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Abstract:

Parisian jobseekers present an abnormally high risk of long-term unemployment, all things being equal. It is a phenomenon specific to Paris and districts closest to the centre. This is a paradox in a job market particularly dense and active. In this article, we propose an explanation which combines the essentials of two mechanisms, Skill Mismatch and Spatial Mismatch. It is because Parisian jobseekers are geographically far from the jobs that suit their profiles that they present a high risk of long-term unemployment. This explanation is corroborated by a model of spatial regimes and correlated errors on the Ile-de-France data and local durations of unemployment.

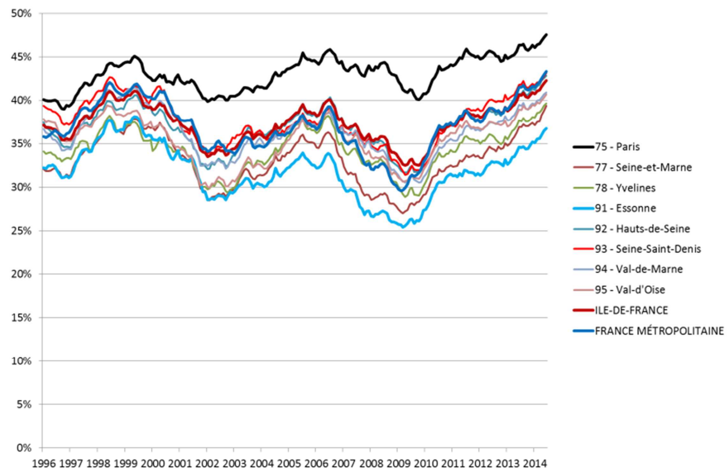
Key words : Paris, unemployment, spatial econometrics, spatial regime models, *Skill Mismatch*, *Spatial Mismatch*.

JEL Codes: C41, J64, R1.

INTRODUCTION

The fact is surprising yet well-established: Parisians are amongst the French the most exposed to the risk of long-term unemployment. We count 90,000 jobsekers of more than a year, 47.6 % of the jobseekers compared to 42.3 % for Ile-de-France and 43.3 % for the whole of metropolitan France. These figures from mid-2014 make Paris the 7th highest French department in terms of duration of unemployment[1]. However, the relative situation of Paris has improved since the crisis. At the end of 2008, Paris was the department of metropolitan France with the highest percentage of jobseekers of more than a year. Figure 1 presents this statistic, calculated monthly by Pôle Emploi, for each department of Ile-de-France, for the entire region and for the whole of France during the period 1996-2014. The permanance of this Parisian particularity is clear. The percentage of jobseekers of more than a year is always higer in Paris during the period. The difference between the percentage of long-term jobseekers in Paris and in Ile-de-France peaks at the end of 2008 at 9 percentage points. It is only 5.4 points in mid-2014, which is nevertheless high.

Figure 1. Percentage of long-term jobseekers among total jobseekers



Field: Jobseekers registered at the end of the month with Pôle Emploi and registered for more than a year in categories A, B, C, as a total of jobseekers, by region and by department.
Source: STMT - Pôle Emploi, DARES.

How can we explain this paradox? How can such an active, dense job market go hand-in-hand with such a feeble rate of return to employment? To answer these questions, we solicit the hypotheses from urban economics and labour economics, according to which the location of

[1] After Aisne, the Vosges, Allier, Pas-de-Calais, Eure, the Somme and the Nord are historically the industrial departments most affected by the crisis.

individuals and the spatial organisation of towns could complicate a return-to-work. We use two principal mechanisms. On one side, we have the disadvantageous effect of the physical disconnection between the place of residence and the centres of work (the hypothesis of Spatial *Mismatch* proposed by KAIN in 1968) and, on the other side, local skills mismatch in terms of jobs on offer and jobs sought (the hypothesis of *Skill Mismatch*), whose first proponents for the labour market were without doubt JACKMAN *et al.* (1990). Taken separately, these explanations do not appear necessarily convincing. *A priori* there is no problem of physical distance from employment for Parisians, given that its inner suburbs appear rich in jobs. The diversity of jobs on offer also seems to go against the idea of a skill mismatch at a local level. But considered together, these explanations become pertinent. Unemployed Parisians live close to a large source of jobs, but their characteristics do not correspond to jobs sought. This is the hypothesis that we want to verify in this work.

This study follows previous work using applied microeconomics to better analyse the geography of unemployment in France (BOUABDALLAH *et al.*, 2002; GASCHET and GAUSSIER, 2004; DUGUET *et al.*, 2009) and particularly follows studies specific to Ile-de-France (GOBILLON and SELOD, 2007; DUGUET *et al.*, 2009; KORSU and WENGLENSKI, 2010; GOBILLON *et al.*, 2011). Compared to all these works, the originality of ours is to focus on the question of the Paris singularity, which has not been explicitly investigated by any previous study, and to attempt to validate an explanation using a specific model.

Firstly, we offer a brief literature review – theoretical and empirical- in order to understand the potential links between spatial organization of a territory and unemployment-to-work transitions. Secondly, we use an exhaustive administrative source, the Pôle Emploi files, to construct fairly precise spatiale flow indicators to describe the return-to-work and to give us an original overview of the Paris situation. Finally, we verify empirically our hypotheses with the help of a spatial econometrics model.

EXPLAINING THE OVEREXPOSURE OF PARISIANS TO UNEMPLOYMENT

To interpret the overexposure of Parisians to long-term unemployment, we favour two hypotheses inspired by urban economics and labour economics. The first is *Spatial Mismatch*, proposed initially by KAIN (1968) which explains local unemployment by the physical distance of jobs. The second is *Skill Mismatch,* which focuses on the local imbalance between jobs on offer and jobs demanded. The first theoricians of the labour market were undoubtedly JACKMAN *et al*. (1990). We develop each hypothesis.

The Spatial Mismatch hypothesis

In a 1968 article, Kain advances the idea whereby living in locations far from jobs has important consequences on unemployment[2]. This intuition led to the emergence of a vast body of literature in the United States focused on the possible relationships between the urban organisation of towns and the local labour market. Together, this literature identifies two principal mechanisms that link this hypothesis to situations experienced in the labour market by certain residents (ARNOTT, 1998).

The first mechanism is the cost of travel. A physical disconnection between the place of residence and the place of work could lead to high travel costs because certain localities are not well-served by public transport. These costs might be aggravated by problems of traffic congestion or by poor public transport, a phenomenon encountered in the Paris region. In this context, jobseekers residing in towns disconnected from employment centres are confronted by monetary and time costs often too high in relation to the wages offered (COULSON et *al.*, 2001; BRUECKNER and ZENOU, 2003). The second mechanism comes from the differents characteristics of the job search process. Firstly, an individual living far from employment centres could encounter difficulties in obtaining information on available work (ROGERS, 1997). IHLANFELDT and SJOQUIST (1990, 1991) show that the physical distance from employment tends to reduce the available information on job vacancies. In these conditions, seeking work far from the domicile could prove too expensive. Individuals will look for a suitable job in a relatively restricted zone, close to home, and will do so even if these jobs are of poor quality (DAVIS and HUFF, 1972).

Some empirical studies have tested this hypothesis for France. BOUABDALLAH *et al.* (2002) were among the first to confirm this hypothesis by showing that the widening of the zone of jobseeking leads to a reduction in the duration of unemployment. The resulting increase in job offers compensates for the increased costs of prospection linked to the widening of area. In line with previous work, CAVACO and LESUEUR (2004) highlight the particularly discriminating effect of spatial contraints (such as the distancing of zones of

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[2] Initially, KAIN's studies on this hypothesis aimed at explaining the differences in employment or unemployment rate between Blacks and Whites in the United States. More generally, this hypothesis concerns particular population categories considered disadvantaged in the labour market. In this study, we do not make distinctions by sub-populations. We suppose that this problem could concern all residents.

concentration of employment or job agencies) during their research into episodes of unemployment. GASCHET and GAUSSIER (2004) also confirm the negative effects of poor accessibility to work on the duration of unemployment in the Bordeaux metropolitan area. DETANG-DESSENDRE and GAIGNÉ (2009) show that better accessibility increases the probability of finding work for the residents of urban and rural fringe zones. RUPERT *et al.* (2009) show that for a given wage, workers are less likely to accept job offers far from their places of residence.

For the Paris region, GOBILLON and SELOD (2007) are among the pioneers. They highlight the relationship between physical accessibility to employment and return-to-work. DUGUET *et al.* (2009) also find that a poor access to employment can increase the duration of unemployment and decrease the rate of exit from unemployment. More recently, KORSU and WENGLENSKI (2010) and GOBILLON *et al.* (2011) also show that limited accessibility significantly increases the risk of unemployment (notably long-term unemployment) for the residents of the region.

The Skill Mismatch hypothesis

The other hypothesis that we employ is that of *Skill Mismatch*. It is based upon the theory by which, locally, some individuals do not have the skills and qualifications necessary to apply for available job vacancies. This results in difficulties finding a job and, where they do find work, it is generally of poor quality and low-paid (PASTOR and MARCELLI, 2000). We then talk about a mismatch between the skills expectations of employers and the qualifications of jobseekers (CARLSON and THEODORE, 1995; DANZIGER and HOLZER, 1997; GORDON,2002).

Numerous empirical studies seem to confirm this hypothesis. For the United States, BAUDER and PERLE (1999) confirm that Blacks are disadvantaged in a context where the labour market requires higher skills but they suffer from a low level of education. MANACORDA and PETRONGOLO (1999) particularly confirm this hypothesis. The authors find that the *Skill Mismatch* is not a serious problem in the labour markets of OECD countries, except for less qualified workers in Great Britain. However, their work does not permit a very precise analysis of the *Skill Mismatch* at town or neighbourhood level. We could also cite the theoretical model developed by THISSE and ZENOU (2000) in which the authors explore the interactions between heterogeneous workers and firms with differing demands for skill levels. In an imperfect market, they find that unemployment could be attributed to an imbalance between the offer and demand for skills. STOLL (2005) also verifies this hypothesis for the suburbs of Los Angeles and Atlanta. He finds a negative relation between poor matching of measured skills and the local level of employment. This mismatch is at the origin of nearly a third of the differences in observed employment rates between Blacks and Whites. Finally, HOUSTON (2005) innovates by simultaneously considering the *Skill Mismatch* and *Spatial Mismatch* Problems. He shows with the help of a conceptual model that each cannot be considered separately. On the contrary, they can be mutually reinforcing and *in fine* explain differences in unemployment observed within metropolitan areas. By combining these two hypotheses we can find a plausible explanation that can be tested with the data. The intuition is simple: Parisian jobseekers live close to a large source of employment but the characteristics of the jobs on offer are not those of the jobs sought. In addition, the job offers that correspond to the characteristics of the jobseekers are, generally, physically far from the centre of Paris. Given the profile of Paris jobseekers, there are suitable job offers but they are situated in the middle suburbs of the Paris metropolitan area, far from the city centre. Physically distanced from job offers that suit them, Parisian jobseekers experience a longer jobsearch than jobseekers in other towns and departments.

MEASURING UNEMPLOYMENT DURATION AND HIS DETERMINANTS

Comparisons of the unemployment rate are based on stock indicators that are informative but inadequate for a complete diagnosis of the nature and causes of the problem. They need to be complemented by labour market flow indicators, such as the rate of unemployment entry and exit, and the duration of unemployment.These flow indicators pose a problem of definition and observation. To calculate them, the best source is the historical statistics records (FHS) of Pôle Emploi, a government source. This permits us to follow the individual paths of jobseekers by recording each successive step from their first registration with their Job center, but it does not follow jobseekers after they are hired if they are no longer registered.

We use the indicators calculated by DUGUET *et al.* (2009) in Ile-de-France and in 22 metropolitan regions[3]. To be able to follow jobseekers over a long enough period, we limit ourselves to the group of persons who registered between July 1, 2001 and June 30, 2002. July 1 is chosen because it coincides with the implementation of a new system of unemployment insurance. Therefore we study a homogeneous period in terms of benefits. The record used is a version of FHS updated on March 31, 2006. Therefore, we study this cohort of unemployed over a period of nearly five years.

[3] The work of Duguet *et al.* (2009) also proposes a detailed explanation of the econometircs methodology used to estimate the rate of exits from unemployment or the duration of unemployment from the records of Pôle Emploi.

To model the unemployment duration, we use a Weibull specification where the rate of exit from unemployment is a function of time spent in unemployment as well as local fixed effects and also depends on the characteristics of the individual, such as age, sex, or level of education. The use of administrative records poses the question of measuring the exit from unemployment. By crossing two definitions of exit from unemployment, *removal from the lists* and *declared return-to-work*, and two measures of the sustainability of the exits, from *at least one month and six months and more*, we obtain four definitions for exit from unemployment. The choice of one or another of these definitions influences the number of exits. By limiting the observation to declared return to work, the number of exits is far lower. In Ile-de-France, it is halved (308,619 rather than 629,046). By limiting ourselves to sustainable exits, we reduce the number of exits by about a quarter (we count 258,952 exits of six months and more with declared return to work). Annex A presents the results of estimations for the Ile-de-France region.

Our dependent variable is this local unemployment duration calculated from individual data. One might suspect an endogeneity problem with other socio-demographic indicators since it seems difficult to distinguish whether an individual is unemployed because he or she lives in a particular town or if he or she lives in a particular town because they are unemployed. This problem is limited in our case because i) the residential mobility is rare in France, especially for job seekers; ii) we follow a cohort of new jobseekers who were previously employed and iii) we control for the characteristics of these job seekers. Most importantly, we want to explain excessive unemployment duration within Paris which is not a deprived location.

Stylised facts: the disadvantage of Paris

Table 1 shows the disadvantage of the Paris labor market regarding the exit rate of unemployment. If the comparison of unemployment rates in the first quarter 2014, between the Ile-de-France and metropolitan France, seems to be favorable to the first (the unemployment rate is 8.6% against 9.7%), it is no longer the case when one is interested in unemployment durations disparities. Indeed, the Ile-de-France has the highest unemployment durations comparatively to the rest of France. This is true for both the definitions used (removal from the lists and declared return-to-work). Unemployment durations before a removal from the lists and declared return-to-work are 11.4 months against 10.3 months and 51.4 months against 40.4 months, respectively. Paris is one of the French departments where job seekers have, on average, the least chance of leaving unemployment. The odds are much lower than the French average (10.5 months) and they are also relatively to any department of

Ile-de-France. The average length enrollment to job center is more than 13 months in Paris, against 11 months in the departments of the region, and 9.3 months in Essonne.

Table 1. Unemployment in Ile-de-France

	Obs.	Rate of unemployment (2014)	Duration of unemployment gross: Removal from lists	Duration of unemployment gross: Return to work	Duration of unemployment net: Removal from lists	Duration of unemployment net: Return to work
Metropolitan France	*36 566*	9,7%	10,5	31,1	10,2	30
Metro France (outside IdF)	*35 266*	9,8%	10,3	28,9	10,3	28,9
Ile-de-France	*1 300*	8,6%	11,4	40,4	10,1	34,5
Paris (75)	*20*	8,1%	13,2	51,4	10,7	40,6
Seine et Marne (77)	*514*	7,9%	10,8	30,6	9,9	27,3
Yvelines (78)	*262*	7,1%	11	32	9	29,2
Essonne (91)	*196*	7,4%	9,3	28,4	8,5	25,7
Hauts-de-Seine (92)	*36*	7,6%	11,3	37,5	10,2	34,9
Seine-Saint-Denis (93)	*40*	12,7%	10,9	46,8	10,2	39,2
Val-de-Marne (94)	*47*	8,6%	10,8	37	9,9	31,9
Val-d'Oise (95)	*185*	9,8%	11	38,1	10,1	33,6

Source: INSEE, from historical statistical records of Pôle Emploi.
Notes: The averages are the averages weighted by the number of unemployed in the towns.

We also want to check if the problem is general, or if it particularly affects certain categories of jobseekers. For example, with Paris, the over-representation of occasional workers in the entertainment industry is sometimes cited as a reason for the high rate of unemployment. To check, we estimate two total rates of local exit, without or with control by individual jobseekers' characteristics.[4] If Paris jobseekers had the same socio-demographic profile of those of Ile-de-France, they would exit unemployment less quickly. This is linked to the fact that Paris jobseekers are more highly qualified than others, which have a favourable effect of the chances of exiting unemployment.

We compute the rate of survival of unemployment with the help of Kaplan Meier non-parametric estimates. The indicators obtained allow us to show descriptively the importance of locality to the duration of unemployment (another way of rendering the rate of exit from unemployment).

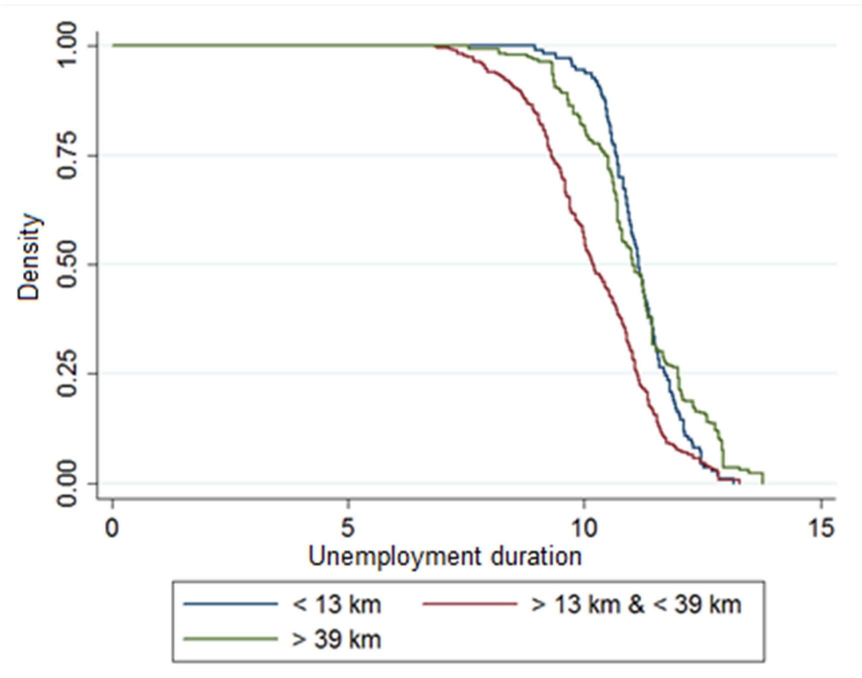
Figure 2 shows the distribution functions calculated for three classes of distance of towns from the centre of the region. The 10% of towns the closest to the centre (within a radius of

[4] These variables are sex, age, nationality, marital situation, number of children, highest educational qualification obtained, disability, type of work contract sought, trade (ROME code), reason for entering unemployment, RMI situation.

13 kilometres) are those where the durations of unemployment are highest, when one considers the definition “Removal from lists”. The 50% of towns the furthest from the centre (more than 39 kilometres) also have serious difficulties in terms of exit from unemployment. Beyond a duration of unemployment of 10 months, the two lines cross. This signifies that long-term jobseekers are more strongly represented in both towns closest to the centre and further from the centre. The 40% of towns within a radius of 13 and 39 kilometres are those where the durations of unemployment observed are the lowest of the groups. We will use these three statiscal classes in order to define our spatial regimes in the estimations.

Note that these inequalities cannot be explained by possible disparities in the socio-economic composition of jobseekers because our analysis of the net durations neutralises these effects. Highlighting a possible problem of physical distance from employment opportunities is not necessarily satisfactory since the highest durations are observed for the towns closest to the centre. Other factors must be identified to permit us to explain this particular pattern.

Figure 2. Net durations of unemployment and distance from centre



Reading: The threshold “ < 13 km” includes all the towns within a radius of 13 kilometres from the centre of Paris (10 % of the towns). The threshold “ > 39 km” includes all the towns beyond a radius of 39 kilometres from the centre (50 % of the towns). The threshold “> 13 km &< 39 km” includes all the towns between the two distances (40 % of the towns). The distances are Euclidean.
Source: Historical statistical records of Pôle Emploi.

The spatial auto-correlation issue

The local duration of unemployment constitutes our variable of interest and we are concerned with its spatial auto-correlation. We calculate the Moran auto-correlation coefficient *I* for the durations of unemployment, which could be interpreted as the relation of the covariance between contiguous observations and the total variance observed in the sample (Jayet, 1993). It is given by:

$$I = \frac{n}{\sum_i \sum_j w_{ij}} \frac{\sum_i \sum_j w_{ij}(x_i - \bar{x})(x_j - \bar{x})}{\sum_j (x_i - \bar{x})^2}$$

Where w_{ij} is a weighting which permits us to take into account the geographical proximity of spatial units *i* and *j*.

When $\mathrm{I} > E[\mathrm{I}] = (\mathrm{n}-1)^{-1}\mathrm{I}$ (respectively I < E[I]), the values taken by the durations are not placed randomly but are close (respectively distanced) for two neighbouring spatial units. The geographically close spatial units are also statistically close (respectively distanced) and we conclude the presence of a positive spatial auto-correlation (respectively negative). When *I* is close to *E[I]*, we conclude the absence of spatial auto-correlation. In this case, we can establish no link between the statistical proximity and the geographical proximity of spatial units.

In fact, the calculation of the Moran index *I* is sensitive to the definition of the matrix of spatial weighting $W(w_{ij})$. There are effectively several criteria to determine the spatial units that will be considered as neighbours: contiguity[5], closest neighbours, distance. Given the clusters of homogeneous towns, we choose to construct a contiguity matrix, where the towns have links with their immediate neighbours. We present in Table 2 the auto-correlation coefficients (Moran *I*) of the net durations of unemployment obtained for different types spatially weighted matrices.

Table 2. Global spatial auto-correlation of duration of unemployment

Matrix W	Moran I	Distance-type	p-value
Queen 1	0,5101	0,0193	0,001
Queen 2	0,3295	0,0133	0,001
Queen 3	0,1954	0,0111	0,001
Distance < 6 km	0,4908	0,016	0,001

Source : Historical statistical records of Pôle Emploi.
Notes : E[I] = -0,0009.

[5] With moves of the type: *Queen*, *Bishop* or *King*, inspired by the chess game.

Whatever the type of matrix used, we see that the duration of unemployment presents a significant positive spatial auto-correlation that is relatively high. Then, the geographically neighbouring towns are also neighbours in terms of duration of unemployment. To consider the spatial auto-correlation problem in our data, we must use an appropriate model. We use the matrix of congituity of the type *Queen* to the order 1 because this presents the highest value for spatial auto-correlation.

Skill and Spatial mismatch indicators

To construct the others variables, we use two different sources of data. Firstly, we use census data produced by INSEE dating from 1999, because it is before the period covered by our Pôle Emploi data. Secondly, we use the Déclarations Annuelles de Données Sociales- annual declaration of workplace data (DADS)[6], an exhaustive source of information on companies and their employees. Our DADS database contains 346,545 firms in Ile-de-France between 2002 and 2005, including 86,342 questioned on the four dates of the survey. They are part of 1149 towns in the region.

To test the *Spatial Mismatch* hypothesis, we use two different indicators. On one hand, we compute the Euclidean distance between the town of the residence and the centre of Paris. Even if towns such as Roissy, Cergy or Saint-Quentin attract more and more workers, Paris remains the most important centre of employment in Ile-de-France and so we consider it as the sole reference. On the other hand, we use an indicator on the density of accessible employment within a radius of 20 km from the centroid of the towns:

$$DE_i = \frac{\sum_j E_j}{\sum_j PA_j}$$

Where DE_i is the density of jobs calculated for the town *i*, *E* is total jobs, *PA* is the total workforce, *j* is the total towns within 20 kilometres of a given town *i*.

To measure the *Skill mismatch*, we adapt the indicator of Jackman *et al.* (1990) that measures the difference between the relative proportions of unemployed by qualification according to the town. This indicator is theoretically interpretted by these authors as the share of structural unemployment having problems of skill mismatch. It corresponds to the semi-variance of the ratio between the rate of unemployment by skills u_q (manual workers, employees, intermediate professions, and managers) and the total rate of unemployment (u) within the town:

[6] Formalité déclarative à laquelle doit s'astreindre toute entreprise employant des salariés.

$$I_{LJS} = \frac{1}{2} V \left(\frac{u_q}{u}\right) \text{ with } 0 < I_{LJS} < 1$$

A high value for this indicator means that some populations encounter more problems of unemployment than others, which shows that locally the jobs do not necessarily meet the needs of local populations and that mismatch explains an important part of local unemployment.

We include also control variables to account for differences in duration of unemployment observed between the towns of the region. Firstly, to control for potential differences in the socio-economic composition between towns, we construct a typology of towns from a principal component analysis then from an ascending hierarchical classification (Ward criteria). These methods are based upon the variables of the 1999 census which measures the proportion of each socio-professional category, the relative distribution of education degrees, as well as the proportion of single-parent families and foreigners residing in each town. The classification allows the creation of four groups of towns that are relatively homogeneous in population: towns with a majority of the population highly qualified, populated essentially by managers (type I), towns with qualified populations with a proportion of single-parent families and foreigners above the average (type II), towns where the majority of residents are manual workers with low educational qualifications (type III), and towns where the proportion of manual workers, single-parent families and foreigners is high (type IV).

In addition to the location of existing jobs, those of jobs created or disappeared are equally important to explore the hypothesis of *Spatial Mismatch*. The towns that are dynamic in terms of creating or destroying jobs are those where the unemployed are more likely to experience short-term unemployment, because the turn-over is to the advantage of jobseekers. To measure the creation and destruction of jobs, we use annual employment flow indicators inspired by DAVIS and HALTIWANGER (1990), created from DADS. The gross creations of jobs correspond to the positive variations between employees *N* on two successive dates, and the gross destruction of jobs to negative variations. The volume of gross creation of employment C_{ct} in the town *i* between the dates *t-1* and *t* is:

$$C_{ct} = \sum_{e \in C^+} \Delta N_{ect}$$

where C^+ is the sub-total of companies e of the towns i for which the number of jobs at the end of the period is more than the number of jobs at the beginning of the period of observation, and Δ operates the difference between *t-1* et *t*. Similarly, the volume of gross destruction of jobs D_{ct} is:

$$D_{ct} = \sum_{e \in C^-} |\Delta N_{ect}|$$

where C^- is the sub-total of companies *e* of the towns *i* that experience a negative variation in employment during the year.

Descriptive statistics

In Table 3, we present some statistics on the indicators used for our analysis in taking into account the different spatial regimes used previously. Firstly, we come back to fact already highlighted by Figure 2: the net duration of unemployment varies strongly depending on locality and notably on the distance from the centre of Paris. The Parisian arrondissements (central city districts) as well as the closest suburbs are effectively those which record the longest net durations of unemployment, with an average duration of around 11.2 months. Conversely, the most favourable towns are those situated the furthest but not on the fringe of the region.

On average, the towns are located at 40 kilometres from the centre, but almost half of the sample is at more than 39 kilometres. We could suspect that these towns suffer from a particularly poor accessibility to jobs, according to the idea that jobs are mostly concentrated in the centre. Actually, the density of employment varies strongly according to the distance from the centre. The indicator is less than one in proximity to Paris because of the concentration of population and so its density is very high. For the year 2007, Paris and its inner ring counted more than 6,500,000 inhabitants (56% of the total population of the region), whereas the land area is 762 km² against more than 12,000 km² for the whole of the region (about 6%). On the other hand, the ratio is higher than one for the towns at a good distance from the centre, which is beyond 13 kilometres. This means that the competition within the labour force to find a job is possibly less strong. At the same time, the indicator does not allow us to know if it is high because of a large reservoir of jobs or a low level of workforce, which does not give us the same reality.

Table 3. Indicators according to locality

Variables	Ile-de-France	Distance to centre < 13 km	13 km >& < 39 km	> 39 km
Net duration of unemployment (in months)	10,759	11,192	10,223	11,101
	1,285	*0,788*	*1,292*	*1,215*
Spatial Mismatch				
Distance to centre (in km)	40,291	8,19	26,749	57,719
	21,006	*3,313*	*7,459*	*13,26*
Job density (radius : 20 km)	1,406	0,951	1,265	1,588
	0,298	*0,079*	*0,259*	*0,212*
Skill Mismatch				
JLS Index	0,018	0,011	0,015	0,021
	0,014	*0,007*	*0,013*	*0,014*
Skill Mismatch for NQ	0,134	0,139	0,118	0,145
	0,054	*0,063*	*0,05*	*0,052*
Local dynamisme				
Creation rate (standardised)	1,027	1,537	0,993	0,521
	4,727	*2,121*	*1,953*	*1,299*
Destruction rate (standardised)	1,089	1,873	1,089	0,62
	3,635	*2,645*	*2,633*	*1,193*
Observations	**1 075**	**110**	**429**	**536**

Sources Pôle emploi FHS, DADS 2002-2005, population census 1999 (INSEE).
Notes: The differences types are presented in italics. The statistics concern the 1075 towns for which the duration of unemployment could be calculated.

The JLS indicator takes a higher value for the towns far from the centre. This may be a first indication of a mismatch of skills for some categories in these towns. The measure of the difference between the rate of people without degrees and local unqualified employment dynamism in the towns reveals a logic that is little different. The indicator is higher for the towns in the centre and those that are relatively far. The difference is lower for the towns at a middle distance, which tends to show that the situation there is more favourable for the unqualified.

Finally, we observe that the dynamism of the towns is strongly linked to their proximity to the centre of the region. The rates of creation and destruction (standardised) are the highest in the centre and the lowest in the furthest towns. The relatively high values for these two indicators show large movements of manpower and so a higher turn-over. Therefore, we can suppose that the weak dynamism for the towns most at the fringe could be a brake on a rapid exit from unemployment.

All these facts show the value of “cutting up” the country. It is highly probable that each of these indicators produces differentiated effects depending upon the zone. The following section presents the results of different estimations from the three spatial regimes previously defined.

Model specification

As a starting point, we consider the following model to explain the duration of unemployment in towns where it can be calculated:

$$Y_i = \alpha + \boldsymbol{\beta X_i} + \boldsymbol{\gamma SP_i} + \boldsymbol{\delta SK_i} + \boldsymbol{\varepsilon_i} \quad \textbf{(1)}$$

Where Y_i is the duration of unemployment for a given town i. X_i is the vector of control variables. It includes certain information relative to local dynamism in terms of employment and relative to the socio-economic composition of the town. SP_i is a vector of variables measuring the accessibility of jobs for each town in the region. SK_i is a vector of variables relative to the local mismatch between skills of individuals and those required for employment.

In presence of spatial auto-correlation, this model can not be estimated by the standard Ordinary Least Squares (OLS) method, because the covariance between the observations is no longer nil. According to the literature, two traditional models could be identified to take auto-correlation into account (LESAGE, 1998; LE GALLO, 2002): a SAR model in which the dependent variable follows a spatially autoregressive process or a SEM model in which spatial dependance relates to errors. *A priori*, both models are applicable. With the SAR model, the spatial auto-correlation of observations is captured by an endogenous variable that is spatially offset (W*y*) and reflects the idea according to which the duration of unemployment in the town is influenced by those of neighbouring towns. With the SEM model, we consider the spatial dependance as a statistical nuisance that can be explained by problems of incorrect specifications (variables omitted, wrong geographic scale, etc.). In our case, spatial auto-correlation could result from two different sources. On one hand, it is probable that there is a problem of variables omitted, because we use only few explicative variables to concentrate on the problems of *Spatial* and *Skill Mismatch.* On the other hand, there could be a problem due to the scale of the analyis retained. The way the spatial data is aggregated could have an effect on the measure of spatial auto-correlation[7]. We suppose that the scale used during the collection of data (the town scale) is aggregated, and could effectively not correspond to the

[7] It is a "Modifiable Areal Unit Problem" (MAUP) (LE GALLO, 2002). This includes two potential problems: (i) the spatial auto-correlation by the level of aggregation used. We talk about the scale effect. (ii) The way of dividing a zone into several subdivisions creates numerous spatial configurations. The auto-correlation could be linked to this problem of the form of spatial units.

scale of the process that we are studying. This gives rise to measurement errors. In this case, the model used must be the SEM. We use the following specification, where the parameters of the equation are estimated by the Maximum-Likelihood method (ML) or by the Generalised Method of Moments (GMM):

$$Y_i = \alpha + \boldsymbol{\beta X_i} + \boldsymbol{\gamma SP_i} + \boldsymbol{\delta SK_i} + \boldsymbol{\varepsilon_i} \qquad \textbf{(2)}$$

$$\text{with } \varepsilon = \lambda W \varepsilon + u \text{ et } u \backsim N(0, \sigma^2 I)$$

where λ is the parameter representing the intensity of the spatial dependance between the residuals of the regression. This dependance is referred to as spatial dependence nuisance.

We start with the hypothesis that the problems of *Spatial* and *Skill Mismatch* do not have the same effect depending on the locality of jobseekers. We could imagine that the problems of accessibility of jobs affect more the inhabitants of towns further from centre or more on the fringe of the region, for example. Similarly, one of our working hypotheses is the idea that jobseekers located in Paris or its inner suburbs are confronted by problems of mismatch between job skills offered and demanded, rather than problems of distance from employment centres.

We consider that there is a discrete spatial heterogenity that takes the form of different spatial regimes relative to the distance from the centre of the region. This aspect could be considered under the form of group heteroscedasticity or/ and a structural instability between the different regimes (LE GALLO, 2004). This heteroscedasticity is shown by the variability of variances in terms of errors according to locality. It could come from missing variables or an incorrect specification of the model. Then we expressly consider three following dichotomous variables:

$$D_{1i} = \begin{cases} 1 \text{ } if \text{ the } town\ i \text{ is at a distance < 13 km from the centre of Paris} \\ \text{0 otherwise} \end{cases}$$

$$D_{2i} = \begin{cases} 1 \text{ if the town } i \text{ is at a distance > 13 km et < 39 km from the centre of Paris} \\ \text{0 otherwise} \end{cases}$$

$$D_{3i} = \begin{cases} 1 \text{ if the town } i \text{ is at a distance > 39 km from the centre of Paris} \\ \text{0 otherwise} \end{cases}$$

We also estimate the following model with permits us to incorporate the three spatial regimes and a group heteroscedasticity:

$$\begin{bmatrix} Y_1 \\ Y_2 \\ Y_3 \end{bmatrix} = \begin{bmatrix} \alpha_1 \\ \alpha_2 \\ \alpha_3 \end{bmatrix} \begin{bmatrix} D_1 & 0 & 0 \\ 0 & D_2 & 0 \\ 0 & 0 & DL_3 \end{bmatrix} + \begin{bmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \end{bmatrix} \begin{bmatrix} X_1 & 0 & 0 \\ 0 & X_2 & 0 \\ 0 & 0 & X_3 \end{bmatrix} + \begin{bmatrix} \gamma_1 \\ \gamma_2 \\ \gamma_3 \end{bmatrix} \begin{bmatrix} SP_1 & 0 & 0 \\ 0 & SP_2 & 0 \\ 0 & 0 & SP_3 \end{bmatrix} + \begin{bmatrix} \delta_1 \\ \delta_2 \\ \delta_3 \end{bmatrix} \begin{bmatrix} SK_1 & 0 & 0 \\ 0 & SK_2 & 0 \\ 0 & 0 & SK_3 \end{bmatrix} + \begin{bmatrix} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \end{bmatrix}$$

with $\varepsilon_i = \lambda W \varepsilon_i + u_i$ et $u_i \backsim N(0, \sigma_i^2 I_i)$, for i = 1,2,3. The classification of towns in the three regimes allows us to test the hypothese on the constancy of the parameters of the model between the different regimes with the help of statistical tests of structural instability (Chow asymptotic test). The parameters are estimated by the Maximum-Likelihood method (ML) and by the Generalised Moments Method (GMM).

Finally, recourse to aggregated regressions permits us to show up the spatial relations contributing to the formation of unemployment at a town level. Using net durations permits us to control for possible effects of composition of jobseekers (for example, a town with a high proportion of low-qualified jobseekers has a high unemployment rate because, all things being equal, there are more unemployed). We reason as if each town had the average composition for the region.

ESTIMATIONS RESULTS

Firstly, we present the results of the estimations without distinguishing between the different spatial regimes (Table 4). The first column presents the results of an OLS model with the use of the matrix of variance-covariance corrected for heteroscedasticity by the White procedure. The Breusch-Pagan test (White test) effectively reveals the presence of heteroscedasticity in the model and requires us to take it into account[8]. The Jarque-Bera test shows, for its part, that the residuals of the model follow normal distribution[9].

Firstly, we observe that the socio-economic composition determines the chances of exit from unemployment in the towns. Towns that are considered the most disadvantaged by their characteristics are the localities the most disadvantaged for a rapid exit from unemployment. Conversely, the most advantaged towns by composition (types I and II) are those where the observed durations of unemployment are lowest. However, concerning these indicators, two limitations must be kept in mind. Firstly, we cannot say which characteristics of this summary indicator contribute the most to explain unemployment duration. Secondly, it is difficult to say if it is the specific characteristics of each individual that have an effect (for example, the fact of being a manager) or more the external factors due to the composition of the neighbourhood (the fact of having managers as neighbours).

[8] The null hypothesis is that of homoskedasticity. We reject the null 'hypothesis if the test statistic (nR^2) is higher than the value obtained in the Khi-deux table. See chapter 8 in the book of WOOLDRIDGE (2002).

[9] The null hypothesis is that the residuals of the model follow normal distribution. To know if we accept this hypothesis, we compare the Jarque-Bera statistic with that in the Khi-deux table at two degrees of freedom. If the estimated value of the Jarque-Bera statistic is lower, we accept the null hypothesis.

Concerning the *Spatial Mismatch* indicators, we see that the distance to the centre increases the average duration of unemployment. So the furthest towns from the principal centre of employment are equally those confronted with the longest durations. This fact suggests that poor accessibility to jobs is effectively a brake on the exit from unemployment because it impedes the process of finding a job. This result is in line with those already found by GOBILLON and SELOD (2007), DUGUET *et al.*(2009). The density of jobs (understood as the ratio between jobs and labour force) in a radius of 20 kilometres shows no significant effect. The relative abundance of jobs locally and/or the potential competition in the workforce does not seem to have an impact on the average duration of unemployment. The indicators used to measure the *Skill Mismatch* problem show the same thrust. However, we observe an effect both positive and significant uniquely for our indicator of poor matching of skills for the unqualified (NQ). If there is a problem of matching between skills offered and demanded, it essentially concerns the unqualified.

Finally, we find that local dynamism has a significant impact on unemployment duration disparities. Living in a town where the rate of job creation is high tends to decrease the duration, while a high rate of destruction increases it. This can be explained by weak local dynamism that decreases the chances of finding a job. The two others columns in Table 4 present the results of the SEM model. The second and third columns present the results estimated by the Maximum-Likelihood method (ML) and by the generalised method of moments (GMM) respectively. Whatever the method, we see that λ is positive and significant at the 1% level. This shows the importance of auto-correlation problem in what concerns error terms and so the necessity of taking it into account in our estimations. Globally, the results are the same as in the model estimated by OLS. We see that the indicator inspired by Jackman, Layard and Savouri to measure *Skill Mismatch* is now significant. The problem of mismatch does not only concern the unqualified, but all the levels of qualification. It is likely that its effect is partially absorbed by the effect of the unqualified's own mismatch. Finally, let us note that the effect of local dynamism is sensitive to the method of estimation used because, if the signs and the sized observed do not change, their significativity varies from one estimation to another.

Table 4. Explaining the durations of unemployment

Variables	OLS-White	SEM-ML	SEM-GMM
Constant	10,124***	10,281***	10,278***
	0,305	*0,331*	*0,306*
Typology (Ref. Type IV)			
Type I	-0,555***	-0,328**	-0,339**
	0,166	*0,119*	*0,124*
Type II	-0,613**	-0,248**	-0,266**
	0,165	*0,118*	*0,112*
Type III	-0,248	-0,212	-0,216
	0,202	*0,148*	*0,138*
Spatial Mismatch			
Distance to centre (in km)	0,014***	0,014**	0,014**
	0,003	*0,005*	*0,005*
Jobs density	0,029	-0,074	-0,073
(radius : 20 km)	*0,175*	*0,19*	*0,161*
Skill Mismatch			
JLS Index	3,34	5,505**	5,431*
	3,008	*2,392*	*3,259*
Skill Mismatch for NQ	3,537***	1,322*	1,430**
	1,019	*0,691*	*0,635*
Local dynamism			
Creation rate (standardised)	-0,075**	-0,027	-0,029*
	0,035	*0,022*	*0,016*
Destruction rate (standardised)	0,060**	0,025	0,026**
	0,028	*0,018*	*0,013*
λ		0,767***	0,778***
		0,022	*0,022*
R²	0,111	0,089	0,092
Log likelihood		-1 383,87	
AIC		2787,742	
Tests			
Jarque-Bera	3,061		
Breusch-Pagan	26,458**		
Observations	**1 075**	**1 075**	**1 075**

*Sources :*Pôle emploi FHS, DADS 2002-2005, population census 1999 (INSEE).
Notes : ***, ** and * denote significance at the 1%, 5% and 10% levels respectively. Standard deviations presented in italics.

Table 5 presents the result of our estimations with a spatial regimes model. We recall that each regime is determined by its distance from the centre (see previous section for more details)[10]. The estimations are done by the Maximum-Likelihood Method and the Generalised Moments Method. The typology of the towns is not introduced here because the distribution within the different types of towns conflicts with the arrangement of spatial regimes. We

[10] We have tested different spatial regimes to verify the robustness of our results. With only two regimes, we have on one side the towns whose distance is less than 39 kilometres from the centre (50% of our sample) and on the other the towns whose distance is more (also 50%). The results are globally close to those we find in distinguishing the three regimes.

show in Annex D that the results are not really affected by the introduction of our socio-economic composition indicator.

Overall, although few of the variables show significant effects, we observe a certain number of differences between the regimes and so the localities of the towns. It would appear that the problems of *Skill Mismatch* (for the whole population or only the unqualified) exclusively concern the towns near the centre of Paris. These problems no longer arise when we look at the third regime, which includes the 50% of the towns furthest from the centre. Conversely, if the proximity to the principal employment centre does not seem to be an advantage for jobseekers living there, it does however represent a net disadvantage for the residents of the most distant towns. For the towns beyond a radius of 39 kilometres, we can note that going a little further increases the duration of unemployment. Finally, local employment dynamism also influences the average duration of unemployment, but exclusively for the furthest towns. We could suppose that the rates of creation and destruction have only minor importance for the residents of towns close to a considerable source of jobs. On the other hand, this is an important factor for those concerned by poor physical access to jobs and/or who have more limited job opportunities than others.

Table 5. Explaining durations of unemployment – Analysis by spatial regime

	SEM-ML			SEM-GMM		
Variables	D_1	D_2	D_3	D_1	D_2	D_3
Constant	11,420***	9,896***	9,684***	11,333***	9,966***	9,678***
	1,149	*0,634*	*0,679*	*0,492*	*0,586*	*0,528*
Spatial Mismatch						
Distance to centre (in km)	-0,058	0,019	0,022**	-0,052	0,015	0,021**
	0,081	*0,024*	*0,009*	*0,047*	*0,019*	*0,008*
Jobs density	-0,172	-0,542	0,048	-0,173	-0,520	0,075
(radius: 20 km)	*0,947*	*0,511*	*0,217*	*0,393*	*0,515*	*0,159*
Skill Mismatch						
JLS Index	4,42	10,285***	-0,694	3,786	10,503**	-0,869
	16,074	*3,147*	*3,798*	*12,733*	*4,557*	*4,757*
Skill Mismatch for NQ	3,143	3,27***	0,291	3,409*	3,301***	0,354
	2,508	*0,926*	*0,811*	*1,96*	*0,892*	*0,756*
Local dynamism						
Creation rate (standardised)	0,021	-0,024	-0,037	0,024	-0,027	-0,039**
	0,078	*0,034*	*0,031*	*0,049*	*0,029*	*0,018*
Destruction rate (standardised)	-0,036	0,017	0,067**	-0,035	0,018	0,069**
	0,068	*0,026*	*0,034*	*0,037*	*0,022*	*0,026*
λ		0,748***			0,754***	
		0,023			*0,024*	
σ^2	0,384	0,741	0,647			
R^2		0,169			0,172	
Log likelihood		-1 373,35				
AIC		2 788,70				
Tests						
Chow		29,930**			51,179***	
Observations	**110**	**429**	**536**	**110**	**429**	**536**

*Sources :*Pôle Emploi FHS, DADS 2002-2005, population census 1999 (INSEE).
Notes: ***, ** and * denote significance at the 1%, 5% and 10% levels respectively. Standard deviations in italics.

Using these estimations with spatial regimes permits to highlight the differentiated effects of the explanations of unemployment duration disparities. The problems of *Skill Mismatch* seem to affect more the towns close to the centre of Paris, whereas the problems of *Spatial Mismatch* are more evident for the towns the furthest from this centre. We must bear this distinction in mind when we suggest public policy solutions.

CONCLUSION

The residents of central Paris are confronted with an abnormally long duration of unemployment. In the middle of the 2000s, the duration of unemployment was 14 months in Paris compared to 11.5 months in the Paris region and 10.5 months for France. Paris was the French department where the proportion of jobseekers of more than a year among the total jobseekers was the highest before the crisis. Paris is not an optimal location from the point of view of return-to-employment, all things being equal. A fringe location, in the inner ring or on the edge of the metropolitan area, but without going too far, is preferrable for reducing the duration of unemployment of a jobseeker.

The objective of this work is to explain this overexposure of Parisians to long-term unemployment. It is to find a factor that affects all the categories of jobseeker, whatever their age, sex, nationality, level of educational qualifications, marital situation, number of children, type of contract sought, trade sought, reason for entering unemployment, all the control variables we use to measure the durations of unemployment. We also seek a sufficiently important factor to have a significant effect on the individual durations of unemployment of 110,000 Parisian jobseekers, and sufficiently durable to exercise an effect over the last 30 years.

The explanation that we offer combines two theoretical mechanisms, *Spatial Mismatch* and *Skill Mismatch*. Parisian jobseekers live close to a high-volume source of jobs but the characteristics of the jobs offered do not correspond to those of jobs sought. However, the job offers that do effectively correspond to the characteristics of jobseekers are generally physically far from the centre of Paris, in the intermediate ring of the Paris metropolitan area. Then, Parisian jobseekers experience a longer jobsearch time than jobseekers of other towns and departments.

This explanation does not exclude other factors playing a role, without us being able to furnish empirical evidence. For example, the Paris stock of public housing could contribute to limiting the geographic mobility of jobseekers. According to the City of Paris, this stock includes 183,500 dwellings subsidised by the central government, the City and the region, to which we add 56,000 intermediate dwellings managed by providers of social housing, but the annual offer is limited to 13,000. Therefore it is very difficult to accede to public housing in Paris, which gives it a higher importance and promotes geographical immobility, which then reduces the perimetre of a jobsearch and increases its duration. The welfare policies of the City of Paris, informal work in the hotels-cafés-restaurants sector and in culture, or even the problems of employment policy in Paris, constitute other factors that could also contribute to lengthening the Parisian duration of unemployment.

References

ARNOTT R. (1998), «Economic theory and the Spatial Mismatch hypothesis», *Urban Studies*, 35(7), pp. 1171-1185.

BAUDER H. and PERLE E. (1999), «Spatial and skills mismatch for labor market segments», *Environment and Planning A*, 31(6), pp. 959-979.

BOUABDALLAH K., CAVACO S. and LESUEUR J-Y. (2002), « Recherche d'emploi, contraintes spatiales et durée du chômage : une analyse microéconométrique », *Revue d'économie politique*, n° 1, pp. 137-157.

BRUECKNER J. and ZENOU Y. (2003), «Space and Unemployment: The labour-Market effects of Spatial Mismatch», *Journal of Labour Economics*, 21(1), pp. 242-262.

CARLSON V. and THEODORE N. (1995), «Are There Enough Jobs? Welfare Reform and Labor Market Reality», *Chicago: Illinois Job Gap Project*.

CAVACO S. and LESUEUR J-Y. (2004), « Contraintes spatiales et durée de chômage », Revue Française d'Economie, 18(3), pp. 229-257.

COULSON E., LAING D. and WANG P. (2001), «Spatial mismatch in Search Equilibrium», *Journal of Labour Economics*, 19, pp. 949-972.

DANZIGER S. and HOLZER H., «Are Jobs Available for Disadvantages Groups in Urban Areas?», *Working paper, Michigan State University and University of Michigan*, 97-406.

DAVIS S. and HALTIWANGER J. (1990), «Gross Job Creation and Destruction: Microeconomic Evidence and Macroeconomic Implications», *NBER Macroeconomics Annual*.

DAVIS S. and HUFF D. (1972), «Impact of Ghettoization on Black Employment», *Economic Geography*, 48, pp. 421-447.

DÉTANG-DESSENDRE C. and GAIGNÉ C. (2009), «Unemployment Duration, City Size, and the Tightness of the Labor Market», *Regional Science and Urban Economics*, 39(3), pp. 266-276.

DUGUET E., GOUJARD A. and L'HORTY Y. (2009), « Les inégalités territoriales d'accès à l'emploi : une exploration à partir de sources administratives exhaustives », *Economie et Statistique*, 415-416, pp. 17-44.

DUGUET E., L'HORTY Y. and SARI F. (2009), « Sortir du chômage en Ile-de-France, Disparités territoriales, *spatial mismatch* et ségrégation résidentielle», *Revue Economique*, 60(4), pp. 979-1010.

GASCHET F. and 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*, vol. 19.

GOBILLON L., MAGNAC T. and SELOD H. (2011), «The Effect of Location on Finding a Job in the Paris Region», *Journal of Applied Econometrics*, 26(7), pp. 1079-1112.

GOBILLON L. et SELOD H. (2007), « Ségrégation résidentielle, accès à l'emploi et chômage : le cas de l'Ile-de-France », *Economie et Prévision*, 180-181, pp. 19-38.

GOBILLON L., SELOD H. and ZENOU Y. (2007), «The Mechanisms of Spatial Mismatch», *Urban Studies*, 44(12), pp. 2401-2427.

GORDON I. (2002), «Unemployment and Spatial Labour Markets: Strong Adjustment and Persistent Concentration», *in* Ron M. et Morrison P., (eds.), *Geographies of Labour Market Inequality. Regional development and public policy*, London: Taylor and Francis.

HOUSTON D. (2005), «Employability, Skills Mismatch and Spatial Mismatch in Metropolitan Labour Markets», *Urban Studies*, 42(2), pp. 221-243.

IHLANDFELT K. et SJOQUIST D. (1990), «Job Accessibility and Racial Differences in Youth Employment Rates», *The American Economic Review*, 80(1), pp. 267-276.

IHLANDFELT K. and SJOQUIST D. (1991), «The Effect of Job Access on Black and White Youth Employment: A Cross-Sectional Analysis», *urban Studies*, 28 (2), pp. 255-265.

JACKMAN R., LAYARD R. and SAVOURI S. (1990), «Labour Market Mismatch: a Framework of Though», *in* Paoda-Schioppa F. (eds), *Mismatch and Labor Mobility*, Cambridge University Press.

JAYET H. (1993), *Analyse Spatiale Quatitative, Une Introduction*, Paris, Economica.

KAIN J. (1968), «Housing Segregation, Negro Employment, and Metropolitan Decentralization», *Quarterly Journal of Economics*, 82, pp.175-197.

KORSU E. and WENGLENSKI S. (2010), «Job Accessibility, Residential Segregation and Risk of Long-Term Unemployment in Paris Region», *Urban Studies*, 47(10), pp.2279-2324.

LE GALLO J. (2002), « Économétrie spatiale : l'auto-corrélation spatiale dans les modèles de régression linéaire », *Économie et Prévision*, 155, p. 139-157.

LE GALLO J. (2004), « Hétérogénéité spatiale, principes et méthodes », *Economie et Prévision*, 162, pp. 151–172.

LESAGE J.P. (1998), «Spatial Econometrics», Université de Tolède, Mimeo.

MANACORDA M. and PETRONGOLO B., «Skill Mismatch and Unemployment in OECD Countries», *Economica*, 66, pp. 181-207.

PASTOR J. and MARCELLI E. (2000), «Men in the hood: Skill, Spatial, and Social Mismatches among Male Workers in Los Angeles County», *Urban Geography*, 21(6), pp. 474-496.

ROGERS C. (1997), «Job Search and Unemployment Duration: Implications for the Spatial Mismatch Hypothesis», *Journal of urban Economics*, 42(1), pp. 109-132.

RUPERT P., STANCANELLI E. and WASMER E. (2009) «Commuting, Wages and Bargaining Power», *Annales d'Économie et de Statistiques*, 95-96, pp. 201-221.

STOLL M. (2005), «Geographical Skills Mismatch, Job Search and Race», Urban Studies, 42(4), pp. 695-717.

THISSE J-F. and ZENOU Y. (2000), « Skill Mismatch and Unemployment », *Economics Letters*, 69, pp. 415-420.

WOOLDRIDGE J. (2002), *Introductory Economics: A Modern Approach*, South-Western College Publishing, U.S.

Annexes

Annex A. Individual determinants of exits from unemployment

	Removal from list		Return to work	
	Coefficient	**Student**	**Coefficient**	**Student**
α	0,917	2252,53	0,843	1148,88
Age (years)	-0,018	236,17	-0,036	234,27
Permanent contract	**réf**		**réf**	
Limited-term contract	-0,382	125,96	-0,491	87,52
Seasonal	-0,104	37,21	-0,168	31,29
Degree level VI	**réf**		**réf**	
Level I et II	-0,001	0,40	0,364	59,17
Level III	0,032	11,30	0,361	66,17
Level IV	-0,030	13,02	0,186	40,06
Level V	-0,051	30,29	0,074	19,93
Without children	**réf**		**réf**	
One child	-0,077	41,31	0,017	4,50
Two children	-0,079	37,41	0,224	56,22
Three or more children	-0,055	22,75	0,235	47,71
Man	**réf**		**réf**	
Woman	-0,062	40,20	-0,223	77,02
Non disabled	**réf**		**réf**	
Disabled	-0,274	98,01	-0,621	94,96
Single, widowed	**réf**		**réf**	
Divorced, separated	0,031	12,44	-0,009	1,83
Married, de facto married	-0,003	1,51	-0,011	3,21
ROME : Serv persons and community	**réf**		**réf**	
Administrative and sales	0,024	10,00	0,039	8,01
Hotels restaurants	0,313	105,82	0,499	84,00
Sales and distribution	0,124	52,34	0,151	30,27
Arts and entertainment	-0,523	102,18	-1,013	86,48
Initial and continuing education	-0,073	13,71	-0,072	7,56
Social work devt local employment	0,042	11,06	0,022	2,93
Paramedical	0,205	37,32	0,315	31,95
Medical	0,025	2,16	0,144	7,26
Managers admin/ communic. information	-0,060	15,70	-0,090	12,47
Managers sales	-0,028	6,21	-0,004	0,50
Agriculture and fisheries	0,102	24,17	0,229	27,35
Public works and extraction	0,190	55,82	0,323	45,34
Transport and logistics	0,010	3,66	0,096	16,82
Mechanical electrical electronic	0,049	14,74	0,094	14,20
Processing	-0,088	20,16	-0,010	1,20
Other manufacturing	0,005	0,97	0,113	9,89
Personal artisanal	0,206	45,12	0,309	34,14
Industrial management	0,117	8,61	-1,873	153,72
Industrial technician	0,037	8,31	0,002	0,20
Management technical industries	0,069	12,28	0,080	8,25
Technical managers outside manufacturing	0,146	27,45	0,195	20,66
Lay-offs for financial reasons	**réf**		**réf**	
Other lay-offs	0,053	18,65	-0,042	8,27
Resignations	0,507	153,49	0,389	63,94
End of contracts	0,292	110,40	0,421	89,42
End of temp work	0,275	86,04	0,236	39,60
First entry	0,568	166,56	0,363	53,66
Return to work of more than 6 months	0,489	115,46	0,309	35,25
Other cases	0,367	137,21	0,153	30,34

Manual workers	**réf**		**réf**	
Skilled workers	0,027	11,12	0,185	36,97
Unskilled employees	-0,008	3,34	-0,051	9,25
Skilled employees	-0,025	10,17	0,144	27,55
Technician, supervisor	-0,003	0,96	0,204	30,85
Manager	-0,030	6,99	0,155	18,80
Non RMI	**réf**		**réf**	
RMI	-0,212	105,27	-0,587	114,12
Full-time	**réf**		**réf**	
Part-time	-0,226	120,70	-0,555	132,22
Nationality French	**réf**		**réf**	
EU 15	0,066	14,39	0,094	10,35
Rest of world	-0,002	0,79	-0,197	35,26

Reading: Results of estimations of Weibull model by Maximum-Likelihood. The coefficients apply to rates of exit from unemployment (i.e. hazard function) in relation to the modality of reference indicated in the table.
Source: Historical statistical records of Pôle Emploi.

Annex B. Results of ACP and CAH

Table B-1. Coordinates, contributions et cosines squared of variables

	Coordonates		Contributions		Cosines squared	
Variables	**Axis 1**	**Axis 2**	**Axis 1**	**Axis 2**	**Axis 1**	**Axis 2**
Proportion of families with foreigner head	-0,12	-0,84	0,45	34,03	0,02	0,70
Proportion of single-parent families	-0,08	-0,75	0,19	27,23	0,01	0,56
Proportion of pers. Low qualified	-0,68	0,53	13,40	13,36	0,47	0,28
Proportion of pers.. >High school diploma +2 years	0,81	0,05	19,01	0,11	0,66	0,00
Proportion of managers	0,90	-0,16	23,18	1,32	0,81	0,03
Proportion of manual workers	-0,82	0,11	19,43	0,59	0,68	0,01
Average income	0,78	0,07	17,51	0,25	0,61	0,01
Unemployment rate	-0,49	-0,69	6,83	23,12	0,24	0,48

Source : population census INSEE (1999).
Fields : Analysis in principal components effected on 1300 towns of Ile-de-France region.

Table B-2. Descriptive statistics of types of towns used for CAH.

	Type I		Type II		Type III		Type IV		Total	
Variables	**Av.**	***Standard-deviation***	**Av.**	***Standard-deviation***	**Av.**	***Standard-deviation***	**Av.**	***Standard-deviation***	**Av.**	***Standard-deviation***
Proportion of families with foreigner head	7,14	*0,04*	5,37	*0,03*	4,69	*0,03*	16,49	*0,06*	6,38	*0,05*
Proportion of single-parent families	9,85	*0,05*	8,42	*0,04*	7,45	*0,05*	16,39	*0,03*	9	*0,05*
Proportion of pers. Low qualified	14,34	*0,04*	23,22	*0,03*	26,54	*0,04*	21,16	*0,03*	22,99	*0,05*
Proportion of pers.. >High school diplom+2	12,31	*0,02*	10,56	*0,02*	6,73	*0,02*	7,14	*0,02*	9,18	*0,03*
Proportion of managers	42,12	*0,09*	20,63	*0,07*	10,5	*0,05*	12,28	*0,07*	19,25	*0,12*
Proportion of manual workers	9,75	*0,05*	18,51	*0,05*	32,21	*0,09*	27,59	*0,07*	22,84	*0,11*
Average income	37 417	*13 778*	23 487	*3 787*	19 944	*3 275*	15 545	*2 538*	23 394	*8 418*
Unemployment rate	7,39	*0,02*	7,38	*0,02*	9,26	*0,03*	15,61	*0,03*	8,77	*0,03*
Number of towns	**171**		**569**		**442**		**118**		**1300**	

Source : population census INSEE (1999).
Fields : Analysis in principal components effected on 1300 towns of Ile-de-France region.

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