368.

Hutchens, Robert M. "Entry and Exit Transitions in a Government Transfer Program: The Case of Aid to Families with Dependent Children," *Journal of Human Resources,* 16(2), 1981, 217-237.

Hyslop, Dean R., "State Dependence, Serial Correlation and Heterogeneity in Intertemporal Labor Force Participation of Married Women," *Econometrica*, 67(6), 1999, 1255-1294.

Lofstrom, Magnus and Frank D. Bean, "Assessing Immigrant Policy Options: Labor Market Conditions and Post-Reform Declines in Welfare Receipt Among Immigrants," *Demography*, forthcoming, 39(4), November 2002.

McFadden, Daniel and Train, Kenneth "Mixed MNL Models for Discrete Response," *Journal of Applied Econometrics*, 15, 2000, 447-470.

Meyer, Daniel R. "Child Support and Welfare Dynamics: Evidence from Wisconsin," *Demography*, 30(1), 1993, 45-62.

O'Neill, June A., Laurie J. Bassi and Douglas A. Wolf "The Duration of Welfare Spells," *Review of Economics and Statistics*, 69, 1987, 241-249.

Plant, Mark W., "An Empirical Analysis of Welfare Dependence," *American Economic Review,* 74(4), 1984, 673-684.

Plotnick, Robert "Turnover in the AFDC Population: An Event History Analysis," *Journal of Human Resources,* 18(1), 1983, 65-81.

Riphanh, Regina T. "Immigrant Participation in Social Assistance Programs: Evidence from German Guestworkers," *IZA Discussion Paper* No. 15, July 1998.

SOPEMI: *Trends in International Migration*, 2000, Paris: OECD.

Table 1.
Observed Unconditional State Probabilities, 1990-96, by Year and Immigrant Group.

Group:	**Natives**	**Immigrants**		
		Non-Refugee	Nordic	Refugee
		Welfare		
Period 1990-96	0.050	0.133	0.125	0.325
1990	0.036	0.091	0.116	0.203
1991	0.042	0.103	0.122	0.251
1992	0.051	0.124	0.133	0.288
1993	0.058	0.142	0.136	0.323
1994	0.057	0.148	0.135	0.345
1995	0.052	0.146	0.116	0.349
1996	0.053	0.153	0.114	0.387
		Unemployment		
Period 1990-96	0.109	0.150	0.151	0.207
1990	0.025	0.039	0.042	0.063
1991	0.046	0.068	0.077	0.114
1992	0.095	0.119	0.136	0.171
1993	0.157	0.182	0.198	0.244
1994	0.166	0.199	0.205	0.255
1995	0.147	0.199	0.186	0.249
1996	0.130	0.183	0.167	0.220
		Employment		
Period 1990-96	0.841	0.717	0.724	0.468
1990	0.939	0.870	0.842	0.734
1991	0.912	0.828	0.802	0.635
1992	0.854	0.756	0.732	0.542
1993	0.785	0.676	0.666	0.434
1994	0.777	0.654	0.660	0.401
1995	0.800	0.655	0.697	0.402
1996	0.817	0.664	0.719	0.393

Note: Source: LINDA 1990-1996.

Table 2.
Transition Matrices, Conditional Probabilities of Leaving Previous Year's State for the Period 1990-96, by Immigrant Group.

Natives

State at Time *t*:	State at Time *t+1*: Welfare	Unemployment	Employment
Welfare	0.662	0.146	0.192
Unemployment	0.048	0.717	0.235
Employment	0.011	0.046	0.942

Non-Refugee Immigrants

State at Time t:	State at Time *t+1*: Welfare	Unemployment	Employment
Welfare	0.714	0.142	0.144
Unemployment	0.100	0.715	0.185
Employment	0.027	0.059	0.914

Nordic Immigrants

	Welfare	Unemployment	Employment
Welfare	0.701	0.134	0.165
Unemployment	0.085	0.727	0.188
Employment	0.029	0.057	0.914

Refugee Immigrants

	Welfare	Unemployment	Employment
Welfare	0.787	0.116	0.098
Unemployment	0.134	0.719	0.147
Employment	0.049	0.095	0.856

Note: Source: LINDA 1990-1996.

Table 3.
Distribution of Welfare and Labor Market Spells 1990-96, by Immigrant Group.

	Natives	Nordic Immigrants	Non-Refugee Immigrants	Refugee Immigrants
Number of Welfare Spells				
None	0.916	0.808	0.787	0.630
One or Two	0.049	0.098	0.111	0.158
Three or four	0.018	0.046	0.044	0.087
Five or Six	0.012	0.029	0.034	0.060
Seven (Entire Period)	0.007	0.020	0.024	0.065
Number of Unemployment Spells				
None	0.762	0.716	0.676	0.599
One or Two	0.113	0.132	0.140	0.177
Three or four	0.081	0.095	0.106	0.141
Five or Six	0.038	0.048	0.064	0.075
Seven (Entire Period)	0.006	0.009	0.014	0.008
Number of Employment Spells				
None	0.021	0.054	0.066	0.130
One or Two	0.057	0.089	0.112	0.160
Three or four	0.088	0.109	0.116	0.146
Five or Six	0.114	0.126	0.132	0.149
Seven (Entire Period)	0.720	0.621	0.573	0.415
Number of Households	53,567	3,928	5,643	4,088

Note: Source: LINDA 1990-1996.

Table 4.
Mean Characteristics by Previous Year's State, 1990-96.

State at t:	Welfare			Unemployment			Employment		
State at t+1:	Welfare	Unemployment	Employment	Welfare	Unemployment	Employment	Welfare	Unemployment	Employment
Age	34.51	31.63	34.31	32.43	36.79	33.93	34.47	35.62	41.88
Elementary School	0.45	0.34	0.36	0.36	0.31	0.24	0.38	0.30	0.29
High School	0.52	0.63	0.60	0.62	0.65	0.69	0.59	0.66	0.57
College	0.03	0.03	0.04	0.02	0.04	0.07	0.03	0.05	0.14
Single	0.76	0.77	0.69	0.77	0.61	0.60	0.67	0.58	0.39
Number of Children	0.45	0.33	0.51	0.34	0.35	0.42	0.56	0.39	0.60
Major City	0.45	0.34	0.44	0.33	0.28	0.32	0.44	0.31	0.37
Social Assistance Norm	4,778	4,515	5,115	4,554	4,921	5,014	5,365	5,214	6,056
County Unemployment Rate (%)	7.07	7.58	6.59	7.68	7.94	7.68	6.21	6.93	6.55
County Avg. Earnings Growth (%)	-2.99	-2.84	-3.40	-2.29	-2.11	-1.07	-4.64	-4.31	-3.73
Number of Observations	41,574	7,430	8,025	5,303	50,513	14,478	7,583	22,791	406,177

Note: Source: LINDA 1990-1996.

Table 5.
Transition Matrices, Predicted Conditional Probabilities of Leaving Previous Year's State for the Period 1990-96, by Immigrant Group.

Panel A: No Control for Initial Condition and Unobserved Heterogeneity (Model 1)

State at Time *t*:	State at Time *t+1*: Natives			State at Time t:	State at Time *t+1*: Non-Refugee Immigrants		
	Welfare	Unemployment	Employment		Welfare	Unemployment	Employment
Welfare	0.520	0.159	0.321	Welfare	0.628	0.171	0.201
	(0.015)	(0.009)	(0.013)		(0.010)	(0.008)	(0.008)
Unemployment	0.041	0.685	0.273	Unemployment	0.093	0.708	0.199
	(0.003)	(0.008)	(0.008)		(0.005)	(0.008)	(0.007)
Employment	0.008	0.036	0.956	Employment	0.021	0.050	0.929
	(0.0004)	(0.001)	(0.001)		(0.001)	(0.002)	(0.002)
	Nordic Immigrants				**Refugee Immigrants**		
	Welfare	Unemployment	Employment		Welfare	Unemployment	Employment
Welfare	0.616	0.158	0.226	Welfare	0.765	0.122	0.113
	(0.013)	(0.009)	(0.008)		(0.004)	(0.003)	(0.003)
Unemployment	0.080	0.729	0.191	Unemployment	0.144	0.720	0.135
	(0.005)	(0.010)	(0.007)		(0.004)	(0.006)	(0.004)
Employment	0.023	0.050	0.927	Employment	0.056	0.093	0.851
	(0.001)	(0.002)	(0.002)		(0.002)	(0.003)	(0.003)

Panel B: Control for Initial Condition and Unobserved Heterogeneity (Model 2)

State at Time *t*:	State at Time *t+1*: Natives			State at Time t:	State at Time *t+1*: Non-Refugee Immigrants		
	Welfare	Unemployment	Employment		Welfare	Unemployment	Employment
Welfare	0.164	0.081	0.756	Welfare	0.297	0.189	0.514
	(0.012)	(0.006)	(0.014)		(0.015)	(0.016)	(0.018)
Unemployment	0.020	0.462	0.519	Unemployment	0.062	0.672	0.266
	(0.001)	(0.018)	(0.018)		(0.004)	(0.016)	(0.018)
Employment	0.012	0.047	0.941	Employment	0.039	0.063	0.899
	(0.001)	(0.002)	(0.002)		(0.002)	(0.003)	(0.004)
	Nordic Immigrants				**Refugee Immigrants**		
	Welfare	Unemployment	Employment		Welfare	Unemployment	Employment
Welfare	0.229	0.228	0.543	Welfare	0.586	0.188	0.226
	(0.010)	(0.020)	(0.020)		(0.009)	(0.007)	(0.008)
Unemployment	0.065	0.731	0.205	Unemployment	0.193	0.685	0.122
	(0.006)	(0.007)	(0.009)		(0.009)	(0.008)	(0.004)
Employment	0.040	0.055	0.906	Employment	0.137	0.102	0.761
	(0.002)	(0.002)	(0.004)		(0.006)	(0.004)	(0.009)

Note: Calculations are based on estimates presented in Table A1. Standard errors, reported in brackets, are computed using the parametric bootstrap. We obtain 1000 draws from the asymptotic distribution of the maximum likelihood parameters and evaluate the transition probabilities for each draw. Standard errors are computed as the standard deviation of the simulated values of the transition probabilities.

Table 6.
Structural State Dependence in Welfare and Unemployment for the Period 1990-96, by Immigrant Group.

	Labor Market State:			
	Welfare		Unemployment	
	Estimate	Standard Error	Estimate	Standard Error
Natives	0.315	0.025	0.673	0.027
Nordic Immigrants	0.372	0.018	1.002	0.017
Non-Refugee Immigrants	0.473	0.025	0.950	0.025
Refugee Immigrants	0.765	0.012	0.951	0.014

Note: Calculations are based on the transition matrices presented in Panel B in Table 6. Standard errors are computed using the parametric bootstrap. We obtain 1000 draws from the asymptotic distribution of the maximum likelihood parameters and evaluate the structural state dependence for each draw. Standard errors are computed as the standard deviation of the simulated values of the state dependence.

Table 7.
Structural State Dependence in Welfare and Unemployment for the Period 1990-96, by Immigrant Group. Using Native's Characteristics for all Immigrant Groups.

	Labor Market State:			
	Welfare		Unemployment	
	Estimate	Standard Error	Estimate	Standard Error
Nordic Immigrants	0.354	0.019	1.001	0.019
Non-Refugee Immigrants	0.478	0.027	0.954	0.026
Refugee Immigrants	0.704	0.019	0.974	0.016

Note: Calculations are based on the transition matrices presented in Panel B in Table 6. Standard errors are computed using the parametric bootstrap. We obtain 1000 draws from the asymptotic distribution of the maximum likelihood parameters and evaluate the structural state dependence for each draw. Standard errors are computed as the standard deviation of the simulated values of the state dependence.

Table 8.
Structural State Dependence in Welfare and Unemployment for the Period 1990-96, by Immigrant Group. Alternative Definition of the Welfare State.

	Labor Market State:			
	Welfare		Unemployment	
	Estimate	Standard Error	Estimate	Standard Error
Natives	0.311	0.034	0.600	0.027
Nordic Immigrants	0.438	0.038	0.857	0.021
Non-Refugee Immigrants	0.434	0.031	0.861	0.024
Refugee Immigrants	0.782	0.025	0.916	0.018

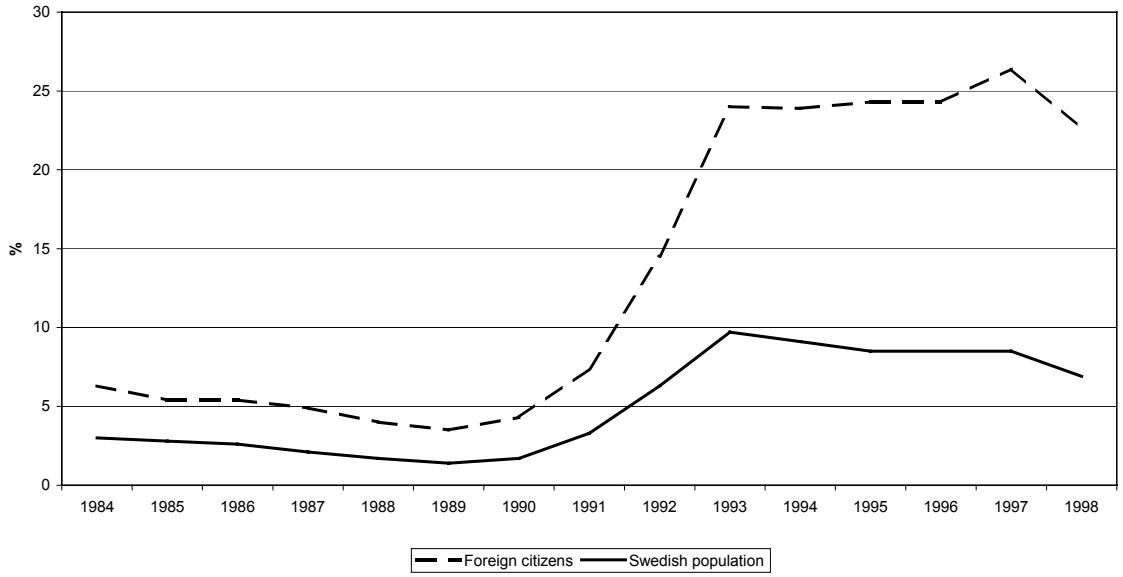
Note: The model specifications are identical to the ones presented in Tables A1-A4.Individuals are assigned to the welfare state if they received welfare at least *three* months during the calendar year. Standard errors are computed using the parametric bootstrap. We obtain 1000 draws from the asymptotic distribution of the maximum likelihood parameters and evaluate the structural state dependence for each draw. Standard errors are computed as the standard deviation of the simulated values of the state dependence.

Table 9.
Structural State Dependence in Welfare and Unemployment for Refugees. Excluding Refugees who Arrived after 1989.

	Labor Market State:			
	Welfare		Unemployment	
	Estimate	Standard Error	Estimate	Standard Error
Refugee Immigrants	0.752	0.023	0.958	0.024

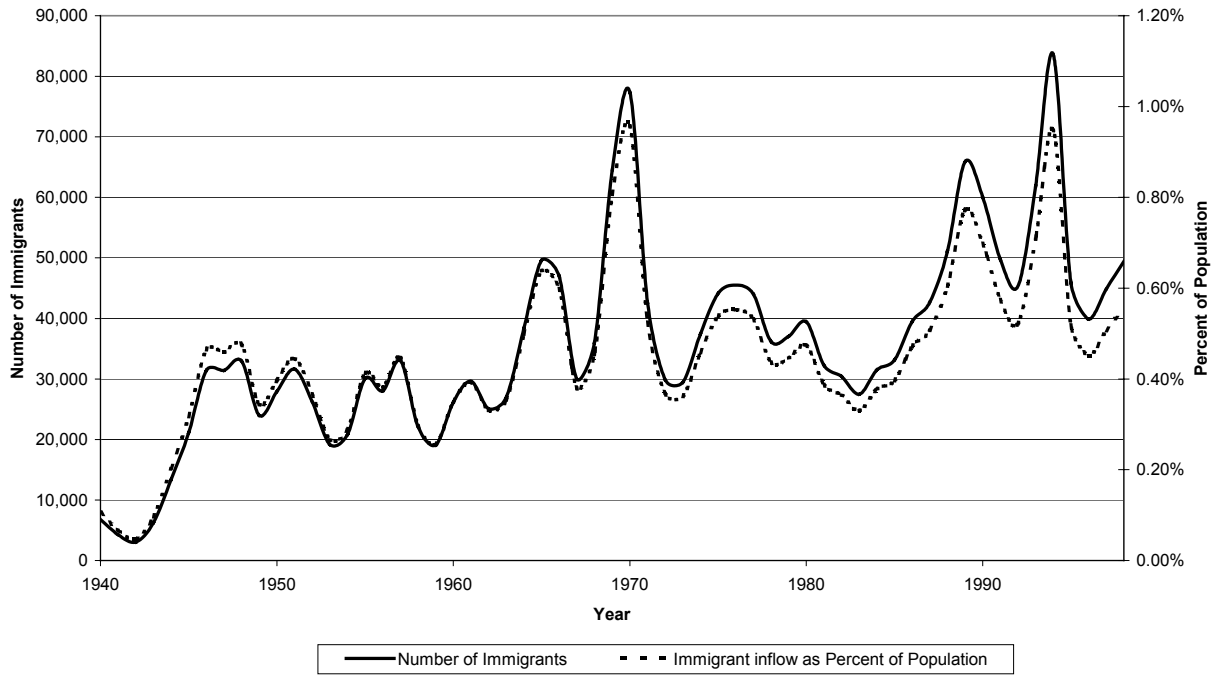
Note: Standard errors are computed using the parametric bootstrap. We obtain 1000 draws from the asymptotic distribution of the maximum likelihood parameters and evaluate the structural state dependence for each draw. Standard errors are computed as the standard deviation of the simulated values of the state dependence.

Figure 1. Average annual unemployment rates 1984-1998. Males and females aged 16-64.



Sources: Labor Force Surveys by Statistics Sweden, 1984-1998.

Figure 2. Immigration into Sweden, Annual Inflow and Proportion of Population, 1940-1998.



Source: Statistics Sweden, Historical Population Development Table, 1999.

Appendix:

Table A1.
Dynamic Multinomial Logit Models of Labor Market State Probabilities: Natives

	Model 1		Model 2	
	Welfare	Unemployment	Welfare	Unemployment
Individual Characteristics:				
Age	-0.019	-0.019	-0.057	-0.046
	(0.004)	(0.002)	(0.005)	(0.004)
High School	-0.389	-0.076	-0.598	-0.194
	(0.059)	(0.037)	(0.082)	(0.051)
College	-1.861	-0.930	-2.506	-1.439
	(0.199)	(0.078)	(0.219)	(0.106)
Single	1.168	0.174	1.397	0.321
	(0.194)	(0.115)	(0.231)	(0.142)
Children	0.305	0.022	0.288	0.017
	(0.159)	(0.097)	(0.194)	(0.119)
Years since migration	n.a.	n.a.	n.a.	n.a.
State Dependence:				
Received Welfare Previous Year	5.259	2.579	3.562	1.277
	(0.069)	(0.074)	(0.113)	(0.093)
Received UI Previous Year	2.887	4.205	1.984	3.491
	(0.082)	(0.041)	(0.093)	(0.063)
Local Labor Market Variables:				
Social Assistance Norm	-0.019	-0.060	-0.016	-0.063
	(0.078)	(0.047)	(0.093)	(0.057)
Local Unemployment Rate	0.044	0.146	0.060	0.168
	(0.026)	(0.015)	(0.032)	(0.018)
Local Annual Earnings Growth	0.017	0.023	0.001	0.015
	(0.022)	(0.013)	(0.024)	(0.014)
Conditions at Time of Entry in the Labor Market:				
Unemployment Rate	0.047	-0.004	0.086	0.005
	(0.035)	(0.025)	(0.046)	(0.029)
GDP Growth	-0.027	-0.013	-0.023	-0.011
	(0.019)	(0.012)	(0.027)	(0.017)
Unobserved Heterogeneity:				
Factor loading	n.a.	n.a.	1.293	0.935
			(0.044)	(0.036)
Probability Type I	n.a.		0.159	
			(0.008)	
Includes Cohort Effects	n.a.		n.a.	
Includes Time Effects	Yes		Yes	
Includes Country Fixed Effects	n.a.		n.a.	
Log-likelihood	-18,844.3		-21,261.1	

Table A2.
Dynamic Multinomial Logit Models of Labor Market State Probabilities: Nordic Immigrants

	Model 1		Model 2	
	Welfare	Unemployment	Welfare	Unemployment
Individual Characteristics:				
Age	-0.012	-0.013	-0.030	-0.016
	(0.002)	(0.002)	(0.004)	(0.002)
High School	-0.211	0.038	-0.310	0.020
	(0.044)	(0.036)	(0.069)	(0.038)
College	-1.391	-0.748	-2.050	-0.894
	(0.152)	(0.094)	(0.178)	(0.110)
Single	0.824	0.289	1.151	0.349
	(0.150)	(0.121)	(0.190)	(0.125)
Children	0.326	-0.146	0.368	-0.140
	(0.122)	(0.102)	(0.156)	(0.104)
Years since migration	-0.037	-0.020	-0.067	-0.022
	(0.012)	(0.009)	(0.018)	(0.010)
State Dependence:				
Received Welfare Previous Year	4.707	2.563	2.994	2.069
	(0.054)	(0.058)	(0.081)	(0.121)
Received UI Previous Year	2.832	4.258	2.459	4.182
	(0.064)	(0.042)	(0.105)	(0.055)
Local Labor Market Variables:				
Social Assistance Norm	-0.068	0.028	-0.073	0.027
	(0.061)	(0.050)	(0.077)	(0.051)
Local Unemployment Rate	0.022	0.135	0.006	0.138
	(0.020)	(0.015)	(0.027)	(0.016)
Local Annual Earnings Growth	-0.025	0.0003	-0.028	0.0015
	(0.018)	(0.014)	(0.021)	(0.014)
Conditions at Time of Entry in the Labor Market:				
Unemployment Rate	0.020	0.113	0.019	0.116
	(0.063)	(0.051)	(0.095)	(0.053)
GDP Growth	-0.022	-0.006	-0.034	-0.008
	(0.014)	(0.012)	(0.023)	(0.012)
Unobserved Heterogeneity:				
Factor loading	n.a.	n.a.	1.248	0.364
			(0.054)	(0.077)
Probability Type I	n.a.		0.182	
			(0.012)	
Includes Cohort Effects	Yes		Yes	
Includes Time Effects	Yes		Yes	
Includes Country Fixed Effects	Yes		Yes	
Log-likelihood	-20,174.9		-24,458.0	

Table A3.
Dynamic Multinomial Logit Models of Labor Market State Probabilities: Non-Refugee Immigrants

	Model 1		Model 2	
	Welfare	Unemploy-ment	Welfare	Unemploy-ment
Individual Characteristics:				
Age	-0.011	-0.010	-0.026	-0.017
	(0.003)	(0.002)	(0.004)	(0.003)
High School	-0.250	0.107	-0.356	0.064
	(0.054)	(0.045)	(0.077)	(0.051)
College	-1.144	-0.356	-1.662	-0.589
	(0.099)	(0.068)	(0.127)	(0.084)
Single	0.626	0.105	0.794	0.161
	(0.152)	(0.120)	(0.186)	(0.131)
Children	0.369	0.111	0.432	0.143
	(0.124)	(0.099)	(0.153)	(0.106)
Years since migration	-0.059	-0.041	-0.101	-0.056
	(0.015)	(0.011)	(0.021)	(0.014)
State Dependence:				
Received Welfare Previous Year	4.917	2.764	3.444	2.009
	(0.063)	(0.065)	(0.090)	(0.099)
Received UI Previous Year	3.012	4.193	2.386	3.895
	(0.071)	(0.047)	(0.098)	(0.078)
Local Labor Market Variables:				
Social Assistance Norm	-0.142	-0.095	-0.175	-0.112
	(0.062)	(0.049)	(0.076)	(0.053)
Local Unemployment Rate	0.072	0.106	0.102	0.126
	(0.024)	(0.018)	(0.031)	(0.021)
Local Annual Earnings Growth	-0.031	0.004	-0.025	0.007
	(0.020)	(0.016)	(0.023)	(0.016)
Conditions at Time of Entry in the Labor Market:				
Unemployment Rate	-0.073	-0.057	-0.156	-0.091
	(0.060)	(0.050)	(0.082)	(0.056)
GDP Growth	-0.029	-0.035	-0.039	-0.038
	(0.017)	(0.013)	(0.024)	(0.015)
Unobserved Heterogeneity:				
Factor loading	n.a.	n.a.	1.329	0.658
			(0.054)	(0.068)
Probability Type I	n.a.		0.238	
			(0.017)	
Includes Cohort Effects	Yes		Yes	
Includes Time Effects	Yes		Yes	
Includes Country Fixed Effects	Yes		Yes	
Log-likelihood	-15,923.4		-19,884.0	

Table A4.
Dynamic Multinomial Logit Models of Labor Market State Probabilities: Refugee Immigrants

	Model 1		Model 2	
	Welfare	Unemploy-ment	Welfare	Unemploy-ment
Individual Characteristics:				
Age	-0.013	-0.017	-0.020	-0.019
	(0.002)	(0.002)	(0.003)	(0.002)
High School	-0.197	0.081	-0.351	0.060
	(0.035)	(0.034)	(0.051)	(0.035)
College	-0.766	-0.119	-1.200	-0.186
	(0.055)	(0.048)	(0.077)	(0.053)
Single	0.341	0.385	0.434	0.400
	(0.089)	(0.086)	(0.111)	(0.088)
Children	0.267	-0.100	0.312	-0.0963
	(0.072)	(0.069)	(0.089)	(0.071)
Years since migration	-0.102	-0.076	-0.169	-0.094
	(0.015)	(0.014)	(0.021)	(0.015)
State Dependence:				
Received Welfare Previous Year	4.625	2.294	3.546	2.012
	(0.041)	(0.042)	(0.058)	(0.066)
Received UI Previous Year	2.776	3.892	2.565	3.836
	(0.049)	(0.037)	(0.070)	(0.0428)
Local Labor Market Variables:				
Social Assistance Norm	-0.072	0.043	-0.067	0.048
	(0.036)	(0.035)	(0.045)	(0.036)
Local Unemployment Rate	0.138	0.105	0.173	0.116
	(0.015)	(0.014)	(0.020)	(0.015)
Local Annual Earnings Growth	-0.050	-0.036	-0.050	-0.038
	(0.013)	(0.012)	(0.015)	(0.013)
Conditions at Time of Entry in the Labor Market:				
Unemployment Rate	0.035	-0.053	0.140	-0.042
	(0.022)	(0.022)	(0.030)	(0.022)
GDP Growth	0.016	-0.030	0.029	0.034
	(0.014)	(0.014)	(0.018)	(0.015)
Unobserved Heterogeneity:				
Factor loading	n.a.	n.a.	1.327	0.373
			(0.044)	(0.068)
Probability Type I	n.a.		0.349	
			(0.014)	
Includes Cohort Effects	Yes		Yes	
Includes Time Effects	Yes		Yes	
Includes Country Fixed Effects	Yes		Yes	
Log-likelihood	-31,694.3		-41,905.1	