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ABSTRACT

When economic crises destabilize labor markets, they offer unique opportunities to explore welfare dynamics and the interplay between partnership formation and social assistance. Using data from Sweden's 1990s economic crisis, characterized by high unemployment, expanding budget deficit, and a large inflow of war refugees from the former Yugoslavia, we examine state dependence in social assistance, which refers to the increased likelihood that households will receive benefits in the future if they have previously received them. Because Swedish social assistance eligibility depends on household-level resources and that partnership formation may correlate with unobserved factors, we focus on individuals who were single in 1990, prior to the recession, tracking their social assistance receipt and household composition over the sub-sequent decade. This approach allows us to compare individuals who remain single throughout the decade with those who form partnerships, assessing how gender, country of birth, and part-nership choices affect state dependence in social assistance. Using a dynamic discrete choice model that addresses both unobserved heterogeneity and initial conditions, we found differ-ences in structural state dependence both between and within the samples of Swedish-born (SB) and foreign-born (FB) individuals. Among singles, SB women exhibit lower structural state dependence than SB men, whereas FB women display slightly higher structural state dependence than FB men but lower than SB men. For FB individuals, the structural state dependence decreases when they partner with a SB individual but increases when they partner with another FB individual, suggesting that partnering with an SB individual may reduce the structural impact of prior welfare dependency, while partnering with an FB individual may reinforce it.

JEL Classification: I30, I38, J18.

Keywords: welfare persistence, social assistance, structural state dependence, unobserved heterogeneity, dynamic discrete choice model, GHK simulator.

1 Introduction

Economic crises test the sustainability of welfare systems and offer unique opportunities to study welfare persistence and their relationship to changes in household composition. During periods of economic stress, increased variation in individual circumstances allows for a more robust analysis of the factors driving social assistance receipt. The Swedish economic crisis of the 1990s, marked by sharp increases in unemployment, rapid budget deficits, and a significant inflow of refugees from former Yugoslavia, offers a valuable context for examining how partnership formation affects state dependence in social assistance. This paper analyzes how state dependence in social assistance varies by gender, country of birth, and partnership choices by tracking individuals who were single before the recession and comparing welfare outcomes between those who remained single and those who formed partnerships.

From an individual perspective, economic turbulence can influence the formation of married and cohabiting relationships (hereafter referred to as partnerships), and partnership status in turn shapes behavioral responses to economic shocks (Hess, 2004). Partnerships formed within the same ethnic background (intraethnic) and those between individuals of different ethnic backgrounds (interethnic) may have differing impacts on natives and immigrants (Furtado and Trejo, 2013; Nottmeyer, 2015). Immigrants in partnership with natives typically achieve higher earnings compared to those in partnership to other immigrants (Meng and Gregory, 2005; Dribe and Lundh, 2008; Dribe and Nystedt, 2015; Furtado and Song, 2015). This relationship appears bidirectional, as increased host country-specific human capital enhances the likelihood of forming ethnic partnerships (Celikaksoy et al., 2010). Moreover, interethnic partenerships typically occur between individuals with similar educational levels (Chiswick and Houseworth, 2011), suggesting educational sorting in partnership formation. This pattern is further complicated by gender differences, as partnership can facilitate human capital accumulation through household division of labor, yielding a partnership premium for men and a penalty for women (Becker, 1993). Furthermore, immigrants with cultural backgrounds similar to natives are more likely to form interethnic

partnerships (Hannemann et al., 2018), potentially reinforcing economic disparities between immigrant groups. Consequently, the interplay between economic shocks, immigration, and partnership formation becomes particularly significant, as labor market outcomes vary based on factors such as educational level, ethnicity, gender, and time spent in the host country. While ethnic networks can initially facilitate job placement for new immigrants, they may subsequently constrain long-term upward mobility and potentially increase the persistence of welfare dependence through continued reliance on social assistance.[1]

Based on these previous findings, our study focuses on analyzing the state dependence in social assistance and how partnership formation affects structural state dependence in social assistance take-up during the analyzed decade. In this way, we contribute to the very limited literature on welfare persistence and social assistance.[2]. Previous research on social assistance's dynamics and persistence in Sweden (Hansen and Lofstrom, 2003, 2009; Andrén and Andrén, 2013) has not addressed two important aspects: the composition of two-adult households with mixed Swedish-born and foreign-born partners, and changes in partnership status over time. Our study fills these gaps by separately analyzing two cohorts who were single in 1990, Swedish-born and foreign-born individuals, and tracking their social assistance receipt and partnership status throughout a decade. We track the payments they received from the welfare system until 2000, contextualizing their experiences with social assistance receipt during 1985-1990. Similar to the framework presented by Biewen (Biewen, 2009), our empirical framework examines whether initial partnership and history of welfare benefits contribute to the persistence of dependence on social assistance. To mitigate the potential bias stemming from the fact that partnership formation might be influenced by unobserved factors, the sample is restricted to individuals who were single in 1990, before the recession began. This strategy allows us to observe how these individuals' social assistance receipt

[1]A related stream of literature suggests that the effects of welfare on migration are relatively small compared to other drivers of migration (Borjas, 1999; Giulietti et al., 2013; Kahanec and Guzi, 2022) and welfare generosity may have some lock-in effect on immigrants' spatial mobility (Guzi et al., 2018).

[2]See Chay et al. (1999), Cappellari and Jenkins (2009), and Wunder and Riphahn (2014) for studies on the US, Britain, and Germany, and Hansen and Lofstrom (2003), Hansen and Lofstrom (2009), and Andrén and Andrén (2013) for studies on Sweden

and household composition evolve over the subsequent decade, thereby isolating the effect of later partnership formation on welfare outcomes.

Our findings indicate differences in structural state dependence between and within samples of Swedish-born (SB) and foreign-born (FB) individuals. Among singles, SB women show lower structural state dependence than SB men, whereas FB women exhibit slightly higher structural state dependence than FB men but lower than SB men. For FB individuals, structural state dependence decreases when they partner with an SB individual but increases when they partner with another FB individual, suggesting that partnering with an SB individual may reduce the structural effects of prior welfare dependence, while partnering with an FB individual may reinforce it. Most notably, the structural state dependence in social assistance is lower when an SB individual forms a partnership. These results not only extend the existing literature by providing empirical evidence on the strength and determinants of structural state dependence in social assistance during economic downturns but also contribute to the very limited literature on the economic effects of intra- and inter-ethnic partnerships (Furtado and Trejo, 2013).

The remainder of the paper is organized as follows: Section 2 outlines the institutional settings of social assistance in Sweden during the 1990s, followed by a detailed presentation of our empirical specification and estimation methods in Section 3. Section 4 describes the data used and Section 5 presents the results. Section 6 discusses the main findings and concludes.

2 Welfare benefits in Sweden during the 1990s

Sweden has a robust and generous welfare system, designed to provide essential social rights to residents in need. The system underwent significant transformations, with a key development being the establishment of universal access to social assistance in 1980 through the Social Services Act, revised in 1998 (Giertz, 2004). Even though the application is

household-based, the Act establishes the universal right that extends to any adult living in a municipality, including foreign-born individuals with residence permits. Once approved, the benefit provides a reasonable, rather than minimal level of living, through two components: a regulated component covering housing and childcare expenses, and a basic consumption component based on the social assistance norm.

Eligibility assessment requires detailed financial disclosures of household resources. Often, employment earnings or other insurance payments do not suffice in ensuring a reasonable standard of living for all household members. Households lacking sufficient means qualify for economic support if no other sources of income are available, with social insurance being the primary alternative when eligible.

Social workers evaluate each case based on household financial needs and the social assistance norm. The requirement involves exhausting all savings and all valuable assets including housing, cars, and other valuable possessions. This stringent requirement and the temporary nature of the benefits likely deter many qualifying households from applying for social assistance (Gustafsson, 2002).

During the 1990s, most municipalities reduced social assistance generosity by approximately 20 percent between 1993 and 1999 (Flood et al., 2004). Despite these reductions, the system maintained its core features: monthly renewal requirements, mandatory job-seeking efforts for unemployed recipients, and the two-part benefit structure. Additionally, the work history requirements for social insurance eligibility led to an overrepresentation of new immigrants among social assistance recipients.[3]

[3]Until 1998, the National Board of Health and Welfare provided general guidelines for the social assistance norm, calculated from cost estimates for household expenditure from the Swedish Consumer Agency. The revised Social Services Act of 1998 introduced a system with more detailed analysis of actual expenditure items and established a national uniform benefit level.

3 Econometric framework

To estimate the structural welfare dependence for different groups of welfare recipients, we use a random effects approach. The dependent variable of central interest, Y_{it}^*, is a latent continuous measure for the propensity of individual i to receive social assistance in period t. The observed analog of the dependent variable, Y_{it}, equals 1 when $Y_{it}^* \geq 0$, and 0 otherwise, for all t. With this setup, the model may be written as:

$$Y_{i1}^* = Z_{i1}\beta_1 + \varepsilon_{i1} \quad \text{(Initial conditions equation)} \tag{1}$$

$$Y_{it}^* = X_{it}\beta_2 + \gamma Y_{it-1} + \varepsilon_{it} \quad \text{(Participation equation)} \tag{2}$$

where $i = 1, \ldots, N;\ t = 2, \ldots, T$; Z_{i1} is a vector of variables explaining the first observation for individual i in the observation window, and X_{it} is a vector of variables explaining the remaining observations. The lagged observed outcome variable, Y_{it-1}, on the right-hand side of the participation equation is used to capture the dependence between past and present social assistance use, and γ is the measure of structural welfare dependence. Having $\gamma > 0$ would imply that the likelihood of being dependent on social assistance in the current period t is greater for those with an earlier experience from period $t-1$ compared to otherwise identical individuals without such an experience. The vector of error terms $\varepsilon_i = (\varepsilon_{i1}, \ldots, \varepsilon_{iT})$ is assumed to be multivariate normal and is fully characterized by the following assumption: $\varepsilon_i \sim N(0, \Sigma)$, where Σ is a $T \times T$ positive definite intertemporal covariance matrix.

To obtain consistent estimates of structural welfare dependence, it is necessary to control for unobserved heterogeneity. That is crucial because it allows us to separate the effect of innate individual differences in terms of social assistance use from that of structural welfare dependence. Following Heckman (1981c), the model is estimated within the framework of a multinomial probit model with an unrestricted intertemporal covariance matrix, Σ, except for the time specific variances that are normalized to 1 along the main diagonal.[4] In relation

[4]Because this is a discrete choice model, some normalization needs to be imposed because utility levels

to the literature that fits dynamic random effects probit models, this approach implies a very general error structure, which is less restrictive than the commonly used component of variance scheme (with or without autocorrelated error components), which is rarely used in the welfare dependency literature.

The random effects approach for dynamic models also requires the specification of the initial conditions of the process, highlighted by equation (1). If the process of social assistance use is in steady state, or if previously unobserved experiences are independent and exogenous to the behavior observed during the first time period, there would be no problem. However, because we do not observe the whole history of the process for all individuals, this is unlikely to be the case. With a relatively short panel, the initial conditions could potentially have a strong impact on the entire path of events, leading to inconsistent estimates. Fortunately, several solutions have been suggested in the literature on how to address this issue. Due to the potential inaccuracy of initial conditions in a short panel, we adopt Heckman's (Heckman, 1981a,b) approach by specifying an approximation of the reduced form equation for initial observations.[5] Empirically, this is conducted by approximating the observed initial period using a univariate probit with as much pre-sample information as possible, estimating its parameters separately, and allowing the error term to freely correlate with the error terms of the participation equation for the remaining observed time periods. The equation for the observed initial time period is estimated simultaneously with the participation equation related to the remaining time periods within the framework of a multivariate probit with a free covariance structure. Hence, the free error structure for the participation equation is easily augmented with the error structure of the initial time period.

Because the model is defined within a framework of a multivariate probit, a likelihood function needs to be specified. The model described by equations (1) and (2) runs over ten

and scales are irrelevant. To generate consistent estimates, it would be sufficient to normalize the variance of the first time period only. However, because of the estimation method used, we choose to normalize the remaining variances as well.

[5]Results by Akay (2011) indicate that Heckman's method outperforms other methods in short panels up to 5 time periods, whereas there is no major difference compared to alternative methods for longer panels. See Wooldridge (2005) Wooldridge (2005) for alternative, commonly used methods.

time periods (1990-1999) and therefore generates the following log-likelihood function:

$$L = \sum_{i=1}^{N} \log[\text{prob}(Y_{i1}, \ldots, Y_{i10})], \tag{3}$$

where

$$\text{prob}(Y_{i1}, \ldots, Y_{i10}) = \int_{a_{i1}}^{b_{i1}} \cdots \int_{a_{i10}}^{b_{i10}} f(\varepsilon_{i1}, \ldots, \varepsilon_{i10} \mid \Sigma) d\varepsilon_{i10} \cdots d\varepsilon_{i1},$$

with $a_{i1} = -Z_{i1}\beta_1$ and $b_{it} = \infty$ if $Y_{i1} = 1$, whereas $a_{i1} = -\infty$ and $b_{i1} = -Z_{i1}\beta_1$ if $Y_{i1} = 0$, with analogous expressions for the remaining time periods according to equation (2) and $f(\cdot \mid \Sigma)$ being the multivariate normal density function. Because we allow all covariances in the covariance matrix to be free, the main difficulty in maximizing the likelihood function is related to the 10-fold integral that should be solved for each individual in the sample. This is solved using a smooth recursive conditioning simulator (the GHK-simulator), which simulates the integrals rather than numerically evaluating them.[6]

The model defined by equations (1) and (2) contains a single measure for the average structural welfare dependence, γ, related to the total sample of individuals used in the estimation. While this is an interesting parameter in general, in this paper, we specifically focus on the importance of household composition and its effects on the size of welfare dependence. We are particularly interested in how the strength of welfare dependence changes when an individual is moving from the state of being single to the state of being a cohabitant, and how the effect varies depending on whether the partner is a Swedish-born or a foreign-born individual. Additionally, we explore whether these effects are different for women and men, hypothesizing that there are behavioral differences between single women and men in forming partnerships, conditional on previous welfare use.

A critical concern for our research design is that our model is, like the majority of previous studies that used dynamic binary response models with unobserved heterogeneity,

[6]For a detailed description of the GHK-simulator, see Train (2003, p126-137). The standard quadrature methods normally used to solve integrals numerically do not work well in practice when the integration problem exceeds five dimensions due to the curse of dimensionality problem; hence, this problem necessitates the use of simulation methods. The empirical work and the numerical problems are all solved using SAS/IML.

estimated built upon the strict exogeneity assumption. However, this assumption may be questionable concerning the unbiasedness of some explanatory variables, such as marital status and the number of children in the household. This is proven empirically by Biewen (2009), which analyzed state dependence in poverty in Germany and found that both the employment status and household composition are likely affected by past poverty outcomes. Although the institutional settings of social assistance in Sweden differ from those used to estimate the state dependence in poverty in Germany, we consider Biewen's concerns and empirical evidence that a household's composition can be influenced by past poverty outcomes. Therefore, in addition to analyzing the persistence of social assistance during the 1990s for working-age individuals who were single in 1990, regardless of changes in their marital status, we also examine the persistence for the subgroup of those who remained single throughout the decade.

Our approach implicitly acknowledges that if welfare receipt affects partnership formation, this bias would likely work against finding a negative effect of partnership on welfare persistence. The reasoning is as follows: if individuals with a higher propensity for welfare dependence are more likely to form partnerships as a welfare-exit strategy, we would observe a positive correlation between welfare persistence and partnership formation. Therefore, if we still find that partnership formation reduces welfare persistence, our estimates could be interpreted as conservative lower bounds of the true effect.

While this design cannot completely eliminate endogeneity concerns, it provides a structured framework for identifying the relationship between partnership formation and welfare dependence across different population subgroups. The separate estimation for Swedish-born and Foreign-born samples, combined with the detailed categorization of partnership types in Table 1, allows us to trace patterns that might suggest whether selection into partnerships based on welfare status differs systematically across these groups. This insight is crucial for policy design, as it helps identify whether certain types of partnerships are more effective pathways for reducing welfare dependence among different population segments.

To estimate welfare dependence effects due to the change in the household's composition, we modified the variable specification in the participation equation, allowing the parameter for structural state dependence to vary by country of birth and gender of the sampled individual and their partners for those who form a partnership during the observation's period. We introduce the following specification:

$$\gamma = \underbrace{(\gamma_0 + \gamma_1 W)}_{\text{Singles}} + \underbrace{(\gamma_2 + \gamma_3 W)}_{\text{married with SB}} \text{SB} + \underbrace{(\gamma_4 + \gamma_5 W)}_{\text{married with FB}} \text{FB}, \tag{4}$$

with W being a binary variable for being a woman, SB being a binary variable for coupling with a Swedish-born individual, and FB being a binary variable for coupling with a foreign-born individual. The reference category for both SB and FB is the state of being single, which implies that the composite parameter $(\gamma_0 + \gamma_1 W)$ is an estimate for those individuals who stay single during the whole period.

To account for heterogeneous effects across immigrant status, we estimate Equation (4) separately for Swedish-born and Foreign-born samples, as presented in Table 2. This approach allows us to distinguish between distinct partnership categories: Singles the entire decade, couples of two Swedish-born individuals (SB&SB), couples of two Foreign-born individuals (FB&FB), and mixed couples (SB&FB and FB&SB). To facilitate the interpretation of Equation 4 and its connection to our empirical analysis, Table 1 presents a comprehensive mapping of how welfare dependence effects vary across different types of partnership. Each coefficient in the equation is adapted for the specific sample, either Swedish-born or Foreign-born, to reflect potential differences in the effects due to the country of birth of the sampled individuals and their partners for those who form partnership during the observation period.

While the specification in Equation 4 captures the relationship between partnership formation and welfare persistence, our empirical strategy addresses potential endogeneity through both model specification and sample design. First, by estimating separate models

Table 1: Structural state dependence in SA and partnership status

	Partner		Partnership	
	Gender	Country of Birth	Status	Total Effect
SB sample				
Man (W=0)	-	-	Single SBM	γ_0^{SB}
Woman (W=1)	-	-	Single SBW	$\gamma_0^{SB} + \gamma_1^{SB}$
Man (W=0)	Woman (W=1)	SB (SB=1 & FB=0)	SBM & SBW	$\gamma_0^{SB} + \gamma_2^{SB}$
Woman (W=1)	Man (W=0)	SB (SB=1 & FB=0)	SBW & SBM	$\gamma_0^{SB} + \gamma_1^{SB} + \gamma_2^{SB} + \gamma_3^{SB}$
Man (W=0)	Woman (W=1)	FB (SB=0 & FB=1)	SBM & FBW	$\gamma_0^{SB} + \gamma_4^{SB}$
Woman (W=1)	Man (W=0)	FB (SB=0 & FB=1)	SBW & FBM	$\gamma_0^{SB} + \gamma_1^{SB} + \gamma_4^{SB} + \gamma_5^{SB}$
FB Sample				
Man (W=0)	-	-	Single FBM	γ_0^{FB}
Woman (W=1)	-	-	Single FBW	$\gamma_0^{FB} + \gamma_1^{FB}$
Man (W=0)	Woman (W=1)	SB (SB=1 & FB=0)	FBM &S BW	$\gamma_0^{FB} + \gamma_2^{FB}$
Woman (W=1)	Man (W=0)	SB (SB=1 & FB=0)	FBW & SBM	$\gamma_0^{FB} + \gamma_1^{FB} + \gamma_2^{FB} + \gamma_3^{FB}$
Man (W=0)	Woman (W=1)	FB (SB=0 & FB=1)	FBM & FBW	$\gamma_0^{FB} + \gamma_4^{FB}$
Woman (W=1)	Man (W=0)	FB (SB=0 & FB=1)	FBW & FBM	$\gamma_0^{FB} + \gamma_1^{FB} + \gamma_4^{FB} + \gamma_5^{FB}$

for Swedish-born and Foreign-born populations, we control for structural state dependence as detailed in Table 1, recognizing that both welfare persistence and partnership formation patterns may systematically vary between populations. But if welfare persistence affects the likelihood of forming partnerships, our estimates based on ten years of data for all individuals who were single at the beginning of the observation period may be biased, and they should be interpreted as conservative lower bounds of the true effect of partnership on welfare persistence.

To mitigate these concerns, our identification strategy relies on comparing welfare persistence patterns between two groups within each sample: the full cohort of individuals who were single at the start of our observation period and later may transition into partnerships, and the subgroup who remained single throughout the decade.

For individuals who remain single throughout the observation period, the welfare state dependence is captured solely by γ_0 for men and $(\gamma_0 + \gamma_1)$ for women, as both SB and FB indicators are zero. These base parameters provide a measure of gender-specific welfare dependence unaffected by partnership dynamics, serving as our key benchmark for understanding how welfare persistence differs by gender in the absence of partnership effects. If we

find that these parameters are higher for those who remain persistently single compared to the initial cohort of singles, this would indicate that individuals with stronger welfare state dependence are less likely to enter partnerships.

For the full cohort of individuals who were single at the start of our observation period, the impact of the later transition into partnerships can be interpreted in comparison to the state of remaining single throughout the decade. Specifically, for individuals who transition into partnerships during our observation period, the welfare dependence effects expand to include partnership-specific parameters, as detailed in Table 1. For instance, when a Swedish-born individual partners with another Swedish-born person, the total effect becomes $(\gamma_0 + \gamma_2)$ for men and $(\gamma_0 + \gamma_1 + \gamma_2 + \gamma_3)$ for women, where γ_2 and γ_3 capture the additional effects of having a Swedish-born partner. Similarly, partnerships with foreign-born individuals introduce parameters γ_4 and γ_5, instead of $\gamma_2 + \gamma_3$, enabling us to quantify how partner's country of birth modifies the baseline welfare persistence patterns.

This estimation framework allows us to isolate the fundamental welfare dependence parameters γ_0 and γ_1 from the partnership effects γ_2 through γ_5. A higher welfare dependence among persistent singles compared to the broader cohort of singles might indicate that individuals with lower welfare dependence are more likely to find partners, though this does not necessarily imply that the new partnership will lead to exit from social assistance. Conversely, if we observe lower welfare dependence among persistent singles, this might suggest that individuals with higher welfare dependence might enter relationships with partners in similar economic situations, potentially increasing their welfare dependence.

4 Data

In this paper, we use data from the same source as Andrén and Andrén (2013), the register-based Swedish Income Panel (SWIP), sampled and organized by Statistics Sweden. SWIP is a stratified random sample of the population living in Sweden containing both a 1% sample

of the Swedish-born population and a 10% sample of the foreign-born population.[7] The stratified panel was initially based on individuals living in Sweden in 1978. Those individuals were followed over time, with repeated yearly cross-sections. To make each yearly cross-sectional subsample representative for its own population, supplementary individuals were added to each sample year to adjust for new births, immigration, emigration, and mortality. Additionally, all household members identified through the tax register, including spouses and children up to the age of 18, were attached to the sampled person. This design makes it possible to construct tax-register-based household units, which might be biased to some extent because not all households register their cohabitation; Sweden being a country where cohabitation without formal marriage is rather common.

We select only individuals who were single in 1990 in the two samples of Swedish-born and foreign-born individuals analyzed by Andrén and Andrén (2013) and follow them, in a balanced panel, until the end of 1999. In addition to living as a single household in 1990, the individuals of our samples are aged 20-50 years and were in the register until the end of 1999. These samples are labeled in all tables and figures as "Single 1990".

In line with previous studies, our descriptive statistics indicate that the country of birth, the number of years in Sweden, and the status as a refugee are important determinants of the probability of receiving social assistance for foreign-born individuals. During the 1990s, residence was permitted for a large number of refugees (more than double the previous decade), but they are not included in our analysis, because we follow the cohort of all individuals who were single in 1990. However, about 34% of the foreign-born in our data are refugees (Table A1 in the Appendix).

We also use information about whether the individuals who were single in 1990 started to live with a partner during the observation period. If this was the case, we control for whether the partner is either Swedish- or foreign-born, which makes it possible to receive estimates for singles as well as for couples in which both members are Swedish-born and couples in

[7]For further information on SWIP, see http://snd.gu.se/en/.

which foreign-born (referred to as homogeneous couples) as well as couples in which one member is a Swedish-born and the other is foreign-born (referred to as mixed couples). These estimates allow us to measure the importance of living together with a partner in relation to social assistance use. Furthermore, it allows us to estimate welfare dependence for different household types, as described in the empirical specification in Section 3.

By estimating our model separately for Swedish-born and Foreign-born samples of singles and comparing individuals who remain single the entire study period (labeled as "Single 1990-99") with those who transition into different types of partnerships, we can examine both selection patterns and subsequent welfare outcomes. By treating persistent singles as a benchmark and comparing them to individuals who eventually partner, the design partially addresses selection issues but cannot categorically rule out time-varying unobservables influencing both partnership formation and welfare status. Thus, while our strategy offers a structured framework for identifying patterns across Swedish-born and Foreign-born groups, it should be viewed as mitigating rather than definitively resolving potential endogeneity.

The dependent variable used in the analysis is discrete and indicates if the household receives social assistance a given year (see Figures 1a-1c and Tables A1 and A2). Given that parents have no obligation to support children after the age of 18 (or 20 if still in secondary school), these children can receive social assistance. In our data, it is still the household that receives social assistance. Because the data are based on yearly numbers and social assistance is received on a monthly basis, it is sufficient for the household of the sample person to have received social assistance for at least one month during the year in order for the household to be defined as being a social assistance receiver in that particular year. Therefore, the results should be interpreted in terms of cross-sectional incidence based on yearly observations and whether the household appears as a social assistance receiver in a given year or not.

In Sweden, between 1990 and 1993 GDP went down by 5% and total employment fell by almost 10%, causing the worst economic crisis in Sweden since the 1930s. In 1990, before the

recession period started, the foreign-born singles have almost a three times higher propensity to receive social assistance than Swedish-born single (Figure 1a and Table A2). The whole decade's history of social assistance receipt for these two stocks of singles shows that the average rate of social assistance is almost unchanged for the Swedish-born singles during the recession years, but it decreases by about 2.5 percentage points, from 1990 to 1994, for the Foreign-born who were single in 1990. Moreover, during the recession's years, there was no difference in the social assistance by gender for Swedish-born singles in 1990: regardless of gender, about 6% of them received social assistance during 1991-1994 (Table A2, Panel A). But there was a relatively big difference between Foreign-born women and men in the level of social assistance use: it decreased from 19.34% in 1990 to 17.27% in 1995 for men and from 17.3% to 14.16% for women (Table A2, Panel B). However, the use of social assistance is relatively different for the subgroups of those who were single the whole decade (Table A2, Panels A and B): there was almost no change for the Foreign-born (about 16% during 1991-1994), while the Swedish-born increased from 7.10% in 1991 to 8.05% in 1993. Moreover, in 1992, there was no difference in the social assistance by gender for both Swedish-born singles (about 7%) and Foreign-born singles in 1992 (about 16%).

An important advantage of register/administrative data is that it gives the analyst the opportunity to work with rather large samples. That is important because we are interested in different household compositions, and some household types have low representation in the population. Hence, survey data would typically not allow us to generate estimates for some of the households that we are interested in. That is especially the case for the foreign-born group, for which we have access to a 10 percent random sample of the foreign-born population living in Sweden. Thus, it is possible to generate estimates with rather good precision in general. Another important benefit of register data in our case is the low degree of attrition. Because few individuals drop out of the sample during the observation window and those individuals who drop out are mainly due to death, emigration, and long-term incarceration, we work with large balanced panels of individuals.

Given the assumptions of the econometric framework presented in the previous section, it is important to make sure that the sampling design of our groups is exogenous. That is, the mechanism used to form the samples should be independent of the behavior that the economic model attempts to explain. Because we aim to estimate structural welfare dependence in social assistance, we need to be able to argue that the process of being a social assistance receiver does not affect the transition from being single to living together with a partner. If that were the case, it would lead to inconsistent estimates due to selection bias. Although Biewen (2009) presents empirical evidence that, in Germany, there are feedback effects between household composition and poverty, we will argue that, in Sweden, the transition from being single to living together with a partner might have very little or no effect on receiving social assistance.

First, we do not focus on poverty. We focus on social assistance, which may be related to poverty but operates under different behavioral models. As already mentioned in Section 2, in Sweden, the potential monthly screening of a household's income, savings, and assets is expected to prevent many households that are below the poverty line from applying for social assistance. However, during the 1990's, a large part of the recipients of social assistance were of working-age and healthy; they are unemployed and sometimes participating in introductory programs for immigrants, or other kinds of activation programs. Very few of the recipients were working poor (Giertz, 2004). Moreover, due to the economic crisis that toughened the conditions for social assistance eligibility, fewer people received social assistance than would have been the case under the previous more generous conditions. It would be problematic to state that poverty decreased during the analyzed decade.

Second, our focus on singles eliminates the argument that poor economic conditions for the household might also lead to stresses and conflicts within the household that could lead the couple to split up, which can lead to further poverty. This potential feedback effect is particularly problematic in dynamic discrete choice models because the explanatory variables in those models are required to be strictly exogenous. We argue that feedback effects are a

minor problem in our analysis within the given design.

The econometric model described in Section 3 controls for the initial conditions problem by estimating a univariate probit model for the observed initial year, allowing its error term to be freely correlated with the error terms of the participation equation. This is basically a selection model, which requires an instrument to best secure the identification of the parameter related to the parameter associated with the lagged dependent variable in the participation equation. The equation for the initial conditions therefore requires an exclusion restriction, which is to say that it needs to contain some exogenous variation that does not appear in the participation equation. Heckman (1981c) expressed this as including as much pre-sample information as possible in the initial conditions equation. In the previous dynamic welfare participation literature, surprisingly few studies use or have access to instruments in their analysis, and therefore they base their identification on the non-linearity of the functional form assumption. Cappellari and Jenkins (2008) are an exception to this limitation, and they used variables related to family background as such an instrument. In our analysis, we have access to information about previous, out-of-sample social assistance use and include five indicator variables as instruments that control for social assistance use up to five years in the past. The results in Andrén and Andrén (2013) indicate that structural welfare dependence loses its significance after three years for both Swedish- and foreign-born individuals. It is therefore believed that our set of instruments serves its purpose well.

5 Results

We analyze separately the samples of Swedish-born and foreign-born individuals, controlling for the initiation of partnership, and the subsamples of individuals who remained single throughout the entire decade, a strategy that allows us to isolate and examine the effects of being single at the onset of a significant economic downturn and how this status interacts

over time with variables that typically challenge the assumption of exogeneity in longitudinal welfare studies, such as changes in marital status.

Table 2 presents the results from the dynamic discrete choice model with respect to the participation equation (Equation 2), while the estimated coefficients for the initial conditions equations (Equation 1) are reported separately in Table A3 in the Appendix.

Although the initial conditions equations primarily serve to control for the endogenous initial time period, making their parameters of secondary interest, it is notable that most estimates in these equations are statistically significant across all four samples. Particularly important are the instruments used in the model, which comprise pre-sample information on social assistance use for all individuals in the analyzed samples. This pre-sample information reveals distinct patterns across population groups and persistence in single status. For Swedish-born individuals, social assistance receipt during 1985–1989 exhibits consistently significant associations with the initial conditions, both for the full sample and for those remaining single throughout 1990–1999. The strongest effect is observed in 1989, while earlier years show moderate effects.

For foreign-born singles, the situation is somewhat different. The estimated parameters related to social assistance use, three and four years back in time, lose their statistical significance. However, the estimate for the variable representing experience more than five years prior is positive, large, and statistically significant, indicating that the impact of previous social assistance use on the propensity at time t is strong and long-lasting. Specifically, while 1989 also shows strong effects, only the estimates for 1985 and 1988 remain statistically significant in both samples, with notably weaker coefficients in 1988.

These patterns indicate that the initial conditions equations effectively capture the endogeneity arising from previous social assistance experience, with particularly strong effects for the year immediately preceding our observation period.

The estimates for the covariances between the error terms of the initial conditions equation and the corresponding error term of the participation equation are all significantly

different from zero, except for the Swedish-born persistent singles, for which the covariance between the first and second time periods is estimated with less precision (see Table A4 in the Appendix).

Table 2 presents coefficient estimates from social assistance participation equations estimated separately for Swedish-born and foreign-born individuals, using the entire sample (Single 1990) and the subsample of individuals who remain single the entire decade (Single 1991–99). The first set of estimates reflects the effect on the propensity to receive social assistance for factors other than those related to partnership formation. For all four groups, the signs of the estimated parameters align with expectations: for example, higher educational attainment reduces the likelihood of receiving social assistance, while being unemployed, having children at home, and living in municipalities with a higher share of social assistance recipients increase this propensity. The age coefficient is consistently negative across both Swedish-born and foreign-born samples, though it is statistically significant only for foreign-born individuals who remained single throughout the decade, suggesting that older individuals in this subgroup are less likely to receive social assistance compared to younger individuals.

The residential context is also correlated with the propensity to receive social assistance. A higher municipal percentage of social assistance recipients is associated with an increased likelihood of receiving social assistance, whereas living in a city region and a higher municipal percentage of unemployed individuals are associated with a lower likelihood. However, at the individual level, being unemployed implies a higher probability of receiving social assistance.

Table 2: Social assistance participation equation's estimates, by sample

	Swedish-born				Foreign-born			
	Single 1990		Single 1991-99		Single 1990		Single 1991-99	
	CE	SE	CE	SE	CE	SE	CE	SE
Individual characteristics								
Age t/100	-0.080	(0.114)	-0.473	(0.951)	-0.089	(0.097)	-0.375	(0.122) ***
Educational level t (CG: Low)								
Secondary	-0.286	(0.021) ***	-0.276	(0.025) ***	-0.159	(0.016) ***	-0.147	(0.020) ***
Post-secondary, or more	-0.739	(0.035) ***	-0.680	(0.043) ***	-0.388	(0.024) ***	-0.404	(0.031) ***
Children at home t	0.059	(0.015) ***	0.053	(0.023) **	0.087	(0.008) ***	0.072	(0.017) ***
City region t	-0.030	(0.026)	-0.014	(0.031)	-0.041	(0.018) **	-0.019	(0.023)
Municipality characteristics t (%)								
Social assistance recipient	0.643	(0.073) ***	0.660	(0.087) ***	0.530	(0.051) ***	0.520	(0.066) ***
Unemployed	-0.180	(0.067) ***	-0.208	(0.079) ***	-0.046	(0.054)	-0.093	(0.068)
Unemployed t	0.435	(0.018) ***	0.477	(0.024) ***	0.294	(0.013) ***	0.304	(0.016) ***
Country of origin (CG: Nordic)								
Western Europe					-0.095	(0.029) ***	-0.088	(0.035) **
Eastern Europe					0.002	(0.037)	0.011	(0.049)
Southern Europe					-0.088	(0.035) **	-0.140	(0.046) ***
Middle East					0.263	(0.033) ***	0.203	(0.047) ***
Rest of the world					0.147	(0.026) ***	0.089	(0.034) ***
Years in Sweden (CG: 0–4 years)								
5–9					-0.094	(0.020) ***	-0.117	(0.028) ***
10–14					-0.117	(0.024) ***	-0.111	(0.032) ***
15–22					-0.147	(0.025) ***	-0.155	(0.033) ***
>22					-0.250	(0.026) ***	-0.257	(0.034) ***
Refugee					0.063	(0.024) ***	0.095	(0.035) ***

	Swedish-born Single 1990		Swedish-born Single 1991-99		Foreign-born Single 1990		Foreign-born Single 1991-99	
	CE	SE	CE	SE	CE	SE	CE	SE
(*continued*)								
Gender & Country of birth								
Woman (W)	-0.042	(0.025) *	-0.090	(0.028) ***	-0.148	(0.021) ***	-0.136	(0.023) ***
Women with children t	0.239	(0.036) ***	0.303	(0.049) ***	0.161	(0.026) ***	0.231	(0.038) ***
SB-partner (SB)	-0.284	(0.046) ***			-0.363	(0.044) ***		
FB-partner (FB)	0.102	(0.086)			0.089	(0.027) ***		
Woman with SB-partner ($SB \times W$)	-0.250	(0.064) ***			-0.186	(0.066) ***		
Woman with FB-partner ($FB \times W$)	-0.328	(0.148) **			-0.408	(0.044) ***		
Structural state dependence in SA								
Y_{t-1}	1.580	(0.043) ***	1.525	(0.049) ***	1.458	(0.034) ***	1.491	(0.039) ***
$Y_{t-1} \times W$	-0.188	(0.035) ***			0.040	(0.025)		
$Y_{t-1} \times SB$	-0.124	(0.078)			-0.186	(0.082) **		
$Y_{t-1} \times FB$	-0.040	(0.180)			-0.047	(0.038)		
$Y_{t-1} \times SB \times W$	0.154	(0.144)			0.275	(0.138) **		
$Y_{t-1} \times FB \times W$	0.065	(0.334)			0.100	(0.069)		
Time-dummies	✓		✓		✓		✓	
Mean Log-likelihood	-1.200		-1.375		-2.407		-2.351	
Number observations	127360		82370		126430		79040	
Number persons	12736		8237		12643		7904	

Notes: CE = Coefficient estimates; SE = Standard errors; ***, ** and * indicate statistical significance at the 1%, 5% and 10% level.

For both groups of foreign-born, refugees have a higher propensity to receive social assistance compared to non-refugees, but increased time in the country reduces social assistance participation, possibly reflecting improved labor market integration or better social networks over time. Moreover, compared to singles born in a Nordic country, being single and born in a non-European country is associated with a higher propensity for social assistance, while being from Western and Southern Europe is associated with a slightly lower propensity.

Notable differences between those who remained single throughout the period and the full sample are relatively modest, suggesting that partnership status may not substantially alter these demographic and socioeconomic patterns in social assistance participation.

The next set of estimates reflects the relationship between gender and partnership patterns in welfare participation, revealing complex interactions between gender and partner choice. In general, women exhibit lower welfare participation than men across all groups, with this effect being more pronounced among foreign-born individuals compared to Swedish-born individuals. However, this gender effect reverses for women with children, who display significantly higher participation rates. This effect is particularly pronounced among Swedish-born women who remained single throughout the period compared to their foreign-born counterparts.

Partnership patterns reveal notable differences between Swedish-born and foreign-born individuals. Having a Swedish-born partner reduces welfare participation for both groups, although the effect is stronger among foreign-born individuals. In contrast, having a foreign-born partner significantly increases welfare participation for foreign-born individuals, while it has no statistically significant effect for Swedish-born individuals.

The interaction between gender and a partner's country of birth further underscores this complexity. For both Swedish-born and foreign-born women, having a partner—regardless of origin—generally reduces welfare participation more than for men. This reduction is particularly pronounced for foreign-born women with foreign-born partners and Swedish-born women with Swedish-born partners. These interaction effects suggest that partnership

formation has differential implications for welfare participation based on both gender and immigrant status.

Until now we have assumed that single individuals have *no previous experience of social assistance*. However, it is plausible that the effects of forming a couple differ when a single individual has such previous experience, as this may influence the type of partner they attract and ultimately form a couple with. The last part of Table 2 presents estimates for gender and various interaction terms between gender, a partner's country of birth, and previous social assistance experience (i.e., the gammas from Equation (4) and Table 1), which can be used to derive the effects of partnership on state dependence on social assistance. For ease of interpretation by partnership status, Table 3 presents the results of the computations presented in Table 1.

Table 3: Structural state dependence in SA given the change in partnership status

	Total Effect		
Partenrship status	Estimates (Table 2)	Single 1990	Single 1991-99
Panel A: SB sample			
Single SB Man (M)	γ_0^{SB***}	1.580***	1.525***
Single SB Woman (W)	$\gamma_0^{SB***} + \gamma_1^{SB***}$	1.392	
SBM & SBW	$\gamma_0^{SB***} + \gamma_2^{SB}$	1.456	
SBW & SBM	$\gamma_0^{SB***} + \gamma_1^{SB***} + \gamma_2^{SB} + \gamma_3^{SB}$	1.228	
SBM & FBW	$\gamma_0^{SB***} + \gamma_4^{SB}$	1.734	
SBW & FBM	$\gamma_0^{SB***} + \gamma_1^{SB} + \gamma_4^{SB} + \gamma_5^{SB}$	1.611	
Panel B: FB sample			
Single FB Man	γ_0^{FB***}	1.458***	1.491***
Single FB Woman	$\gamma_0^{FB***} + \gamma_1^{FB}$	1.498	
FBM & SBW	$\gamma_0^{FB***} + \gamma_2^{FB***}$	1.272	
FBW & SBM	$\gamma_0^{FB***} + \gamma_1^{FB} + \gamma_2^{FB} + \gamma_3^{FB***}$	1.265	
FBM & FBW	$\gamma_0^{FB***} + \gamma_4^{FB***}$	1.733	
FBW & FBM	$\gamma_0^{FB***} + \gamma_1^{FB} + \gamma_4^{FB***} + \gamma_5^{FB}$	1.873	

The first estimate, γ_0, shows a large and statistically significant coefficient for the lagged dependent variable, indicating that receiving social assistance in one year substantially in-

creases the probability of receiving it in the next year for all four groups of men. This is the only parameter that is estimated for both the entire group of individuals who were single in 1990 and the subgroup that did not change their marital status during the entire decade (1990–99). There is almost no difference between these two estimates for either the sample of Swedish-born or the sample of foreign-born individuals, which suggests that the persistence in receiving social assistance is robust even when individuals experience changes in partnership status. Nevertheless, slight differences emerge that may have potential policy relevance. The magnitude of the estimates is slightly higher for Swedish-born men compared to foreign-born men, suggesting that, on average, Swedish-born men exhibit marginally higher structural welfare persistence. Furthermore, within the Swedish-born sample, the difference in magnitude for the entire group versus the estimate for the subgroup of persistent singles (Single 1991–99) indicates that Swedish-born (SB) men who form partnerships have higher state dependence than those who remain single throughout the period. In contrast, for foreign-born (FB) men, those who remain single throughout the decade exhibit slightly higher state dependence than the overall group, implying that forming a partnership may increase the likelihood of escaping social assistance dependency for this group. Regardless, prior receipt of social assistance remains a strong predictor of future receipt.

Single women exhibit different patterns in year-to-year receipt od social assistance compared to men. Specifically, SB single women have slightly lower state dependence than SB single men, whereas FB single women exhibit slightly higher state dependence than FB single men.

When individuals form partnerships, the effect of past social assistance use is modified by both the gender and the country of birth of the partners. In partnerships where both partners are Swedish-born, the persistence effect is lower compared to singles. These differences suggest that the impact of prior social assistance receipt may vary between partners and may depend on their respective gender roles within the couple.

When SB individuals partner with a FB individual, the social assistance persistence ef-

fect is even higher, suggesting that mixed-nationality partnerships may be associated with a stronger influence of past social assistance use on current use. However, the pattern differs for FB individuals: among them, forming a partnership with a SB partner reduces state dependence, regardless of the foreign-born individual's gender. In contrast, when both partners are foreign-born, the persistence effect is much higher compared to other groups. This indicates that for foreign-born individuals, partnering with someone of the same background is linked to a greater likelihood that past social assistance receipt will lead to future use, compared to partnering with a SB individual.

6 Discussion and Conclusion

We analyzed how partnership formation influences welfare outcomes for individuals who were single before the recession by using a dynamic random effects probit model that controls for unobserved heterogeneity and addresses the initial conditions problem. Our analysis reveals two key findings. First, the effect of forming a partnership on receiving social assistance varies significantly by gender and country of birth. Partnership with an Swedish-born (SB) individual reduces the propensity to receive social assistance, while partnering with a foreign-born (FB) individual increases it. However, for women, partnership reduces the propensity for social assistance regardless of their partner's country of birth.

Second, while previous welfare experience significantly influences these patterns, its impact varies across groups. Among singles, structural state dependence is significantly lower for SB women, and both FB women and men exhibit slightly lower structural state dependence than SB men. For FB men, structural state dependence is higher among those who remain single throughout the decade and among those partnering with an FB individual, but it is lower when an FB man partners with an SB woman.

These results suggest several policy directions. To reduce welfare persistence, policies should focus on promoting social and economic integration for FB individuals, particularly

singles, through targeted employment support, reskilling programs, and intercultural initiatives that mitigate barriers to forming partnerships across communities. In addition, encouraging early labor market attachment through apprenticeships, implementing a gradual tapering of welfare benefits to avoid welfare traps, and providing incentives for households with employed adults can foster financial independence. One example involves enhancing collaboration between municipal social offices and work integration social enterprises that offer work practice opportunities for individuals without prior employment (Andrén and Kremer, 2024). Additionally, programs that strengthen cohesion in mixed households and address the unique barriers faced by FB men in partnerships with FB women can further mitigate welfare dependence. Finally, cross-sector collaboration integrating welfare support with active labor market interventions should underpin these strategies to ensure inclusive and sustainable outcomes.

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Appendix A. Supplementary tables

Table A1: Mean observable characteristics in 1990, by sample

	Swedish-born singles		Foreign-born singles	
	1990	1990-99	1990	1990-99
Social assistance recipient (%)	6.12	7.31	18.47	17.16
Unemployed (%)	8.36	8.33	9.25	9.41
Age (in years)	31.14	32.39	33.29	34.56
Children at home	0.20	0.19	0.38	0.30
Educational level (%)				
Primary	26.97	29.99	57.91	54.42
Secondary	54.46	53.60	31.59	34.46
Post-secondary, or more	18.57	16.41	10.50	11.12
City region (%)	30.21	29.83	38.20	39.22
Municipality characteristics				
Social assistance recipient (%)	4.11	4.12	4.51	4.53
Unemployed (%)	1.33	1.34	1.25	1.24
Years in the country in 1990 (%)				
0 – 4			30.94	22.89
5 – 9			12.57	12.46
10 – 14			14.02	15.25
15 – 22			22.87	26.66
22+			19.60	22.75
Country of origin (%)				
Nordic countries			43.25	49.63
Western Europe			9.29	9.88
Eastern Europe			9.00	8.89
Southern Europe			8.33	8.41
Middle East			13.64	8.27
Rest of the world			16.50	14.90
Refugee			35.62	30.01
Sample size	12736	8237	12643	7904

Table A2: Social assistance recipient (%) 1985-1999, by sample and gender

	Singles 1990			Singles 1990-99		
	All	Men	Women	All	Men	Women
Panel A: Swedish-born sample						
1985	6.52	5.55	7.86	7.14	5.95	8.91
1986	6.90	6.00	8.14	7.51	6.40	9.19
1987	6.51	5.93	7.31	6.94	6.28	7.94
1988	6.49	5.39	8.01	6.92	5.59	8.91
1989	6.24	5.25	7.60	6.86	5.69	8.61
1990	6.12	5.47	7.03	7.31	6.40	8.67
1991	5.89	5.78	6.04	7.10	6.82	7.52
1992	5.98	6.01	5.93	7.36	7.31	7.43
1993	6.42	6.46	6.37	8.05	7.73	8.52
1994	6.04	6.16	5.87	7.34	7.13	7.67
1995	5.46	5.43	5.52	6.59	6.28	7.06
1996	5.31	5.24	5.40	6.47	6.05	7.10
1997	4.87	4.92	4.79	6.02	5.89	6.22
1998	4.36	4.34	4.38	5.35	5.16	5.64
1999	3.93	4.02	3.82	4.77	4.70	4.88
Sample size	12736	7370	5366	8237	4940	3297
Panel B: Foreign-born sample						
1985	11.49	11.88	10.95	12.87	12.75	13.06
1986	12.79	12.89	12.65	14.20	13.43	15.27
1987	13.76	13.73	13.81	14.74	13.82	16.02
1988	14.71	14.75	14.66	15.60	14.70	16.86
1989	16.39	16.49	16.25	16.46	15.16	18.27
1990	18.47	19.34	17.30	17.16	15.94	18.84
1991	17.20	18.64	15.24	16.33	15.77	17.13
1992	16.51	18.07	14.38	16.33	16.21	16.50
1993	16.78	18.55	14.37	16.85	17.54	15.90
1994	15.95	17.27	14.16	15.49	15.59	15.33
1995	14.63	15.77	13.06	14.16	14.26	14.02
1996	14.58	15.17	13.77	14.13	13.67	14.77
1997	14.25	14.85	13.41	13.84	13.45	14.38
1998	12.72	13.17	12.11	12.27	11.76	12.97
1999	11.69	13.02	9.89	10.98	11.10	10.81
Sample size	12643	7283	5360	7904	4565	3339

Table A3: Estimates for initial-conditions equation, by sample

	Swedish-born						Foreign-born					
	Single 1990			Single 1991-99			Single 1990			Single 1991-99		
	CE	SE		CE	SE		CE	SE		CE	SE	
Constant	-1.879	(0.133)	***	-1.535	(0.456)	***	-0.980	(0.100)	***	-0.743	(0.128)	***
Age/10	-0.632	(0.274)	**	-1.795	(2.826)		-0.870	(0.217)	***	-1.679	(0.272)	***
Educational level												
Secondary	-0.273	(0.048)	***	-0.246	(0.057)	***	-0.240	(0.044)	***	-0.190	(0.053)	***
Post-secondary, or more	-0.684	(0.098)	***	-0.686	(0.117)	***	-0.456	(0.091)	***	-0.436	(0.114)	***
Woman	-0.133	(0.060)	**	-0.176	(0.072)	**	-0.208	(0.044)	***	-0.053	(0.055)	
Women with children	0.257	(0.099)	***	0.328	(0.123)	***	0.055	(0.063)		0.178	(0.094)	*
Children at home	0.151	(0.049)	***	0.212	(0.060)	***	0.213	(0.022)	***	0.198	(0.040)	***
City region	0.065	(0.067)		0.117	(0.079)		-0.171	(0.040)	***	-0.157	(0.052)	***
Municipality characteristics (%)												
Social assistance recipients	0.502	(0.240)	**	0.369	(0.280)		0.266	(0.143)	*	0.275	(0.183)	
Unemployed individuals	-0.087	(0.386)		-0.330	(0.443)		0.877	(0.249)	***	0.674	(0.317)	**
Unemployed individuals $_t$	0.450	(0.059)	***	0.474	(0.072)	***	0.282	(0.044)	***	0.348	(0.055)	***
Social assistance recipient												
1985	0.290	(0.068)	***	0.316	(0.080)	***	0.333	(0.052)	***	0.332	(0.063)	***
1986	0.252	(0.070)	***	0.205	(0.083)	**	0.040	(0.053)		0.059	(0.065)	
1987	0.252	(0.067)	***	0.316	(0.080)	***	0.020	(0.049)		0.072	(0.064)	
1988	0.393	(0.062)	***	0.463	(0.074)	***	0.136	(0.044)	***	0.195	(0.058)	***
1989	1.138	(0.059)	***	1.074	(0.072)	***	1.088	(0.038)	***	1.038	(0.050)	***

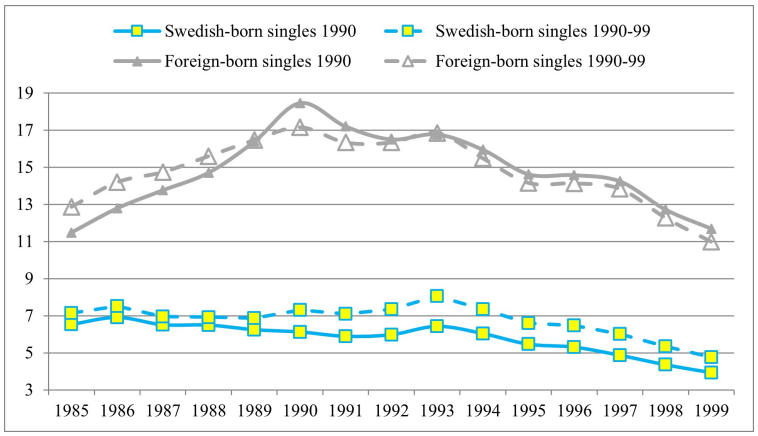
Table A4: Correlations

	Swedish-born						Foreign-born					
	Single 1990			Single 1991-99			Single 1990			Single 1991-99		
	CE	SE		CE	SE		CE	SE		CE	SE	
Cov1	0.063	(0.026)	**	0.017	(0.032)		0.020	(0.032)		-0.005	(0.038)	
Cov2	0.080	(0.027)	***	0.057	(0.034)	*	0.056	(0.034)		0.069	(0.041)	*
Cov3	0.076	(0.027)	***	0.07	(0.035)	**	0.064	(0.035)	*	0.051	(0.040)	
Cov4	0.155	(0.027)	***	0.166	(0.034)	***	0.166	(0.034)	***	0.165	(0.042)	***
Cov5	0.265	(4.946)		0.238	(0.334)		0.240	(4.580)		0.254	(24.028)	
Cov6	0.183	(0.350)		0.195	(0.234)		0.196	(0.323)		0.162	(2.461)	
Cov7	0.212	(0.028)	***	0.208	(0.036)	***	0.213	(0.036)	***	0.211	(0.042)	***
Cov8	0.266	(0.027)	***	0.202	(0.037)	***	0.205	(0.036)	***	0.222	(0.043)	***
Cov9	0.167	(0.028)	***	0.262	(0.036)	***	0.265	(0.036)	***	0.250	(0.044)	***
Cov10	0.243	(0.021)	***	0.238	(0.028)	***	0.234	(0.028)	***	0.245	(0.033)	***
Cov11	0.225	(0.022)	***	0.300	(0.028)	***	0.300	(0.028)	***	0.292	(0.033)	***
Cov12	0.289	(0.022)	***	0.256	(0.029)	***	0.254	(0.029)	***	0.254	(0.035)	***
Cov13	0.206	(5.417)		0.203	(0.341)		0.196	(4.734)		0.201	(0.244)	
Cov14	0.322	(0.023)	***	0.329	(0.029)	***	0.328	(0.029)	***	0.332	(0.035)	***
Cov15	0.367	(0.217)	*	0.310	(7.631)		0.312	(0.122)	**	0.336	(0.583)	
Cov16	0.358	(0.023)	***	0.357	(0.030)	***	0.358	(0.031)	***	0.408	(0.034)	***
Cov17	0.285	(0.025)	***	0.414	(0.029)	***	0.418	(0.029)	***	0.430	(0.032)	***
Cov18	0.237	(0.020)	***	0.301	(0.028)	***	0.294	(0.028)	***	0.309	(0.033)	***
Cov19	0.287	(0.022)	***	0.311	(0.030)	***	0.310	(0.030)	***	0.344	(0.034)	***
Cov20	0.285	(0.026)	***	0.337	(0.036)	***	0.336	(0.036)	***	0.341	(0.041)	***
Cov21	0.319	(0.022)	***	0.351	(0.029)	***	0.347	(0.029)	***	0.366	(0.033)	***
Cov22	0.360	(0.023)	***	0.358	(0.029)	***	0.356	(0.029)	***	0.356	(0.035)	***
Cov23	0.355	(0.243)		0.357	(0.344)		0.353	(0.239)		0.335	(1.063)	
Cov24	0.292	(0.025)	***	0.387	(0.031)	***	0.390	(0.031)	***	0.382	(0.036)	***
Cov25	0.243	(0.021)	***	0.205	(0.030)	***	0.199	(0.030)	***	0.220	(0.036)	***
Cov26	0.294	(0.027)	***	0.218	(0.036)	***	0.220	(0.036)	***	0.217	(0.042)	***
Cov27	0.270	(0.023)	***	0.305	(0.029)	***	0.300	(0.029)	***	0.311	(0.034)	***
Cov28	0.325	(0.023)	***	0.335	(0.032)	***	0.330	(0.032)	***	0.337	(0.036)	***
Cov29	0.360	(0.023)	***	0.321	(0.031)	***	0.315	(0.031)	***	0.337	(0.038)	***
Cov30	0.307	(0.097)	***	0.344	(0.327)		0.345	(0.338)		0.383	(0.157)	**
Cov31	0.261	(0.025)	***	0.275	(0.035)	***	0.266	(0.035)	***	0.251	(0.043)	***
Cov32	0.285	(0.023)	***	0.286	(0.031)	***	0.283	(0.032)	***	0.317	(0.038)	***
Cov33	0.319	(0.022)	***	0.354	(0.030)	***	0.350	(0.030)	***	0.294	(0.036)	***
Cov34	0.334	(0.023)	***	0.319	(0.032)	***	0.318	(0.033)	***	0.335	(0.039)	***
Cov35	0.317	(0.024)	***	0.368	(0.030)	***	0.368	(0.030)	***	0.340	(0.035)	***
Cov36	0.268	(0.022)	***	0.253	(0.031)	***	0.248	(0.031)	***	0.249	(0.035)	***
Cov37	0.274	(0.023)	***	0.268	(0.032)	***	0.261	(0.033)	***	0.271	(0.039)	***
Cov38	0.294	(0.023)	***	0.268	(0.032)	***	0.264	(0.032)	***	0.278	(0.037)	***
Cov39	0.282	(0.023)	***	0.271	(0.031)	***	0.272	(0.032)	***	0.290	(0.036)	***
Cov40	0.234	(0.022)	***	0.279	(0.030)	***	0.273	(0.030)	***	0.273	(0.036)	***
Cov41	0.270	(0.024)	***	0.278	(0.033)	***	0.272	(0.033)	***	0.267	(0.040)	***
Cov42	0.226	(0.024)	***	0.310	(0.031)	***	0.309	(0.031)	***	0.323	(0.037)	***
Cov43	0.207	(0.023)	***	0.200	(0.034)	***	0.194	(0.034)	***	0.253	(0.038)	***
Cov44	0.251	(0.024)	***	0.229	(0.034)	***	0.231	(0.035)	***	0.289	(0.042)	***
Cov45	0.197	(0.023)	***	0.263	(0.034)	***	0.258	(0.034)	***	0.281	(0.042)	***

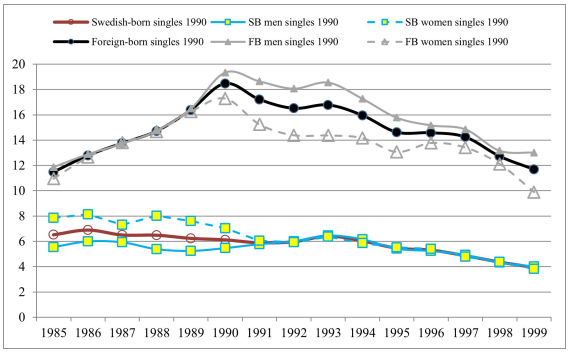
Notes: Where the position of the covariance is displayed in the table below. See next page.

Var1	Cov1	Cov10	Cov18	Cov25	Cov31	Cov36	Cov40	Cov43	Cov45
	Var2	Cov2	Cov11	Cov19	Cov26	Cov32	Cov37	Cov41	Cov44
		Var3	Cov3	Cov12	Cov20	Cov27	Cov33	Cov38	Cov42
			Var4	Cov4	Cov13	Cov21	Cov28	Cov34	Cov39
				Var5	Cov5	Cov14	Cov22	Cov29	Cov35
					Var6	Cov6	Cov15	Cov23	Cov30
						Var7	Cov7	Cov16	Cov24
							Var8	Cov8	Cov17
								Var9	Cov9
									Var10

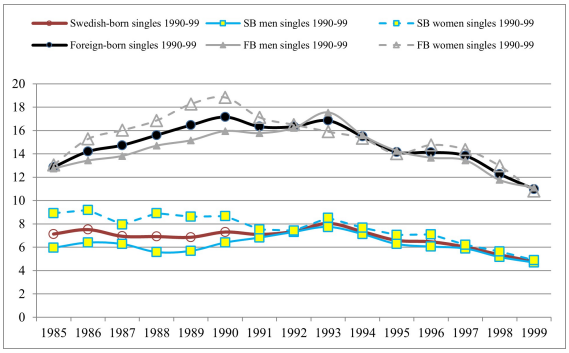
Appendix B. Supplementary figures



(a) All singles 1990 and singles 1990-1999



(b) Singles 1990 by gender



(c) Singles 1990-1999 by gender

Figure 1: Social assistance (%), 1985-1999, by samples of Swedish-born & foreign-born singles in 1990, and subsamples of singles 1990-1999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