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# Housing ownership, social housing and unemployment: an econometric analysis of the Paris area

Emmanuel DUGUET \*, Yannick L'HORTY \* and Florent SARI \*\*

## ABSTRACT

In order to explain the spatial inequalities in unemployment-to-work transitions in the Paris area, we use an exhaustive administrative data set from the French National Employment Agency (Agence Nationale pour l'Emploi). We find strong local disparities between *communes*, even when we control for a large number of socio-economic variables. In order to explain this geography, we investigate the effects of the urban structure on unemployment-to-work transitions. Our results suggest an extension of Oswald's findings (1999): the unemployment-to-work transitions are lower in the areas that have either a higher than average proportion of housing ownership or a higher proportion of social housing. Furthermore, the former effect appears only when the latter is controlled for.

**JEL Classification:** C41, J64, R1.

**Keywords:** Unemployment, residential segregation, housing ownership, social housing.

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## 1. Introduction

The Paris area is the third most populated in Europe, with more than 12 million inhabitants, and is by far the most important centre of employment in France. Paradoxically, in this agglomeration where the standard of living is higher than in the rest of France or Europe, unemployment is quite high, especially within the city of Paris itself. The aim of the present study is to analyse spatial disparities in terms of unemployment duration in the Paris area using flow indicators at the commune level or at the post code level when the commune is too small to allow for statistical analysis. The chances of leaving unemployment are estimated for each commune by means of econometric techniques applied to micro-data from administrative sources. We estimate the probability of leaving unemployment for each commune as if it had the average age, sex and qualifications structure of the Paris area (Ile-de-France)<sup>1</sup>.

Local disparities between Ile-de-France towns are strong, whatever indicator we use to evaluate them. They remain high when we control for differences in age, sex or qualification distribution. And yet, vast zones of the Ile-de-France have very similar durations of unemployment. The present article seeks to explain these disparities between communes using the theoretical background provided by spatial economics. Our aim is to understand how the organization of the urban space influences the economic opportunities of its inhabitants.

Studying the exit from unemployment rate from a spatial perspective is not a new idea. In 1968, Kain argued that the disconnection between the place of residence and the place of work (the “spatial mismatch”) could impede the exit from unemployment for the more fragile populations. Following this intuition, a large number of studies have been produced in the United States on the spatial organization of cities and the related unemployment problems (Ihlanfeldt and Sjoquist, 1990; Rogers, 1997; Immergluck, 1998; etc.). Most of these developments focused on local American labour markets, while the literature on European cities is scarcer. In empirical studies, unemployment disparities are often explained by problems of access to job opportunities, by residential segregation effects or by housing

ownership effects. We mobilize these different arguments in order to explain inter-commune disparities in unemployment-to-work transitions within the Paris area.

The first section describes the methodology we have used to measure the probability of exiting unemployment. The second section presents the determinants of spatial disparities. The final section estimates the impact of these determinants on the flows out of unemployment.

## **2. Measurement issues**

This study covers all unemployed workers who are registered by the ANPE (the French National Employment Agency), whether they receive benefits or not. The data are drawn from the exhaustive version of the ANPE's *Fichier Historique Statistique* (FHS - historical statistics file). In order to follow the job-seekers over a sufficiently long time, we limited our study to the workers who registered between July 1<sup>st</sup>, 2001 and June 30<sup>th</sup>, 2002. Our data were updated on March 31<sup>st</sup>, 2006.

### **2.1. Definition of the exit from unemployment**

There are many ways to exit the ANPE file, including the failure to sign on or removal from the file for administrative reasons. In this paper, we restrict our analysis to the cases where the unemployed found a job. In the other cases, we consider that the duration is censored. Overall, with this definition, there were 308,619 exits from unemployment declared by the cohort of job-seekers who registered in the Ile-de-France region between July 1<sup>st</sup>, 2001 and June 30<sup>th</sup>, 2002 and who were monitored until March 31<sup>st</sup>, 2006.

We compute a “net duration” of unemployment in order to distinguish the territorial effects from the effects of the individual variables. A net duration is defined as the duration of unemployment that we would observe if the job-seekers had the same characteristics in every territory (that is, *ceteris paribus*). Technically, the net duration is obtained by estimating a commune fixed effect duration model. In addition to the commune fixed effects, this model includes all the socio-economic characteristics of the job-seekers, making it possible to estimate a *ceteris paribus* territorial effect. The duration of unemployment is modelled using a Weibull specification<sup>2</sup>. We also set a minimum number of 100 unemployed workers registered in each commune. Below this number, we group together the communes that share the same post code, provided that they also have fewer than 100 job-seekers. If there are

fewer than 100 job-seekers in the whole post code area, we discard the corresponding communes from the data set. The socio-economic variables used to calculate durations are: sex, age, nationality, marital status, number of children, highest qualification obtained, handicap, type of job contract sought (long-term, short-term), profession, reason for unemployment, and situation regarding the RMI (the guaranteed minimum welfare payment).

## **2.2. Territorial effects**

The likelihood of leaving unemployment varies greatly from one commune to another in the Paris area. In the most 10% favourable communes, the duration of unemployment does not exceed 23.4 months, while it is more than 41.6 months in the 10% most unfavourable ones. Thus, the maps of unemployment duration display strong disparities in the unemployment duration for job-seekers (Figure 1)<sup>3</sup>.

The general pattern of the maps for the exit from unemployment in the Ile-de-France is concentric. The exit from unemployment is more infrequent in the centre and the furthest outskirts than it is in the intermediate peripheral zone. Thus, Paris and the inner suburbs are marked by the presence of large areas that are unfavourable to the exit from unemployment. Then there is a kind of ring around the inner suburbs where the average duration of unemployment is shorter. Finally, the communes that are the furthest away from the centre are generally characterized by long durations of unemployment. We can also observe territories that are uniformly favourable or unfavourable to the exit from unemployment. In the south of the Ile de France, for example, there is a large zone favourable to the exit from unemployment in the *département*<sup>4</sup> (a sub-regional administrative district) of the Essonne (in the south). There are also zones characterised by long durations of unemployment, which appear in dark grey on Figure 1.

## **[Insert Figure 1: Unemployment duration in the Paris area (Ile-de-France)]**

The geography of unemployment duration remains approximately the same whether we control for the individual characteristics of the unemployed or not. This means that, overall, the disparities between communes cannot be primarily explained by their differences in socio-economic composition. We have also checked that these results remain valid when we take into account the duration of exits. Most of the large areas we have identified as being favourable or unfavourable to employment remain almost unchanged when we restrict our analysis to the exits from unemployment that last for longer than 6 months.

Overall, the picture of spatial disparities in the exit from unemployment obeys a concentric logic, with the centre and the outer periphery presenting relatively low rates of access to employment, while the intermediate ring has high rates of exit from unemployment. The local duration of unemployment presents a flattened U-curve as a function of the closeness to the centre (Figures 2-1 and 2-2). The issue we then face is how to explain this geography for exits from unemployment.

### **3. Literature review**

Economic theory suggests that the location of individuals and the spatial organisation of towns can produce a spatial concentration of unemployment in some towns, through different series of mechanisms. Among them, we can identify the unfavourable role of the physical disconnection between areas of residence and employment opportunities (the hypothesis of spatial mismatch) or the negative effects of the residential segregation.

In this paper we also want to check for the role of housing tenure. We test an additional determinant: the local importance of social housing. In the Paris area, social housing represents 20% of total housing on average. Access to the social housing system is both difficult and lengthy, since only 40% of the applications are successful, and applicants have to wait for several years on average.

#### **3.1. The problems of accessibility to job opportunities.**

In a seminal paper published in 1968, J. F. Kain put forward the idea that living in areas far away from centres of employment has important consequences for unemployment

rates. This intuition led to the emergence of a vast literature in the United States, examining the possible relationship between the organisation of cities and the local labour market. Overall, this literature identifies two main mechanisms linking spatial mismatch to the situations experienced in the labour market by some inhabitants (Arnott, 1997).

The first mechanism derives from the commuting costs. A physical disconnection between the place of residence and the place of work can generate heavy commuting costs when some areas do not benefit from suitable public transport facilities. These costs can be exacerbated by problems of traffic congestion or low-quality public transport, which is very likely to be the case in the Paris area. In this situation, unemployed people living in neighbourhoods and/or towns that are disconnected from employment centres face financial and time costs that are too high compared with the wages they are offered (Coulson, Laing and Wang, 2001; Brueckner and Zenou, 2003).

The second mechanism concerns the different characteristics of the job-search process. Firstly, an individual living far from employment centres can experience difficulties in obtaining information about the jobs available (Rogers, 1997). For Simpson (1992), major cities are made up of a series of “islands” containing information about job opportunities. This information circulates freely within each island, but its transmission between different islands is costly. Under these conditions, looking for a job far from one’s home may prove to be too costly. As a consequence, individuals will look for jobs efficiently within a relatively limited zone, close to their place of residence, even if the jobs available in that area are of low quality (Davis and Huff, 1972). Other empirical studies have shown that the physical distance from the centres of employment tends to reduce the information available about job opportunities (Ihlanfeldt and Sjoquist, 1990, 1991). There are several explanations for this phenomenon, including the idea that companies may prefer relatively local forms of recruitment such as placing advertisements in local newspapers or in shop windows.

## **[Insert Figure 2: Distance from the centre of Paris and unemployment duration]**

### **3.2. Residential segregation and neighbourhood effects.**

Another series of arguments, that relates the spatial organisation of cities and problems of unemployment, focuses on the effects of residential segregation. To begin with, residential segregation can hinder the acquisition of human capital. For example, a concentration of students in difficulty can have a negative effect on the learning process, because the success of a given student depends on the socio-economic characteristics of the other students in his class (Bénabou, 1993). So, in neighbourhoods where there is a concentration of students in difficulty, the externalities of human capital exert a negative influence on educational success and future employability. Another direct consequence of this phenomenon is that these districts are often exposed to the emergence of social problems that can detract from the employability of job-seekers. In 1991, Crane developed the “epidemic theory of ghettos”, according to which the probability of a young person adopting a certain form of behaviour is highly correlated with the proportion of individuals who have already adopted that behaviour. This process is confirmed among the unemployed: when the adults in a neighbourhood are massively unemployed, young people are less motivated to look for a job. These fragile populations do not represent a model of success, and consequently they create very little incentive for the others to seek jobs.

Another mechanism arises from the fact that a large number of jobs are found through the intermediary of personal contacts, and low-qualified workers, young people entering the labour market and ethnic minorities use these informal methods more frequently (Holzer, 1988). Job-seekers living in districts with high unemployment rates have a high probability of knowing other unemployed people, making it hard for them to find jobs through their social networks. Individuals living in such disadvantaged areas are likely to have social networks of low quality.

Lastly, residential segregation is also likely to reduce the probability that individuals living in deprived areas will receive offers of employment, because employers may adopt discriminatory behaviour towards the inhabitants of some places. This kind of attitude arises because employers consider, on average, that the inhabitants of these stigmatised areas have worse working habits or are more likely to adopt deviant behaviour. In addition, in jobs where customer contact is essential, employers may discriminate against the inhabitants of deprived districts in order to satisfy the prejudices of their customers (Holzer and Ihlanfeldt, 1998).

### **3.3. Housing ownership and unemployment**

In the 1990s, A. Oswald argued that a high percentage of the unemployment observed in European countries may be explained by the increase in the rate of home ownership during the last decades. The main argument for his finding is the following: due to high transaction costs, homeowners are less mobile than tenants when they become unemployed. Indeed, homeowners may have to sell and buy a house when they need to change their residential location in order to accept a job offer. For this reason, they may have more difficulties in finding a job and, as a consequence, they are likely to stay unemployed for longer.

Oswald's hypothesis can easily be extended to social housing tenants in France. Firstly, it appears that social housing tenants have lower mobility rates than other tenants. In France, families with an income below a given threshold and with certain demographic characteristics (for example, large families, single-parent families, etc) can ask for moderate-rent housing, called Habitations à Loyer Modéré (HLM). As the threshold is rather high, there is a large number of families asking for this social housing and the waiting period may be considerable<sup>5</sup>. When families obtain their housing, they have the right to stay in it for an indefinite period whatever their income (even if their income rises above the initial threshold). In addition, the rent is only weakly indexed to household income and remains much lower than in the private sector. For these different reasons, individuals have very few incentives to leave their social housing and so they may face the same type of dilemma as the homeowners during their job search process.

Secondly, it is commonly admitted that, due to access conditions, public housing concentrates individuals that are often in a disadvantaged position, such as unemployed, low-skilled or low-income workers. In this case, the phenomena of "peer effects", the role models, social networks or territorial discrimination discussed in the previous section, might be relevant to explain unemployment duration. In this study, our dependent variable is the net unemployment duration in each commune. With this variable, we already control for the potentially unfavourable human capital composition of the district. By introducing the percentage of social housing into our analysis, we assess the potential problem of the mobility of social housing tenants while controlling for the fact that they are on average less employable.

The effects of the urban structure on local labour market performance have been tested in a large number of North American studies, but they remain largely unexplored in France.

When studying the consequences of the urban structure on the exit from unemployment, one of the difficulties lies in identifying what derives from a pure phenomenon of socio-spatial segregation, what derives from a spatial mismatch between jobs and job-seekers, and what derives from housing ownership. These phenomena need to be clearly distinguished. For example, it is important to control for the effects of residential segregation in order to estimate the importance of the influence of spatial mismatch on the chances of returning to employment, and *vice-versa*.

#### **4. Testing the effects of urban structure on the access to employment**

The Ile-de-France is characterised by strong disparities in terms of exit from unemployment. To explain this phenomenon, we use a model that takes into account the problems of physical access to jobs, residential segregation and housing ownership.

##### **4.1. The data**

The aim is to explain the observed differences in the duration of unemployment observed at the commune level in the Paris area. The estimations, using data from the ANPE's historical statistics file, provide us with rates of exit from unemployment at the commune level. We have calculated net exit rates, that are defined as the exit rates *ceteris paribus*, obtained by controlling for individual characteristics specific to each job-seeker. The advantage of using these rates is to ensure that differences in rates of exit from unemployment are not due to the composition of the local labour market, which could differ sharply between communes.

Once the characteristics of the job-seekers have been taken into account, it is relevant to investigate the effects of the local context. To do so, we use data from the INSEE<sup>6</sup> Population Census of 1999, giving information on demographic composition, qualifications of the active population, types of household, jobs available etc. We use these data to construct indicators of employment composition, segregation and access to employment. Lastly, matrices of travelling times between communes, supplied by the *Direction Régionale de l'Équipement d'Ile-de-France* (DREIF), provide information on the travelling times between all communes in the Ile-de-France both for journeys by car and for journeys by public transport, enabling us to identify the remoteness of a given commune.

## 4.2. Measurement of segregation

The literature on urban economics has shown that numerous characteristics of the neighbourhood can affect the probability of being employed, such as the overall rate of unemployment, the level of qualifications, the percentage of blue-collar workers, etc. Including these characteristics simultaneously in a regression can raise problems of multicollinearity, because the indicators of composition/segregation are often highly correlated with each other. We have therefore performed a data analysis in order to measure segregation in a given commune. We set out to identify communes that are socially and economically homogeneous within the Paris area. The method is similar to that used by Dujardin *et al.* (2007). We group the communes together using a hierarchical ascending classification (HAC) using the Wald criterion. The variables used cover the demographic structure (percentage of foreigners, of single-parent families and the unemployment rate), composition in terms of qualifications (percentage of low-qualified workers, and of people with two years of higher education or more) and composition in terms of socio-professional categories (percentages of employees and executives). They also include social network quality indicators or “peer effects” (living in a privileged neighbourhood is all the more beneficial since there is a high level of human capital).

Using this method, we identify four types of commune: very deprived, fairly deprived, fairly privileged and very privileged (see Appendix 2). The first type of commune is characterised by sizeable foreign populations, large numbers of single-parent families and far-above-average rates of unemployment. These communes also generally have a less qualified and less highly-educated population. The main nucleus is located in the inner northern suburbs. It covers most of the Seine-Saint-Denis, reaching into the Val-d’Oise (Garges, Sarcelles, Villiers-le-Bel) in the north and the Hauts-de-Seine in the west (Figure 3). The composition of the fairly deprived communes is closer to the national average. However, the main characteristics of these communes are a less highly-educated population, a strong presence of blue-collar workers and relatively lower incomes. They cover most of the Seine-et-Marne and the western edges of both the Yvelines and the Val d’Oise. Communes of this type are rare in the inner suburbs. They correspond almost exclusively to periurban zones of detached housing. The fairly privileged communes have characteristics close to the national average, but they differ in having a more qualified population with a more favourable demographic structure. They are spread throughout the Paris area, especially on the western fringe. Finally, the very privileged communes have a taxable income well above the average,

combined with a highly-qualified population. Their high proportion of foreign families can be explained by the presence of a number of Parisian districts and inner suburban communes. They are located mainly in the west of Paris, within the inner circle of suburbs and in the Yvelines.

### **4.3. The measurement of accessibility to jobs**

Accessibility to jobs is a central question in the Ile-de-France region. In 2003, out of the 4.9 million employees living in the Ile-de-France, three out of four worked away from their place of residence. Out of these 3.7 million people, 2.4 million worked not only outside their commune but also outside the *département* in which they lived (Jabot, 2006).

To measure accessibility to jobs, we have restricted our study to the administrative limits of the Ile-de-France. This methodological choice does raise a problem, insofar as the Ile-de-France job market is obviously not bounded by these administrative limits. Gilli (2005) showed that daily commuting throughout the whole Paris basin suggests the existence of an area incorporating several different administrative regions. Nevertheless, the majority of commuting concerns journeys inside the Ile-de-France. In 2003, only 24,000 residents worked outside the Ile-de-France, whereas 120,000 inhabitants of other areas are employed in the Ile-de-France. Furthermore, employees living in the Ile-de-France and working outside of it are equally likely to be employees, executives, or all other socio-professional categories (Jabot, 2006). For these reasons, the bias resulting from our decision to confine the study to regional administrative limits would appear to be fairly negligible, although this restriction should be borne in mind when interpreting the measurements of accessibility.

To describe the accessibility to jobs of the different communes of the region, we have constructed a number of indicators<sup>7</sup>. The first is the density of employment accessible within a radius of 20 kilometres of a given commune<sup>8</sup>. A second indicator measures the proportion of jobs in the region that are accessible within 45 minutes' travelling time from a given commune. This 45-minute threshold is justified by several studies carried out by the DREIF, showing that the average commuting time in 2001-2002 was 36 minutes<sup>9</sup>. The total number of jobs calculated in this way is then divided by the total number of jobs in the region. The indicator was constructed for all the communes and for two types of mode of transport: cars and public transport.

#### 4.4. The model

We draw on theories developed in the framework of urban economics to explain why the return to employment differs from one commune to another within the Ile-de-France region. To test these theories, the use of OLS poses a problem for one particular reason: the need to take into account spatial autocorrelation. OLS estimation of a link with spatial effects is inappropriate when the observations are not independent. One of the characteristics of models that use geolocalised data is that the disturbance of the regression may be spatially correlated. These disturbances are more strongly correlated for nearby communes than for distant ones. This phenomenon is likely to happen in our case, since the previous sections have shown homogeneous zones where the communes present similar durations of unemployment. A test carried out on the first version of our model confirms the existence of such a correlation. To correct for it, we introduce the following spatially lagged model:

$$Y_i = \alpha + \rho WY_i + \beta_i \text{Segreg} + \gamma_i \text{Access} + \varphi_i \text{Housing} + \varepsilon_i$$

where  $W$  is a matrix of spatial weights  $N \times N$  with elements  $\omega_{ij}$ , that summarizes the interactions between communes  $i$  and  $j$ . This matrix of spatial weights is sensitive to the definition of interaction that is chosen. We consider that two communes are neighbours when they are contiguous by a move of the “Queen” at the order of two. Thus,  $\omega_{ij} = 1$  if communes  $i$  and  $j$  are contiguous according to this definition; otherwise  $\omega_{ij} = 0$ . The spatially lagged variable represents the average of exits from unemployment in the communes that are close according to the previous definition. The parameter  $\rho$  represents the autoregressive coefficient. A positive sign indicates the presence of spill-over effects from neighbouring communes, not accounted for by the variables used in our model. The parameters:  $\alpha$ ,  $\rho$ ,  $\beta$ ,  $\varphi$  and  $\gamma$  are estimated using maximum likelihood.

The left-hand variable  $Y_i$  is the rate of exit from unemployment in a given commune  $i$ . *Segreg* represents the set of segregation dummies obtained from the HAC. In this way, we look at the differentiated effect of living in one type of commune rather than another. *Access* is a vector of variables measuring the accessibility to jobs for each of the communes in the Ile-de-France. Besides the simple indicator of the car-ownership rate for households, we take the proportion of jobs accessible within 45 minutes (by car or by public transport) and the density of jobs within a radius of 20 kilometres. Finally, *Housing* includes two variables that

take into account the residential status of the inhabitants: the percentage of individuals that are homeowners and the percentage of individuals that live in social housing.

These regressions allow us to study the spatial mechanisms that contribute to the formation of unemployment at the commune level. We use the “net rates” of exit from unemployment, in order to control for the possible composition effects. This measurement is equivalent to assuming that each commune has the average composition of the Ile-de-France, for all the variables indicated in Table 2. Under these conditions, our estimation allows us to take the full measure of the segregation effects. However, this method is subject to the risk of “ecological error”, an error of interpretation consisting in inferring at an individual level the results obtained at an aggregate level.

Establishing a link between the place of residence and the performance of individuals on the labour market raises a possible problem of endogeneity. This is typically the case if we start with the premise that individuals do not choose their location at random. It is probable that individuals group together spatially according to similar characteristics, with similar results on the labour market. Under these conditions, it is difficult to determine whether an individual is unemployed because (s)he lives in a particular neighbourhood or if (s)he lives in that neighbourhood because (s)he is unemployed. We are not able to take this bias into account in our estimations, due to the limitation of data on the access to social housing.

#### **4.5. The results**

We successively test different groups of variables (Models 1 to 3) in order to explain the differences in the net rates of exit from unemployment (Table 1). Using net rates enables us to explain differences of situation in terms of exit from unemployment for a comparable composition of job-seekers from different communes

The three models differ in the way in which we test the Oswald hypothesis. The first model includes only the percentage of households that are homeowners, then in Model 2 we introduce the percentage of households living in social housing and, finally, in Model 3 we include both variables in the regression.

Whatever the model retained, the results concerning residential segregation and measures of accessibility are generally the same. Concerning problems of segregation, the reference corresponds to the most deprived communes in our typology. Not surprisingly, we observe that these communes are the most unfavourable in terms of exit from unemployment,

even with comparable socio-economic characteristics. The other types of commune perform very similarly to each other, so that the most deprived communes are the only ones to suffer from segregation. This supports the idea that when social networks are poorly developed or of low quality, the chances of leaving unemployment sharply decrease. While this confirms the effects of segregation on the return to employment, it does not tell us which mechanism is the most important. We do not know whether the negative effect comes from the low quality of social networks, peer effects, a phenomenon of territorial discrimination or some combination of the three.

If we consider the variables measuring access to jobs, we can see that the signs of their impact are compatible with economic theory. Living in communes that are disconnected from the centres of employment has a negative effect on the exit from unemployment. However, this observation needs to be qualified, in that living in the immediate proximity of centres of employment also appears to impede the exit from unemployment. Concretely, both the car-ownership rate of households and the proportion of jobs that can be reached within 45 minutes by public or private transport increase the rate of exit from unemployment at the commune level. If access to public or private transport appears to favour the exit from unemployment, the same is not true for the fact of living in immediate proximity to the centre of employment. It appears that a high density of jobs (defined by the ratio of jobs to the active population) within a radius of 20 kilometres tends to impede the return to employment. This result reflects the poor performance of certain agglomerations despite their wealth of jobs, notably Paris and its inner suburbs. This result is related to the fact that, often, the people that work in Paris tend to live in the suburbs where the rents are lower.

Finally, the effects of residential status on the unemployment-to-work transitions are more ambiguous. Model 1 shows a positive and non-significant effect linked to the percentage of households that are homeowners. This finding seems to contradict the Oswald hypothesis, but it is misleading since an important variable is not accounted for. Model 2 shows a negative effect on exit from unemployment rates linked to the percentage of individuals that are living in social housing. Here it is important to bear in mind that the negative effect found for social housing is not explained by the fact that, on average, this type of housing concerns fragile populations, because our net duration has already corrected for it.

In Model 3, we find that being a homeowner or living in social housing both decrease the chances of leaving unemployment. This result is compatible with the Oswald hypothesis. We can therefore conclude that the insignificant effect found with Model 1 was due to a

missing variable in the regression. This result also suggests that empirical analyses should not focus too narrowly on the percentage of homeowners, but should systematically include the percentage of social housing. Nevertheless, it appears that the percentage of social housing residents is more unfavourable to exit rates from unemployment than the percentage of homeowners.

The introduction of employment zone<sup>10</sup> dummies in all the models allows us to take into account the problems of unobserved heterogeneity and to control for the specificity of local labour markets. This territorial division has been preferred to that of employment basins or population catchment areas, which give considerable weight to the Paris basin and therefore mask the heterogeneity that we are trying to capture. Overall, the effect of the territory remains important even after taking into account the effects of composition, physical distance from jobs and residential segregation. It appears that the employment zone of Paris (the reference) is the most unfavourable in terms of exit from unemployment. Thus, living in this employment zone increases the duration of unemployment compared to other employment zones in the region. This result runs counter to preconceptions based on the misleading fact that job density is higher in Paris.

**[Insert Table 1: Explaining net rates of exit from unemployment]**

## **5. Conclusions**

In the Paris area, the chances of leaving unemployment vary considerably from one commune to another. There are, however, regularities in the spatial disparities of exit from unemployment. There is a contrast between the composition of job-seekers in the North and the East on the one hand, and the South and the West on the other. There is also a rather concentric pattern, with the centre and the outer periphery presenting low rates of return to employment while the intermediate periphery presents high rates. Even when we control for the characteristics of the job-seekers, there remain wide disparities in the rates of exit from unemployment. Such a phenomenon raises questions about the effects of urban structure on the return to employment.

The origins of this observed geographical pattern probably lie in problems of physical distance from jobs, of residential segregation or of lack of mobility due to housing ownership or social housing. Firstly, some communes appear to suffer from poor physical connections

to job opportunities. The isolation of a commune from the centres of activity makes job prospecting costly and inefficient. This would appear to be the case for part of the Seine et Marne and for communes on the outskirts of the Val-d'Oise and the Yvelines. Secondly, we can mention the effects of residential segregation: the clustering together of fragile populations in a given district can impair the employability of individuals, damage the quality of the social networks used to obtain jobs and spur territorial discrimination by employers. This explanation may be relevant for the *département* of the Seine-Saint-Denis, a number of districts in Paris and some communes in the inner suburbs.

The regressions we have performed also give credit to the Oswald hypothesis, but with a reservation: the importance of social housing should be accounted for when testing this hypothesis. We find that the percentage of social housing and the percentage of homeowners both reduce the exit rate from unemployment, with a stronger effect for the former.

We should also mention a certain number of limits to this study. Firstly, the data are restricted to the Ile-de-France. This raises a problem in the measurement of accessibility, because we have ignored some employment areas that border the Ile-de-France. There is prior evidence, however, that this introduces a marginal bias into the analysis. In addition, we do not take into account the endogeneity of individuals' choice of location, which can be a source of bias insofar as individuals probably do not choose their town of residence at random. A possible spatial sorting of individuals is therefore likely to affect our results. Thirdly, although we do show the effect of residential segregation on the exit from unemployment, it is difficult to tell whether this is due to neighbourhood effects, the low quality of social networks or a problem of territorial discrimination.

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## **Appendix 1: Estimation of unemployment-to-work transitions**

**[Insert Table 2: Individual determinants of exit from unemployment]**

## **Appendix 2: Typology of communes**

**[Insert: Table 3: Coordinates, contributions and cosine-squared of variables on axis 1 and 2.]**

**[Insert Table 4: Descriptive statistics of commune type applied by the HAC]**

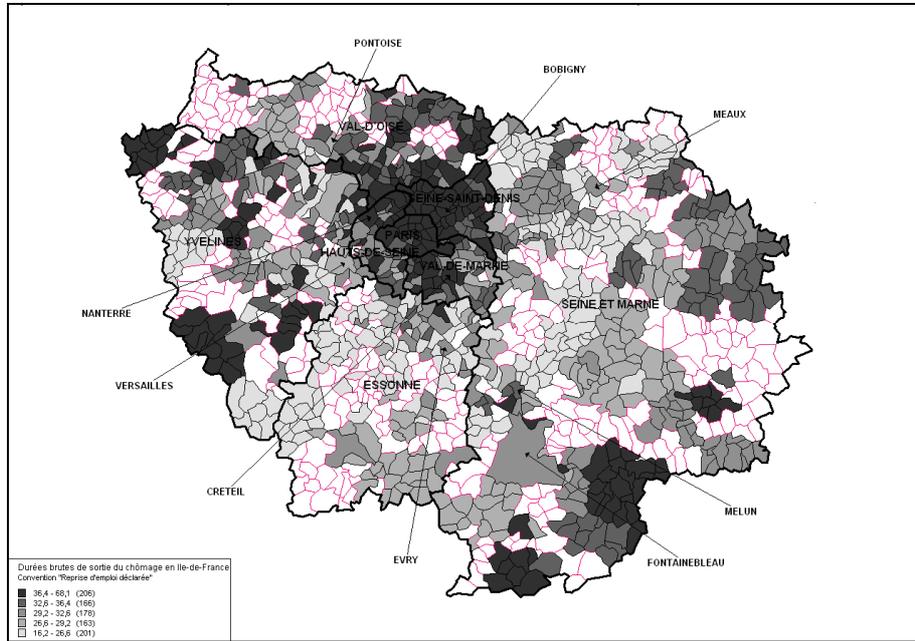
## **Appendix 3: Sample statistics**

**[Insert Table 5-1: Table 5-1: Continuous variables]**

**[Insert Table 5-2: Table 5-1: Segregation distribution]**

## Figures, Tables and Annexes

**Figure 1: Unemployment duration in the Paris area (Ile-de-France)**

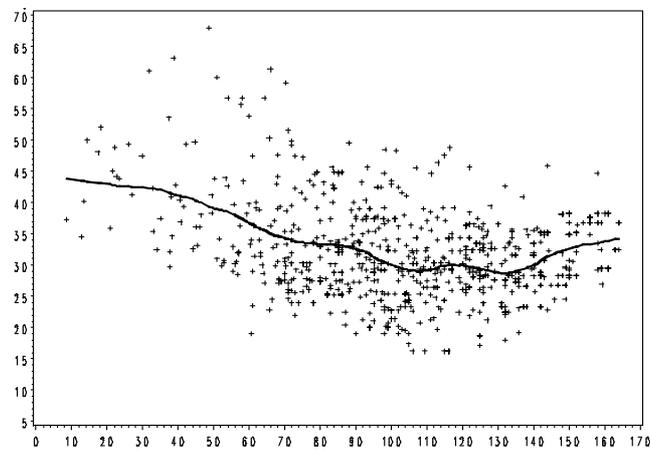


*Interpretation:* The map shows the average duration of unemployment in months for each commune in the Paris area. The communes coloured in light grey exhibit the quickest exit from unemployment. The communes in dark grey exhibit the slowest exit from unemployment. The durations were calculated for each commune using a Weibull model with commune fixed effects.

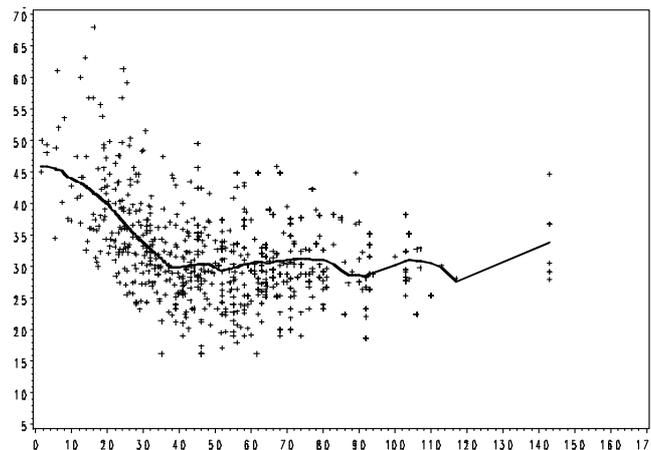
*Source:* Solstice Estimations, CEE, using data from the ANPE's historical statistics file.

**Figure 2: Distance from the centre of Paris and unemployment duration.**

### 2-1. Travelling by car



## 2-2. Travelling by public transport



*Interpretation:* each dot represents one of the 914 communes for which we were able to calculate the duration of unemployment. The vertical axis represents the duration of unemployment in months.. The horizontal axis represents the travelling time, in minutes. The centre has been defined as the first (central) *arrondissement* in Paris. The curve represents the non-parametric estimation of the average duration of unemployment, using an Epanechnikov adaptative kernel estimator.

*Source:* Solstice estimations and matrices of travelling times between communes in 2003 (DREIF).

**Table 1: Explaining net rates of exit from unemployment.**

	model 1		model 2		model 3	
	coeff	student's t	coeff	student's t	coeff	student's t
<b>Independent variables</b>						
Constant	0,133	4,63***	0,177	5,82***	0,179	5,88***
<b>Segregation</b>						
Highly deprived communes	ref.		ref.		ref.	
Fairly deprived communes	0,027	4,88***	0,02	3,37**	0,019	3,22**
Fairly privileged communes	0,032	6,05***	0,024	4,34***	0,023	4,23***
Very privileged communes	0,031	5,12***	0,021	3,17**	0,019	2,86**
<b>Access to jobs</b>						
Car-ownership rate	0,048	1,65*	0,028	1,01	0,049	1,64*
Density of jobs within 20km	-0,011	-1,68*	-0,014	-2,09**	-0,013	-1,98**
% of jobs accessible within 45mn by public transport	0,016	1,48	0,018	1,71*	0,018	1,73*
% of jobs accessible within 45mn by private car	0,03*	1,83*	0,025	1,51	0,022	1,36
<b>Housing tenures</b>						
Percentage of homeowners	0,019	1,59			-0,027	-1,68*
Percentage of public housing			-0,058	-4,35***	-0,078	-4,38***
<b>Employment zones dummies<sup>1</sup></b>	yes		yes		yes	
<b>(Rho) Spatial autoregressive parameter</b>	0,465	12,71***	0,471	12,98***	0,469	12,96***
Log likelihood	1751,34		1759,41		1760,82	
AIC	-3432,68		-3448,81		-3449,63	
R-squared	0,595		0,602		0,604	
Number of observations	914		914		914	

1. Employment zones are geographical units based on the home-to-work transport connections. There are 26 employment zones in the Ile de France. These dummies are used to control for correlated unobserved heterogeneity at this level of aggregation.

*Source:* Solstice, INSEE Population Census (1999) and matrices of travelling times between communes in 2003 (DREIF).

\*\*\* Significant at 1%; \*\* significant at 5%; \* significant at 10%.

**Table 2: Individual determinants of exit from unemployment**

Maximum likelihood estimation of the Weibull model. The coefficients are applied to the hazard function describing the unemployment-to-work transitions. The coefficients of the dummy variables should be interpreted by comparison with the reference indicated in the Table.

	Return to employment declared	
	Coefficient	Student
$\alpha$	0,843	1148,88
<b>Age (years)</b>	-0,036	234,27
<b>Permanent contract</b>	<b>ref.</b>	
Fixed-term contract	-0,491	87,52
Seasonal employment	-0,168	31,29
<b>Qualification level VI</b>	<b>ref.</b>	
Levels I and II	0,364	59,17
Level III	0,361	66,17
Level IV	0,186	40,06
Level V	0,074	19,93
<b>Without children</b>	<b>ref.</b>	
One child	0,017	4,5
Two children	0,224	56,22
Three children and more	0,235	47,71
<b>Man</b>	<b>ref.</b>	
Woman	-0,223	77,02
<b>Non-disabled</b>	<b>ref.</b>	
Disabled	-0,621	94,96
<b>Single, widowed</b>	<b>ref.</b>	
Divorced, separated	-0,009	1,83
Married, marital life	-0,011	3,21
<b>Profession : Services to persons</b>	<b>ref.</b>	
Administrative and commercial services	0,039	8,01
Hotel and catering	0,499	84
Delivery and sale	0,151	30,27
Arts and Entertainment	-1,013	86,48
Initial and vocational training	-0,072	7,56
Social intervention	0,022	2,93
Paramedical	0,315	31,95
Medical	0,144	7,26
Admin executives communic. information	-0,09	12,47
Sales executives	-0,004	0,5
Agriculture and fishing	0,229	27,35
Construction industry and extraction	0,323	45,34
Transport and logistics	0,096	16,82
Mechanics, electricity, electronics	0,094	14,2
Processing industry	-0,01	1,2
Others industries	0,113	9,89
Craftsmen	0,309	34,14
Industrial supervisory staff	-1,873	153,72
Industry executives	0,002	0,2
Industrial technical executives	0,08	8,25
Non-industrial supervisory staff	0,195	20,66

<b>Redundancy</b>	<b>ref.</b>	
Other layoffs	-0,042	8,27
Resignation	0,389	63,94
End of contract	0,421	89,42
End of temporary contract	0,236	39,6
First entry	0,363	53,66
Return to work after more than 6 months	0,309	35,25
Other cases	0,153	30,34
<b>Unskilled blue-collar</b>	<b>ref.</b>	
Skilled blue-collar	0,185	36,97
Unskilled employee	-0,051	9,25
Skilled employee	0,144	27,55
Technician, supervisor	0,204	30,85
Executives	0,155	18,8
<b>Non minimum income</b>	<b>ref.</b>	
Guaranteed minimum welfare income	-0,587	114,12
<b>Full time</b>	<b>ref.</b>	
Part time	-0,555	132,22
<b>French nationality</b>	<b>ref.</b>	
EU 15	0,094	10,35
Rest of the world	-0,197	35,26

Source: Solstice Estimations, CEE, using data from the ANPE's historical statistics file.

**Table 3: Coordinates, contributions and cosine-squared of variables on axis 1 and 2.**

Variables	Coordinates		Contributions		Cosine-squared	
	Axis 1	Axis 2	Axis 1	Axis 2	Axis 1	Axis 2
% household heads of foreign nationality	-0,12	-0,84	0,45	34,03	0,02	0,70
% single-parent families	-0,08	-0,75	0,19	27,23	0,01	0,56
% at most lower secondary diploma	-0,68	0,53	13,40	13,36	0,47	0,28
% university degree	0,81	0,05	19,01	0,11	0,66	0,00
% executives	0,90	-0,16	23,18	1,32	0,81	0,03
% blue-collar	-0,82	0,11	19,43	0,59	0,68	0,01
Average income tax	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

Comment: We only keep the first two factorial axes because they explain 69.4% of the total inertia of the cloud.

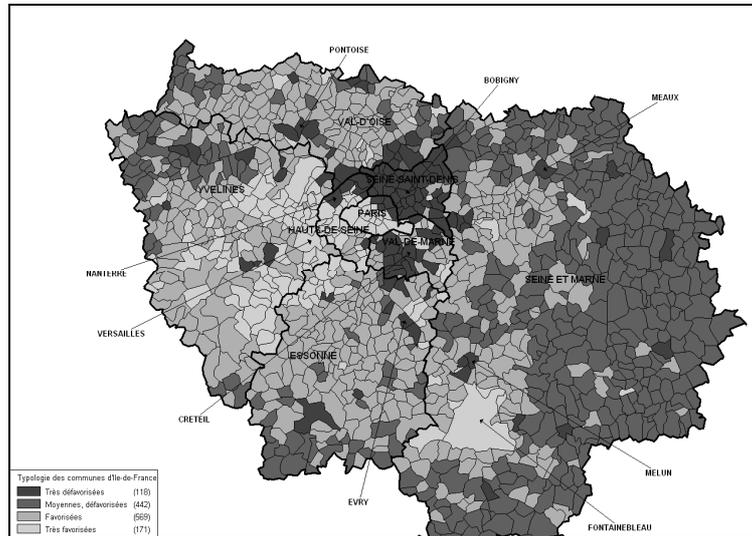
**Table 4: Descriptive statistics of commune type applied by the HAC.**

Means of the variables

Type of commune	Very deprived	Fairly deprived	Fairly privileged	Very privileged	Total
% household heads of foreign nationality	16,49	4,69	5,37	7,14	6,38
% single-parent families	16,39	7,45	8,42	9,85	9,00
% at most lower secondary diploma	21,16	26,54	23,22	14,34	22,99
% university degree	7,14	6,73	10,56	12,31	9,18
% executives	12,28	10,50	20,63	42,12	19,25
% blue-collar	27,59	32,21	18,51	9,75	22,84
Average income tax	15545	19944	23487	37417	23394
Unemployment rate	15,61	9,26	7,38	7,39	8,77
Number of communes	118	442	569	171	1300

Source : INSEE Population Census (1999).

**Figure 3: Commune segregation typology in the Paris area**



Source: Typology created with a hierarchical ascending classification on INSEE Population Census (1999).

**Table 5-1: Continuous variables**

Variables	Observations	Mean	Standard deviation	Minimum	Maximum
Rate of Exit from unemployment	914	0,4	0,055	0,268	0,572
Car-ownership rate	914	0,869	0,111	0,28	1
Density of jobs within 20km	914	1,375	0,319	0,164	3,765
% of jobs accessible within 45mn by public transport	914	0,177	0,241	0,001	0,87
% of jobs accessible within 45mn by private car	914	0,104	0,147	0,005	0,859
% of homeowners	914	0,684	0,192	0,138	1
% of public housing	914	0,109	0,152	0	0,778

Source: Solstice estimations, INSEE Population Census (1999) and matrices DREIF.

**Table 5-2: Segregation distribution**

Segregation variable	%
Very deprived	12,58
Fairly deprived	31,62
Fairly privileged	42,78
Very privileged	13,02

Source: authors' calculation from INSEE Population Census (1999).

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## Notes

<sup>1</sup> The *commune* is the smallest administrative unit in France. A commune is usually the territory of a city, town or village. Its size and particularly its population may vary considerably (the most populated, Paris, has more than two million inhabitants, the least populated zero). In France, there are more than 36 000 communes and 1,300 in the Paris region. We define a commune as the smallest political entity that elects a Mayor. Notice that Paris is an exception since it has both a Mayor and 20 Deputy Mayors, one for each of its 20 districts. In this case, our analysis is at the district level, which makes 20 observations for the city of Paris alone.

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<sup>2</sup> We have checked that the use of other estimation techniques does not significantly alter the exit rates. The coefficients estimated with the Weibull model are very close to those estimated using a interval-constant hazard model or a Cox model. In our estimations, the parameter  $\alpha$  of the Weibull model, which summarizes the relationship between the duration of unemployment and the chances of exiting unemployment at each period, is close to one. This special case  $\alpha=1$  corresponds to the exponential model, where the duration of unemployment has no effect on the hazard rate. In this case, all the previous generalizations give equivalent results.

<sup>3</sup> The disparities observed in the exit from unemployment can also be found at a more aggregate level than the commune-level. We have estimated durations of unemployment for different levels of disaggregation and find a close link between geography and length of unemployment.

<sup>4</sup> The *départements* were created after the French Revolution. Mainland France is divided into 95 departments (101 including the overseas *départements*). Paris is an exception since it is both a city and a *département*. The Ile de France region includes 8 *départements*.

<sup>5</sup> For example, within Paris itself the average waiting time is 10 years.

<sup>6</sup> The INSEE is the French National Institute of Statistics and Economic Studies.

<sup>7</sup> These indicators tend to over-value the weight of the communes the furthest away from Paris. In fact, many of these communes may have access to centres of employment outside the region (particularly in Picardy), but our indicators do not allow us to take this into account in the analysis. In other words, this methodological choice presupposes that the inhabitants of certain communes are far from the centre of employment formed by Paris, whereas in fact they probably have other sources of employment closer at hand.

<sup>8</sup> The reference for this indicator is a Euclidean distance, corresponding to the distance “as the crow flies”. Distances are measured from the coordinates of the centroid of each town.

<sup>9</sup> General transport survey 2001-2002: “*La mobilité des franciliens en quelques chiffres*”.

<sup>10</sup> Employment zones (INSEE) are geographical units based on daily home-to-work connections. There are 26 employment zones in the Ile-de-France.



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