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From Unemployment To Work: An Econometric Analysis With Spatial Constraints

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Abstract: *The aim of our research is to analyze how the urban organization affects the unemployment-to-work transitions by considering several spatial indicators. This permits to capture two separate effects: "spatial mismatch" and "neighbourhood effects". In order to study the unemployment-to-work transitions, we implement survival models. They are applied on a sample obtained by merging three French databases: the "Trajectoires des demandeurs d'emplois" survey, the 1999 French census and finally, a database containing town inventory information. More precisely, in this paper, we analyze the duration of the first observed employment episode by using spatial indicators and by controlling three potential biases (endogeneity bias, selection bias and attrition bias).*

Keywords: *analysis, unemployment-to-work transitions, spatial constraints, endogeneity bias, selection bias, attrition bias.*

1. INTRODUCTION

Various studies in labour economics, especially those developed within the framework of the job search theory analyze the effects of individual characteristics and public policies on the unemployment-to-work transitions. Nevertheless, there is a scarce literature taking into account spatial constraints. Kain (1968) underlined that job accessibility is a main determinant of the unemployment-to-work transitions, particularly for minorities, less-skilled workers, etc. Kain's theory implied the development of a North-American literature analyzing relationship between towns' spatial organization and unemployment in local labour markets (see for example, Ihlanfeldt and Sjoquist (1990), Rogers (1997), Immergluck (1998), etc.). In France, there are very few papers on this topic. In 2002, Bouabdallah, Cavaco and Lesueur analyzed the impact of spatial constraints on the unemployment duration. Two years later, Gaschet and Gaussier (2004) discussed the spatial determinants of the unemployment-to-work transitions in the Bordeaux area and Gobillon et al. (2006) concentrated their analysis on the Paris region. Finally, in a very recent paper, Duguet, Goujard and L'Horty (2007) highlighted the importance of taking into account the spatial dimension in the study of the unemployment to-work transitions.

The aim of our research is to analyze how the urban organization affects the unemployment-to-work transitions and more precisely the duration of the first observed employment after a period of unemployment. The originality of this paper is the introduction of several spatial indicators. This permits to capture two separate effects. On the one side, we analyze the physical disconnection from jobs as the distance between the residence place and the working place can imply adverse labour market outcomes (the "spatial mismatch" phenomenon). On the other side, we study "neighbourhood effects" because the residential segregation has a potentially harmful role on the economic outcomes of the poor-area residents.

In order to analyze the duration of the

first employment we implement survival models on a file obtained by merging three databases: the "Trajectoires des demandeurs d'emplois" survey, the 1999 French census and finally, a database containing town inventory information. Our analysis takes into consideration, at the same time, several dimensions: individual characteristics, "local labour supply" characteristics, individual's past trajectory on the labour market, etc. It also aims to control for three possible biases: endogeneity bias, selection bias and attrition bias.

The remainder of the paper develops as follows. The second section gives a review of the literature of the unemployment-to-work transitions with spatial constraints. The third section presents the data and the database construction. The fourth section outlines our econometric strategy, the fifth one presents our findings and discusses the results. Finally, the sixth section provides conclusion.

2. BACKGROUND

Highlighting the determinants of unemployment-to-work transitions is a recurrent aim in labour economics. The job search theory developed by Mortensen (1986), Lancaster (1990) or more recently by Cahuc and Zylberbreg (2004) analyzes the effects of individual characteristics and public policies on the job search process and on the unemployment duration. Nevertheless, job search models do not take into account the effects of individual's environment. For example, Holzer (1991) emphasizes the existence of a negative correlation between residence place and job search process, especially for the less-skilled workers or ethnics minorities. This negative correlation hides the so-called spatial mismatch hypothesis.

This hypothesis is firstly introduced by Kain in 1968. Kain argues that being disconnected from jobs (living far away from them) can have some important consequences on the unemployment process. Kain's theory led to a rich North-American literature analyzing the relationship between towns' spatial organization and local labour market unemployment. On the whole, this literature identified two broad channels linking the spatial mismatch hypothesis to the bad labour market situations of a part of the inhabitants (Arnott, 1997).

The first channel is given by commuting costs. A physical disconnection between working place and residence place can lead to substantial commuting costs as most suburban locations do not have an appropriate public transportation system. In this case, workers face costs that are often too important in comparison with the salary they are offered. Coulson, Laing and Wang (2001) propose an urban model analyzing relationship between commuting costs and adverse labour-market outcomes. In an empirical paper, Holzer et al. (2003), showed that the expansion of the railway system in San Francisco increased employment for minority workers living near the station.

The second channel is given by different features of the job search process. First, a worker residing far away from job opportunities may encounter some difficulties in obtaining information on jobs (Rogers, 1997). Simpson (1992) argues that metropolitan areas consist in a series of "islands" with information about job opportunities (which is free within islands but has a cost among islands). In these conditions, searching a job far away from the residence area can be too costly. Jobseekers search efficiently only in a restricted area, near their residence, even if there are only poor-quality jobs (Davis and Huff, 1972). Moreover, other empirical studies show that the physical distance to jobs reduces information availability regarding to job vacancies (Ihlanfeldt and Sjoquist, 1990, 1991). There are several explanations to this phenomenon: some firms use spatially-limited search modes such as having advertisements published in local newspapers, posting "wanted" signs in shops, etc. Second, another mechanism that can explain unemployment for a part of the residents relies on the incentives to job search. Residents who pay low rents may feel less pressure to find a well-paid job. An empirical study of Patacchini and Zenou (2006) demonstrates that residential location may affect the job search effort. Using English sub-regional data, these authors confirm that an increase in housing prices raises the intensity of search.

The two channels presented above emphasize that if a geographical area is located far from job opportunities, this can imply bad labour-market outcomes. No doubt, this has an

impact in terms of social networks. An important proportion of jobs are usually found through personal contacts. If job seekers live far away from jobs, the probability to have contacts in unemployment is high and so they could not rely on their "social networks". An individual residing in disadvantaged neighbourhoods benefits from poor quality social networks. In a recent paper, Selod and Zenou (2006) develop an urban model in which low-quality social networks increase unemployment in a given area.

Residing in neighbourhoods disconnected from jobs and with adverse labour-market outcomes has also consequences in terms of role models. For example, Benabou (1993) shows that in areas where low-ability students are concentrated, human capital externalities can further deteriorate the learning process and school achievements. A second consequence is that these neighbourhoods are often exposed to the emergence of social problems that can also deteriorate the job seekers' employability. In 1991, Crane develops the epidemic theory of ghettos. His theory shows that the propensity of young people to adopt a given behaviour is strongly correlated with the proportion of individuals already showing this behaviour. For the unemployed individuals this phenomenon is also verified: when the adults of the neighbourhood are unemployed, this does not determine young people to search a job. These fragile populations do not provide role models of social success and so they do not motivate the others to find a job.

Although the spatial mismatch hypothesis and its consequences on the local labour-market outcomes is tested in many North-American empirical studies, in France there are very few papers on this topic. For example, in 2004, Gaschet and Gaussier discuss the spatial determinants of the unemployment-to-work transitions in the Bordeaux area. They confirm the existence of spatial mismatch effects. Nevertheless, these effects depend on the distance considered in the construction of the spatial indicators. As for Dujardin and Goffette-Nagot (2006), they estimate the effects of living in a deprived neighbourhood on the unemployment level in the Lyon area. They have the following result: living in the 35% more deprived neighbourhoods of the Lyon area increases significantly the probability of being unemployed. Finally, Dujardin et al. (2003) / Gobillon et al. (2007) try to emphasize the determinants of unemployment in the Brussels metropolitan area / in the Paris region. The two papers find out that residential segregation plays an important role on the unemployment rate. The results concerning spatial mismatch are more contrasted. The spatial mismatch hypothesis seems to be more valid in the Paris region than in the case of the Brussels metropolitan area.

In this paper, in order to analyze how the urban organization affects the unemployment-to-work transitions, we use the French "Trajectoires des demandeurs d'emplois" survey. This survey has already been used in some recent empirical studies (see for example, Cavaco and Lesueur (2004), Choffel and Delattre (2003), Bouabdallah, Cavaco and Lesueur (2002), etc.). On the whole, the authors showed very discriminatory effects of the spatial constraints on the unemployment duration and on the job search success. Bouabdallah et al. (2002) point out a negative effect of the enlargement of the job search area on the unemployment duration. In 2003, Choffel and Delattre analyze the impact of living in a sensitive urban area (called in France ZUS) on the unemployment duration. They find out that living in a ZUS increases the unemployment duration. This relation is explained partly by the transportation difficulties of the ZUS residents.

3. DATA AND INDICATORS

In order to analyze the unemployment-to-work transitions with spatial constraints, we use a rich statistical dataset obtained from matching three French databases. Nevertheless, our analysis sample is obtained by imposing a number of "cleaning" criteria.

First, we use *the "Trajectoires des demandeurs d'emplois" (TDE) survey* which is produced by the Statistical Department of the French Labour Ministry (DARES). This survey consists in analyzing the trajectories of individuals entering the French "Job centre" organisations (Agence Nationale pour l'Emploi – ANPE) between April 1st 1995 and June 30th 1995. In other words, all individuals are unemployed and decide to register to the ANPE. So, individuals' trajectories begin with

a first sequence of unemployment. One of the original points of the survey is that individuals are all entering the ANPE at the same time.

Individuals inhabit one of the following three French regions: Nord-Pas-de-Calais, Ile-de-France and Provence-Alpes-Côtes-d'Azur and they are born between 1940 and 1979. Individuals seek a full-time or a part-time job being a permanent contract or not. Individuals are questioned three times – three waves (four for the residents of the north region). Each questioning corresponds approximately to a one year period. From a questioning to another not all the individuals respond (there is a problem of attrition) implying that the duration of the trajectory is different from an individual to another. The TDE survey stands for a panel data source. The survey is made of several databases, each one corresponding to a wave of questioning and to the nature of the sequence on the labour market (employment, unemployment, inactivity, military service, education or training course). The DARES constructed a synthetic database which corresponds to a summary of the individual's trajectory after entering the ANPE. The trajectory is divided in a variable number of sequences regarding individuals' situation on the labour market (being employed, unemployed, inactive, etc.). So, for each individual we have a number of observations equal to the number of his/her sequences. Our analysis is based on this specific file.

The synthetic file contains initially 8,125 individuals (corresponding to 31,548 observations). All individuals in this file must begin their trajectory with a sequence of unemployment. We erase individuals who begin their trajectory with a non-unemployment episode (326 individuals). This problem might appear as a consequence of some errors during the construction of the synthetic file. For some individuals, the first unemployment sequence of the trajectory is followed by another unemployment episode. We aggregate these two sequences into a unique first sequence of unemployment.

We recall that the phenomenon analyzed in this paper is the duration of the first employment sequence of the trajectory. This represents our principal endogenous variable (*first_empl*). We identify the existence and at the same time the duration of such a sequence and depending on its position on the trajectory we construct a censure (*cens_first_empl*). If *first_empl* is observed before the end of the observation period *cens_first_empl* is equal to 0. If *first_empl* is observed at the end of the period of observation *cens_first_empl* is equal to 1. We say then that the episode of first employment is right censored because we can not observe its end.

As one of the possible determinants of the duration of the first employment is the duration of the unemployment sequence since entering the ANPE, we construct two other variables: the unemployment duration of the first sequence of the trajectory (*unempl*) and its right censure (*cens_unempl*). If individual's trajectory is represented only by a unique unemployment sequence then *cens_unempl = 1*, otherwise *cens_empl = 0*. As individuals are all entering the ANPE at the same time, there is no left censure for this indicator.

Other potential determinants of the duration of the first employment episode are the other previous sequences. Before the first employment episode we can have sequences of inactivity, training period, education or unemployment. As the duration of *first_empl* depends not only on the type of the previous sequences but also on their duration, for each type of previous episode we construct three dummy variables: var_1, var_2 and var_3, where *var* = inactivity, training period, education or unemployment. These dummies can be written as follows:

$$\mathrm{var}_1 = \begin{cases} 1, \text{ if the var duration is equal to } 0 \\ 0, \text{ otherwise} \end{cases}$$

$$\mathrm{var}_2 = \begin{cases} 1, \text{ if the var duration is inferior to the median of the var duration} \\ 0, \text{ otherwise} \end{cases}$$

$$var_3 = \begin{cases} 1, \text{ if the var duration is superior or equal to the median of the var duration} \\ 0, \text{ otherwise} \end{cases}$$

In order to calculate the var_2 and var_3 variables we take into account the attrition problem. A part of the individuals responded only to the first wave of questioning (w1). Another part responded to the first two waves (w2) and another part to the three waves (w3). The observation periods are different for these three groups of individuals. Durations are conditioned to the observation period. For these reasons we calculated for each group the median durations of inactivity, unemployment, training period or education. (*For the group of individuals who responded only to the first wave of questioning we have the following median durations (the durations are given in months): 4 for inactivity, 3 for training period, 4 for education and 3 for unemployment. For the group of individuals who responded to the first two waves of questioning we have the following median durations: 4 for inactivity, 5 for training period, 4 for education and 6 for unemployment. And finally for the group of individuals who responded to the three waves of questioning we have the following median durations: 7 for inactivity, 6 for training period, 6 for education and 8 for unemployment.*

One limit of the construction of these dummies is that we do not take into consideration their linking. Another limit is that we suppose that they are exogenous to the model.)

As we want to control for a possible attrition bias we construct an attrition variable (which is called *attrition*) which is defined in the following way:

$$attrition = \begin{cases} 1, \text{ if the individual responded to the three waves of questioning} \\ 0, \text{ otherwise} \end{cases}$$

From the TDE survey we retain other explanatory variables. We first erase the observations with missing values for the following variables: geographical region of residence retained at a fine level (the French *commune*), father's nationality, parents' occupational category, the number of years since the individual is living in his/her house, having the driving licence, not having access to any transportation means, being the owner of his/her house. For the other explanatory variables the number of missing values is too important. We construct then a missing value category in order not to loose too much information. From the TDE survey, we finally use a rich range of indicators:

(a) *Individual characteristics:* gender (man versus woman), age (four classes of age: 16-25, 26-35, 36-49, 50 or more), father's nationality (French versus other), individual's born place (France versus other), parents' occupational category when the individual was 16 (seven classes of occupational categories: farmer; artisan, trader, entrepreneur; executive, engineer, professional, professor; technician, supervisor, travelling salesman, intermediate profession; white-collar worker; blue-collar worker and other-inactive, unemployed, retired and no response), the number of years since the individual is living in his/her house, being the owner of his/her house, qualification level (five categories: primary education, secondary education, short technical education, long technical education and higher education), marital status (in couple, divorced or single), number of children (0 children, 1 child, two children and three children and more), the employment area where the individual is living in (8 categories: Cergy-Pontoise, Mantes, Poissy-les-Mureaux, Roubaix, Lens, Aix en Provence, l'Etang de Berre and Marseille).

(b) *Household characteristics:* income of the household where the individual is living in (three classes of income: non

response, inferior to the median household income (9050 francs) and superior or equal to the median household income), number of individuals living in the household, number of individuals having less than 15 years old living in the household, number of unemployed living in the household, number of individuals perceiving a financial benefit from the State.

(c) *Mobility constraints:* having the driving licence, not having access to any transportation means.

(d) *Characteristics of the last employment:* the type of contract during the last employment (five categories: non response, permanent contract, fixed-term contract, temporary work and other contracts), reasons of loosing his/her last employment (five categories: collective dismissal, other types of dismissal, demission, end of a fixed-term contract, other reasons), type of job (non response, full-time and part-time), the occupational category of the last employment (four categories: blue-collar worker; white-collar worker; executive, engineer, professional, professor and technician, supervisor, travelling salesman, intermediate profession), the duration of the last employment (in months), the industry where the individual worked during the last employment (five categories: non response, agriculture, manufacture industry, tertiary industry and other), the firm size were the individual had the last employment (five categories: inferior to 10 employees, between 10 and 49 employees, between 50 and 200 employees, 200 and more employees, non response).

(e) *Characteristics of the first unemployment sequence:* situation before the ANPE unemployment sequence (six categories: employment, education, training period, unemployment, inactivity and other), job search type (six categories: network, temporary agency, local organisations, ANPE, school and other), perceiving the minimum benefit (the French RMI) (three categories: non response, yes, no), perceiving unemployment benefits (three categories: non response, yes, no), the job search intensity (five categories: non response, less than 5 hours per week, between 5 and 10 hours per week, between 10 and 20 hours per week, 20 hours and more per week).

(f) *Characteristics of the first employment sequence:* the type of contract (five categories: non response, permanent contract, fixed-term contract, temporary work and other contracts), the time to reach his/her job from the residence place (seven categories: non response, sales rep, less than 15 minutes, from 15 to 30 minutes, from 30 to 45 minutes, from 45 to 60 minutes, more than an hour), occupational category (six classes of occupational categories: artisan, trader, entrepreneur; executive, engineer, professional, professor; technician, supervisor, travelling salesman, intermediate profession; white-collar worker; blue-collar worker and other – non response included), monthly salary (three categories: non response, less than the median salary (5048 francs) and more than the median salary).

Second, we use *the 1999 French census(Individuals' trajectories are observed from 1995 till 1998. We make the strong supposition that the aggregated charateristics of the towns individuals live in are constant in time.)* More precisely, we concentrate on the population and employment characteristics of the towns where the unemployed individuals inhabit. From the 1999 census we construct two classes of indicators: aggregated characteristics of the population of the geographical areas unemployed live in (calculated at the level of the French *commune*) and employment accessibility indicators. The first category is usually mobilized to capture the effects of the "residential segregation" and the second category of indicators is traditionally used to control the "spatial mismatch". From this database we also construct an indicator

describing households' motorisation rate and another measuring the distance to the nearest railway station (in meters).

(a) Aggregated characteristics of the population. These indicators are calculated at the French *commune* level. We construct the following variables: the proportion of individuals without a diploma certificate, the proportion of working women in the total number of working individuals, the unemployment rate, the part of working individuals of less than 30 years old in the total number of working individuals, the part of working foreigners in the total number of working individuals, the part of working individuals in employment who work in the employment area of the *commune*, the ratio of the number of jobs and working people, the part of people not having the French "A-level" (called the "Baccalauréat"- BAC) in the population of more than 15 years old.

(b) *Employment accessibility indicators.* First, we construct a spatial indicator which represents the ratio of the sum of jobs and of the sum of working individuals for all the *communes* that are accessible for an individual within a circle with a variable radius (20, 30 or 40 km) (we call this variable $dens_i$ [1]Second, we construct a very similar spatial indicator. For a given *commune* we identify using Euclidean distances all other *communes* included in a circle with a 35 km radius. Then we sum the jobs in all these *communes* and we divide them by the sum of all the employments of the French region where the given *commune* is located (it is called $dens_{35}$)[2] This indicator gives the part of regional jobs accessible within a circle with a radius of 35 km. Third, for each *commune*, for all the individuals having a job, we calculate the average distance between their residence place and their working place (*avg_dist*). And finally, we create a synthetic accessibility indicator. It has four classes: *class 1- bad accessibility* (the distance to the nearest railway station is superior to the average, the distance between work place and residence place is superior to the average, employment densities are inferior to the average value and the part of accessible jobs is inferior to the average value); *class 2 – medium accessibility but far from jobs*; *class 3 - medium accessibility but near from jobs* and *class 4 – good accessibility*.

[1] $dens_{ij} = \frac{\sum_j \text{jobs}_j}{\sum_j \text{working individuals}_j}$, where i=20, 30, 40 km and j represents the communes that are accessible for an individual from his/her residence place in a circle with a radius of i km.

Third, we use a database produced by the French National Institute of Statistics (INSEE) which contains *town inventory information*. From this database we construct the following variables: the existence of an ANPE in the *commune* the unemployed lives in (dummy variable), the distance to the nearest highway (calculated in km), the access time to the nearest highway, the distance to the nearest town having at least 10,000 inhabitants (in km).

$$^{2}dens_{35} = \frac{\sum_{j} \text{jobs}_{j}}{\sum \text{jobs for the French region where the commune is located}};$$

$dens_{35}$ is calculated for each commune and j represents all the communes that are accessible for an individual from his/her residence place in a circle with a radius of 35 km.

As the variables constructed from the 1999 census and from the town inventory files are calculated at the level of the *commune*, we merge them with the TDE survey by the *commune* where the unemployed live in. After merging the three databases our sample is limited to 7,544 unemployed individuals. Nevertheless, a part of the econometric estimation is made on a sub-sample of this database (only for the individuals having a first employment) and this reduces the sample to 5,102 individuals.

4. ECONOMETRIC STRATEGY

In this paper we analyze the duration of the first employment sequence with spatial constraints by using survival models. More precisely, in order to estimate this duration, we use log-location scale models for which we assume a parametric form for the distribution of the survival time (see box 1 for a brief presentation of Weibull survival models). We explain the duration of the first employment episode with the following variables: the duration of the first unemployment episode since the entrance to the ANPE, the other previous sequences before the first employment (these variables are described in the third section), individual's characteristics, the characteristics of the last employment before the entrance to the ANPE, the characteristics of the present employment and some spatial indicators.(*For this estimation we tried several spatial indicators by taking into account the possible correlation problems between these variables.)* Finally, for the spatial indicators we retained the part of households where the reference individual is a blue-collar worker and a variable of disconnection from work (the travelling time between home and work). This equation is called the main equation and it is estimated on the sample containing 5,102 individuals.

Box 1: Survival models with Weibull distribution

Let T denote a continuous non-negative random variable representing survival time, with probability density function (*pdf*) $f(t)$ and cumulative distribution function (*cdf*) $F(t) = \Pr\{T \le t\}$. We focus on the survival function $S(t) = \Pr\{T > t\}$, the probability of being alive at t, and the hazard function $\lambda(t) = f(t) / S(t)$. Let $\Lambda(t) = \int_0^t \lambda(u)du$ denote the cumulative (or integrated) hazard and recall that $S(t) = \exp\{-\Lambda(t)\}$. Any distribution defined for $t \in [0, \infty)$ can serve as a survival distribution. We can also draft into service distributions defined for $y \in (-\infty, \infty)$ by considering $t = \exp\{y\}$, so that $y = \log(t)$. More generally, we can start from a r.v. W with a standard distribution in $(-\infty, \infty)$ and generate a family of survival distributions by introducing location and scale changes of the form $\log T = Y = \alpha + \sigma W$. We now review the case of the Weibull distribution.

T is Weibull with parameters λ and p, denoted $T \sim W(\lambda, p)$, if $T^p \sim E(\lambda)$. The cumulative hazard is $\Lambda(t) = (\lambda t)^p$, the survivor function is $S(t) = ewp\{-(\lambda t)^p\}$, and the hazard

is $\lambda(t) = \lambda p(\lambda t)^p$. The log of the Weibull hazard is a linear function of log time with constant $p \log \lambda + \log p$ and slope *p−1*. Thus, the hazard is rising if *p>1*, constant if *p=1*, and declining if *p<1*. The Weibull is also related to the extreme-value distribution: $T \sim W(\lambda, p)$ iff $Y = \log T \quad \alpha + \sigma W$, where *W* has the extreme value distribution, $\alpha = -\log \lambda$ and $p = 1/\sigma$. The proof follows from a change of variables; start from *W* and change variables to $Y = \alpha + \sigma W$, and then change to $T = e^Y$.

We suppose that estimating the duration of the first employment can be affected by three biases: an endogeneity bias, a selection bias and an attrition bias. Concerning the endogeneity bias, we control it exclusively for the sequence of unemployment(*We are conscient that variables such as the spatial indicators or the other sequences before the first employment episode can be endogeneous but we treat them as being exogenous. In a prolongation of this work we will consider their possible endogeneity.)*

We use once again a Weibull survival model and we estimate it on the sample containing 7,544 individuals. Then, we recuperate the *xbetas* estimated with this model and we introduce them in the main equation instead of consider directly the duration of the unemployment sequence. The determinants of the duration of the first unemployment sequence are the following: individual's characteristics, the characteristics of the last employment, the characteristics of the unemployment period and spatial constraints. Concerning the spatial constraints we first make an analysis in terms of correlation. We note that we can not introduce at the same time an important number of such variables because they are correlated. We finally retain two variables: the average distance (calculated for each *commune*) between the residence place and the working place (*avg_dist*) and the unemployment rate. Our exclusion variables (variables that explain the duration of the unemployment episode but are supposed not to be correlated to the duration of the first employment) are the reasons of the end of the last employment. The relationship between these indicators and the duration of the first employment is supposed not to be direct.

We can also have a problem of selection bias. We want to estimate the effects of the determinants of the first employment sequence, but not all the individuals have on the observed period such an episode. So, there is a possible bias related to the fact that having a first employment sequence (we note this dummy variable *having_first_empl*) is not randomly distributed among the population. So, with a probit model we explain in a separate equation the probability of having a first employment during the observation period:

$$having\_first\_empl_i = 1[having\_first\_empl^*_i > 0] \quad 1[\phi + w_i\gamma + u_i] \tag{1}$$

$having\_first\_empl^*$ is a latent variable of having a first employment sequence ($having\_first\_empl = 1$) or not ($having\_first\_empl = 0$).

1[.] is the indicator function, *i* represents the individual and u_i is the error term which follows a normal distribution. This model is estimated on the 7,544 sample by using individual's characteristics and some characteristics of the last employment. In order to control the selection bias we calculate the inverse Mills ratios and we introduce them in the principal equation (we note them $lambda_{first\_empl}$) instead of introducing directly a binary variable saying if an individual has or not a first employment episode. The inverse Mills ratios are defined as the ratios of the probability density function over the cumulative distribution function of a distribution. For the probit modelling it is not

necessary to have an exclusion variable because anyway the model is well identified (Maddala, 1974).

And finally, the fact that some people do not respond to the three waves of questioning might hide different realities: maybe they changed their address, maybe they refused to respond because of their situation on the labour market, etc. In a separate equation, we estimate (with a probit model) the probability that individuals responded to the three waves with individuals' characteristics.

$$attrition_i = 1[attrition^*_i > 0] = 1[\eta + z_i\delta + v_i] \quad (2)$$

$attrition^*$ is a latent variable of having responded to the three waves of questioning ($attrition = 1$) or not ($attrition = 0$).

1[.] is the indicator function, i represents the individual and v_i is the error term which follows a normal distribution. As for z_i, it represents the set of exogenous explanatory variables which are mainly individual's characteristics. Even it is not necessary to have an exclusion variable, we can suppose that the number of years since the individual is living in his/her house affects the attrition probability. We can imagine that if the number of years is high the individual is attached to his/her residence and so there are less chances to change the address and so finally this might increase the probability that an individual responded to the three questioning waves. We can also imagine that there is not direct relationship between the number of years spent in the residence and the duration of the first employment. We then calculate the inverse Mills ratios and introduce them in the main equation (we note them $lambda_{attrition}$).

5. RESULTS

5.1. Description of the sample

First, summary statistics are given in table 1 and table 2. They are calculated on the file containing 7,544 individuals

Table 1: Sample statistics (7,544 individuals) –binary variables

Variable	0 (%)	1 (%)
The individual responded to the 3 waves (attrition)	35.19	64.81
Man	48.18	51.82
Classes of age		
16-25	63.92	36.08
26-35	67.33	32.67
36-49	73.58	26.42
50 or more	95.17	4.83
Born in France	18.73	81.27
French father	26.52	73.48
Father's occupational category		
Farmer	97.19	2.81
Artisan, trader, entrepreneur	91.49	8.97
Executive, engineer, professional, professor	91.03	8.51
Technician, supervisor, travelling salesman, intermediate profession	87.78	12.22
White-collar worker	89.38	10.62
Blue-collar worker	48.33	51.67
Other	94.80	5.20

Mother's occupational category		
Farmer	98.86	1.14
Artisan, trader, entrepreneur	96.61	3.39
Executive, engineer, professional, professor	98.12	1.88
Technician, supervisor, travelling salesman, intermediate profession	94.67	5.33
White-collar worker	80.26	19.74
Blue-collar worker	89.44	10.56
Other	42.05	57.95
Qualification level		
Primary education	78.41	21.59
Secondary education	91.65	8.35
Short technical education	59.92	40.08
Long technical education	91.25	8.75
Higher education	82.28	17.72
Marital status		
In couple	46.74	53.26
Single	60.62	39.38
Divorced	92.76	7.24
Number of children		
No children	75.57	24.43
1 child	73.38	26.62
2 children	76.66	23.34
3 children and more	74.39	25.61
Having the driving licence	24.92	75.08
Not having access to any transportation means	73.22	26.78
Household's income		
Inferior to 9050 francs	48.36	51.64
Superior or equal to 9050 francs	51.64	48.36
Being the owner of the residence	75.49	24.51
Employment area		
Cergy	88.20	11.80
Mantes-la-Jolie	90.35	9.65
Poissy	88.34	11.66
Roubaix-Tourcoing	84.53	84.53
Lens	82.58	17.42
Aix-en-Provence	90.81	9.19
L'Etang-de-Berre	93.04	6.96
Marseille-Aubagne	82.14	17.86
Having an ANPE in the commune	38.18	61.82
Type of contract during the last employment		
Non response	77.39	22.61

Permanent contract	62.73	37.27
Fixed-term contract	77.48	22.52
Temporary work	95.02	4.98
Other contracts	87.39	12.61
Occupational category of the last employment		
Blue-collar worker	66.22	33.78
White-collar worker	68.88	31.12
Technician, supervisor, travelling salesman, intermediate profession	90.75	9.25
Executive, engineer, professional, professor	95.84	4.16
Reasons of loosing the last job		
Collective dismissal	86.36	13.64
Other types of dismissal	89.46	10.54
End of a fixed-term contract	68.98	31.02
Demission	88.88	11.12
Other reasons	87.86	12.14
Situation before the ANPE unemployment sequence		
Employment	44.26	55.74
Education	87.08	12.92
Training period	93.68	6.32
Unemployment	93.44	6.56
Inactivity	85.78	14.22
Other	95.08	4.92
Industry for the last employment		
Non response	77.23	22.77
Agriculture	95.16	4.84
Manufacture industry	89.62	10.38
Tertiary industry	98.28	1.72
Other	39.71	60.29
Firm size for the last employment		
Inferior to 10 employees	78.45	21.55
Between 10 and 49 employees	79.59	20.41
Between 50 and 200 employees	87.71	12.29
200 employees and more	83.59	16.41
Non response	70.67	29.33
Type of the last job		
Non response	78.84	21.16
Full-time	41.62	58.38
Part-time	79.53	20.47
Job search type during ANPE unemployment sequence		
Network	73.73	26.27
Temporary agency	80.53	19.47

Local	93.66	6.34
ANPE	43.43	56.57
School	98.74	1.26
Other	96.22	3.78
Perceiving the minimum benefit (RMI)		
Non response	87.86	12.14
Yes	92.15	7.85
No	19.99	80.01
Perceiving unemployment benefits		
Non response	88.12	11.88
Yes	47.61	52.39
No	64.26	35.74
Job search intensity		
Non response	84.89	15.11
Less than 5 hours per week	76.88	23.12
Between 5 and 10 hours per week	69.11	30.89
Between 10 and 20 hours per week	81.64	18.36
20 hours and more per week	87.47	12.53
Observations	**7,544**	

Field: unemployed individuals entering the ANPE between April 1st 1995 and June 1st 1995. Sample obtained by merging three databases: the "Trajectoire des demandeurs d'emplois" survey (DARES), the 1999 French census and finally, a database containing town inventory information (INSEE).

Table 2: Sample statistics –Continuous variables

Variable	Number of observations	Mean	Std Dev	Minimum	Maximum
Proportion of working women in the total number of working individuals	376	0,45	0,03	0,34	0,51
Part of working individuals of less than 30 years old in the total number of working individuals	376	0,24	0,04	0,1	0,36
Part of households where the reference individual is a blue-collar worker	376	0,22	0,08	0	0,53
Part of working foreigners in the total number of working individuals	376	0,08	0,07	0	0,26
Part of working individuals in employment who work in the employment area of the *commune*	376	0,27	0,15	0	0,76
$dens_{20}$	376	0,79	0,11	0,51	1,16
$dens_{30}$	376	0,86	0,11	0,58	1,12
$dens_{35}$	376	0,46	0,21	0,02	0,94

avg_dist	376	13,38	4,24	5,35	41,01
Unemployment rate	376	0,18	0,07	0,03	0,38
Households' motorisation rate	376	0,78	0,1	0,42	1
Part of people not having the French "A-level" in the population of more than 15 years old	376	0,62	0,09	0,27	0,83
Distance to the nearest railway station	376	3,13	3,15	0,07	34,44
Duration of the last employment	376	34,27	54,29	1	473
Duration of the ANPE unemployment sequence	7544	10,29	9,28	1	37
Duration of the first sequence of employment	7544	4,3	5,66	0	37
Number of years since the individual is living in his/her house	7544	9,63	8,03	1	56
Number of individuals living in the household	7544	3,63	1,81	1	16
Number of individuals having less than 15 years old living in the household	7544	0,84	1,14	0	13
Number of unemployed living in the household	7544	0,32	0,62	0	6
Number of individuals perceiving a financial benefits from the State	7544	0,13	0,37	0	4

Field: unemployed individuals entering the ANPE between April 1st 1995 and June 1st 1995. Sample obtained by merging three databases: the "Trajectoires des demandeurs d'emplois" survey (DARES), the 1999 French census and finally, a database containing town inventory information (INSEE).

Second, we calculate unemployment survival rates with the non-parametric Kaplan-Meier estimator. This method permits to assess the instantaneous probability of acceding to a job. The Kaplan-Meier estimator can reveal some discriminating effects of the spatial constraints. We analyze the potential effects of three spatial indicators: not having access to any transportation means, an employment accessibility indicator ($dens_{30}$) and *commune*'s unemployment rate (see figures 1, 2 and 3). Estimators are calculated for a sub-sample of individuals: young people aged between 16 and 25 years old. We choose to restrain our Kaplan-Meier analysis to this population for two reasons: they represent a particularly fragile population and we can avoid some bias problems as, in general, young people still live with their parents.

Figure 1 shows that young people not having access to any transportation means are more likely to stay in unemployment for longer periods than individuals having access to at least one transportation means. Not having access to any transportation means seem to be very discriminating as it represents a major obstacle to mobility. So, these young individuals can not prospect for jobs in large areas. This result confirms the spatial mismatch hypothesis: a disconnection from jobs is adverse to an efficient job search process.

Job accessibility is measured with a spatial indicator ($dens_{30}$) which represents the ratio of the sum of jobs and of the sum of working individuals for all the *communes* that are accessible for an individual within a circle with a 30 km radius. From this indicator we construct a dummy variable *dens30km* which is equal to 1 if $dens_{30}$ is superior to its average accessibility rate and which is equal to 0 otherwise. Figure 2 shows that young people

are more likely to endure important unemployment durations when they live in *communes* with poor job accessibility. Living close to areas rich in terms of employment increases the job accessibility and consequently decreases the unemployment survival rate.

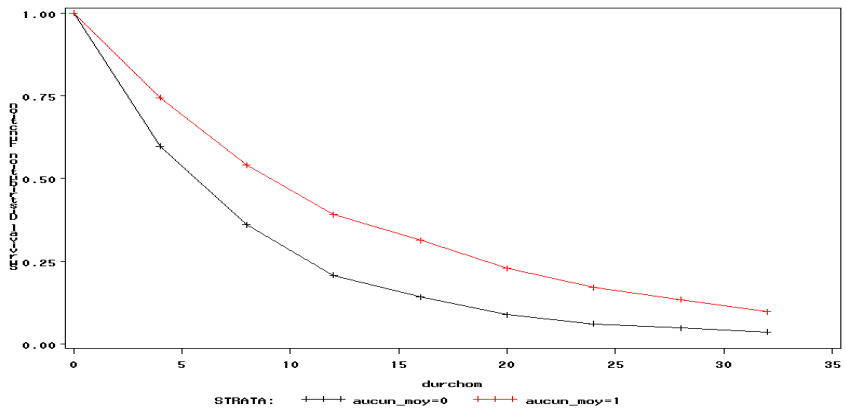

Figure 1: Unemployment survival rate–the effect of not having access to any transportation means

Field: unemployed individuals entering the ANPE between April 1st 1995 and June 1st 1995 aged between 16 and 25 years old. Sample obtained by merging three databases: the "Trajectoires des demandeurs d'emplois" survey (DARES), the 1999 French census and finally, a database containing town inventory information (INSEE).
Note: *aucun_moy=1* means the individual does not have access to any transportation means and *aucun_moy=0* means that the individual has access to at least one transportation means.

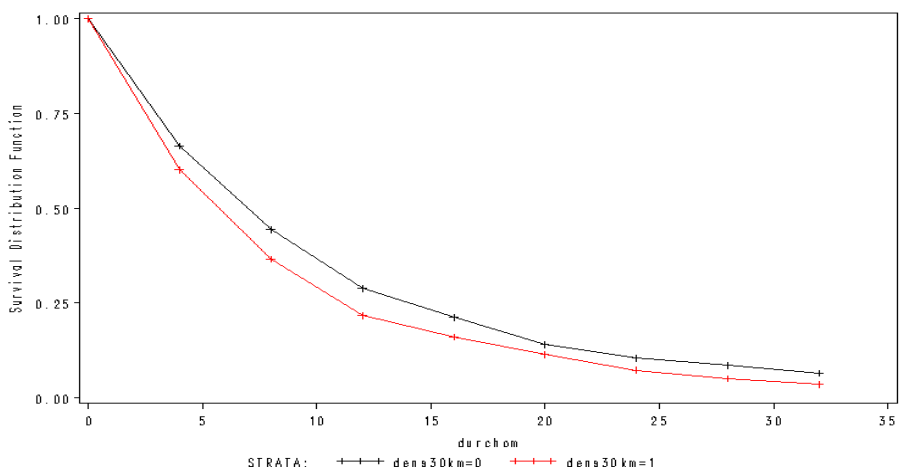

Figure 2: Unemployment survival rate-the effect of living close to jobs

Field: unemployed individuals entering the ANPE between April 1st 1995 and June 1st 1995 aged between 16 and 25 years old. Sample obtained by merging three databases: the "Trajectoires des demandeurs d'emplois" survey (DARES), the 1999 French census and finally, a database containing town inventory information (INSEE).

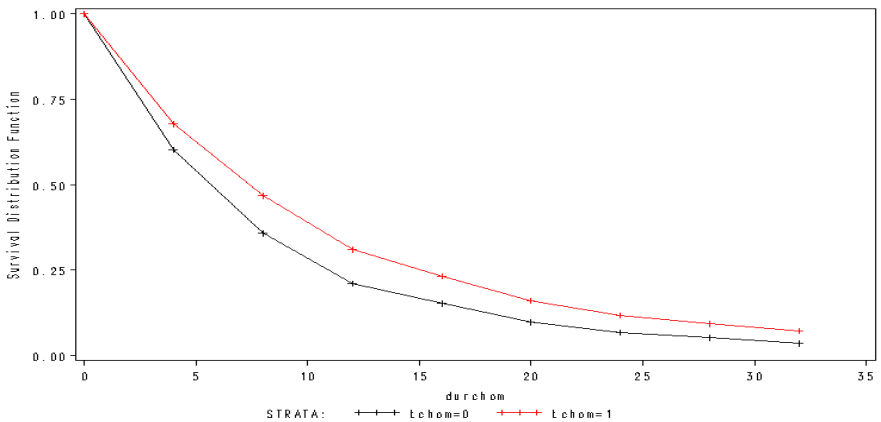

Figure 3: Unemployment survival rate-the effect of living in communes with an important unemployment rate

Field: unemployed individuals entering the ANPE between April 1st 1995 and June 1st 1995 aged between 16 and 25 years old. Sample obtained by merging three databases: the "Trajectoires des demandeurs d'emplois" survey (DARES), the 1999 French census and finally, a database containing town inventory information (INSEE).
Note: tchom=1 means that the unemployment rate of the *commune* the individual is living in is superior to the average of the unemployment rate. *tchom=0* otherwise.

Finally, figure 3 points out the effect of living in *communes* with an important unemployment rate. It appears that individuals are more likely to be unemployed in *communes* experiencing bad-labour markets outcomes. Individuals living in areas with low unemployment rate (inferior to the average) are reducing sensibly their unemployment duration comparatively to others individuals close to areas with higher unemployment rates (superior to the average).

The last result can be explained by the existence of a residential segregation effect or of a neighbourhood effects. Living in a deprived neighbourhood has consequences in terms of sociability, school achievements and it may deteriorate individuals' employability.

5.2. Estimation results

Table 3 describes the results of the estimation of the ANPE unemployment duration. The first unemployment episode is explained with individuals' characteristics, spatial constraints, etc.

Table 3: Weibull survival model estimates – equation of the unemployment sequence

Variable	Coefficient	Standard Error
Intercept	3,391***	0,1691
Gender		
Female	ref.	
Male	-0,1125***	0,0299
Classes of age		
16-25 years old	-0,1745***	0,0336
26-35 years old	ref.	
36-49 years old	0,1906***	0,0335
50 years old and more	0,6151***	0,0695
Born in France	-0,0806**	0,0349

Father's occupation		
Farmer	0,0243	0,102
Artisan, trader, entrepreneur	0,0943*	0,0541
Executive, engineer, professional, professor	0,0147	0,0527
Technician, supervisor, travelling salesman, intermediate profession	ref.	
White-collar worker	0,0807*	0,05
Blue-collar worker	0,0263	0,0391
Other	0,0836	0,0656
Mother's occupation		
Farmer	0,1588	0,1494
Artisan, trader, entrepreneur	-0,1507*	0,0844
Executive, engineer, professional, professor	0,1633*	0,0972
Technician, supervisor, travelling salesman, intermediate profession	ref.	
White-collar worker	-0,0245	0,0572
Blue-collar worker	-0,0673	0,064
Other	-0,012	0,055
Qualification level		
First school	ref.	
Primary education	0,0768*	0,0514
Secondary education	-0,1006*	0,0571
Short technical education	-0,0688*	0,0438
Long technical education	-0,2207***	0,0572
Higher education	-0,2101***	0,0534
Marital status		
In couple	0,0182	0,052
Single	0,0364	0,0557
Divorced, widow	ref.	
Number of children		
No children	ref.	
1 child	-0,0296	0,0373
2 children	-0,0726*	0,0454
3 children and more	-0,1526**	0,0646
Number of individuals in the household	0,0714***	0,0136
Household's income		
Inferior to 9050 francs	ref.	
Superior or equal to 9050 francs	-0,2591***	0,0269
Having the driving licence	-0,2234***	0,0333
Not having access to any transportation means	0,2408***	0,0315
Being the owner of the residence	0,0226	0,0295
Distance to the railway station	0	0
Employment area		
Cergy	-0,1802**	0,0592

Mantes-la-Jolie	-0,1391**	0,0642
Poissy	-0,1903**	0,0615
Roubaix-Tourcoing	-0,2073***	0,0613
Lens	-0,0967*	0,0547
L'Etang-de-Berre	-0,0289	0,062
Marseille-Aubagne	0,0608	0,0552
Aix-en-Provence	ref.	
Type of contract during the last employment		
Permanent contract	ref.	
Fixed term contract	-0,2124***	0,0563
Temporary work	-0,4609***	0,0656
Other contracts	-0,1675**	0,0636
Occupational category of the last employment		
Blue-collar worker	ref.	
White-collar worker	0,1208***	0,0364
Technician, supervisor, travelling salesman, intermediate profession	0,0007	0,0467
Executive, engineer, professional, professor	0,1819	0,0676
Reasons of loosing the last job		
Collective dismissal	*ref.*	
Other types of dismissal	-0,126**	0,052
End of a fixed-term contract	-0,0639	0,0501
Demission	-0,1662**	0,0627
Other reasons	-0,0247	0,0534
Situation before the ANPE unemployment sequence		
Employment	ref.	
Education	-0,0996**	0,038
Training period	-0,2027***	0,0605
Unemployment	0,0958*	0,0537
Inactivity	0,3463***	0,041
Other	-0,1923***	0,061
Industry for the last employment		
Non response	-0,2325**	0,1132
Agriculture	-0,2452***	0,0659
Manufacture industry	ref.	
Tertiary industry	-0,0521	0,0971
Other	-0,1398***	0,0425
Firm size for the last employment		
Less than 10 employees	ref.	
10-49 employees	-0,095**	0,0373
50-99 employees	0,0377	0,0437
100-199 employees	-0,0931**	0,0408

More than 200 employees	-0,0436	0,0559
Last job was a part-time job	0,0946**	0,0379
Job search type during ANPE unemployment sequence		
Social and professional network	ref.	
Private employment agencies	-0,0648**	0,0319
Unsolicited application	0,0675	0,0492
ANPE	0,1478***	0,0269
Entrance examination	-0,2169**	0,0994
Other	0,123**	0,0622
RMI	-0,5154***	0,0514
Unemployment benefits	-0,5361***	0,0348
Job search intensity (hours/week)		
5 to 10	-0,0155	0,0333
10 to 20	-0,094**	0,0385
more than 20	-0,1889***	0,0434
Spatial constraints		
Average distance from residence place to work place	0,1124**	0,0054
Unemployment rate	0,9945***	0,2861
Weibull Shape	1,1095	0,0112
Log Likelihood	-10084,3	
Number of observations	**7271**	

Field: unemployed individuals entering the ANPE between April 1st 1995 and June 1st 1995. Sample obtained by merging three databases: the "Trajectoires des demandeurs d'emplois" survey (DARES), the 1999 French census and finally, a database containing town inventory information (INSEE).
Note: * indicates significance at 10%, ** indicates significance at 5% and *** indicates significance at 1%.

Concerning mobility variables, we observe that having a driving licence reduces the unemployment duration. On the contrary, not having access to any transportation means increases the duration of the first unemployment episode. These effects tend to show the necessity of being mobile during the job search process. Being motorised represents a way to accommodate physical disconnection between work place and residence place. However, in our study, the fact that the *communes* do not have an appropriate public transportation system appears to be not significantly determining for the unemployment duration. The distance to the closest railway station has also no effect on the duration of unemployment. Being a resident of one of the three Paris region employment areas seems to be an advantage for the individuals: it diminishes the unemployment duration. The explanation is that employment areas in Paris represent more dynamic local labour markets and they probably have a more efficient public transportation system.

The previous situations of the ANPE unemployment sequence are also some important determinants. Occupational categories, reasons for loosing the last job or characteristics of the last firm where the individual worked are also influential variables. An individual having known a collective dismissal or who had a part-time job will face a more important unemployment duration. Moreover, the duration depends on the job search strategy. An intensive job search reduces the unemployment survival.

Finally, the unemployment rate of the town where the individual inhabits affects

highly the unemployment duration. This variable can be seen as an indicator of the neighbourhood composition. Living in a place affected by substantial social problems may have consequences in terms of roles models. Towns with adverse labour-markets may deteriorate the learning process, school achievements or job seekers' employability. Concerning the spatial mismatch hypothesis, we note that the average distance from the residence place to the work place, is "unfavourable" to the unemployment duration. An important distance is a proxy of the disconnection from jobs. This result is consistent with the theory developed in previous section.

The results of the second equation are listed in table 4. We explain the probability of having a first job on the period of questioning. Most of the variables retained have been already used in the previous estimation. Coefficients of this equation are relatively close to those of the unemployment duration model. Being a young male with a high level of diploma and with French parents is more "favourable" to the employment access. In addition, it is surprising to see that a blue-collar worker is more likely to find a job than an executive or a professional. As in the previous equation, living in Paris regions is better in terms of job accessibility than to live in PACA or in Nord-Pas-de-Calais. Finally, having a driving licence or a vehicle is still a consistent determinant to find a job.

Table 4: Selection regression estimates for the access to a first employment – probit model

Variables	Coefficients	Standard Error
Intercept	-0,4987***	0,1725
Individual characteristics		
Female	ref.	
Male	0,2266***	0,0388
16-25 years old	0,2968***	0,0481
26-35 years old	ref.	
36-49 years old	-0,127**	0,0457
more than 50 years old	-0,539***	0,0835
Born in France	0,0457	0,0511
Father's nationality (=French)	0,0845*	0,0443
Father's occupation		
Farmer	-0,1557	0,1259
Artisan, corporate manager	-0,1447*	0,0756
Executive or professional	-0,0548	0,0774
Intermediary profession	ref.	
Employee	-0,1342*	0,0706
Workman	-0,0161	0,0568
Retired	-0,1833**	0,0867
Mother's occupation		
farmer	0,2834*	0,1937
artisan, corporate manager	0,2324**	0,118
executive or professional	0,1195	0,1437
intermediary profession	ref.	
employee	0,2861***	0,0832
workman	0,2846**	0,092
retired	0,1817**	0,0787
number of years in this housing	0,00193	0,00252

Educational attainment		
first school	ref.	
general studies (first cycle)	-0,1182*	0,0642
general studies (second cycle)	0,0227	0,0749
technical diploma (short)	0,0603	0,0562
technical diploma (long)	0,1954**	0,0796
University degree	0,3182***	0,0723
Marital status		
couple, engaged	0,03	0,0453
single	ref.	
divorced, widowed	-0,00308	0,073
Number of children		
no child	0,011	0,0522
one	ref.	
two	0,1028**	0,0504
three and more	0,0727	0,0701
number of individuals in the household	-0,0983***	0,0227
household income (<median)	ref.	
household income (>median)	0,2782***	0,0375
Mobility		
driving licence	0,2478***	0,0447
no vehicle	-0,2996***	0,0419
homeowner	-0,0283	0,0426
distance at the railway station	-0,000013*	0,00000675
Employment area		
Cergy (1138)	0,1808**	0,0768
Mantes-la-Jolie (1141)	0,2967***	0,0829
Poissy (1139)	0,2605***	0,0826
Roubaix-Tourcoing (3110)	0,2521***	0,0751
Lens (3122)	-0,015	0,0769
L'Etang-de-Berre (9344)	0,1751**	0,0856
Marseille-Aubagne (9349)	0,0246	0,0717
Aix-en-Provence (9342)	ref.	
presence of a French Job Centre (ANPE)	0,000337	0,0424
Last contract		
permanent contract	ref.	
fixed term contract	0,3003***	0,0459
temporary work	0,6008***	0,0921
others	0,1859**	0,063
Socio-professional category of last position		
workman	ref.	
employee	-0,1399**	0,0495
intermediary profession	0,0539	0,0673
executive or professional	-0,1366*	0,0942

Activity		
agricultural sector	0,1905**	0,0918
industry	ref.	
construction sector	0,1984*	0,1397
tertiary sector	0,1575**	0,0583
Size of the last company		
less than 10 employees	ref.	
10-49 employees	0,092*	0,0507
50-99 employees	-0,0192	0,0592
100-199 employees	0,037	0,0559
more than 200 employees	0,0158	0,0744
part-time job	0,00608	0,0512
Observations	7271	
Likelihood ratio	957,7033	
Percent concordant	71,9	

Field: unemployed individuals entering the ANPE between April 1st 1995 and June 1st 1995. Sample obtained by merging three databases: the "Trajectoires des demandeurs d'emplois" survey (DARES) the 1999 French census and finally, a database containing town inventory information (INSEE).

Note: * indicates significance at 10%, ** indicates significance at 5% and *** indicates significance at 1%.

Table 5: Regression estimates for answering to the three waves of questioning – probit model

Variables	Coefficients	Standard Error
Intercept	-0,0697	0,1043
Individual characteristics		
female	ref.	
male	-0,199***	0,0342
16-25 years old	0,0241	0,0406
26-35 years old	ref.	
36-49 years old	-0,0342	0,0424
more than 50 years old	-0,0824	0,0788
born in France	0,1009**	0,0416
number of years in this housing	0,0075***	0,00224
Educational attainment		
first school	ref.	
general studies (first cycle)	-0,0535	0,0609
general studies (second cycle)	0,0708	0,0703
technical diploma (short)	0,0268	0,0529
technical diploma(long)	0,1665**	0,0723
University degree	0,2089**	0,0644
Marital status		
single	ref.	
couple, engaged	0,1699***	0,0399

divorced, widowed	0,114*	0,068
Number of child		
no child	0,011	0,0473
one	ref.	
two	0,0812*	0,0461
three and more	0,0655	0,0649
number of individuals in the household	-0,00522	0,0164
household income (<median)	ref.	
household income (>median)	0,1846***	0,0334
driving licence	0,0212	0,0386
homeowner	0,0271	0,0383
Employment area		
Cergy (1138)	-0,1172*	0,0658
Mantes-la-Jolie (1141)	0,0868	0,0694
Poissy (1139)	-0,00029	0,0661
Roubaix-Tourcoing (3110)	0,2407***	0,0637
Lens (3122)	0,3933***	0,0638
L'Etang-de-Berre (9344)	0,2796***	0,0766
Marseille-Aubagne (9349)	0,0278	0,0603
Aix-en-Provence (9342)	ref.	
Socio-professional category of last position		
workman	ref.	
employee	-0,0322	0,0382
intermediary profession	0,1001*	0,0577
executive or professional	0,0203	0,0836
Observations	7544	
Likelihood ratio	312,6876	
Percent concordant	61,9	

Field: unemployed individuals entering the ANPE between April 1st 1995 and June 1st 1995. Sample obtained by merging three databases: the "Trajectoires des demandeurs d'emplois" survey (DARES), the 1999 French census and finally, a database containing town inventory information (INSEE).
Note: * indicates significance at 10%, ** indicates significance at 5% and *** indicates significance at 1%.

Table 5 gives the results for the other Probit model. In this equation we try to assess the determinants of individuals' non-responses to successive interviews. Our aim is to control of a possible attrition bias in the main equation.

The main equation (see table 6) explains the duration of the first job. We take into account several biases: an endogeneity bias (for the unemployment duration), a selection bias and an attrition bias.

Table 6: Weibull duration model estimates – main equation

Variables	Coefficients	Standard Error
Intercept	1,9045**	0,9943
xbeta_unemployment	-0,0553*	0,038

$lambda_{first\_empl}$	-0,1134	0,2012
$lambda_{attrition}$	0,899	1,1726
Individual characteristics		
female	ref.	
male	-0,1453	0,1288
16-25 years old	-0,1745***	0,0336
26-35 years old	ref.	
36-49 years old	0,0556	0,0048
more than 50 years old	0,1425	0,0695
born in France	-0,0688	0,0817
father's nationality (=French)	0,0047	0,0387
Father's occupation		
farmer	0,1286	0,1257
artisan, corporate manager	0,2191**	0,0657
executive or professional	0,1203**	0,0595
intermediary profession	ref.	
employee	0,1226**	0,0573
workman	0,096**	0,0429
retired	0,1216*	0,0804
Mother's occupation		
farmer	0,0785	0,1811
artisan, corporate manager	-0,0285	0,1023
executive or professional	0,0514	0,1149
intermediary profession	ref.	
employee	0,0034	0,069
workman	-0,0084	0,0765
retired	0,0308	0,0648
Educational attainment		
first school	ref.	
general studies (first cycle)	-0,0421	0,074
general studies (second cycle)	0,0271	0,0829
technical diploma (short)	0,0248	0,0574
technical diploma(long)	0,0442	0,1247
University degree	0,0411	0,1453
Marital status		
couple, engaged	0,0733	0,1167
single	ref.	
divorced, widowed	0,0729	0,1034
Number of children		
no child	-0,0376	0,0443
one	ref.	
two	0,0331	0,0665
three and more	-0,0493	0,0742

number of individuals in the household	0,0224	0,0237
household income (<median)	ref.	
household income (>median)	0,1378	0,1206
Mobility		
driving licence	-0,0028	0,0469
no vehicle	-0,0257	0,0475
homeowner	-0,0261	0,0366
distance to the railway station	0	0
number of years in this housing	0,0057	0,0052
Employment area		
Cergy (1138)	-0,1336	0,1068
Mantes-la-Jolie (1141)	-0,0792	0,0985
Poissy (1139)	-0,2262**	0,0755
Roubaix-Tourcoing (3110)	-0,1044	0,1678
Lens (3122)	-0,0216	0,2478
L'Etang-de-Berre (9344)	-0,098	1887
Marseille-Aubagne (9349)	0,0608	0,0552
Aix-en-Provence (9342)	ref.	
Socio-professional category of the new position		
workman	ref.	
employee	0,0582	0,0508
intermediary profession	0,0658	0,0843
executive or professional	-0,0516	0,0931
Activity		
others	-0,4345***	0,1311
agricultural sector	0,095	0,0782
industry	ref.	
construction sector	-0,0146	0,107
tertiary sector	-0,0194***	0,0487
Size of the firm		
less than 10 employees	ref.	
10-49 employees	-0,1135**	0,0438
50-99 employees	-0,0701*	0,0499
100-199 employees	-0,1662***	0,0469
more than 200 employees	0,0271	0,0668
part-time job	-0,0228	0,0397
contract		
permanent contract	ref.	
fixed term contract	-0,6293***	0,0368
temporary work	-2,0531***	0,2192
others	-0,0814*	0,0511
guaranteed income	-0,5154**	0,0514
salary (< median)	ref.	

salary (> median)	0,1484***	0,0360
Sequences between the registration to the French Job Centre and the first job		
no inactivity	ref.	
inactivity duration (< median)	0,1209	0,1116
inactivity duration (>median)	-0,3039*	0,1791
no formation	ref.	
training duration (<median)	0,0531	0,0696
training duration (>median)	0,0691	0,0891
no studies	ref.	
studies duration (<median)	-0,2716*	0,1835
studies duration (<median)	0,2018	0,1694
no unemployment	ref.	
unemployment duration (< median)	-0,0263	0,0918
unemployment duration (< median)	0,5562***	0,1337
Spatial constraints		
Travelling time (home-to-work) in minutes		
<15 minutes	ref.	
15-30 minutes	-0,0155	0,0371
30-45 minutes	-0,0207	0,0535
45-60 minutes	-0,1247**	0,0615
more than 60 minutes	-0,1512**	0,0566
Part of households where the reference individual is a blue-collar worker	0,4867*	0,2608
Weibull Shape	1,1965	0,0145
Log Likelihood	-6442,619198	
Number of observations	5102	

Field: unemployed individuals entering the ANPE between April 1st 1995 and June 1st 1995. Sample obtained by merging three databases: the "Trajectoires des demandeurs d'emplois" survey (DARES), the 1999 French census and finally, a database containing town inventory information (INSEE).
Note: * indicates significance at 10%, ** indicates significance at 5% and *** indicates significance at 1%.

First of all, the estimates for $lambda_{first\_empl}$ and $lambda_{attrition}$ are not significant. Only *xbeta_unemployment* is significant confirming that the unemployment duration is endogenous. More important the first unemployment sequence, less important the duration of the first employment episode. A substantial duration of the unemployment sequence may be interpreted as a negative signal (a loss in terms of experience, knowledge or even sociability).

Young people have shorter first employment duration. Curiously, variables as the educational attainment, the marital status or household information are not significant. Finally, information concerning the first employment seems to be determinant for our analysis. The type of contract, the size of the firm in which the individual is hired or the time necessary to go to work are variables influencing strongly the employment duration. We remark that an increase in the time between home and job's location affects the employment duration. Thus, an individual may quit his job in order to save money from transportation.

A previous inactivity sequence with a duration superior to the median decreases the employment duration. More surprising, we see that a substantial unemployment sequence is relatively favourable to employment (it increases the duration of the first employment).

An important number of spatial constraints were tested in this model. We finally retained two variables: for "neighbourhood effects" we use the part of households where the reference individual is a blue-collar worker and for "spatial mismatch" we use a variable of disconnection from work (the travelling time between home and work). We note that living in a town with an important part of blue-collar workers has a positive effect on the duration of employment. We also observe that higher the disconnection between work and home, less are the chances to find an employment with a long duration.

6. CONCLUSION

In this paper we analyze how the urban organization affects the unemployment-to-work transitions by considering several spatial indicators. This permits to capture two separate effects: "spatial mismatch" and "neighbourhood effects". In order to study the unemployment-to-work transitions, we implemented survival models on a sample obtained by merging three French databases. We found that spatial indicators matter in the unemployment-to-work transition, for both the unemployment and employment durations.

First, we emphasize that the unemployment rate of the town where the individual inhabits affects highly the unemployment duration. This variable can be seen as an indicator of the neighbourhood composition. Living in a place affected by substantial social problems may have consequences in terms of roles models. Concerning the spatial mismatch hypothesis, we note that the average distance from the residence place to the work place, is "unfavourable" to the unemployment duration. An important distance is a proxy of the disconnection from jobs.

Second, we found that living in a town with an important part of blue-collar workers has a positive effect on the duration of the first employment after an unemployment sequence. We also observe that higher the disconnection between work and home, less are the chances to find an employment with a long duration.

REFERENCES

[1] BOUABDALLAH K., CAVACO S., LESUEUR J.-Y. (2002) : « Recherche d'emploi, contraintes spatiales et durée du chômage : une analyse microéconométrique », Revue d'Economie Politique, n°1, pp137-157.

[2] BRUECKNER J. K., THISSE J-F., ZENOU Y. (2002) : « Local labour markets, job matching, and urban location », International Economic Review, vol. 43, n°1, février 2002, pp. 155-169.

[3] CALVO-ARMENGOL A., ZENOU Y. (2001) : « Job matching, social network and word-of mouth communication », Seminar paper, Institute for International Economic Studies, n°695.

[4] CHOFFEL P., DELATTRE E. (2003) : « Habiter un quartier défavorisé : quels effets sur la durée du chômage ? », Premières informations et premières synthèses, DARES, n°43.1, 8p.

[5] CRANE J. (1991) : « The epidemic theory of ghettos and neighbourhood effects on dropping out and teenage childbearing », American Journal of Sociology, vol. 96,pp. 1226-1259.

[6] DUGUET E., GOUJARD A., L'HORTY Y. (2007) : « Les disparités spatiales du retour à l'emploi : une analyse cartographique à partir de sources exhaustives », Document de travail, n°85, CEE.

[7] DUJARDIN C., SELOD H., THOMAS I. (2007): « Residential segregation and unemployment: the case of Brussels », Document de travail, n°0704, INRA-LEA.

[8] GASCHET F., GAUSSIER N. (2004): « Urban segregation and labour markets within the Bordeaux metropolitan area: an investigation of the spatial friction », Working Papers of GRES, Cahiers du GRES 2004-19.

[9] GOBILLON L., SELOD H. (2006) : « Ségrégation résidentielle, accessibilité aux emplois et chômage : le cas de l'Ile-de-France », Document de travail, n°0605, INRA-LEA.

[10] GRANOVETTER M. (1973): « The strength of weak ties », American Journal of Sociology,

n°78, pp. 1360-1380.
[11] IHLANDFELDT K. R., SJOQUIST D. L. (1990): « Job accessibility and racial differences in youth employment rates », The American economic review, pp. 267-276.
[12] IHLANFELDT K., SJOQUIST D. (1998): « The spatial mismatch hypothesis: a review of recent studies and their implications for welfare reform », Housing Policy Debate, 9, 849-892.
[13] IMMERGLUCK D. (1998): « Job proximity and the urban employment problem: do suitable nearby jobs improve neighbourhood employment rates? », Urban Studies, 35, 7-23.
[14] KAIN J.F. (1968): « Housing segregation, negro employment, and metropolitan decentralization », Quarterly Journal of Economics, 82, 32-59.
[15] KAIN J.F. (1992): « The spatial mismatch hypothesis: three decades later », Housing Policy Debate, 3, 371-460.
[16] ROGERS C.L. (1997): « Job search and unemployment duration: Implications for the spatial mismatch hypothesis » in Journal of Urban Economics, 42, pp.109-132.
[17] SELOD H., ZENOU (2001) : « Social interactions, ethnic minorities and urban unemployment », Annales d'Economie et de Statistique, 63-64, 183-214.
[18] SMITH T., ZENOU Y. (2003): « Spatial Mismatch, search effort and urban spatial structure » in Journal of Urban Economics, 54, pp. 185-214.
[19] ZENOU Y. (2000): « Urban unemployment, agglomeration and transportation policies », Journal of Public Economics, n°77, p.97_133.

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