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French enterprise zone program : did it help the residents of deprived neighborhoods ? *

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Abstract

This paper evaluates the effect of the French enterprise zone program on residents of these deprived neighborhoods. A second contribution is the evaluation of the composition effects in the zones and of externalities on the neighbors of the enterprise zones. The third contribution is the evaluation of a specific feature : the local hiring condition. It shows that there are a significant decreasing effect of the program on unemployment of residents and some small negative externalities on neighboring areas. There is also evidence of composition effects. There is thus two channels for the effect of the program on residents : residents already there before designation (or that would have been there in absence of the program) got more jobs but the program also helps to attract or retain residents with better labor market outcomes. Moreover, the results suggest that the local hiring condition is working.

Keywords : segregation, urban, evaluation, enterprise zone, place-based policy.

JEL codes : R10, J00, R580

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Introduction

Urban problems are still pervasive in France despite decades of urban policies. Very recently, in August 2012, some violent episodes occurred in poor urban neighborhoods. In 2013, the State urban policy have been completely redefined, in particular the number of targeted areas have been reduced. In a context of budgetary restrictions, it has been decided to concentrate subsidies on the more distressed areas.

The economic treatment of urban and spatial segregation issues started in France in the the 90's, inspired by UK (70's) and American (80's and 90's) enterprise zone experiences. They were the first French place-based economic policies. There used to be some place-based policies but related to housing renovation or public facilities. The French enterprise zone program was created in 1996, then renewed and extended in 2003 and 2007. It gives very large tax exemptions to firms located in the enterprise zones and it has a specific feature, a local hiring condition : the payroll exemptions are granted only if at least 20% of the workers are residents of the enterprise zone. Until now, this program have been mainly evaluated at the firm level and it is found to have a significant effect on employment in the firms. There is only one evaluation of the effects for residents from Gobillon, Magnac, and Selod (2012) : it is limited to the Paris region and they found a small but short term effect on the unemployment exit rate.

The first contribution of this paper is thus to evaluate an effect on residents for the whole France. The second contribution is to detail the channels of the effects through the evaluation of composition effects in the zones, externalities on the neighboring areas of the enterprise zones and the effect of the local hiring condition. The French Labour Force surveys of 1993 to 2007 are used as they collect very detailed information on labour market situations. The program is evaluated with a Difference-in-Difference approach.

Neumark and Simpson (2014) provides a very detailed review on place-based policies. In their terminology, enterprise zone programs are "place-based people strategies" as they intend to help the people residing of the deprived areas. The French program is clearly in that case, especially with the local hiring condition. Neumark and Simpson (2014) provide some theoretical background to explain why place-based strategies might be more efficient than people-based strategies but they conclude that welfare implications are not clear from a theoretical point of view and that it is all the more important to evaluate these programs empirically.

The American literature evaluating these programs found very heterogenous results. The older papers date back to the mid-90's (Papke (1994), Boarnet and Bogart (1996) among others). Before Neumark and Simpson (2014), Lynch and Zax (2011) and Ham, Swenson, Imrohoroglu, and Song (2011) also reviewed the evidence on enterprise zones and found it difficult to give a general statement about their efficiency. The American programs were very heterogenous in their design. They were various state programs in the 80's and a federal program in the 90's. This naturally leads to the question of which features are

the most efficient, in particular in a context of budgetary restrictions, as these programs are generally very costly. This also strongly suggests to examine precisely the channels of the effect by distinguishing the effects on people and on firms and evaluating the possible spillovers as it is done in the present study.¹

Section 1 presents the French enterprise zone program more precisely, section 2 the data and the methodology. Global results and some robustness checks are presented in section 3. Section 4 studies more precisely the channels of the effects and section 5 the local hiring condition. Section 6 concludes.

1 The French program of enterprise zones

1.1 The design of the program

The "Pacte de Relance pour la ville" law was enacted in 1996 (effective in 1997). It created 3 types of priority zones, roughly nested. First 751 ZUS (Zones d'Urbanisation Sensibles, urban special zones) were defined. The choice was inspired by previous urban programs and by qualitative criteria such as "deteriorated housing" and "unbalance between residential and working zones". Among these ZUS, 416 ZRU (Zones de Redynamisation Urbaine, urban redynamisation zones) were then defined and among them 44² ZFU (Zones Franches Urbaines, urban enterprise zones, hereafter designated as ZFU 1G) which were the most disadvantaged according to a synthetic index. This index of deprivation was computed using the unemployment rate, the proportion of residents under 25 years old, the proportion of residents without a diploma and the municipality average earnings. The ZFU counted about 700 000 residents in the 1990's.³ The ZFU program has been renewed and extended to 41 new zones in 2003 (effective in January 2004, hereafter designated as ZFU 2G) and 15 in 2006 (effective in 2007, hereafter designated as ZFU 3G) which created a second and third generation of ZFU. There are thus today 100 ZFU.

The ZFU are the French equivalent of the US and UK enterprise zones : the firms located in the enterprise zones (ZFU) benefit from large tax exemptions (corporate income tax, local business tax, payroll tax) for 5 years, the idea being to help firms to settle in theses zones and to hire there. These exemptions are granted to new firms as well as to firms already in the zone before designation. As a comparison, the firms in the ZRU benefit from exemptions for only one year and only when they are new. The ZRU are thus very lightly treated comparing to the ZFU (see table 15 for a detailed comparison). There are no systematic exemptions for the ZUS.

¹A recent paper on a federal American program (Freedman (2013)) also studies the effect on residents and the potential composition effects as in the present study and finds that resident composition effects might be important.

²38 without French overseas territories

³Bilan des zones franches urbaines, rapport au parlement (2001)

In 2002 and 2008, apart from the creation of new ZFU, the program was also renewed for the existing ZFU and a progressive exit of the program was implemented : instead of a total stop of the exemptions for a firm after 5 years, a degressive rate is applied to the exemptions the following 3 to 9 years. A firm can thus be treated up to 14 years.

Apart from this design with three roughly nested types of zone, another key feature of the program is the fact that payroll tax exemptions are conditioned on local hiring : a proportion of at least 20% of employees must be living in the zone for the firm to benefit from payroll tax exemptions. The level of this condition has been extended to 33% in 2002 and 50% in 2012. In 2002, it has also been extended to all residents of the ZUS who are located within the same urban unit as a ZFU. The residents of the ZUS (or ZRU) who are in the same urban unit⁴ of a ZFU can therefore be directly impacted by the program since 2002. Lastly the jobs eligible for the clause are only the ones with a CDI ("contrat à durée indéterminée") or at least 12 months contract, hereafter designated as long-term contracts.

The enterprise zones programs can be effective through several mechanisms : maintaining and attracting jobs in designated zones in order to have a better distribution of jobs on the territory, helping the residents to get these jobs, creating jobs by reducing the cost of labour (and having these zones benefit as a priority from this effect). These objectives are not incompatible but however different : the first concerns the location of jobs, the second the location of workers and the third, job creation. The local hiring clause clearly raises the question of the employability of the residents. The reason why residents of these zones are experiencing deeper difficulties to find a job are not clear : low productivity, wrong signalling, discrimination, spatial mismatch... However, the design of the ZFU program does not make any difference between these reasons. It reduces the cost of employing the residents which can be a remedy to low productivity but by bringing the firms close to them, it can also improve information and reduce prejudice that caused discrimination for instance. But, like all positive discrimination program, it could have the opposite effect : the fact of being chosen to be a priority zone may have a stigmatizing effect and the tax exemptions may not compensate for it. The residents of the zones may have even more difficulties to find jobs outside the zones after designation. Another common criticism of this kind of program is that it is possible for a firm to move some offices in the zone to benefit from the exemptions without really bringing in activity. The law defined some limits to this possibility but it is hard to check and frauds are still possible. All these negative side effects are difficult to measure. They could be very small compared to the effect of the program or very high for a small effect of the program.

⁴Urban units are defined by the Insee (French national institute of statistics) as a municipality or a group of municipalities forming a continuous built zone (no space of more than 200 meters between two buildings) and with at least 2000 inhabitants.

1.2 Existing literature on the French program

The evaluation literature on French enterprise zones is scarcer than on American zones but in a way more concordant.⁵ Most of these studies have used establishment level data and are thus concentrated on firm outcomes (see table ?? in appendix). Rathelot and Sillard (2008), Givord, Rathelot, and Sillard (2013), Mayer, Mayneris, and Py (2013), Trevien, Givord, and Quantin (2012) and Briant, Lafourcade, and Schmutz (2013) all studied business creations and/or employment located in the zones. They found a small positive effect on these outcomes for the second generation and a stronger effect for the first (Trevien, Givord, and Quantin (2012)).

The papers which estimate geographical spillovers (Givord, Rathelot, and Sillard (2013), Mayer, Mayneris, and Py (2013)) found them negative in the sense that a significant part of business or employment creations is resulting from transfers from other zones rather than real creations. Briant, Lafourcade, and Schmutz (2013) also showed that the effect of the program is very heterogenous according to the geography of the zone : for instance the accessibility of the zone is very important for its success (measured on firm outcomes). Indeed, isolation is a barrier to commuting. If workers cannot adjust their behavior and commute in, tax credits are primarily spread over workers who already work in the zone or live there. This will concentrate benefits on them in isolated zones. There is thus a trade-off, either the zone is isolated and the subsidies benefit mainly to the residents but few jobs are created, or the zone is enough accessible and more jobs are created, but only some of them are for residents. As the program was implemented to help the residents of this neighborhoods to find jobs thus it is crucial to be able to address this question.

Gobillon, Magnac, and Selod (2012) partly addressed it looking at the unemployment exit rate of the residents of the Paris region enterprise zones. They found a small positive effect but temporary. They studied the first generation for which the effect on establishments is quite strong but it seems that this did not benefit much to the residents of the ZFU. This result is valid for the Paris region and for people registered at the National Agency of Employment. However, people under 25 years old who do not have enough work experience, often do not have rights to social benefits : some of them might thus not be registered at the National Agency of Employment as they have no incentives to do so.⁶ Due to the data, they estimated the effect at the municipality level rather than at the enterprise zone level (which are smaller than a municipality) which probably lessened the estimation of the effect.⁷

⁵This could be due to the fact that there is basically only one program of enterprise zones in France.

⁶In France, unemployed people who do not have worked enough to have unemployment benefits, are nonetheless entitled to a minimum income, but only if they are above 25 years old.

⁷Goffette-Nagot, Charlot, Dujardin, Havet, and Sidibé (2012) estimated a more general effect on unemployment using census data but they do not have a clear result. However census data are not the best source for unemployment status.

2 Data and methodology

To evaluate the effects of the program on the residents of the zones rather than on the people working there, it is necessary to use data with the location of the residence of the workers. The French Labor Force Survey is a survey conducted at the main residence of households and fine geographical information (at the census block level, finer than municipality) was gathered for the surveys of 1993 to 2011 . All household members aged 15 and above are interviewed. The survey is a rotating panel data (dwellings are interviewed several times) and the sample is stratified and clustered. Areas of 40 dwellings (or 20 in the cities of more than 100 000 inhabitants) are sampled and all the dwellings in the area are surveyed.⁸ This data set is thus of particular interest for this evaluation as the geographical level is sufficiently fine to identify the enterprise zones and it provides a lot of information on the labor market situation of the residents.

2.1 Econometric method

A Difference-in-Difference method (hereafter DD) is implemented on the treated group (residents of the enterprise zones) and a control group that has to be defined. The model is the following : i is the individual and t the year. Y is the outcome of interest (for instance the unemployment rate), T is a dummy for living in a treated zone and γ_t is a year fixed effect.

$$Y_{it} = \alpha T_i + \beta T_i * 1_{t \geq 97} + \gamma_t + u_{it} \quad (1)$$

The β coefficient in the linear regression 1 gives the effect of the treatment under the hypothesis that the difference between treated and control would have been constant over time in the absence of treatment. The coefficient is then estimated by Ordinary Least Squares (OLS). In this basic framework, errors are assumed to be homoscedastic, which is probably not the case here for two reasons : first, this is panel data and as an area is observed 3 times (before 2002 and 6 times after), the 3 (or 6) observations are likely to be correlated (serial correlation, see Bertrand, Duflo, and Mullainathan (2004)) ; second, the sample is clustered, so it is very likely that the errors for individuals of the same area are correlated (spatial correlation).

To take into account the serial correlation problem, one can allow for a correlation between the errors of each individual. The variance of the residuals is then, with $T=3$ for instance :

⁸A comparison of the sample of ZUS in the Labor Force survey of 1999 with the Census confirms that they are representative. For instance, the unemployment rate (with the Census definition) is 25% in the ZUS (computations made from the results in Tocqueux and Moreau (2002)) and 25.6% in the sample in 1999. The activity rate of the 15-24 years old is 33% in the census and it is 31.6% in our sample. The weights provided by the producer (Insee) are used for statistics and estimations.

$$V(u) = I_N \otimes \begin{pmatrix} \sigma_{11} & \sigma_{12} & \sigma_{13} \\ \sigma_{12} & \sigma_{22} & \sigma_{23} \\ \sigma_{13} & \sigma_{23} & \sigma_{33} \end{pmatrix} = I_N \otimes \Omega \quad (2)$$

where N is the number of individuals, I_N is the identity matrix. Ω is then estimated by $\hat{\Omega} = \overline{\hat{u}_i \hat{u}_i'}$ where $\hat{u}_i' = (\hat{u}_{i1}, \hat{u}_{i2}, \hat{u}_{i3})$ is the estimated residual for individual i . With $\hat{x}_i' = (\hat{x}_{i1}, \hat{x}_{i2}, \hat{x}_{i3})$ the explanatory variables, the variance of the estimator is thus :

$$\hat{V}(\hat{\beta}) = \frac{(\overline{\hat{x}_i' \hat{x}_i})^{-1} \overline{\hat{x}_i' \hat{\Omega} \hat{x}_i} (\overline{\hat{x}_i' \hat{x}_i})^{-1}}{N} \quad (3)$$

or

$$\hat{V}(\hat{\beta}) = \frac{(\sum_{i=1}^N \hat{x}_i' \hat{x}_i)^{-1} (\sum_{i=1}^N \hat{x}_i' (\sum_{i=1}^N \hat{u}_i \hat{u}_i') \hat{x}_i) (\sum_{i=1}^N \hat{x}_i' \hat{x}_i)^{-1}}{N} \quad (4)$$

To take also into account potential heteroscedasticity, a White style robust covariance matrix can be computed, as following :⁹

$$\hat{V}(\hat{\beta}) = \frac{(\sum_{i=1}^N \hat{x}_i' \hat{x}_i)^{-1} (\sum_{i=1}^N \hat{x}_i' \hat{u}_i \hat{u}_i' \hat{x}_i) (\sum_{i=1}^N \hat{x}_i' \hat{x}_i)^{-1}}{N} \quad (5)$$

The estimation 5 of the variance of the estimator does not require the number of observations by individuals to be the same. In our case, it is important as some sampling areas at the beginning and end of the period are observed only once or twice (due to the sample design).

Lastly, to take into account the potential spatial correlations, I aggregate the data at the sampling area level as suggested by Bertrand, Duflo, and Mullainathan (2004). The model is then, with a indexing a sampling area and A the total number of sampling areas :

$$\begin{aligned} Y_{at} &= \alpha T_a + \beta T_a * 1_{t \geq 97} + \gamma_t + u_{at} \\ &\text{with} \\ V(u) &= \frac{\sigma}{2} I_A, \\ &\text{and} \\ \hat{V}(\hat{\beta}) &= \frac{(\sum_{a=1}^A \hat{x}_a' \hat{x}_a)^{-1} (\sum_{a=1}^A \hat{x}_a' \hat{u}_a \hat{u}_a' \hat{x}_a) (\sum_{a=1}^A \hat{x}_a' \hat{x}_a)^{-1}}{A} \end{aligned} \quad (6)$$

⁹see Wooldridge (2009) for more details.

This is the model that will be estimated in the remainder of the paper.

2.2 Choice of the control group

As the ZFU have been chosen among the ZRU which are very specific urban neighborhoods, it makes sense to try to find a control group among the ZRU. Indeed these neighborhoods have been chosen at the same time with very similar criteria (the synthetic index mentioned earlier), so they are more likely to be a good control group. The effect estimated will thus be the effect of becoming ZFU compared to ZRU.

As there have been several waves of the program, the zones that will be ZFU later (in 2004 and/or 2008) could be used as a control group for the first generation. One can assume that the ZFU of the next generations have common features with the first ones. It is a standard strategy in the evaluation literature. But previous papers have shown that the second generation is quite different from the first (Givord, Rathelot, and Sillard (2013)) and there are too few observations of 3rd generation zones for a control group. For these same reasons, the 2nd and 3rd generations will not be studied.¹⁰

The estimations will be made on the period 1993-2007 so the results are not affected by the crisis of 2008.¹¹ It means that the effect is estimated up to 10 years after the start of the program.

Among the ZRU, there are several ways to construct a good control group :

- The first possibility consists in taking all ZRU. The ZFU1G have been chosen among the ZRU as the worse for some social indicators, so by nature they will have a different level of unemployment but as the ZRU are also deprived zones, one can assume (and partly test) that their evolutions were similar before designation and would have remained similar without the program. Some ZRU became ZFU during the observed period (in 2004 or 2008). This is controlled for by adding a dummy.
- Another solution is to exclude the ZRU that will be in the 2nd or 3rd generation of ZFU. In particular, the ZFU2G have been found to be quite specific. As I will focus my estimations on the period before the crisis of 2008, I also test a control group excluding only the ZRU which become ZFU in 2004 (ZFU2G) but not the ones of 2008 (ZFU3G) as the estimations will be mainly run on the period 1993-2007.
- One might be concerned by the fact that the ZRU which are too close geographically to the ZFU might be affected by the treatment, in particular since the extension in 2002 of the hiring clause to all the ZUS of the same urban unit as a ZFU. A third approach excluding the ZRU that are in the same urban unit of a ZFU is thus tested.

¹⁰I tried to find a suitable control group for the 2nd generation in the same spirit as for the ZFU1G but the placebo tests rejected them.

¹¹I made the same kind of estimations on the period 1993-2011, controlling for the ZFU3G and the results are similar.

- Lastly, a very common approach in the literature is to use a propensity score matching method : one estimates the probability of being treated according to some characteristics. Each zone gets a score according to this model and each treated zone is matched to the non treated zone with the closest score (closest neighbor method). Some information about the zones from the census of 1990 (population size, share of 15-25 year old, unemployment rate, share of non European citizens) is used to find a match for the ZFU1G among the ZRU (see appendix C).

3 Global results on the employment of the residents

The results are presented with the ZRU that are not in the 2nd generation as a control group but they are similar for all control groups (see comparisons and placebo tests further in this section). This is the preferred specification as it allows to keep enough observations to have power in the estimations. //

The DD estimation shows a reduction of 6.8 percentage points of the unemployment in the ZFU (see table 1). And it is a significant effect. As the previous study evaluating the effect for the residents was studying only the Paris region and found a small significant effect, an estimation is run without the Paris region to check if this drives the results. Without the Paris region, the effect is almost identical, 6.9 percentage points, and still significant. So the first result of this paper is to show a significant effect of the program and not only for the Paris region. The unemployment rate is one way to look at the effect but it depends both on number of jobs occupied by residents¹² and their participation in the labor force. So one might want to look also at the employment rate of the population. Here the population studied is the 15-65 years old as the people working outside this age interval are very few and very specific. As the program concerns private sector firms, it is interesting to distinguish employment in private and public sector to check if the effect is really on private sector jobs. Also at the same period some public jobs were massively created for young people ("emplois jeunes") and especially young people of these neighborhoods.¹³ The program was the same for the ZFU and ZRU but it will be reassuring that the effect is not driven by public jobs. The population of the 15-65 years old is thus divided between wage earners of the private sector, wage earners of the public sector, self-employed and people without jobs (unemployed or out of the labor force). The table 2 presents the DD estimation of the effect of the program on the shares of this four groups (the effects sum up to zero). And it shows a significant increase of people working in the private sector (wage earners or self employed) and a significant decrease of people without jobs while there is no significant effect for the public sector. This confirms thus the first results. //

¹²Note that it is not possible to determine if the jobs are indeed located in the ZFU but they are no reason why jobs opportunities outside the zones would evolve differently between treated and control groups.

¹³The "emplois jeunes" were specific jobs for people under 26 year old and a part of 26-30 year old unemployed people. They were created in the public or non-profit sector and the remuneration was partially paid by the State. The program was created in 1997 and stopped in 2002. Only the already existing contracts kept going on after 2002.

Table 1: DD estimations for unemployment rate

Control group	ZRU never ZFU1G or 2G	ZRU never ZFU1G or 2G without Paris region
Geographical scope	all	
ZFU1G	0.040 (0.029)	-0.001 (0.034)
ZFU1G*post 97	-0.068** (0.028)	-0.069** (0.030)
Controls for ZFU in UU	yes	yes
year fixed effects	yes	yes
UU fixed effects	yes	yes
obs. (sampling areas*year)	2 504	2 171
obs. (individuals*year)	63 394	53 781
R^2	0.26	0.25

Source : French Labor Force Survey, 1993-2007

*** significant at 1%. ** significant at 5%. * significant at 10%. Weighted estimations. As the individual data is aggregated at the sampling area level for the estimations, both the number of individuals and sampling areas are presented. A control for the fact that there is a ZFU in the same urban unit is added as since 2002, the hiring clause applied to all ZUS of the same urban unit than a ZFU, so the inhabitants of a ZRU belonging to the same urban unit than a ZFU are also treated.

Table 2: DD estimations for employment of 15-65 years old

	share among 15-65 years old private sector wage earners	share among 15-65 years old public sector wage earners	share among 15-65 years old self employed	share among 15-65 years old without jobs
ZFU1G	-0.056** (0.025)	-0.009 (0.017)	-0.009 (0.006)	0.074** (0.030)
ZFU1G*post97	0.043* (0.024)	0.009 (0.016)	0.013** (0.006)	-0.065** (0.029)
Controls for ZFU in UU	yes	yes	yes	yes
year fixed effects	yes	yes	yes	yes
UU fixed effects	yes	yes	yes	yes
obs. (sampling areas*year)	2 538	2 538	2 538	2 538
obs. (individuals*year)	107 911	107 911	107 911	107 911
R^2	0.28	0.26	0.13	0.27

Source : French Labor Force Survey 1993-2007

*** significant at 1%. ** significant at 5%. * significant at 10%. Weighted estimations. As the individual data is aggregated at the sampling area level for the estimations, both the number of individuals and sampling areas are presented. Note that the number of observations slightly varies with the outcome (unemployment or jobs). This is due to the fact that when the outcome is computed on a smaller population, some sampling areas have no observations (it happens that no one of the sampling area is in the labor force for instance) and thus do not contribute to the estimations. A control for the fact that there is a ZFU in the same urban unit is added as since 2002, the hiring clause applied to all ZUS of the same urban unit than a ZFU, so the inhabitants of a ZRU belonging to the same urban unit than a ZFU are also treated.

Table 3: Placebo estimations for the effect of ZFU1G on unemployment rate

	(1)	(2)	(3)	(4)	(5)
ZFU1G	0.046 (0.044)	0.040 (0.047)	0.034 (0.046)	0.048 (0.038)	0.144*** (0.045)
ZFU1G*1993	-0.008 (0.052)	0.005 (0.054)	0.003 (0.053)	0.044 (0.051)	-0.006 (0.050)
ZFU1G*1994	-0.016 (0.041)	-0.015 (0.043)	-0.010 (0.042)	0.006 (0.045)	-0.018 (0.045)
ZFU1G*1995	-0.005 (0.025)	-0.002 (0.027)	0.004 (0.027)	0.033 (0.039)	-0.013 (0.030)
year fixed effects	yes	yes	yes	yes	yes
UU fixed effects	yes	yes	yes	yes	yes
obs. (sampling areas*year)	537	414	438	299	223
obs. (individuals*year)	11889	9392	9812	7303	4807
R^2	0.42	0.45	0.44	0.57	0.52

Source : French Labor Force Survey, 1993-1996

(1) all ZRU. (2) ZRU never ZFU. (3) ZRU never ZFU1G or 2G. (4) ZRU never ZFU1G or 2G not in UU of 1G or 2G. (5) matched ZRU.

*** significant at 1%. ** significant at 5%. * significant at 10%. Weighted estimations. As the individual data is aggregated at the sampling area level for the estimations, both the number of individuals and sampling areas are presented.

Before going into further details, the validity of the strategy is tested through placebo tests (table 3) and the robustness of the results to the choice of the control group is also tested (table 4). The idea of the placebo test is to test if the treated and control groups were really similar in trend before the treatment of 1997. Only the years 1993 to 1996 are used. The test can be done only if several years of observation before the treatment are available as it is necessary to measure not only the difference between the two groups but also their trends. A regression is then run controlling for the difference in level of unemployment between the two groups (dummy ZFU1G) as in the previous DD estimation and estimating an effect of a "fake" or placebo in treatment in some years (1993, 1994 and 1995). None of this fake treatment for any possible control groups is significant (table 3) which means that the control and treated group did have similar trends in unemployment before the start of the program. Our identification strategy thus appears valid.

As all the possible control groups are valid, the robustness of the results to the choice of the control group can be tested. They are very similar, all significant and not significantly different from one another (see table 4). //

This effect of roughly 7 percentage points can be compared to other results on the first generation of ZFU. First Trevien, Givord, and Quantin (2012) estimated that the program induced a creation of 41500 to 56900 jobs (estimates for the year 2001, 5 years after the start of the program). According to an administrative report of 2002¹⁴, there are 72 409 jobs in ZFU in December 2001 and among them 63 325 are exonerated. So it appears that the majority of this jobs are due to the program.

But these jobs are not necessarily occupied by residents : only 25% of these jobs are

¹⁴Bilan des zones franches urbaines, rapport au parlement (2002)

Table 4: Unemployment rate, DD estimations on different control groups

	(1)	(2)	(3)	(4)	(5)
ZFU1G	0.039 (0.027)	0.039 (0.029)	0.040 (0.029)	0.240*** (0.086)	0.106*** (0.032)
ZFU1G*sup97	-0.078*** (0.027)	-0.061** (0.028)	-0.068** (0.028)	-0.091*** (0.028)	-0.073*** (0.028)
Controls for ZFU in UU	yes	yes	yes	no	yes
Controls for ZFU2G	yes	no	no	no	yes
year fixed effects	yes	yes	yes	yes	yes
UU fixed effects	yes	yes	yes	yes	yes
obs. (sampling areas*year)	2 954	2 403	2 504	1 203	997
obs. (individuals*year)	74 574	61 247	63 394	30 644	23 761
R ²	0.24	0.27	0.26	0.35	0.33

Source : French Labor Force Survey 1993-2007

(1)all ZRU. (2) ZRU never ZFU. (3) ZRU never ZFU1G or 2G. (4) ZRU never ZFU1G or 2G not in UU of 1G or 2G. (5) matched ZRU.

*** significant at 1%. ** significant at 5%. * significant at 10%. Weighted estimations.

A control for the fact that there is a ZFU in the same urban unit is added as since 2002, the hiring clause applied to all ZUS of the same urban unit than a ZFU, so the inhabitants of a ZRU belonging to the same urban unit than a ZFU are also treated. For some specifications a control for becoming a ZFU2G is added as some control groups contains ZRU that became ZFU2G on the period. These ZRU can be used in the control group only for the years before they became ZFU2G.

occupied by residents (the estimation ratio is available only for 1999¹⁵). If we assume that the ratio is identical in 2001, it means that there are roughly 16 000 jobs exonerated and occupied by residents of the ZFU. This is an upper bound of the direct effect¹⁶ of the program for the residents as there is no evaluation of how much of these jobs would have existed without the program.

Gobillon, Magnac, and Selod (2012) found that the program created 10 jobs per semester per enterprise zone in the Paris region. Assuming this number is the same for the enterprise zones outside the Paris region and for all the semesters from 1997 to 2001, this leads to an estimation of $10 \times 2 \text{ semesters} \times 5 \text{ years} \times 38 \text{ zones} = 3\,800$ jobs created in 2001 thanks to the program and benefiting to the residents.

There are approximately 294 000 people in the labor force in the ZFU1G in the 1999 Census. So the estimated 6.8 percentage points reduction in unemployment corresponds to approximately 20 000 jobs. This is quite close to the 16 000 upper bound estimated before. However this estimation is not very precise due to the small number of observations : the 95% confidence interval is 3 800 to 36 000 jobs. The effects could be much smaller : the lower bound of the interval is in fact of the same magnitude that the estimation of Gobillon, Magnac, and Selod (2012). We can still conclude for now that there is an effect for the whole program, not only for the Paris region and that this effect is of at least the magnitude estimated by Gobillon, Magnac, and Selod (2012).

¹⁵Bilan des zones franches urbaines, rapport au parlement (2002)

¹⁶It however does not take into account potential positive externalities : the program might also have increased the number of non exonerated jobs available to the residents through an increase of local economic activity for instance.

Table 5: DD estimations for the municipalities containing a ZFU, 1993-2007

	unemployment rate	share among 15-65 years old private sector wage earners
Municipalities with a ZFU 1G	0.037*** (0.009)	-0.021** (0.010)
Municipalities with a ZFU 1G*post1997	-0.015* (0.008)	-0.005 (0.008)
Controls for munip. with ZFU2G	yes	yes
year fixed effects	yes	yes
UU fixed effects	yes	yes
obs. (sampling areas*year)	19 343	19 591
obs. (individuals*year)	400 657	621 091
R^2	0.09	0.23

Source : French Labor Force Survey 1993-2007

*** significant at 1%. ** significant at 5%. * significant at 10%

The controls are municipalities containing a ZRU but some of these ZRU became ZFU2G in 2004 so a control dummy of having a ZFU2G (and its effects since 2004) is added.

4 Channels of the effect

In this part, we will try to identify the channels of the global effect estimated previously. In fact, this result is not directly comparable to the one of Gobillon, Magnac, and Selod (2012) for two reasons. First, they estimate the effect at the municipality level and not at the enterprise zone level. Second, they estimate an effect controlling by individual characteristics such as education or nationality.

4.1 Geographical level of measurement and externalities

The geographical level of the data used has been found to be rather important. First there is a mechanical effect : if the effect is measured at a higher level of geographical aggregation than the treated zone (and there are no externalities), the estimated effect is a mean of a zero effect and the effect of the program. Indeed Gobillon, Magnac, and Selod (2012) found that when they restrained their estimation to zones where the enterprise zone is a bigger part of the municipality, they found a bigger effect. In table 5, the DD estimations are reproduced aggregating the data at the municipality level and the effect is indeed much diluted, but it remains significant. This may explain why the estimation of Gobillon, Magnac, and Selod (2012) is closer to the lower bound of the present evaluation. In case there are geographical spillovers or externalities, measuring at the municipality level can be more problematic. There could be for example negative spillovers if ZFU unemployed residents are employed instead of neighbors. Then the number of jobs measured at the ZFU level will be higher and there will be a negative effect on the neighbors. To evaluate this issue, table 6 presents a DD estimation of the effect of the ZFU program on

Table 6: Outcome: unemployment rate for the neighbouring zones in the same municipality

	unemployment rate	share among 15-65 years old private sector wage earners
Neighbors of a ZFU 1G	0.029*** (0.008)	-0.014 (0.011)
Neighbors of a ZFU 1G*post1997	-0.002 (0.007)	-0.016* (0.009)
Controls for neigh. of ZFU2G	yes	yes
year fixed effects	yes	yes
UU fixed effects	yes	yes
obs. (sampling areas*year)	16 389	16 600
obs. (individuals*year)	325 709	494 687
R^2	0.09	0.26

Source : French Labor Force Survey 1993-2007

*** significant at 1%. ** significant at 5%. * significant at 10%. Weighted estimations. As the individual data is aggregated at the sampling area level for the estimations, both the number of individuals and sampling areas are presented. The controls are neighbors of municipalities containing a ZRU but some of these ZRU became ZFU2G in 2004 so a control dummy of having a ZFU2G (and its effects since 2004) is added.

the neighbors of the zones.¹⁷ There is no significant effect on the unemployment rate of the neighbors and a small negative effect on the private sector employment. There might be some negative externalities on the neighbors but of a smaller magnitude than the effect of the program.

4.2 Composition effects

Another issue is the composition effect of the program. If one of the effect of the program is to change the social composition of the zone, this is not measured by an estimation controlling for individual characteristics. And this is an interesting effect from a policy point of view : is the unemployment rate decrease due to new residents or to residents present before the designation finding a job? One way to test it, is to run the same regression with controls and see if the estimated effect is different. Table 7 shows that the estimated effect is then lower by half (and not significant) so it appears that some composition effects occurred.

Indeed estimating the effect of the program on some sociodemographic characteristics (see table 8) shows that the population is a bit older and more educated.

To examine more precisely this question, it would be interesting to distinguish the new residents of the zone from the others. This information is not available, but thanks to the survey design, it is possible to know if the residents were living in the same dwelling the

¹⁷Neighbors are defined as living in a municipality which contains a ZFU without living in the ZFU. The control groups are the neighbors of the ZRU, a placebo test has been made to verify that they are a valid control group.

Table 7: DD estimations with sociodemographic controls

Outcome	unemployment rate	private wage earners among 15-65 years old
age	-0.029*** (0.008)	0.064*** (0.008)
age squared	0.000** (0.000)	-0.001*** (0.000)
non Europeans	0.231*** (0.037)	-0.177*** (0.036)
single head family	0.134*** (0.033)	-0.152*** (0.045)
men	0.105*** (0.035)	0.035 (0.056)
junior high school	-0.092* (0.054)	0.156** (0.069)
low vocational	-0.220*** (0.035)	0.247*** (0.042)
high school	-0.264*** (0.044)	0.373*** (0.055)
some college	-0.313*** (0.045)	0.440*** (0.064)
university	-0.268*** (0.041)	0.257*** (0.061)
ZFU1G	0.020 (0.023)	-0.015 (0.024)
ZFU1G*post97	-0.037 (0.023)	0.033 (0.025)
Controls for ZFU in UU	yes	yes
year fixed effects	yes	yes
UU fixed effects	yes	yes
obs. (sampling areas*year)	2 493	2 529
obs. (individuals*year)	62 202	90 022
R^2	0.51	0.54

Source : French Labor Force Survey 1993-2007

*** significant at 1%. ** significant at 5%. * significant at 10%. Weighted estimations. As the individual data is aggregated at the sampling area level for the estimations, both the number of individuals and sampling areas are presented.

Table 8: Sociodemographic characteristics

	age (in years) in whole population	share of non Europeans in whole population	share of at least high school graduates among 15-65 years old
ZFU1G	-3.2*** (1.1)	0.052 (0.032)	-0.047** (0.020)
ZFU1G*post97	2.5** (1.2)	-0.031 (0.032)	0.055** (0.021)
Controls for ZFU in UU	yes	yes	yes
year fixed effects	yes	yes	yes
UU fixed effects	yes	yes	yes
obs. (sampling areas*year)	2 548	2 548	2 538
obs. (individuals*year)	126 855	126 856	107 911
R^2	0.31	0.31	0.34

Source : French Labor Force Survey 1993-2007

*** significant at 1%. ** significant at 5%. * significant at 10%. Weighted estimations. As the individual data is aggregated at the sampling area level for the estimations, both the number of individuals and sampling areas are presented.

Table 9: Share of new residents in the zone (less than one year)

	share of new residents (less than 1 year) from anywhere	share of new residents (less than 1 year) from inside the municipality	share of new residents (less than 1 year) from outside the municipality
ZFU1G	−0.005 (0.017)	0.006 (0.010)	−0.010 (0.012)
ZFU1G*post97	−0.016 (0.017)	−0.014 (0.011)	−0.002 (0.012)
Controls for ZFU in UU	yes	yes	yes
year fixed effects	yes	yes	yes
UU fixed effects	yes	yes	yes
obs. (sampling areas*year)	1 794	1794	1 794
obs. (individuals*year)	58 801	81132	58 801
R^2	0.24	0.21	0.22

Source : French Labor Force Survey 1993-2007

*** significant at 1%. ** significant at 5%. * significant at 10%. Weighted estimations. As the individual data is aggregated at the sampling area level for the estimations, both the number of individuals and sampling areas are presented.

year before.¹⁸ I define as a new resident someone who did not live in the same dwelling the year before. It is only a proxy of what it would be useful to measure as they might arrive from a dwelling of the zone. It is not possible to know if they come from the zone but at least if they come from another municipality; so they are split between the ones coming from within and outside the municipality. The proportion of new residents with either definition was not much impacted by the program (table 9). In a second step I examine if the characteristics of these new residents changed because of the program. For the residents coming from the same municipality, there have been some small changes, they are a bit older, more educated and less foreigners (however it is not significant, see table 10). They thus have more favorable characteristics regarding labor market outcomes. Table 11 shows that they are indeed less unemployed. The characteristics of new residents coming from outside the municipality have not changed (results are presented in appendix).

So there have been a change in composition of the ZFU due to the program and it seems mostly through a reallocation within the municipality. It might be that some residents of the neighborhood with better chances to be hired decided to move inside the zone to benefit from the program. If they were living already close, the move might not have been too costly. It shows again that measuring the effect at the municipality level would tell a different story.

¹⁸The information is not asked at each interview, so the number of observations is lower.

Table 10: Sociodemographic characteristics of new residents from the same municipality

	age in whole population	share of non Europeans in whole population	share of at least high school graduates among 15-65 years old
ZFU1G	-1.7 (1.8)	0.018 (0.054)	-0.030 (0.051)
ZFU1G*post97	0.9 (2.2)	-0.048 (0.047)	0.085 (0.056)
Controls for ZFU in UU	yes	yes	yes
year fixed effects	yes	yes	yes
UU fixed effects	yes	yes	yes
obs. (sampling areas*year)	1 093	1 093	1 050
obs. (individuals*year)	3 866	3 866	3 285
R^2	0.20	0.22	0.28

Source : French Labor Force Survey 1993-2007

*** significant at 1%. ** significant at 5%. * significant at 10%. Weighted estimations. As the individual data is aggregated at the sampling area level for the estimations, both the number of individuals and sampling areas are presented.

Table 11: Labor market outcomes of new residents from the same municipality

	unemployment rate	private wage earners among 15 65 years old
ZFU1G	0.0 (0.1)	-0.046 (0.062)
ZFU1G*post97	-0.2** (0.1)	0.152** (0.067)
Controls for ZFU in UU	yes	yes
year fixed effects	yes	yes
UU fixed effects	yes	yes
obs. (sampling areas*year)	978	1 071
obs. (individuals*year)	2 397	3 717
R^2	0.28	0.26

Source : French Labor Force Survey 1993-2007

*** significant at 1%. ** significant at 5%. * significant at 10%. Weighted estimations. As the individual data is aggregated at the sampling area level for the estimations, both the number of individuals and sampling areas are presented.

5 Efficiency of the hiring clause

The local hiring clause was tightened in 2001 (effective in 2002), it was raised from 20% to 33% and was extended to the workers of all ZUS of the same urban unit as a ZFU. The first column in table 12 details the effect of the program on unemployment year by year to test if there is an added specific effect of the ZFU1G after 2002. The effects are indeed stronger and more significant since 2002. So the tightening of the clause seems to have had an effect for the ZFU1G. The second column in table 12 presents the same estimations but for the share of 15-65 years old working as private sector wage earners and the results are similar.

I also estimate the effect on the type of contracts as it is one of the condition of the local hiring clause. There is potentially a selection effect if I study the contracts of employed people only. If more jobs were created but with short term contract and at the same time the long term contract share rises for those who would have been employed without the program, the rate of long term contract among the employed might decrease. Or if the jobs created have the same distribution between short and long term contracts than those that existed already, there will be no effect of the program on the share of long term contracts among employed people. So the results would have to be interpreted relatively to the distribution without the programs. To avoid this, it is more straightforward to present the share of long term (and respectively short term) contracts as a private sector wage earners among the 15-65 year old (table 13). There is a positive effect of the program on long term contracts but it is not significant. Nonetheless when effects are detailed by year (table 14), they are stronger and more significant year after year. On the other hand, the short term contracts do not significantly rise. This hints that the hiring clause had an effect.

Table 12: Outcome : unemployment rate and share of private wage earners among 15-65 years, effect by year

	unemployment rate	share among 15-65 years old private sector wage earners
ZFU 1G	0.039 (0.028)	-0.055** (0.025)
ZFU 1G*an=1997	-0.001 (0.036)	-0.001 (0.029)
ZFU 1G*an=1998	-0.037 (0.041)	0.005 (0.031)
ZFU 1G*an=1999	-0.039 (0.041)	0.034 (0.033)
ZFU 1G*an=2000	-0.036 (0.042)	0.046 (0.035)
ZFU 1G*an=2001	-0.054 (0.038)	0.049 (0.033)
ZFU 1G*an=2002	-0.117*** (0.035)	0.043 (0.036)
ZFU 1G*an=2003	-0.085** (0.039)	0.057 (0.038)
ZFU 1G*an=2004	-0.107*** (0.041)	0.054 (0.038)
ZFU 1G*an=2005	-0.103** (0.042)	0.035 (0.038)
ZFU 1G*an=2006	-0.085** (0.042)	0.061 (0.046)
ZFU 1G*an=2007	-0.080** (0.038)	0.064 (0.042)
Controls for ZFU in UU	yes	yes
year fixed effects	yes	yes
UU fixed effects	yes	yes
obs. (sampling areas*year)	2 504	2 538
obs. (individuals*year)	63 872	107 911
R ²	0.26	0.28

Source : French Labor Force Survey 1993-2007

*** significant at 1%. ** significant at 5%. * significant at 10%. Weighted estimations. As the individual data is aggregated at the sampling area level for the estimations, both the number of individuals and sampling areas are presented. Note that the number of observations slightly varies with the outcome (unemployment or jobs). This is due to the fact that when the outcome is computed on a smaller population, some sampling areas have no observations (it happens that no one of the sampling area is in the labor force for instance) and thus do not contribute to the estimations.

Table 13: Type of contracts

	among 15-65 years old long term contracts of private sector wage earners	among 15-65 years old short term contracts of private sector wage earners
ZFU1G	-0.056** (0.022)	0.001 (0.009)
ZFU1G*post97	0.020 (0.022)	0.006 (0.010)
ZFU1G*post2002	0.042 (0.026)	-0.014 (0.013)
Controls for ZFU in UU	yes	yes
year fixed effects	yes	yes
UU fixed effects	yes	yes
obs. (sampling areas*year)	2 538	2 538
obs. (individuals*year)	107 911	107 911
R^2	0.22	0.16

Source : French Labor Force Survey 1993-2007

Long term contracts : undetermined duration (CDI) or at least than 12 months. Short term contracts : duration inferior to 12 months.

*** significant at 1%. ** significant at 5%. * significant at 10%. Weighted estimations. As the individual data is aggregated at the sampling area level for the estimations, both the number of individuals and sampling areas are presented.

Table 14: Outcome : type of contracts, effect by year

	among 15-65 years old long term contracts of private sector wage earners	among 15-65 years old short term contracts of private sector wage earners
ZFU 1G	-0.056** (0.022)	0.001 (0.009)
ZFU 1G*an=1997	-0.009 (0.025)	0.008 (0.013)
ZFU 1G*an=1998	-0.012 (0.028)	0.017 (0.013)
ZFU 1G*an=1999	0.029 (0.032)	0.005 (0.015)
ZFU 1G*an=2000	0.043 (0.033)	0.003 (0.014)
ZFU 1G*an=2001	0.055* (0.030)	-0.006 (0.016)
ZFU 1G*an=2002	0.053 (0.033)	-0.011 (0.019)
ZFU 1G*an=2003	0.056 (0.035)	0.002 (0.019)
ZFU 1G*an=2004	0.071** (0.034)	-0.017 (0.018)
ZFU 1G*an=2005	0.056 (0.035)	-0.021 (0.021)
ZFU 1G*an=2006	0.071* (0.040)	-0.010 (0.018)
ZFU 1G*an=2007	0.058* (0.035)	0.005 (0.020)
Controls for ZFU in UU	yes	yes
year fixed effects	yes	yes
UU fixed effects	yes	yes
obs. (sampling areas*year)	2 538	2 538
obs. (individuals*year)	107 911	107 911
R^2	0.22	0.16

Source : French Labor Force Survey 1993-2007

Long term contracts : undetermined duration (CDI) or at least than 12 months. Short term contracts : duration inferior to 12 months.

*** significant at 1%. ** significant at 5%. * significant at 10%. Weighted estimations. As the individual data is aggregated at the sampling area level for the estimations, both the number of individuals and sampling areas are presented.

6 Conclusion

To conclude, there is a significant decreasing effect of the ZFU program on unemployment, valid outside Paris. There is also evidence of composition effects within the municipality containing the enterprise zones. There are thus two channels for the effect of the program on residents : residents already there before designation (or that would have been there in absence of the program) got more jobs but the program also helped to attract or retain residents with better labor market outcomes. Moreover, the results show that the local hiring condition is working. From a methodological point of view, this points out again to the necessity to evaluate the effect at a very fine geographical level and not only for firms but also for residents. From a public policy point of view, it could be more efficient to attach benefits to people rather than to places. The French government is indeed experimenting a new policy of "emplois francs" in which hiring subsidies are attached to the residents of deprived zones whatever the place they are working.

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A Comparison of ZFU and ZRU

Table 15: ZFU and ZRU exemptions in 1997

	ZRU	ZFU
Payroll tax ("Cotisations sociales")	1 year exoneration <ul style="list-style-type: none"> • within a limit of 50 employees and 1.5 minimum wage • for long term contracts 	5 years of exoneration <ul style="list-style-type: none"> • within a limit of 50 employees and 1.5 minimum wage • local hiring clause from the 3rd employee • for long term contracts • firms of less than 50 employees at their date of creation • some activities are excluded
Individual social charges (health system) of artisans and tradespeople ("Cotisations sociales personnelles maladie artisans/commerçants")	no	5 years of exoneration <ul style="list-style-type: none"> • within a limit of 1.5 minimum wage
Local business tax ("taxe professionnelle")	5 years of exoneration <ul style="list-style-type: none"> • plant of less than 150 employees • within a limit determined yearly (990 kF in 2000, half for plants already existing) • whatever the activity 	5 years of exoneration <ul style="list-style-type: none"> • firms of less than 50 employees at their date of creation • within a limit determined yearly (2835 kF in 2000) • some activities are excluded
Corporate tax ("impôts sur les bénéfices")	5 years of exoneration <ul style="list-style-type: none"> • restricted to new firms • degressive : 100% for year 1 and 2, 75 % for year 3, 50 % for year 4, 25 % for year 5 • within a limit since 2000 • no employees number restriction 	5 years of exoneration <ul style="list-style-type: none"> • for new firms and firms existing the 01/01/1997 • within a limit of 400 000 F for the yearly profit • no employees number restriction
Tax on properties ("Taxe foncière sur les propriétés bâties")	no	5 years of exoneration for business properties
Specific Paris region tax on creation of offices ("redevance sur création de bureaux")	no	exemption
Transfer rights for acquisitions of businesses ("Droits de mutation pour les acquisitions de fonds de commerce")	exemptions up to 700 000 F	exemptions up to 700 000 F

B Literature on French enterprise zones

Article	Generation and Period	Geographical level of data	Evaluation method	Outcomes	Effect
Rathelot and Sillard (2008)	2nd, 2002-2007	address	propensity score matching, DD	firm creations, employment	+
Givord, Rathelot, and Sillard (2013)	2nd, 2002-2007	address	propensity score matching, DD	firm creations, employment	+ effect, - spillovers
Mayer, Mayneris, and Py (2013)	2nd, 1995-2007	address	DD, DDD, regression discontinuity	location choice of plants	+effect but many relocations (- spillovers)
Trevien, Givord, and Quantin (2012)	1st	address	propensity score matching, DD, regression discontinuity	employment and business locations	stronger + effect
Briant, Lafourcade, and Schmutz (2013)	2nd, 1995-2002, 2003-2006	address	DD + geographical indices	firm creations, employment, wages	+, heterogeneous, - spillovers
Gobillon, Magnac, and Selod (2012)	1st, 1993-2003, Paris region	municipality	duration model	exit rate of unemployment of residents	+ but small and temporary effect

C Parameters of the matching equation

Table 16: Probability of a ZRU of being a ZFU1G

Intercept	−0.220 (1.634)
unemployment rate	−6.970*** (1.775)
share of 15-25 year old	6.765*** (2.087)
size of population	0.000*** (0.000)
share of non Europeans	−4.697*** (1.526)
primary school	−0.008 (0.037)
junior high school	0.003 (0.062)
low vocational	−0.071* (0.040)
high vocational	−0.175 (0.109)
high school	−0.060 (0.052)
some college	0.002 (0.119)
university	−0.080 (0.112)
Observations	305
Percent Concordant	77.2

Source : French Census 1990

Logistic model, *** significant at 1%. ** significant at 5%. * significant at 10%

The ZFU were chosen among the ZRU, partly according to an index computed with information from the 1990 Census (the unemployment rate, the proportion of residents under 25, the proportion of residents without a diploma) and the mean earnings of the city (income tax data). Using a logistic estimation (see tables 16), I compute a score with the census information ¹⁹ and match the ZFU with the closest ZRU according to this score. I add also the size of the zone in terms of population as the ZFU were supposed to have at least 10 000 residents. I then located in the Labor Force surveys the ZUS belonging to the municipalities of these matched ZRU and used them as a potential control group. This little approximation is due to the fact that after 2002, I have geographical information only on ZFU, ZUS and municipalities in the data and not directly on ZRU.

¹⁹The mean earnings information was not available