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Anna Piil Damm and Michael Rosholm

Centre for Research and Analysis of Migration
Department of Economics, University College London
Drayton House, 30 Gordon Street, London WC1H 0AX

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Anna Piil Damm* and Michael Rosholm†

* Department of Economics,
Aarhus School of Business,
† Department of Economics,
University of Aarhus

Non-Technical Abstract

We argue that spatial dispersal policies on refugees and asylum seekers influence labour market assimilation of refugees through two mechanisms: first, the local job offer arrival rate and, second, place utility. Our partial search model with simultaneous job and residential location search predicts that the reservation wage for local jobs decreases with place utility. We argue that spatial dispersal decreases average place utility of refugees which decreases the transition rate into first job due to large local reservation wages. We investigate both mechanisms empirically and test the predictions of the theoretical model by evaluating the employment effects of the Danish spatial dispersal policy carried out 1986-1998.

Centre for Research and Analysis of Migration
Department of Economics, Drayton House, 30 Gordon Street, London WC1H 0AX
Telephone Number: +44 (0)20 7679 5888
Facsimile Number: +44 (0)20 7916 2775

EMPLOYMENT EFFECTS OF SPATIAL DISPERSAL OF REFUGEES*

Anna Piil Damm† Michael Rosholm‡

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Abstract

We argue that spatial dispersal influences labour market assimilation of refugees through two mechanisms: first, the local job offer arrival rate and, second, place utility. Our partial search model with simultaneous job and residential location search predicts that the reservation wage for local jobs decreases with place utility. We argue that spatial dispersal decreases average place utility of refugees which decreases the transition rate into first job due to large local reservation wages. We investigate both mechanisms empirically and test the predictions of the theoretical model by evaluating the employment effects of the Danish spatial dispersal policy carried out 1986-1998.

Keywords: Spatial Dispersal, Refugees, Job Search, Residential Search

JEL: J64, J61, J68, J15

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†CAM and Department of Economics, Aarhus School of Business, Prismet, Silkeborgvej 2, DK-8000 Aarhus C. Email: apd@asb.dk.

‡Department of Economics, University of Aarhus, Building 326, DK-8000 Aarhus C. Email: mrosholm@econ.au.dk.

I. Introduction

Spatial dispersal policies aimed at asylum seekers and refugees are commonly believed to promote their labour market assimilation. This study provides theoretical and empirical evidence that spatial dispersal policies may in fact hamper labour market assimilation of refugees and asylum seekers.[1]

Mandatory spatial dispersal policies that direct all newly-arrived refugees and asylum seekers away from immigrant-dense metropolitan areas are implemented in several European countries, e.g. UK, Germany, the Netherlands, Norway and Denmark. Voluntary spatial dispersal policies are used in other European countries, e.g. Sweden. The rationale for a spatial dispersal policy is in general threefold; first, to distribute the financial and social costs of receipt of asylum seekers and refugees between local authorities (the public finance motive); second, to avoid increasing pressure on housing in areas that are already under stress (the housing motive); and third, to increase the speed of acquisition of host-country-specific human capital, such as language skills and knowledge about the host country through increased interaction with the majority population (the assimilation motive).

Opponents to spatial dispersal policies claim, however, that lack of free location choice increases secondary migration rates, i.e. relocation within the host country, which will undo some of the intended results of the policy. This claim is supported by evidence for the United States [Forbes 1985], Norway [Djuve and Kavli 2000], Sweden [Aaslund 2001] and Denmark [Hummelgaard et al. 1995; Damm 2005a] which report relocation rates of 33-38% of placed refugees three-four years after initial settlement, higher relocation rates out of rural areas and secondary migration towards towns and cities. Furthermore, Edin et al. [2004] conclude that refugees dispersed according to the Swedish mandatory spatial dispersal policy in place until 1994, the 'Whole of Sweden' strategy, experienced long-run losses (in terms of earnings, idleness and welfare receipt) due to the dispersal policy. Specifically, their estimates suggest that the probability of being idle eight years after immigration would have been 19 percentage points higher if refugees had stayed in the assigned municipalities compared to the situation of free location choice prior to implementation of the dispersal policy. However, they stress that the secondary migration pattern lowered the potential long-run losses of the policy because of the tendency for refugees to leave regions with bad employment prospects.

This study provides a theoretical model for analysis of how spatial dispersal policy affects employment outcomes of asylum seekers and refugees. In addition, it provides

[1] The Geneva Convention from 1951 defines a refugee as a person who due to well-founded fear for persecution because of his race, religion, nationality, belonging to a certain social group or political views is staying outside his country of citizenship and who is not able to - or due to such fear does not want to - seek that country's protection.

empirical evidence of the employment effects of the Danish spatial dispersal policy in place between 1986 and 1998.

We argue that spatial dispersal policies may affect job finding rates of asylum seekers and refugees through two mechanisms. First, settlement in sparsely populated regions without immigrant networks may give rise to different job-offer arrival rates than settlement in immigrant-dense metropolitan areas. Whether such a difference exists is an empirical question. Second, lack of free initial location choice is likely to decrease refugees' initial place utility. We investigate the effect of low place utility on the job finding rate by formulating a search model in which non-employed individuals simultaneously search for a job (locally and outside the local labour market) and for a better location of residence. Our model predicts that the lower the current place utility, the higher are the transition rates into a new region of residence and into non-local employment and the lower is the transition rate into local employment. We argue that the local reservation wage effect is likely to dominate the non-local reservation wage effect. If so, lower place utility decreases the overall job finding rate while acceptance of a residential offer in a new region increases the overall job finding rate.

We test the hypotheses of the model using administrative register data on refugees subject to the Danish spatial dispersal policy. Specifically, we estimate the effects of initial location characteristics and the average effect of relocation on the transition rate into first job. We correct for selection into relocation by joint estimation of the duration of the first non-employment spell and the duration of a residential spell, using the timing-of-events method, i.e. a bivariate mixed proportional hazard model. Our empirical results show, first, that the hazard rate into first job decreases with the local population size and the local number of immigrants. These findings support the implementation of a spatial dispersal policy in Denmark. Second, on average relocation has a large and positive effect on the hazard rate into first job. This effect provides evidence in favour of our hypothesis that spatial dispersal leads to lower average place utility and thereby reduces local and overall job finding rates. Simulation results show that in the Danish case the latter effect dominates the former; the Danish spatial dispersal policy may in fact have slowed down labour market assimilation of asylum seekers and refugees.

II. The Danish Spatial Dispersal Policy

1986 marks the start of the first Danish spatial dispersal policy on refugees and asylum seekers who had just received a permit to stay for reasons of asylum.[2] Henceforth, we refer

[2]Until June 2002 Denmark gave asylum to Convention refugees, i.e. persons who were defined as refugees according to the Geneva Convention from 1951, and to foreigners who were not defined as refugees according to the Geneva Convention, but who for similar reasons as stated in the Convention

to such recognized refugees and asylum seekers as refugees. The Danish Government urged the Danish Refugee Council to implement the dispersal policy after a surge of refugees in the mid-eighties made it increasingly difficult for the Council to satisfy the location preferences of most new refugees for accommodation in the larger cities. The policy was in force until 1999 under the charge of the Council. The Council's assignment policy aimed at promoting an equal share of refugees in all counties. At the county level, the Council aimed at attaining an equal share of refugees in municipalities (local authority districts) with suitable facilities for reception such as housing, educational institutions, employment opportunities, and co-ethnics. In practice, these dispersal criteria implied that refugees were provided with permanent housing in cities and towns and to a lesser extent in the rural districts [Ministry of Internal Affairs 1996]. In 1987, 243 out of a total of 275 municipalities in Denmark had received refugees [Danish Refugee Council 1987].

Dispersal was voluntary in the sense that only refugees who were unable to find housing themselves were subject to the dispersal policy. However, the take-up rate was high; between 1986 and 1997 approximately 90% of refugees were provided with permanent housing by the Council (or after 1995 by a local government) under the terms of the dispersal policy [Annual Reports of the Danish Refugee Council 1986-1994 and the Council's internal administrative statistics for 1995-1998].

Once settled, refugees participated in Danish language courses during an introductory period of 18 months while receiving social assistance. Refugees were urged to stay in the assigned municipality during the entire introductory period. However, there were no relocation restrictions. Refugees could move away from the municipality of assignment at any time, in so far as they could find alternative housing elsewhere. Receipt of welfare was unconditional on residing in the assigned municipality.

The dispersal policy did, at least in the short run, influence the location pattern of refugees. In 1993 the settlement pattern of refugees resembled that of the Danish population and differed greatly from that of non-western immigrants.[3]

In 1999, a new spatial dispersal policy was implemented in Denmark. It aimed at increasing employment assimilation of refugees by means of mandatory and increased spatial dispersal and an extended introduction programme supplied by the municipality of assignment and by making receipt of social assistance in the first three years conditional on residing in the assigned municipality [Law no. 474 passed July 1, 1998].

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or other weighty reasons should not be required to return to the home country ('de facto' refugees). [Coleman and Wadensjö 1999, 249].

[3] 33% of refugees and 26% of the Danish population lived in the capital or its suburbs while as much as 71% of non-western immigrants lived there. 56% of refugees and 59% of the Danish population lived in towns outside the capital as opposed to only 24% of non-western immigrants. The remaining shares lived in rural districts [Danish Refugee Council 1993].

Damm [2005b] argues that the Danish spatial dispersal policy 1986-1998 gave rise to a random initial residential distribution of refugees who were provided permanent housing by the Council, conditional on seven characteristics of the individual at the time of assignment: family size, health (in need of special treatment of medical or mental health problems), special educational needs, the location of close relatives, nationality, year of immigration (over time it became increasingly difficult for the Council to find housing in the larger and medium-sized towns) as well as reluctance to accept assignment to a non-preferred county. These governing factors suggest that non-single refugees with special health treatment and educational needs and refugees with close family in Denmark near whom they were determined to live and who arrived early in the observation period were most likely to realise their preferred settlement option. Three of these characteristics are observed in Danish administrative registers (described in Section V): family status (measured by marital status and number of children), nationality, and year of immigration. Moreover, Damm [2005b] argues that age and nationality may be decent proxies for special educational needs, and that nationality and size of the ethnic stock may be decent proxies for whether the individual had relatives in Denmark at the time of assignment. In contrast, the registers do not contain any decent proxy for need of special treatment for medical or mental health problems. Note, however, that there was no systematic mental health examination of refugees at the time of assignment. Furthermore, since mental health problems are taboos, they tend to be treated at a late stage, if treated at all. Whether a refugee was in need of special mental treatment at the time of assignment is therefore likely to have had little influence on initial settlement. Similarly, the last-mentioned characteristic is probably of minor importance: the combination of high take-up rates and low reassignment rates indicates that only a small fraction of the refugees insisted on living in a particular area.

In the empirical analysis we thus condition on five out of the six characteristics of the individuals that may have had a significant influence on their intial settlement. This allows us to treat the initial residential location of a refugee as otherwise exogenous.

III. Theoretical Model

In this section, we formulate a partial search model to investigate how spatial dispersal policies on refugees affect their labour market assimilation.[4]

Knowledge of the main features of spatial dispersal policies is a prerequisite for formulation of such a model. Past and current spatial dispersal policies on refugees implemented in Europe have two features in common. First, the authorities decide the initial location

[4]For more details on the model, see Damm and Rosholm [2003].

of individuals subject to the policy. Second, the initial location tends to be a location outside immigrant-dense cities.

Spatial dispersal policies may influence job offer arrival rates of individuals subject to the policy if individual job offer arrival rates depend on location choice, both at the regional and the neighbourhood level. Regional characteristics that may affect individual job offer arrival rates include regional unemployment rates that could differ systematically between immigrant-dense cities and more sparsely populated regions without immigrants. Whether this is the case is an empirical issue to be evaluated in any given context. Neighbourhood characteristics that potentially influence individual job offer arrival rates include the level of segregation of immigrants in the neighbourhood of residence. Several competing theories exist about how settlement in an immigrant-dense neighbourhood affects job offer arrival rates of immigrants. The spatial mismatch hypothesis [Kain 1968; Ihlanfeldt and Sjoquist 1990] and the hypothesis about slower acquisition of host-country-specific human capital [Chiswick 1991; Chiswick and Miller 1995, 1996; Lazear 1999] predict that settlement in immigrant enclaves affects immigrant labour market outcomes negatively. In contrast, theories about human capital externalities [Borjas 1995, 1998; Cutler and Glaeser 1997], social network effects [Portes 1987; Lazear 1999; Bertrand et al. 2000] and peer group effects [Coleman 1966; Wilson 1987; Case and Katz 1991; Borjas 1995; Glaeser et al. 1996] predict that settlement in immigrant enclaves affects immigrant labour market outcomes positively or negatively depending on the socioeconomic characteristics of enclave members. Hence, theoretically the employment effect of settlement in immigrant-dense neighbourhoods is ambiguous in sign and therefore ought to be investigated empirically in a given context.

For these reasons the theoretical model formulated by us ignores that spatial dispersal may affect individual job offer arrival rates by affecting the job offer arrival rate in the local labour market. Our objective is instead to formulate a model that enables us to predict how the lack of free location choice affects job finding rates of individuals subject to the policy.

A related literature exists, which explains job and residential search behaviour for unemployed and employed workers in general. Many of these studies rely on a sequential ordering of the decision to change residence or job. So individuals search either for jobs given their residence or for a new residence given their job. Examples of the former models include Sugden [1980], Simpson [1980], Van Ophem [1991], Van den Berg [1992], Rouwendal and Rietveld [1994] and Molho [2001]. The latter models include Weinberg [1979], Weinberg et al. [1981], Smith and Clark [1982], Clark and Flowerdew [1982] and Pickles and Davies [1991]. However, a theory which does not rely on such sequential ordering of the decision to change job or residence is better suited for understanding the interaction between the two decisions. Such a simultaneous search model is developed by

Van Ommeren et al. [1997, 2000]. In their model, individuals maximise life-time utility by moving through different labour market and residential location states, taking into consideration that moving from one state to another is costly. Optimal strategies are derived both for employed and non-employed individuals giving rise to four reservation value strategies, for job moves/acceptance and residential relocation for employed and unemployed individuals, respectively. One of their main conclusions based on the search model is that the reservation wages for employed and non-employed depend on labour market characteristics as well as housing market characteristics. That is also the case for the reservation place utility.

The model by Van Ommeren et al. [1997, 2000] constitutes a good description of the interaction between job and residential mobility for native born individuals. Refugees, however, may initially differ from natives, e.g. by lack of information necessary for conducting job search outside a defined local labour market. Furthermore, spatial dispersal policies aim at labour market assimilation of refugees within the region of assignment. For these two reasons, the distinction between the local labour market and the non-local labour market is important for analysis of employment effects of spatial dispersal policies on refugees. The model by Van Ommeren et al. [1997, 2000] does not distinguish between local and non-local job search. The optimal search strategies for refugees may therefore be different from those described in Van Ommeren et al. [1997, 2000].

In our model refugees begin searching at the time of receipt of a residence permit. Individuals may search in three dimensions. First, individuals can search for a new residential location instead of the location of assignment. Second, they may search for a job locally, i.e. within commuting distance of the present residence, and finally, they may search for employment outside the local labour market.

Individuals face a set of alternative residential locations and a set of alternative employment opportunities. The individual examines the costs and benefits of any residential location or job offer, taking into account once-only costs associated with changing residential location. As a non-local job is a job situated outside feasible commuting distance by assumption, the individual will have to move in order to accept such a job offer. In order to avoid further technical complexities, we assume that a job offer in the non-local labour market carries with it a residential offer, that is, it is a draw from a bivariate distribution of job and residential offers.

Individuals derive utility from income y and place utility r[5]. The income is b while non-employed (e.g. social assistance) and the wage w while employed. The instantaneous utility u experienced by an individual is assumed to be a linear function of y and r,

[5]The concept of 'place utility' was developed by Wolpert who defined it as "a positive or negative quantity, expressing respectively the individual's satisfaction or dissatisfaction with respect to that place" [Wolpert 1965, 162].

$$u(y, r) = y + r \tag{1}$$

where r is suitably normalized. The cross-derivatives are assumed to be zero because we want to focus on the 'pure' dependencies between the reservation strategies and not on dependencies arising from interaction terms in the utility function. The individual faces once-only costs, c, of changing residence.

From the individual's point of view, the economy consists of two labour markets, the local labour market which contains all jobs within commuting distance from the current location of residence, and the non-local labour market which contains all jobs in the rest of the country. We assume that job offers in both regions arrive according to a Poisson process with arrival rate α_l in the local labour market and α_n in the non-local labour market. Note that a job offer in the non-local labour market carries with it a residential location offer, because an individual cannot work outside the local labour market without changing residence. Furthermore, individuals receive residence offers from outside the local labour market (with no associated job offers) which arrive according to a Poisson process at rate β.

When a job offer is accepted, the individual keeps the job forever. Moreover, once a job is accepted, the individual also stops searching for a new residence and thus settles down forever. This implies that the value of holding a job paying the wage w at a location yielding place utility r is

$$W(w, r) = \frac{w + r}{\rho} \tag{2}$$

where ρ is the discount rate.

A residence offer is characterised by the place utility r, which is a random draw from a distribution $F_r(r)$. A job is characterised by the wage w and by its location. Local job offers are random draws from a distribution $F_w(w)$. Non-local job offers are random draws from the joint wage and place utility distribution $F_{w,r}(w, r)$. The suprema of w and r are denoted as $\bar{w}$ and $\bar{r}$, respectively. For simplicity we assume that $f_{w,r}(w, r) = f_w(w)f_r(r)$.

The value of being unemployed is the discounted expected lifetime utility derived from income flows and current place utilities, denoted by the value function $V(r_0)$, where r_0 denotes the place utility at the initial (exogenous) location. Note that under the assumption of random initial location, which is basically what the spatial dispersal policies conducted in Denmark aspire at, the initial place utility is a random draw from $F_r(r)$. The flow value of being non-employed with initial place utility r_0 is[6]

[6]Details of the derivations as well as the proofs of all propositions made below can be found in Damm and Rosholm [2003].

$$\begin{aligned}\rho V(r_0) &= b + r_0 + \alpha_l E_w \max\left[0, W(w, r_0) - V(r_0)\right] \\ &\quad + \alpha_n E_{w,r} \max\left[0, W(w, r) - c - V(r_0)\right] \\ &\quad + \beta E_r \max\left[0, V(r) - c - V(r_0)\right].\end{aligned} \tag{3}$$

The interpretation of the asset equation 3 is as follows. The flow value of being non-employed is equal to the sum of four components: The instantaneous utility of the current income and residence, the option value of local job search, the option value of non-local job search, and the option value of residential search. The flow value of being non-employed can be shown to be increasing in current place utility.

Assuming that $b < \overline{w}$ and that $\alpha_l, \alpha_n, \beta, \rho > 0$ ensures the existence of reservation values $w^*(r_0), \left\{R_{w|r}(r_0)\right\}$ and $r^*(r_0)$. $w^*(r_0)$ is the reservation wage for local jobs while $\left\{R_{w|r}(r_0)\right\}$ is a set of reservation wages for jobs outside the commuting area. These are conditional on the current place utility, r_0, but also on the place utility associated with the job offer, that is, there is a distribution of reservation wages over associated place utilities. Finally, $r^*(r_0)$ is the reservation place utility for residence offers. In the rest of the paper, the dependence of the reservation values on current reservation place utility is suppressed for notational simplicity.

These reservation strategies imply that job and residential mobility of non-employed persons are described by transition rates which are the products of an offer arrival rate and an acceptance probability.

The transition rate into a local job is thus

$$h_l = \alpha_l \left[1 - F_w(w^*)\right] \tag{4}$$

while the transition rate into a non-local job is

$$h_n = \alpha_n \left(1 - E_r[F_w(R_{w|r})]\right) \tag{5}$$

The transition rate into employment, h, is the sum of the local and non-local job finding rate

$$h = h_l + h_n \tag{6}$$

Exploiting the reservation value properties, elaborating further on the value function equations using integration by parts allows us to rewrite the asset equation as

$$\begin{aligned}\rho V(r_0) &= b + r_0 + \frac{\alpha_1}{\rho}\int_{w^*}^{\overline{w}}[1-F_w(w)]dw \\ &\quad + \frac{\alpha_2}{\rho}\int_0^{\bar{r}}\int_{R_{w|r}}^{\overline{w}}[1-F_w(w)]dwdF_r(r) \\ &\quad + \beta\int_{r^*}^{\overline{r}}\partial V(r)/\partial r\cdot[1-F_r(r)]dr \qquad (7)\end{aligned}$$

We now have the following results:

Proposition 1 *r^* increases with r_0.*

The intuition for this result is straightforward. The higher current place utility, the better must a residence offer be for an individual to accept it. Thus, living in a location which offers a *low* place utility implies a low reservation place utility and consequently a *high* transition rate into a new region of residence, h_r.

Proposition 2 *$R_{w|r}$ increases with r_0, while w^* decreases with r_0.*

Thus, living in a place which offers a low place utility implies a low reservation wage for jobs involving a residential move and consequently a high transition rate into such jobs, h_n. The intuition for the result is that the lower current place utility, the less attached is an individual to his current residential location, and consequently, for a given place utility offer r, the lower will the wage offers from outside the local labour market have to be to attract him to the job.

Turning to the second result, an increase in the current place utility decreases the reservation wage for local jobs, because the option value of receiving a non-local job offer and of receiving a residential offer both decrease. Thus, living in a place which yields low place utility implies that an individual must be 'compensated' for the low place utility by a high wage. Therefore, the individual will set a high reservation wage in the local job market and consequently have a low local job finding rate, h_l.

Proposition 3 *h increases with r_0 if and only if*

$$\frac{\alpha_1 f_w(w^*)}{1+\frac{\alpha_1}{\rho}[1-F_w(w^*)]} > \frac{\alpha_2 f_w(R_{w|r})}{\frac{\alpha_2}{\rho}\int_0^{\bar{r}}[1-F_w(R_{w|r})]dF_r(r)+\frac{\beta}{\rho}[1-F_r(r^*)]}$$

The proposition states that the transition rate into employment increases with current place utility, if the increase in the transition rate into local jobs, resulting from the decline in the local job reservation wage, w^*, exceeds the decline in the transition rate into jobs outside the local labour market, resulting from the increase in the national job reservation wage, $R_{w|r}$. In the case of the Danish labour market, this derivative is likely to be positive, as the transition rate into local jobs is close to 100 times larger than the transition rate into jobs outside the local labour market [Munch et al. 2005]. Hence, we would expect the impact on the local job reservation wage to dominate.

These comparative static results can be used for analysing the implications of a spatial dispersal policy for refugees. Spatial dispersal is likely to imply relatively low average values of current place utility, r_0, due to lack of an ethnic network and lack of influence on the choice of location. Since refugees are not free to choose where to live, some of them will find themselves in locations to which they attribute very low place utility. Proposition 1 then implies that, *a priori,* spatial dispersal policies are likely to lead to lower reservation place utilities and consequently higher relocation rates, especially in case of mandatory spatial dispersal. The high subsequent migration rates of refugees who had initially been subject to spatial dispersal found in empirical studies for the United States, Sweden, Norway and Denmark are supportive evidence in favour of this hypothesis.

Moreover, Proposition 2 implies that, *a priori*, spatial dispersal policies - low average values of current place utility - are expected to lead to *lower* transition rates into *local* employment due to higher local reservation wages and to *higher* transition rates into employment *outside* the local labour market due to lower reservation wages in the non-local labour market. Hence, spatial dispersal policies have the likely implication that a better local wage offer is required to compensate the individual for the foregone option value from non-local job search and residential search.

The implication of Proposition 3 is that the effect of spatial dispersal policies on the job finding rate is ambiguous. However, empirically the effect is likely to be negative, at least for most European labour markets, which are characterised by much higher transition rates into local jobs than the transition rates into jobs outside the local labour market [Munch et al. 2005].

IV. Empirical Model

A duration model is a natural empirical counterpart of a search model. We simplify the empirical model relative to the theoretical model by ignoring the distinction between local and non-local jobs. The reason is that our empirical objective is to estimate the effect of the spatial dispersal policy on the overall job finding rate.

IV.A. Econometric Specification

The random variable T_u denotes the duration since receipt of residence permit until the first job. This is our key variable of interest. Let the random variable T_r denote the time spent in a given municipality of residence. In addition, m is an index denoting whether a residential spell is the first, second, third up to the Mth residential spell for that person. Finally, let x_u and x_{rm} be time-invariant vectors of observed covariates (initial values) and v_u and v_r represent unobserved covariates.

The transition rate into a new residential location and the transition rate into first job are assumed to be given by Mixed Proportional Hazard (MPH) functions,

$$h_r(t_{rm}|x_{rm}, v_r) = \lambda_r(t_{rm}) \cdot \varphi_r(x_{rm}) \cdot \exp(v_r), m = 1, ..., M \tag{8}$$

$$\begin{aligned} h_u(t_u|t_{rm,}x_u, v_u) &= \lambda_u(t_u) \cdot \varphi_u(x_u) \cdot \exp(\delta_1 \mathbf{I}\{m = 2\}) \\ &\quad \cdot \exp(\delta_2 \mathbf{I}\{m > 2\}) \cdot \exp(v_u) \end{aligned} \tag{9}$$

where x_{rm} includes a set of indicators for whether it is the first, second, ..., mth residential spell of the individual. $\mathbf{I}(.)$ is an indicator function for the event in brackets. The hazard rate into first job is consequently allowed to change at the moment at which an individual makes a residential move. $\delta_m, m = 1, 2$, are the main parameters of interest since the estimate of δ_m is the causal effect of relocation on the job finding rate and can be interpreted as an average effect of treatment on the treated. In the empirical analysis we restrict the causal effect of relocations subsequent to the first relocation to be the same since very few persons move more than twice. However, we do allow the effect of a relocation to vary with time since the relocation happened. That is, the parameters δ_1 and δ_2 are allowed to vary with time since relocation (this dependence is suppressed above for simplicity).

The likelihood contribution of a residential spell and of the first non-employment spell is, conditional on observed and unobserved covariates,

$$L_{rm} = h_r(t_{rm}|x_{rm}, v_r)^{d_r} \cdot \exp[-\int_0^{t_{rm}} h_r(s|x_{rm}, v_r)ds] \tag{10}$$

$$L_u = h_u(t_u|t_{rm,}x_u, v_u)^{d_u} \cdot \exp[-\int_0^{t_u} h_u(s|t_{rm}, x_u, v_u)ds] \tag{11}$$

respectively, where d_r and d_u are non-censoring indicators. A residential spell is treated as right-censored if a person finds a job before making a (further) relocation. The total contribution to the likelihood function for a single individual is then

$$L = \int_{V_u} \int_{V_r} L_u(t_u|t_{rm,}x_u, v_u) \cdot \prod_{m=1}^{M} L_{rm}(t_{rm}|x_{rm}, v_r)dG(V_u, V_r) \tag{12}$$

where G(·) is the joint CDF for V_u and V_r, and M is the number of residential spells an individual experiences before finding the first job.

We assume the distributions of the unobserved terms to be discrete with two-by-two unrestricted mass-point locations. Let v_u^1, v_u^2, v_r^1, and v_r^2 denote the mass-points of V_u and V_r, respectively. The associated probabilities are as follows:

$$Pr(V_u = v_u^1, V_r = v_r^1) = p_1 \qquad Pr(V_u = v_u^1, V_r = v_r^2) = p_2 \tag{13}$$

$$Pr(V_u = v_u^2, V_r = v_r^1) = p_3 \qquad Pr(V_u = v_u^2, V_r = v_r^2) = p_4 \tag{14}$$

with $0 \leq p_i \leq 1$ for i =1,...,4, and $\sum_{i=1}^{4} p_i = 1$.We normalise the distribution of the unobservables by letting $\exp(v_j^1) = 1$ for $j = u, r$.

The observed part of the individual-specific hazard function is specified as: $\varphi_j(X_l) = exp(X_l'\beta_j)$, $j = u, r$ and $l = u, rm$. The baseline hazard rates are assumed to be piecewise constant, i.e. $\lambda_j(t) = \exp(\alpha_{jk}), k = 1, ..., K_j$, $j = u, r$, where K_j is the number of intervals for the baseline hazard of spell type j. The length of each baseline interval is chosen on the basis of the empirical hazard functions for exit to first job and exit from municipality of residence presented in Section V.

IV.B. Identification

Abbring and Van den Berg [2003] provide identification results for this model, which has become known as the 'timing-of-events' model. The main identification issue is how to disentangle the effect of relocation from the selection effect. If individuals who move at time t_r have relatively short (long) durations, t_u, it can be for two reasons: Either the individual 'treatment' effect is positive or treated individuals have relatively high values of v_u and would have found a job relatively fast anyway. The authors show that given an assumption of no anticipation of the realisation of the treatment (relocation), the two effects can be disentangled without resorting to exclusion restrictions. However, individuals are allowed to know the probability distribution of time until relocation. The identification argument is based on exogenous variation in the timing of events. If there is exogenous variation in the timing of relocation, it can be identified separately from the selection effect caused by unobserved individual heterogeneity. The reason is that in that case the effect of relocation does not appear in the non-employment hazard before relocation has occurred while unobserved heterogeneity is constant over the non-employment spell. Additional identification requirements are independence of x_r and x_u from v_i, $i = u, r$ and an assumption of existence of the first moment of v_i unless multiple observations are available for each v_i pair, which they are not in the present context.

We believe that the assumption of no anticipation is approximately satisfied in the present context due to housing market regulations and frictions faced by refugees. Refugees

have limited access to owner-occupied housing because of liquidity constraints and the law prohibiting foreigners with less than five years of residence in Denmark buying real estate in Denmark. This may explain why only 6% of movers in the refugee sample described in Section V lived in owner-occupied housing after the move. Turning to the private rental market, it is characterised by extensive rent control which results in queues. Refugees in particular are likely to have to queue for a long time because of lack of a Danish network to facilitate access, and due to potential discrimination by private landlords. In contrast, refugees have easy access to social housing because socially and economically disadvantaged individuals with housing problems have priority to 25% of vacant social housing units. Renters in the social housing sector typically have 3 months' notice. Therefore, an apartment vacancy is often announced only 2-2.5 months prior to the apartment vacancy. An individual who wants to apply for a vacant apartment is therefore likely to receive notice about the vacance approximately two months before the actual apartment vacancy. Remember that individuals are allowed to know the distribution of residential spell durations, just not the actual date of relocation too long in advance. In the present context with fairly long residential spells, 2 months' anticipation is of minor importance.

V. Data

V.A. Refugee Sample

Our micro data on refugees is extracted from longitudinal administrative registers of Statistics Denmark on the immigrant population in Denmark 1984-2000. Our sample selection criteria result in a refugee sample with information on 28,056 individuals. Ideally, this sample should cover observations on all adult refugees who were assigned to a municipality by the Council under the terms of the spatial dispersal policy carried out from 1986 to 1998. However, information on admission category of immigrants and the assignment municipality of refugees is missing in the registers. We take account of the first issue by applying an algorithm based on country of origin and the first year of residence permit to Denmark to extract individuals from the 17 largest refugee-sending countries. The algorithm was constructed from official figures on the annual number of residence permits granted to refugees by country of origin. Solving the second data issue is further complicated by the fact that refugees may initially have lived in temporary housing in proximity of the municipality to which they were later assigned, on average after 1 year. We identify the municipality of assignment by using a rather complicated algorithm which we constructed based on information on the Council's internal administrative statistics on temporary housing. We define the first municipality of residence observed in the registers as a municipality of temporary housing if the person relocates to another municipality within the county within one year after receipt of residence permit. Otherwise the first

municipality is defined as the municipality of assignment. Furthermore, we want to exclude family-reunified immigrants from refugee-sending countries, because they were not subject to spatial dispersal, unless they immigrated shortly after their spouse. We therefore exclude immigrants from refugee-sending countries, who at the time of immigration were married to either 1) a Dane, 2) an immigrant from a non-refugee-sending country or 3) an immigrant from a refugee-sending country who had immigrated at least one year earlier. Unfortunately, the registers do not allow us to exclude the 10% of refugees who turned down the Council's offer of housing under the terms of the spatial dispersal policy. Finally, we include only individuals aged 18-59, because individuals outside this age range are unlikely to search for a job.

For each individual we have monthly information on labour market state. Moreover, we know the individual's municipality of residence (at the end of each year) and the date of the last residential move (by the end of each year). This allows us to construct the first non-employment spell and hence the time until first job, and all residential spells prior to the first job for each individual. Employment covers labour market states such as employment as wage-earner, self-employment and assistant spouse, but excludes participation in active labour market programmes and leave schemes. We ignore residential moves within a municipality.

Descriptive statistics on the non-employment and residential spells are shown in Table I. Note that 52% of men and 34% of women find employment in the observation period, on average 39 months after immigration. Note further that 32% of residential spells for men and 26% of residential spells for women are completed, on average after 21 months of residence.

Further investigation of features of the spells (not reported in Table I) shows the following. First, on average the first employment spell lasts a year and it exceeds 3 months for 70% of the individuals. Second, 33% of men and 27% of women have moved at least once before finding their first job and 9 % of men and 5% of women have moved at least twice before finding their first job.

Table I

Descriptive statistics on non-employment and residential spells.

Sub sample	Non-employment spell	Frequency	Distr. (%)	Mean duration
MEN	Completed	8,896	52.4	37.8 (28.9)
	Right-censored	8,083	47.6	53.1 (37.8)
	All	16,979	100	45.1 (34.3)
WOMEN	Completed	3,727	33.6	40.4 (31.1)
	Right-censored	7,350	66.4	50.1 (36.1)
	All	11,077	100	46.8 (34.8)
	Residential spells			
MEN	Completed	7,990	31.8	19.5 (18.4)
	Right-censored	16,802	68.2	34.5 (28.6)
	All	24,792	100	29.7 (26.7)
WOMEN	Completed	3,799	25.7	22.7 (21.0)
	Right-censored	11,013	74.3	39.3 (30.7)
	All	14,812	100	35.0 (29.4)

Notes: Standard deviations are reported in parentheses.

The empirical hazard functions for exit to first job and for exit from the initial municipality of residence are shown separately for men and women in Figures I and II. The empirical hazard function for exit to first job attains its maximum in month 18 for men and month 17 for women, while the empirical hazard function for exit from the initial municipality of residence peaks in month 13 for both men and women. The empirical survivor functions for first non-employment spell and residence in the initial municipality are shown separately for men and women in Figures III and IV. The first figure shows that after 12 years 18% of men and 32% of women will not have found a job. The second figure shows that after 12 years 40% of men and 50% of women will still live in the initial municipality.

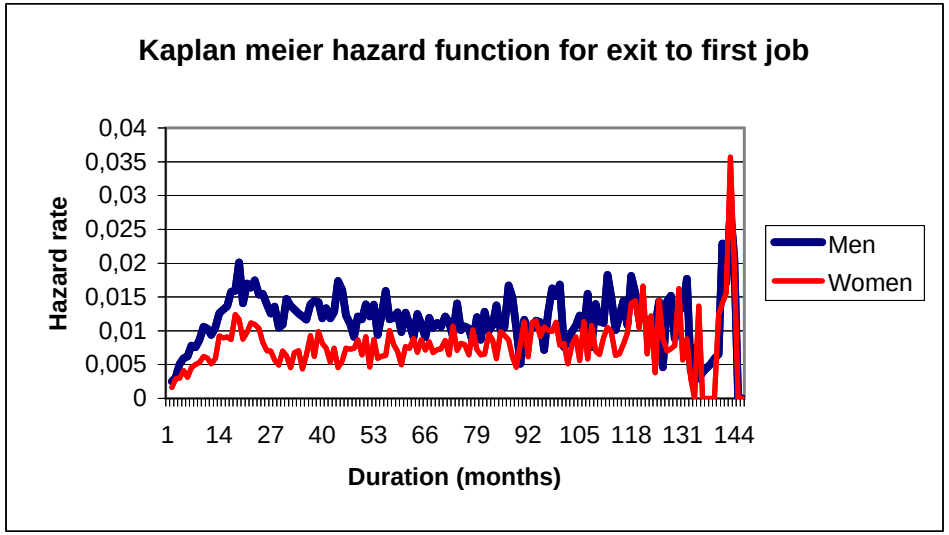

Figure I

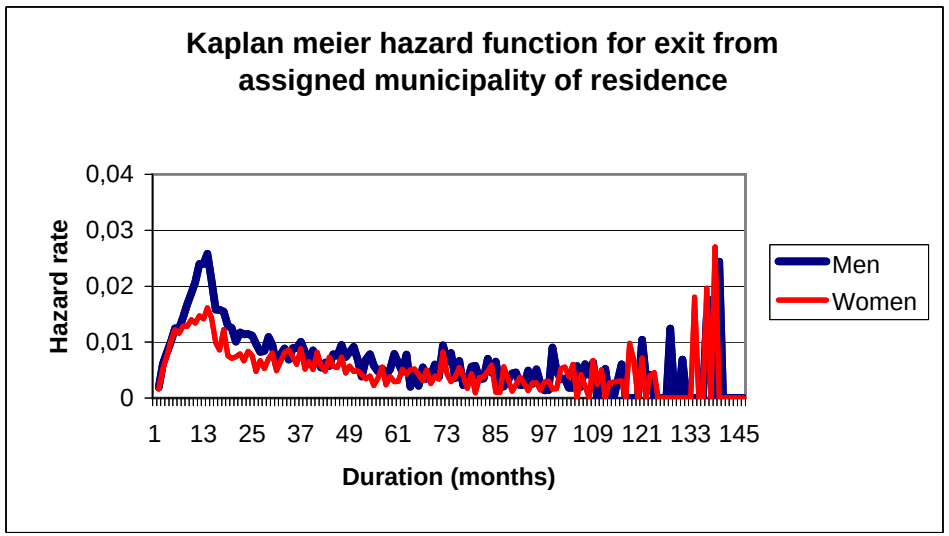

Figure II

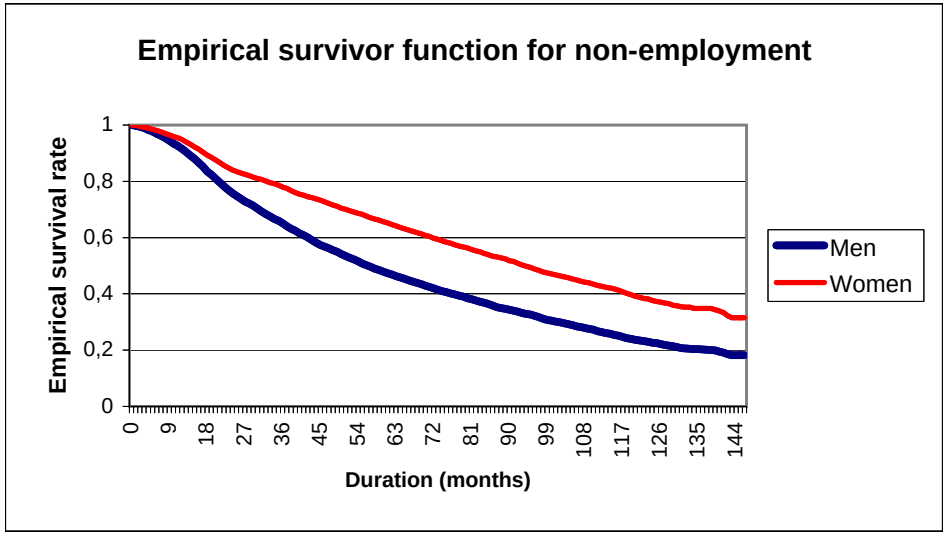

Figure III

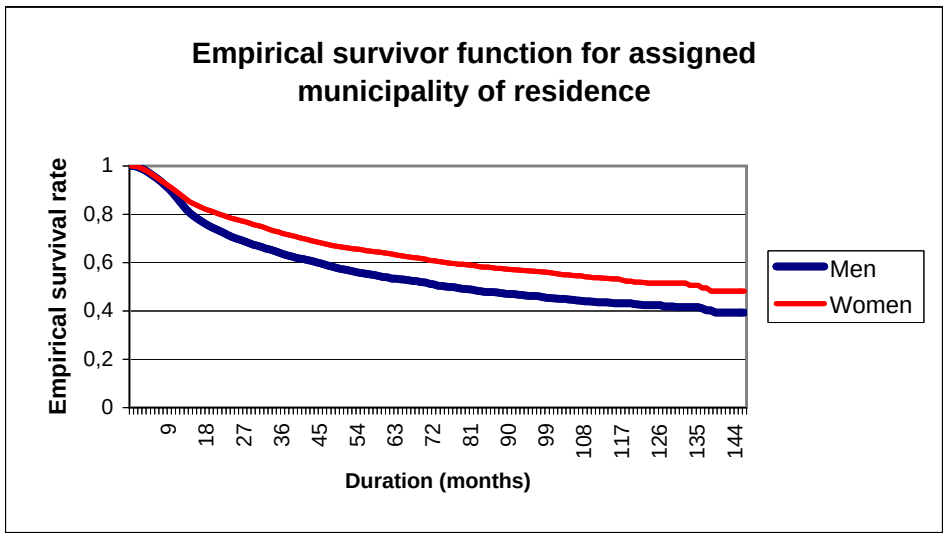

Figure IV

We now turn to description of the initial geographical settlement and relocation pattern of individuals in our sample. Denmark is divided into 275 municipalities which vary extensively in number of inhabitants. The four largest municipalities have more than 100,000 inhabitants. They cover at least parts of the four largest cities in Denmark: Copenhagen, Aarhus, Odense and Aalborg. 132 municipalities have between 10,000 and 100,000 inhabitants. We refer to these as medium-sized. They cover mainly urban areas. Finally, 139 municipalities have less than 10,000 inhabitants and are referred to as small. They cover both smaller urban areas and rural districts. In the 1990s, 18% of the Danish population lived in small municipalities, 61% in medium-sized municipalities and 21% in large municipalities. Individuals in our sample were initially slightly overrepresented in the large municipalities and slightly underrepresented in the small municipalities.

Turning to the relocation pattern of individuals in our sample, the relocation rates out of the initial municipality of residence decreases with municipality size. This may indicate that individuals' relocation decisions were affected by the size of municipality of assignment. In contrast, the net inflow of movers is increasing with municipality size. In fact, only large municipalities experience a positive net-inflow of movers. In sum, secondary migration of unemployed refugees increased the concentration of unemployed refugees in the larger municipalities.

V.B. Explanatory Variables

The job offer arrival rate in a given region is likely to be affected by a number of local labour market characteristics and the reservation values are likely to be affected by both local labour market and housing characteristics. Therefore, we include a number of municipality-specific variables. The variable definitions and primary data sources are given in Table A.I and their first two moments are shown in Table A.II in the Appendix.

We expect the regional unemployment rate to be a key variable, influencing the regional job offer arrival rate negatively. Another factor which may influence the regional job offer arrival rate is the extent to which local councils co-operate with local firms with respect to qualifying refugees for the host-country labour market, for instance by use of private job training programmes as part of active labour market programmes. The extent to which such a co-operation takes place is unobserved to us, but it is believed to be systematically related to the share of right-wing versus left-wing representation in the local councils, and therefore we include the share of right-wing votes at the latest local election in the empirical analysis.

A labour market characteristic of potential importance for the reservation wage is the share of the county's jobs located in the municipality in which a person lives. A higher share of the county's jobs could increase the local job offer acceptance rate due to a higher arrival rate of jobs with low commuting costs for which the individual sets a lower

reservation wage than for jobs with high commuting costs.

Turning to housing market factors which may influence the rate of relocation out of a given municipality, we expect the local residence offer arrival rate to be increasing with the number of social housing units in per cent of the total local housing stock. A higher share of social housing units may reduce the relocation rate out of the municipality, since adjustment of housing consumption can take place within the current local area.

We argue in the following that current place utility of recent refugees increases with the local number of co-ethnics and immigrants, local access to vocational educational institutions and local access to amenities offered by larger cities. Recent immigrants may derive high place utility from living close to co-ethnics for the following two reasons. First, recent immigrants are likely to have limited information about the host country whereas ethnic enclaves constitute well-known cultural, social and economic environments which facilitate their adjustment to the new society [Piore 1979; Kobrin and Speare 1983]. Specifically, residence in an ethnic enclave strengthens feelings of security, solidarity and identity within the group due to the common cultural background. Furthermore, the local ethnic network may establish social institutions that support its members in relation to the rest of the society. In addition, local ethnic labour markets may develop further employment opportunities. Finally, the ethnic network may convey information about employment opportunities outside the residential area. Second, living near ethnic enclaves helps to reduce the costs of consumption of so-called ethnic goods defined as the consumption characteristics of an ethnic group not shared with the host population, broadly defined to include market and non-market goods and services, including social interactions for themselves and their children with people of the same origin [Chiswick and Miller 2005].

We believe the current place utility to be increasing in the size of the local population, because recent immigrants tend to settle in larger cities [Bartel 1989], which may be due to a preference for residing near airports which facilitate contact with old networks abroad, due to access to a large variety of goods and services in general and due to the local population being more accustomed to interactions with foreigners.

New refugees are likely to prefer living in a local area with many institutions for vocational and higher education for numerous reasons. First, due to lack of education from the source country. Second, due to lack of approval of foreign educations in the host country. Third, due to a need for upgrading the skill level for employability in the host country labour market, for instance due to a high minimum wage and a mismatch between low-skilled job demand and supply in the host country.

Finally, to control for individual-specific differences in hazard rates, some of which may be due to the observed individual-specific differences in initial settlement, we include a number of demographic and socio-economic variables available in the administrative

registers as controls: age, marital status, number of children, country of origin, and year of immigration, as well as years of education. These variables are also defined in Table A.I and their first two moments are shown in Table A.II in the Appendix.

VI. Policy Evaluation

We now turn to evaluating the employment effects of the Danish spatial dispersal policy in force 1986-1998. To this end we have estimated the timing-of-events model described in Section IV. The model is estimated separately for men and women to allow their job search process to be driven by different factors. The estimated hazard functions are plotted in Figures A.I and A.II in the Appendix, for an individual with mean observable and unobservable characteristics. The corresponding estimated survivor functions are plotted in Figures A.III and A.IV in the Appendix. In this section, we describe the main results of the estimated models.[7]

VI.A. How Location Characteristics Affect Employment

Our results confirm that the local labour market characteristics significantly affect the speed at which refugees find their first job, see Table II. Initial settlement in regions with high unemployment harms employment prospects of refugees. A percentage point increase in the regional unemployment rate is associated with a 2.6% - $(exp(-0.0266) - 1)\cdot 100$ - decrease in the hazard rate into first job for men and a 1.7% decrease in the hazard rate into first job for women. The interpretation is that high regional unemployment implies a low job offer arrival rate. The percentage of county jobs in the municipality of residence has a small, but significantly positive effect on the hazard rate into first job; a percentage point increase is associated with a 0.5% increase in the hazard rate for men and with a 1.7% increase in the hazard rate for women. Similarly, the percentage of right-wing votes at the latest local election is found to have a significantly positive, although moderate, effect on the job finding hazard rate. This finding could be due to right-wing dominated municipalities having more efficient active labour market programmes for refugees due to higher participation rates of unemployed refugees in private sector on-the-job training rather than class room training as a result of closer cooperation with local firms compared to left-wing dominated municipalities.

[7] The full set of estimation results are available on request.

Table II

Estimated effects of initial location characteristics on the hazard rate into first job.

Sub sample:	Men		Women	
Variable:	Coefficient	Std. error	Coefficient	Std. error
Reg. unemp. rate/100	-2.666**	0.654	-1.705	0.956
% of county jobs/100	0.521*	0.211	1.709**	0.310
% right-wing votes/100	1.092**	0.122	2.179**	0.186
Log(immigrants)/10	-2.601**	0.242	-3.514**	0.376
Greater Copenhagen area	-0.158**	0.039	-0.008	0.058
Medium municipality	0.432**	0.068	0.661**	0.102
Small municipality	0.445**	0.094	0.718**	0.140
Log(co-ethnics)/10	0.420**	0.137	0.424*	0.209
No. of educ. institutions/100	2.688*	0.653	2.193*	0.947
% social housing/100	1.696**	0.152	2.860**	0.225

Notes: One and two asterisks indicate significance of the estimate at the 5 and 1 % levels, respectively. Controls for demographic and socio-economic characteristics and time-invariant unobserved characteristics of the individual are included. In addition, selection into relocation is taken into account.

More importantly, our results show that initial settlement in a municipality with many immigrants is detrimental to employment outcomes of refugees. A percentage point increase in the number of immigrants in the municipality of residence is associated with a 23% decrease in the hazard rate into first job for men and a 30% decrease in the hazard rate into first job for women. A likely explanation may be that presence of immigrants increases the probability of entry into the informal rather than the formal labour market. Another explanation could be congestion; too many immigrants in one location may be more than the local labour market can absorb due to excess supply of low-skilled labour. However, further research into the causes of this negative correlation is needed.

Residence outside a large municipality is found to have a significantly positive and large effect on the hazard rate into first job. Specifically, the hazard rate for men is 54-56% larger for individuals living in a small or medium-sized municipality than for similar individuals who live in a large municipality. The effects are larger for women. The hazard rate into first job is approximately twice as large for women who live in a small or medium-sized municipality as for women who live in a large municipality. The interpretation of the effects of the size of the local population is not straightforward. It could be an exposure effect, i.e. the smaller the local population the more exposed the refugee is to host-country culture and language. Similarly, residence in the greater Copenhagen area versus residence outside that area has an additional significant and negative effect

on the hazard rate into first job for men, possibly for the same reason.The findings of a significant, negative effect of local population size and the presence of immigrants on the hazard rate into first job both support the assumption underlying dispersal policies, that spatial dispersal of refugees away from immigrant-dense cities facilitates their labour market assimilation.

However, interestingly the presence of co-ethnics in the municipality of residence has a significant and positive effect on the hazard rate into first job. A percentage point increase in the number of co-ethnics increases the hazard rate by 4.3% for both sexes. This finding can be interpreted as evidence in favour of existence of positive ethnic network effects among co-ethnics, in particular that ethnic networks enhance the employment opportunities by conveying information about employment opportunities or because jobs are created within ethnic enclaves. However, in view of our theoretical model at least part of the effect may arise because an ethnic network locally increases place utility which decreases the reservation wage with respect to local job offers. We will develop this argument further in Subsection VI.C. In any case, causes for this positive correlation warrant further research.

Finally, the number of institutions for vocational and higher education and the share of social housing in the municipality of residence is associated with a moderate, but significantly positive effect on the hazard rate into first job for both men and women.

VI.B. Selection into Relocation

Our results confirm that the local housing offer arrival rate for which we use the percentage of social housing in the total local housing stock as a proxy, influences the relocation rate negatively, see Table III. The effect is significant but modest. A 1% point increase in the percentage of social housing is associated with a 1% decrease in the relocation rate out of the municipality.

We argued in Section V that current place utility is increasing with the local number of co-ethnics and immigrants, local access to vocational institutions and local access to amenities offered by larger cities. Our results support the hypothesis. In particular, a 1% increase in the local number of immigrants significantly decreases the relocation rate by 9.5% for men and 17% for women. Similarly, a 1% increase in the local number of co-ethnics significantly decreases the hazard rate of relocation by 11% for men and 8% for women. These findings are consistent with the hypothesis that place utility increases with these two factors, which capture the importance of ethnic networks and ethnic goods. Furthermore, compared to men who live in a large municipality, men residing in a medium and a small municipality have a 33% and 84% higher relocation rate, respectively. For women, the corresponding numbers are 66% and 102%, respectively. Surprisingly, the relocation rate is also higher for individuals residing in the greater Copenhagen area com-

pared to individuals outside that area. However, descriptive evidence (not reported here) shows that this finding is mainly explained by high rates of relocation (between municipalities) within the greater Copenhagen area. Finally, as expected access to institutions for vocational or higher education has a negative effect on the relocation hazard rate, however only insignificantly. Therefore, access to vocational or higher education does not seem to be an important determinant of refugees' place utility.

The regional unemployment rate, which is closely related to the job offer arrival rate, is found to have an insignificant effect on the relocation hazard rate. Similarly, the effect of the share of the county job in the municipality of residence is found to be insignificantly positive for men, but significantly positive for women. The positive sign may be due to the above-mentioned higher rates of migration within the greater Copenhagen area. Interestingly, the effect of the share of right-wing votes at the latest local election is significantly positive for men. This may suggest that the policy instruments used by right-wing dominated municipalities have a side-effect in that the instruments make some male refugees leave the municipality.

Table III

Estimated effects of initial location characteristics on the hazard rate of relocation.

Sub sample:	Men		Women	
Variable:	Coefficient	Std. error	Coefficient	Std. error
Reg. unemp. rate/100	-1.323	0.808	-0.317	1.129
% of county jobs/100	0.204	0.274	1.003*	0.435
% right-wing votes/100	0.467**	0.143	0.373	0.215
Log(immigrants)/10	-0.989**	0.291	-1.838**	0.439
Greater Copenhagen area	0.542**	0.050	0.560**	0.077
Medium municipality	0.287**	0.094	0.506**	0.148
Small municipality	0.609**	0.121	0.705**	0.184
Log(co-ethnics)/10	-1.190**	0.170	-0.824**	0.253
No. of educ. institutions/100	-1.192	0.862	-0.172	1.348
% social housing/100	-1.237**	0.185	-2.072**	0.289
First location	0.889**	0.039	1.332**	0.062

Notes: One and two asterisks indicate significance of the estimate at the 5 and 1 % levels, respectively. Controls for demographic and socio-economic characteristics and time-invariant unobserved characteristics of the individual are included.

Finally, note that residence in the assigned municipality implies a hazard rate of relocation which for men is as much as 2.4 times larger than the hazard rate for relocation out of subsequent municipalities of residence. The effect is even larger for women, namely 3.8 times larger. A large, positive effect could be expected given the initial random assignment of around 90% of the individuals to a municipality of residence.

VI.C. The Causal Effect of Relocation

Estimates of the average time-varying effects of relocation on the hazard rate into first job are shown in Table IV. The effects of the first move and of more than one move are estimated separately for 6 different intervals of time since the move: 1-3 months, 4-6 months, 7-12 months, 13-18 months, 19-24 months and more than 24 months. For men, relocation away from the assigned municipality on average has a significantly positive effect on the hazard rate into first job and the effect tends to increase with time since the move. On average, leaving the assigned municipality also has a significantly positive effect on the hazard rate into first job for women, except in the first time interval in which the effect is close to zero. The time-varying effect of moving twice relative to staying in the assigned municipality is also significantly positive in most time-intervals and increasing with time since the second move.

For men, the hazard rate into the first job increases by 24% 1-3 months after the first move, 68% 4-6 months after the first move and around 58% from then on. For women, the hazard rate into first job increases by 0% 1-3 months after the first move, 76% 4-6 months after the first move and 47%-85% from then on. The average effects of having moved twice are slightly higher.

These positive effects of carrying out a cross-municipal move are likely to stem at least in part from the two following effects. First, residence in a location of own choice after the move may imply a lower local reservation wage due to increased place utility and consequently a higher local job offer acceptance rate. Second, differences in unobserved location characteristics before and after the move, such as presence of friends and family in the municipality of destination which can facilitate job search in the new local labour market, may increase both the local job offer arrival rate as well as place utility which will increase the local job offer acceptance rate through the local reservation wage effect.

Table IV

Estimated effects of relocation on the hazard rate into first job.

Sub sample:	Men		Women	
Variable:	Coefficient	Std. error	Coefficient	Std. error
One move:				
Move 0-3 months ago	0.216*	0.103	-0.016	0.215
Move 4-6 months ago	0.520**	0.091	0.568**	0.164
Move 7-12 months ago	0.489**	0.073	0.384**	0.139
Move 13-18 months ago	0.466**	0.078	0.589**	0.134
Move 19-24 months ago	0.464**	0.083	0.391**	0.153
Move > 24 months ago	0.408**	0.055	0.614**	0.088
Two moves:				
Second move 0-3 months ago	0.374*	0.165	-0.018	0.447
Second move 4-6 months ago	0.270	0.181	0.814*	0.334
Second move 7-12 months ago	0.311*	0.136	0.212	0.319
Second move 13-18 months ago	0.564**	0.131	0.585*	0.293
Second move 19-24 months ago	0.504**	0.141	0.525	0.307
Second move > 24 months ago	0.568**	0.084	0.595**	0.154

Notes: One and two asterisks indicate significance of the estimate at the 5 and 1 % levels, respectively. Controls for demographic and socio-economic characteristics and time-invariant unobserved characteristics of the individual and observed location characteristics are included. In addition, selection into relocation is taken into account.

Since we only observe when an individual begins a job and not - which would have been preferable - when an individual actually gets the job, one may worry that the positive effects at least in part stem from reverse causality; some movers may have found a job in another region prior to moving to the region. However, if that was the case, we would expect the hazard rate into first job to be very high immediately after relocation and to decline thereafter. Our estimates of the time-varying effect of relocation on the hazard rate into first job show exactly the opposite. For both sexes, the two relocation effects are estimated to increase with time since the move. Furthermore, the first relocation effect for men is estimated to be small 1-3 months after the move. Similarly, both relocation effects for women are estimated to be zero 1-3 months after the move.

Besides the relocation effects reported in Table IV, relocation affects the hazard rate into first job through changes in the observed location characteristics, i.e. if observed characteristics of the municipality of destination differ from those of the municipality of origin. We refer to this relocation effect as the relocation effect due to observables and to

the relocation effects reported in Table IV as the relocation effects due to unobservables. We calculate the average relocation effect due to observables in the following way,

$$(\bar{X}_{after}^{location} - \bar{X}_{before}^{location})\hat{\prime}\hat{\beta}_u^{location} \tag{15}$$

where $\bar{X}^{location}$ denotes the mean of observed municipality characteristics across movers, 'before' refers to the beginning of the first residential spell and 'after' refers to the time immediately after relocation. Table V reports the relocation effect due to observables for the first move and for two moves. On average, this effect is negative, and for men it is statistically significant. For women, the effects are insignificant at the 5% level. Hence, (male) refugee migrants moved to locations with less favourable employment prospects than in the assigned municipality. Specifically, the average effect of changes in location characteristics after the first move corresponds to a decline in the hazard rate into first job by 12-13%. The average effect of changes in location characteristics after two moves is larger; it corresponds to a decline in the hazard rate into first job by 19% for men and 15% for women. The difference in the size of the relocation effect due to observables after one move and two moves is explained by the fact that relocations from a small or medium-sized municipality to a large municipality constitute a larger share of second-time relocations than first-time relocations.

The total average effect of relocation on the hazard rate into first job is the sum of the relocation effect due to unobservables and the relocation effect due to observables. Hence, relative to no move the hazard rate into first job for men increases by 8% 1-3 months after the first move, 46% 4-6 months after the first move and around 38% from then on. Relative to no move the hazard rate into first job for women decreases by 15% in the first three months after the first move, but 4-6 months after the first move it increases by 51% and from 7 months after the first move and onwards it fluctuates between an increase of 26% and 59%. The total average effects of having moved twice are similar. Thus, for men the hazard rate into first job is almost unchanged initially after relocation while it declines for women, but a few months after relocation it increases to a level which significantly exceeds the hazard rate in the case of no relocation.

Table V

The relocation effect due to observables on the hazard rate into first job.

Sub sample:	No. of moves	Relocation effect due to observables	
		Effect	Std. error
MEN	One	-0.134	0.061
	Two	-0.212	0.068
WOMEN	One	-0.146	0.085
	Two	-0.167	0.088

Are relocation effects of the estimated size also economically significant? We can answer this question by calculating the effect of relocation on the predicted average duration until the first job is found. For a person with observed characteristics X and unobserved characteristics $\hat{v}_u$, this is given by

$$E(T_u|X,\hat{v}_u) = \int_0^\infty \hat{S}(t_u|X,\hat{v}_u)dt_u = \int_0^\infty (\exp(-\int_0^{t_u} \hat{h}(s|X,\hat{v}_u)ds)dt_u \qquad (16)$$

Table VI summarizes the estimated relocation effects in the following way. First, we calculate the predicted mean duration for an individual who does not move. Next, we calculate the change in the predicted duration for two different relocation scenarios: one relocation 16 months after initial settlement and two relocations in months 16 and 31. For an average man, the relocation effects correspond to a decrease in predicted time until first job of 22 months for one relocation (corresponding to a 27% reduction) and 24 months for two relocations. For an average woman, the relocation effects are even larger: a 41 months decrease (corresponding to a 34% reduction) if she moves 16 months after initial settlement and a 39 months decrease if she moves twice. All effects are statistically significant. Refugees who move away from the municipality of assignment find a job faster than they would have otherwise, despite the fact that municipalities of assignment have more favourable observed characteristics in terms of employment than municipalities of destination. These results support the hypothesis that lack of free initial location choice decreases current place utility which slows down employment assimilation due to reservation wage effects. Individuals with low place utility in the assigned municipality postpone local job search or acceptance until they have found a satisfactory municipality in which to reside, and then they lower their local reservation wage in order to find local employment.

Table VI

Predicted mean duration and change in mean duration of first non-employment spell for an individual with mean observed characteristics. Months.

		Predicted mean duration	Predicted change in mean duration	
		0 moves	1 move	2 moves
Sub sample:	Unobserved type:		Month 16	Months 16, 31
MEN	Type 1 ($\hat{v}_u$= 0)	58.5 (1.86)	-14.4 (1.37)	-15.4 (1.55)
	Type 2 ($\hat{v}_u$= -1.018)	135.1 (8.00)	-38.9 (3.87)	-46.2 (4.54)
	Average person	82.6 (2.84)	-21.9 (2.06)	-24.4 (2.51)
WOMEN	Type 1 ($\hat{v}_u$= 0)	97.0 (5.32)	-30.5 (3.55)	-29.1 (5.35)
	Type 2 ($\hat{v}_u$= -0.920)	206.2 (21.92)	-77.4 (7.97)	-74.2 (13.60)
	Average person	122.6 (6.73)	-41.3 (4.27)	-39.3 (7.54)

Notes: An average male person is $0.45 \cdot type1 + 0.55 \cdot type2$. An average female person is $0.571 \cdot type1 + 0.429 \cdot type2$. Standard errors calculated by Monte Carlo methods are reported in parentheses.

VI.D. Simulation Results: A Case for Abandonment of Spatial Dispersal

The estimated model can be used to predict the time until first job for an individual in the counterfactual case of no spatial dispersal policy, i.e. for an individual who is unrestricted in initial and subsequent residential choice. Obviously, such a calculation entails many assumptions, and it should therefore be interpreted cautiously. Nevertheless, we feel that it can provide instructive information of use for policy makers.

We calculate the predicted time until first job for an individual with mean demographic and socio-economics characteristics under three different sets of assumptions about the counterfactual distribution of refugees across municipalities and compare it with the predicted time until first job for an individual with average demographic and socio-economic characteristics who stays in a municipality with average municipality characteristics under the dispersal policy. In scenario 1, we assume that all newly arrived refugees settle and remain settled in one of the four largest municipalities in Denmark. In addition, we assume that each municipality share corresponds to its share of the net-inflow of *all immigrants* (mainly refugees and family-reunified immigrants) to large municipalities in 1984. This scenario can be regarded as a worst case scenario, since it counterfactually assumes that all newly arrived refugees settle and remain settled in a large city while in fact it was only 52% of the net-inflow of immigrants that settled in one of the large municipalities in 1984. In scenario 2, we keep the first assumption but relax the second assumption and instead assume that the share of refugees that settle in each large municipality corresponds to

the actual municipality share of the 1984 cohort of *refugees* that settled in a large municipality. Finally, in scenario 3 we relax both of the strong assumptions made in scenario 1. Instead of the first assumption we assume that refugees settle and stay in a large or medium-sized municipality. 97.4% of the 1984 cohort of refugees did in fact initially settle in either a large or a medium-sized municipality. We divide medium-sized municipalities in two categories: medium-sized municipalities within the greater Copenhagen area and those outside. We assume that the municipality (category) share of refugees corresponds to the actual municipality (category) share of the 1984 cohort of refugees who initially settled in a large or medium-sized municipality. This is likely to be the most realistic scenario.

In each scenario, refugees are distributed across municipalities by making random draws from the relevant distribution, and subsequently mean location characteristics including mean number of immigrants and co-ethnics are recalculated before the expected durations are calculated.

In Table VII, we report the change in expected duration under each scenario relative to stayers under the dispersal policy. Looking at the simulation results for scenarios 1-3, we find that removal of the dispersal policy leads to an increase in the average time until first job. The impact is significant under scenarios 1 and 2, while the effects are very small and insignificant under scenario 3.

In scenarios 1-3, we ignore that free location choice may increase place utility which according to our theoretical model will increase the overall job-finding rates through reservation wage effects. We allow for this potential effect in scenarios 4-6 which are otherwise replications of scenarios 1-3. In particular, we assume that the effect of free location choice on the hazard rate into first job corresponds to the average relocation effect due to unobservables. This amounts to assuming that the estimated relocation effect due to unobservables on the hazard rate into first job reflect either unobserved municipality characteristics or reservation wage effects rather than the event of relocation itself. Under this additional assumption, removal of the dispersal policy significantly decreases the expected time until first job in all scenarios.

The true counterfactual is likely to lie somewhere between those measured by the scenarios 3 and 6, hence, it is tempting to conclude that the Danish spatial dispersal policy 1986-1998 has not promoted employment assimilation of refugees. In contrast, it is likely to have harmed the employment assimilation process because a significant number of placed refugees may have been reluctant to accept a local job offer due to low place utility in the assigned municipality.

Table VII

Predicted change in mean duration of first non-employment spell for an individual with mean observed characteristics in absence of a spatial dispersal policy. Months.

		Change in expected duration relative to stayers under scenario		
Sub sample:	Unobs. heterogeneity:	1	2	3
MEN	Type 1 ($\hat{v}_u$= 0)	12.2 (4.0)	10.1 (3.7)	0.9 (0.7)
	Type 2 ($\hat{v}_u$= -1.018)	31.6 (10.7)	26.1 (9.4)	2.3 (1.9)
	Average person	17.9 (6.0)	15.0 (5.7)	1.3 (1.1)
WOMEN	Type 1 ($\hat{v}_u$= 0)	23.4 (10.7)	26.9 (12.1)	2.2 (1.9)
	Type 2 ($\hat{v}_u$= -0.920)	53.3 (22.8)	57.7 (20.6)	5.2 (3.9)
	Average person	31.5 (14.4)	34.4 (14.8)	3.0 (2.2)
		4	5	6
MEN	Type 1 ($\hat{v}_u$= 0)	-7.7 (2.9)	-9.6 (3.2)	-15.9 (3.7)
	Type 2 ($\hat{v}_u$= -1.018)	-19.7 (8.9)	-24.1 (8.1)	-38.8 (8.9)
	Average person	-11.6 (4.6)	-14.0 (5.0)	-23.2 (5.3)
WOMEN	Type 1 ($\hat{v}_u$= 0)	-21.5 (8.4)	-19.4 (9.3)	-34.4 (12.2)
	Type 2 ($\hat{v}_u$= -0.920)	-51.1 (20.6)	-46.7 (20.8)	-79.9 (26.0)
	Average person	-28.5 (12.8)	-26.7 (12.3)	-45.7 (16.3)

Notes: An average male person is $0.45 \cdot type1 + 0.55 \cdot type2$. An average female person is $0.571 \cdot type1 + 0.429 \cdot type2$. Municipality shares used in each scenario are as follows. Scenarios 1 and 4: Copenhagen: 0.601, Aarhus: 0.221, Odense: 0.082, Aalborg: 0.097. Scenarios 2 and 5: Copenhagen: 0.337, Aarhus: 0.362, Odense: 0.078, Aalborg: 0.224. Scenarios 3 and 6: Copenhagen: 0.208, Aarhus: 0.138, Odense: 0.048, Aalborg: 0.137, medium-sized municipalities in the greater Copenhagen area: 0.085, medium-sized municipalities outside the greater Copenhagen area: 0.298. Standard errors calculated by Monte Carlo methods are reported in parentheses.

VII. Concluding remarks

Spatial dispersal policies may influence labour market assimilation of refugees through two mechanism, first, by affecting the job offer arrival rate in the local labour market since it depends on regional characteristics, and second, by affecting initial place utility, which depends on neighbourhood characteristics. We have constructed a partial search model in which non-employed individuals search simultaneously for a job and a better location of residence in order to investigate the effect of place utility on job search theoretically. Our model predicts that the transition rate into local employment increases with place utility

while the transition rate into employment outside the local labour market decreases with place utility. We argue that spatial dispersal policies are likely to decrease average place utility of newly arrived refugees; first, due to lack of free location choice; second, because place utility tends to increase with the local number of co-ethnics and immigrants, local access to vocational institutions and local access to amenities offered by larger cities. By decreasing place utility of newly arrived refugees, spatial dispersal policies are likely to decrease overall transition rates into first job.

We test these predictions in the context of the Danish spatial dispersal policy on refugees in force from 1986 until 1998. Under this policy refugees were randomly assigned to locations conditional on a few observed characteristics. Our empirical results show that refugees assigned to locations outside immigrant-dense cities had a higher hazard rate into first job than refugees assigned to immigrant-dense cities. However, refugees assigned to locations outside immigrant-dense cities also had a significantly higher hazard rate of relocation than refugees within these cities. In particular, the relocation rate was found to decrease with the local number of co-ethnics and immigrants and local population size. Moreover, for movers relocation away from the assigned municipality increases the hazard rate into first job, even though the destination municipalities on average are characterised by less favourable employment conditions. The effect of relocation is small initially, but increases with time spent in the new municipality. This finding rules out reverse causality. We interpret the positive effect of relocation as evidence of an improvement of unobserved location characteristics, e.g. presence of an ethnic network. These unobserved factors may not only increase the local job offer arrival rate, but may also increase the local job offer acceptance rate by increasing place utility.

Simulation results show that under reasonable assumptions about the counterfactual distribution of refugees across locations in absence of the dispersal policy, the employment effect of assignment to locations outside immigrant-dense cities is positive but insignificant. In contrast, the employment effect of lack of free initial location choice is negative and possibly large. As a consequence, removal of the dispersal policy would not harm the employment assimilation process of refugees, but might in fact promote it.

Overall, these results speak against using mandatory spatial dispersal policies to promote labour market assimilation of refugees. Furthermore, they strongly speak against spatial dispersal policies that restrict secondary migration of refugees, e.g. by making social benefits entitlement conditional on residence in the assigned municipality. This type of relocation restriction is an inherent part of the current Danish dispersal policy in practise since 1999.

Instead of mandatory spatial dispersal policies we recommend a voluntary spatial dispersal of refugees across locations with low regional unemployment, a high percentage of county jobs, institutions for vocational and higher education and many co-ethnics. By

making dispersed settlement voluntary, place utility increases and as a result the transition rate into local employment increases.

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Appendix

Table A.I reports the definitions and primary sources of data for the variables used in the empirical analysis. Information on gender, age and marital status come from population registers, Statistics Denmark. Their defintions are obvious and are therefore not given in Table A.I.

Table A.II presents means and standard deviations of the variables used in the empirical analysis.

Table A.I
Variable definitions and primary sources of data. Part A.

Variable	Definition	Primary source of data
Individual characteristics		
Children aged 0-2	Dummy for presence of children between 0 and 2 years of age in the household	Population register, Statistics Denmark (DST)
Children aged 3-17	Dummy for presence of children between 3 and 17 years of age in the household	Population register, DST.
Country of origin	Dummy for immigrant source country	Population register, DST.
Year of immigration	Dummy for first year of receipt of residence permit	Population register, DST.
Years of education	Number of years of education prior to immigration constructed from an education code of highest degree attained prior to immigration	Surveybased register on immigrants' education level attained prior to immigration, Statistics Denmark (DST).
Ethnic stock	Number of immigrants and descendants of immigrants from immigrant source country in Denmark	Population register, DST. Author's calculations based on 100 per cent sample of immigrants.
Municipality characteristics		
Greater Copenhagen	Copenhagen and Frederiksberg County Municipality and Copenhagen County	Population register, DST.
Large municipality	Municipality with at least 100,000 inhabitants	Population statistics (population counted data), DST.
Medium municipality	Municipality with 10,000-99,999 inhabitants	Population statistics (population counted data), DST.
Small municipality	Municipality with less than 10,000 inhabitants	Population statistics (population counted data), DST.

Table A.I
Variable definitions and primary sources of data. Part B.

Variable	Definition	Primary source of data
No. of immigrants	Number of immigrants and descendants of immigrants in municipality *j*	Population register, DST. Author's calculations based on 100 per cent sample of immigrants.
No. of co-ethnics	Number of immigrants and descendants of immigrants from source country *k* residing in municipality *j*	Population register, DST. Author's calculations based on 100 per cent sample of immigrants.
Regional unemployment rate	The unemployment rate in a radius of DKK 60 (approx. USD 10) of transport around the largest post office in municipality j	Unemployment register (population counted data), DST, and cost of transport statistics, the Ministry of Transport. Constructed by Local Government Studies.
% of county jobs	Number of individuals employed in municipality *j* in per cent of the total number of individuals employed in the county	Registerbased labour force statistics (population counted data), DST.
No. of educ. institutions	Number of institutions for vocational and higher education in municipality *j*	Integrated pupil register (population counted data), DST.
% social housing	Number of social housing dwellings for all-year residence in per cent of the total number of dwellings for all-year residence in municipality *j*	Buildings and housing statistics (population counted data), DST.
% right-wing votes	Sum of votes for the Liberal Party and the Conservative People's Party in per cent of the sum of votes for the Liberal Party, the Conservative People's Party, the Social Democratic Party and the Socialist People's Party at the latest municipal election. The two former parties are traditional, right-wing parties whereas the latter two are traditional, left-wing parties.	Election statistics, DST.

Table A.II

Summary Statistics.Mean of Initial Values. Part A.

Sub sample:	Men	Women
Variables	(N=16,979)	(N=11,077)
Age	29.19 (9.29)	31.56 (10.48)
Married	0.40 (0.49)	0.72 (0.45)
Children aged 0-2	0.15 (0.35)	0.26 (0.44)
Children aged 3-17	0.28 (0.45)	0.52 (0.50)
Country of origin:		
Poland	0.01 (0.11)	0.03 (0.16)
Iraq	0.14 (0.34)	0.09 (0.28)
Iran	0.16 (0.36)	0.12 (0.33)
Vietnam	0.05 (0.22)	0.07 (0.26)
Sri Lanka	0.10 (0.30)	0.06 (0.23)
No citizenship	0.17 (0.38)	0.14 (0.35)
Ethiopia	0.01 (0.11)	0.01 (0.08)
Afghanistan	0.02 (0.13)	0.02 (0.13)
Somalia	0.05 (0.22)	0.06 (0.23)
Rumania	0.01 (0.08)	0.01 (0.10)
Chile	0.00 (0.03)	0.00 (0.04)
Bosnia-Herzegovina	0.26 (0.44)	0.37 (0.48)
Ex-Yugoslavia (excl. BH)	0.01 (0.07)	0.01 (0.09)
Yugoslavia	0.01 (0.12)	0.02 (0.07)

Table A.II

Summary Statistics. Mean of Initial Values. Part B.

Sub sample:	Men	Women
Variables	(N=16,979)	(N=11,077)
Year of immigration:		
1985	0.05 (0.21)	0.03 (0.16)
1986	0.18 (0.39)	0.09 (0.29)
1987	0.08 (0.26)	0.07 (0.26)
1988	0.06 (0.25)	0.05 (0.22)
1989	0.07 (0.25)	0.06 (0.24)
1990	0.05 (0.21)	0.05 (0.22)
1991	0.05 (0.23)	0.06 (0.23)
1992	0.06 (0.24)	0.06 (0.25)
1993	0.05 (0.21)	0.05 (0.22)
1994	0.03 (0.18)	0.04 (0.18)
1995	0.32 (0.47)	0.44 (0.50)
1996	0.00 (0.01)	0 (0)
Years of education	4.81 (6.28)	4.68 (5.97)
Years of education missing	0.61 (0.49)	0.60 (0.49)
Ethnic stock	8,507 (5,406)	10,164 (5,429)
Municip. of residence:		
Greater Copenhagen	0.16 (0.37)	0.16 (0.37)
Large municipality	0.26 (0.44)	0.25 (0.43)
Medium municipality	0.60 (0.49)	0.61 (0.49)
Small municipality	0.14 (0.34)	0.14 (0.35)
No. of immigrants	8,184 (16,362)	7,682 (15,463)
No. of co-ethnics	255 (406)	289 (440)
Regional unemp. rate	9.80 (2.34)	10.09 (2.32)
% of county jobs	23.19 (25.35)	21.87 (24.10)
No. of educ. institutions	8.01 (9.79)	7.54 (9.38)
% social housing	19.63 (11.06)	20.33 (12.06)
% right-wing votes	41.97 (13.08)	42.43 (13.24)

Note: Standard deviations are reported in parentheses.

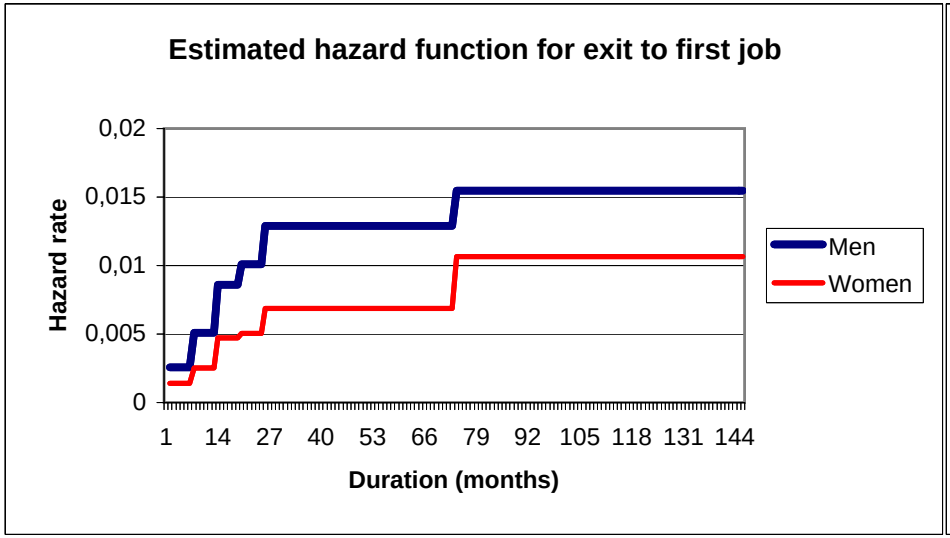

Figure A.I

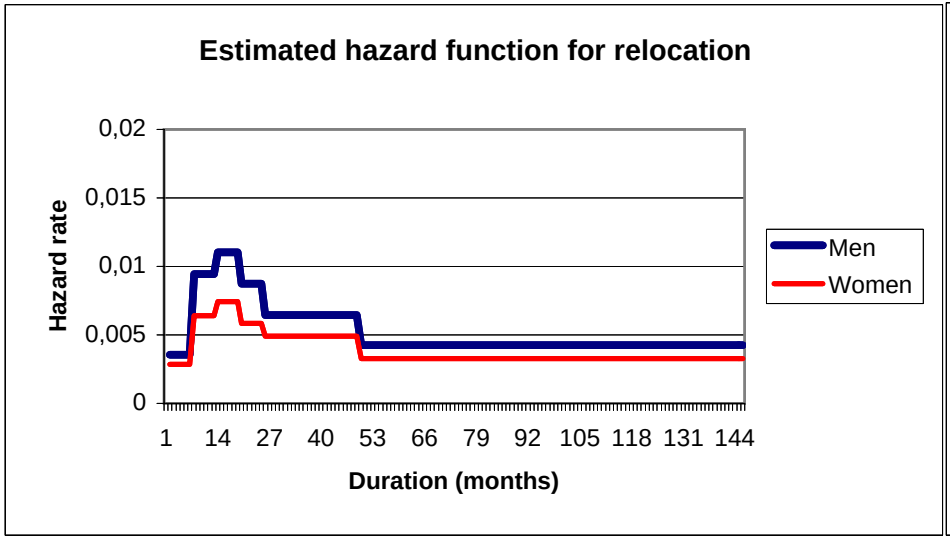

Figure A.II

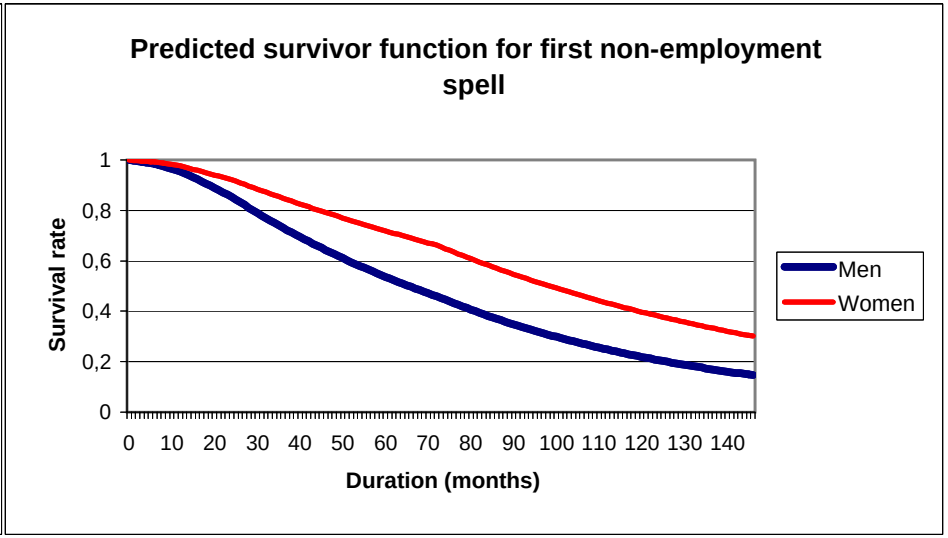

Figure A.III

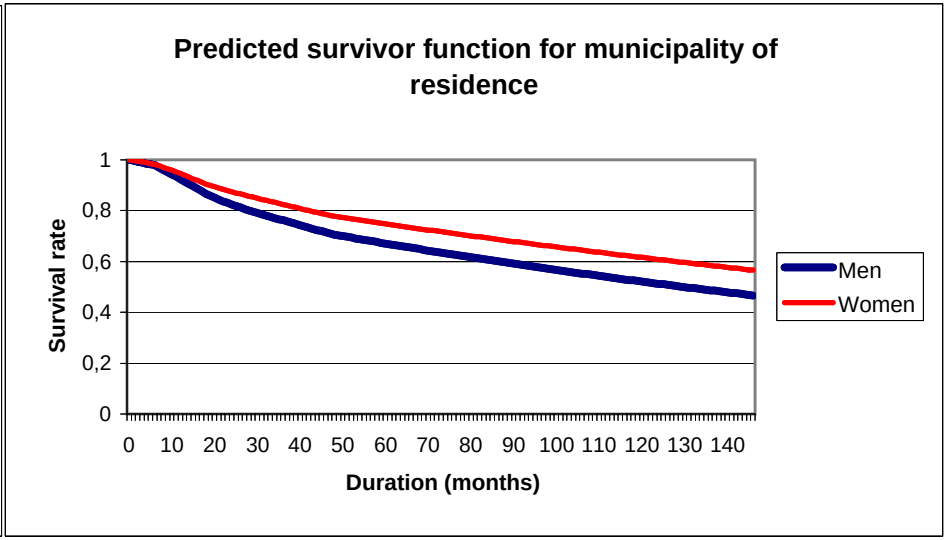

Figure A.IV