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The impact of Urban Enterprise Zones on establishment location decisions: Evidence from French ZFUs *

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Abstract

In this paper, we study the impact of a French enterprise zones program—the "Zones Franches Urbaines" (ZFUs) policy—on establishment location decisions. Our empirical analysis is based on a micro-geographic dataset that provides exhaustive information on the location of establishments in France over the period 2002-2007 at the census block level. Our identification strategy, which combines spatial and time differencing, assesses how the probability that an establishment locates in the ZFU area rather than in the non-ZFU area of a municipality changes after the implementation of the policy. We also implement double difference estimations, using the fact that targeted urban areas have been selected in different waves over time. Finally, we exploit a discontinuity in the eligibility criteria of the policy as an exogenous source of variation to estimate the impact of the treatment. We find that conditioning on locating in a municipality that hosts a ZFU, the policy has a positive and sizable impact on the probability to locate in the ZFU part rather than in the non-ZFU part of municipalities. However the impact is highly heterogeneous across zones, industries and firms. Moreover, we show that the policy mostly generates diversion effects within municipalities.

Keywords: Firm Location, Enterprise zones, Spatial and Time Differencing; *JEL codes:* R12, R38, R58.

Résumé

Cet article évalue l'impact de la mise en place des Zones Franches Urbaines (ZFU) sur les décisions de localisation des entreprises. L'analyse empirique s'appuie sur une base de données contenant de l'information sur la localisation de tous les établissements en France sur la période 2002-2007. Notre stratégie empirique, qui est basée sur une différenciation spatiale et temporelle, consiste à comparer la probabilité qu'une entreprise choisisse de se localiser dans la partie ZFU plutôt que dans la partie non-ZFU d'une ville, avant et après la création en 2004 des ZFUs dites de seconde génération. Nous adoptons également une stratégie de différence de différences, en utilisant les villes possédant une ZFU à partir de 2007 comme un groupe de contrôle pour les villes possédant une ZFU à partir de 2004. Enfin, nous exploitons des discontinuités dans les critères d'éligibilité des entreprises aux exonérations pour nous assurer que nous estimons bien l'effet de la politique. Les résultats montrent que, conditionnellement au fait de se localiser dans une ville bénéficiant d'une zone ciblée, la politique a un impact positif et significatif fort sur la probabilité que les entreprises se localisent en ZFU. Cependant cet impact positif moyen doit être nuancé. L'effet de la politique varie selon la taille des entreprises, selon l'industrie considérée et selon les caractéristiques des zones ciblées. La politique génère par ailleurs principalement un déplacement infra-municipal d'activité, entraînant un mouvement de (re)localisation d'établissements de la partie non-ZFU de la ville vers la partie ZFU de la ville bénéficiant des exonérations fiscales.

Mots-clés: Localisation, Zones Franches Urbaines, Différence de différences; *Codes JEL:* R12, R38, R58.

1 Introduction

As in many countries, spatial inequalities within French municipalities are striking. Some urban areas featuring low income, high unemployment rate, low level of education and deprived social housing coexist with wealthy neighborhoods. These urban disparities have important social and economic implications. They are often linked to social segregation and exclusion phenomena, and in some circumstances, may lead to urban violence, as was the case during the riots in French suburbs in 2005. As a response, several countries, including the US, the UK and France, have provided tax incentives to promote the economic development of these lagging areas. However, the efficiency of such schemes is controversial (Peter and Fishers, 2004).

The objective of this paper is to evaluate the impact of a French enterprise zones program on establishment location decisions. Initiated in 1996, this program, the "Zones Franches Urbaines (ZFU)" policy, is still ongoing and aims at encouraging the location of new economic activities, reducing unemployment and improving welfare in deprived urban areas of French municipalities. It represents the most important effort by public authorities in favor of depressed urban areas in France.[1] In the ZFU areas, existing establishments or new establishments can be exempted from employer social contributions, taxes on corporate profits, business taxes and property tax on built lands for a period ranging from three to nine years.

ZFUs have been created in three waves over time, the first generation in 1996, the second generation in 2004 and the third generation in 2007. Our empirical analysis focuses on the evaluation of second generation ZFUs. It is based on a micro-geographic dataset which provides exhaustive information on the location of establishments in France over the period 2002-2007 at the census block level. We also use a Geographical Information System to gather information on the exact geographical boundaries of the urban areas targeted by the policy. We are therefore able to identify all establishments in France locating in a municipality which has a ZFU area within its boundaries; for those establishments, we know precisely whether they locate in the ZFU part of the municipality or not. Our benchmark identification strategy consists in comparing the probability that an establishment locates in the (future) ZFU part rather than in the non ZFU part of a municipality, before and after the implementation of the policy in 2004 (i.e. when establishments located in the ZFU area start benefiting from tax exemptions).

The probability that an establishment locates in the ZFU part rather than in the non-ZFU part of a municipality increases by 2.4 percentage points on average, once the ZFU part of the municipality officially benefits from tax incentives. The probability of locating in the ZFU part of a municipality being initially equal to 8.9% in 2002-2003, this means that it

[1] Three types of zones, whose geographical boundaries were set by decree, were actually defined: the "Zones Urbaines Sensibles (ZUS)", the "Zones de Redynamisation Urbaine (ZRU)" and the "Zones Franches Urbaines (ZFU)". Facing an increasing degree of economic difficulties, these zones benefit from an increasing package of tax exemptions. The ZFUs benefit, by far, from the largest incentives. See Appendix for more details.

increases by 27% thanks to the policy. Results are qualitatively the same when we use double differences, using municipalities benefiting from the ZFU scheme in 2007 as a control group for municipalities designated in 2004. They are also robust to a falsification test based on firm size discontinuities in the eligibility criteria.

The impact of the policy appears however to be highly heterogeneous; it is stronger for initially less depressed ZFU areas and for establishments in sectors in which relocation costs are lower. Results also indicate that the effect is almost four times higher for relocations than for "pure" creations and that ZFU areas attract smaller firms. Finally, there is no significant increase in the flow of establishments at the municipality level after the implementation of the policy. Put together, these results indicate that the policy leads to some diversion of economic activity within municipalities, driven by opportunistic (re)locations of existing and new establishments toward ZFU areas. However, the ZFU policy does not have any business creation effect at the municipality level.

Most evaluations of similar programs focus on labor market outcomes.[2] However, the impact on business location *per se* is also an important outcome to evaluate for several reasons. First, the primary goal of these promotion policies is to revitalize the areas they target. Given the importance of agglomeration effects in firm location decisions (see in particular Crozet, Mayer, and Mucchielli, 2004; Devereux, Griffith, and Simpson, 2007), attracting new establishments is crucial to generate positive dynamics on business entry in targeted zones. Second, the entry of new firms can be an important component of employment growth (Rathelot and Sillard, 2009; Billings, 2009; Givord, Rathelot, and Sillard, 2013), and investigating the effect of such programs on establishment dynamics largely contributes to the understanding of the effects on local employment (Greenbaum and Engberg, 2004; Bondonio and Greenbaum, 2007; Neumark and Kolko, 2010). Finally, the presence of new establishments may have positive externalities well beyond direct business and job creations by enhancing local demand for shops, restaurants, infrastructures, cultural activities, thereby creating new perspectives in terms of quality of life for residents of targeted zones.

Our contribution to the literature is threefold. First, our study contributes to the literature on local taxation and firm location decisions by showing that the within-municipality tax differential caused by the ZFU policy affects strongly and significantly firm location decisions. This result contrasts with previous studies finding at most weak effect of between-municipalities tax differential on firm location decisions (Rathelot and Sillard, 2008; Duranton, Gobillon, and Overman, 2011).

Second, we depart from the literature evaluating the impact of urban enterprise zones on business entry (see in particular in the case of France Givord, Rathelot, and Sillard, 2013) by going much deeper in the analysis of the mechanisms that drive average changes in the

[2]For studies evaluating US enterprise zones, see in particular Bondonio and Engberg (2000); O'Keefe (2004); Hanson (2009); Ham, Swenson, Imrohoroglu, and Song (2011); Elvery (2009); and Busso, Gregory, and Kline (2010). For studies on the French enterprise zones program, see Rathelot and Sillard (2009); Gobillon, Magnac, and Selod (2012), Givord, Rathelot, and Sillard (2013) and Briant, Lafourcade, and Schmutz (2012).

level of economic activity in targeted zones. Indeed, by working on location decisions at the establishment level, we provide evidence that the positive average impact of the ZFU policy we measure varies significantly according to firm-level, industry and zone characteristics. Moreover, by focusing on location decisions within municipalities which host a ZFU, we are also able to assess how the untreated part of municipalities hosting these zones is impacted. We show that the policy generates intra-municipal business diversion. These results have important implications for policymakers who aim at improving the design and efficiency of such schemes.

Finally, we develop an original estimation strategy that follows closely establishment location behavior and allows to control finely for endogeneity issues. By focusing on municipalities hosting a ZFU, we investigate the location decisions between the treated and the untreated parts within a municipality, conditioning on having chosen to locate in this municipality. We ignore the choice of the municipality itself; we show that this is not an issue since the policy has no effect on the number of establishment creations in the municipalities hosting ZFUs. Such a strategy enables us to control in an original way for omitted variables and simultaneity issues the evaluation of enterprise zones programs usually suffers from. First, comparing the probability to locate in the ZFU part rather than in the non-ZFU part of a municipality, before and after the implementation of the policy, we control for both time-invariant and time-varying characteristics that are common to the two zones of a municipality, as well as for the time-invariant attractiveness differential between the ZFU part and the non-ZFU part of the municipality. Moreover, we exploit specific features and discontinuities in the implementation of the policy as exogenous sources of variation in the treatment to go further in the assessment of the causal impact of the policy.

The rest of the paper is organized as follows. Section 2 presents a brief overview of previous research. Section 3 describes the policy we evaluate. Section 4 details the estimation strategy and Section 5 the data. Section 6 presents baseline results on the average effect of the ZFU policy and Section 7 investigates potential heterogeneous impact of the policy. Results on the spatial pattern of the ZFU policy are detailed in Section 8. The last section concludes.

2 Previous research

Our paper relates to two strands of the literature. First, it contributes to the analysis of the impact of taxation on firm's location decisions. Second, it contributes to the literature on the evaluation of urban enterprise zones programs. In this section, we briefly present the recent advances in these fields and we discuss how we depart from existing studies.

2.1 Firm location decisions and tax differential : different results

Most enterprise zones programs rely on the assumption that tax incentives are an efficient tool to attract firms in specific locations. An important literature has tried to quantify the

elasticity of firm location decisions to tax differentials.

At the infra-national level (location decisions between different places within a given country), the evidence is mixed. Using a regression discontinuity design approach combined with instrumentation, Rathelot and Sillard (2008) find on French data that higher local corporate taxes discourage firm location, but this effect is shown to be weak. Duranton, Gobillon, and Overman (2011) use spatial differencing, time differencing and instrumentation to assess the effect of local taxation in the UK on the level of economic activity. The level of property tax set up by Local Authorities has a negative effect on firm-level employment growth, but does not affect firm entry.

Several studies suggest that the influence of policies aimed at attracting firms in depressed areas is also at most very weak. Crozet, Mayer, and Mucchielli (2004) find a weak impact of European structural funds and of the French "Prime d'Aménagement du Territoire" on the location of FDI in French regions.[3] Devereux, Griffith, and Simpson (2007) evaluate a similar policy in favor of lagging regions in the UK (the Regional Selective Assistance Scheme). The effect of these subsidies is weak, but magnified when the number of plants in targeted areas is higher. This suggests that subsidies cannot compensate for the lack of agglomeration externalities in deprived areas.

Our study shows that the infra-municipal tax differential caused by the ZFU policy affects strongly and significantly firm location decisions, but also highlights that the effect of the policy is stronger the lower the attractiveness differential between the targeted zone and the rest of the municipality.

2.2 Evaluation of enterprise zones schemes: different outcomes of interest

Recent research has mainly focused on labor market outcomes and the evidence is mixed. In evaluations of US enterprise zones programs, many studies find no significant effect on employment growth in targeted zones or on the employment status of the residents of the zones, while some other studies find a positive effect, at least in the short-run.[4] Regarding studies on European countries, Einio and Overman (2011) evaluate Local Employment Growth Initiative areas in the UK. They find a positive effect on employment, obtained however at the expense of the immediate periphery of targeted zones.

The literature on business location is however more scarce. Some studies have analyzed business creations along with employment effects. While Billings (2009) finds no significant effect of enterprise zones in Colorado on the number of establishments in targeted zones, Neumark and Kolko (2010) tend to find a negative effect in the case of the program conducted in California. Nevertheless, some studies suggest that more complex dynamics may be at work,

[3] "Prime d'Aménagement du Territoire" is a subsidy granted to firms locating in lagging regions.

[4] For studies finding no effect on employment growth see Boarnet and Bogart (1996); Bondonio and Engberg (2000), Lynch and Zax (2011); and Hanson (2009). For studies finding no effect on the employment status of zones' residents, see Elvery (2009) ; and for some studies finding a positive effect on employment, see O'Keefe (2004); Ham, Swenson, Imrohoroglu, and Song (2011) and Busso, Gregory, and Kline (2010).

the benefits of such programs on the entry of new firms being potentially compensated by the exit of some firms due to competition effects (Greenbaum and Engberg, 2004; Bondonio and Greenbaum, 2007).

In the case of France, Gobillon, Magnac, and Selod (2012) focus on the effect of French enterprise zones in the Paris region. They find a small effect on the rate at which unemployed workers in targeted areas find a new job; however, this effect is significant in the short-run only. Givord, Rathelot, and Sillard (2013) use propensity score matching techniques and show that this program had a positive impact on the number of establishments and on employment growth in targeted areas, but their results suggest again short-run effects only. Briant, Lafourcade, and Schmutz (2012) show this impact to be stronger for less geographically isolated zones.

We depart from these studies in several ways. First, we focus on business creation rather than employment. This is an important outcome as attracting new establishments is crucial for reviving economic activity. Second, we also study the impact of the ZFU program on individual establishment location decisions. This enables us to show that beyond the average effect, the impact of the policy varies according to establishment-level, industry-level and area-level characteristics. Finally, we study both the treated and the non-treated part of municipalities, which allows us to precisely identify the spatial pattern of the effect of the policy we measure.

2.3 Evaluation of enterprise zones schemes: different methodologies

Previous research has also widely varied in terms of empirical strategies. A first major challenge in the evaluation of enterprise zones is that zones designated by the policy are different from non-targeted zones. Consequently, evaluations of such enterprise zones must be able to distinguish outcomes that result from prior economic conditions in the targeted areas from outcomes attributable to the implementation of policy. Ideally, one would like to compare outcomes in targeted areas with outcome in untreated areas that have similar characteristics. A second major concern is that there might be unobservable factors varying over time which coincide with the implementation of the policy. Attempts to control for such endogeneity issues have been diverse. They include before/after comparisons (Papke, 1994; Greenbaum and Engberg, 2004), combined with i) a control group consisting of areas eligible for enterprise zone designation or which applied but were rejected (Boarnet and Bogart, 1996; Hanson, 2009), ii) a control group consisting of areas later designated as enterprise zones (Busso, Gregory, and Kline, 2010; Neumark and Kolko, 2010), iii) propensity score matching (O'Keefe, 2004; Givord, Rathelot, and Sillard, 2013; Elvery, 2009), or border analysis (Billings, 2009).

We contribute to this literature by exploiting the specific features of our data and of the policy to propose an original estimation strategy. We first implement a before/after analysis based on the probability to locate in ZFUs within municipalities. This estimation combines

spatial and time differencing, in the spirit of Duranton, Gobillon, and Overman (2011); it controls for the time-invariant attractiveness differential between targeted and non targeted zones, as well as for municipality-level time-invariant and time-varying characteristics. We then adopt double differences, using municipalities with ZFUs designated in 2007 (third generation ZFUs) as a control group. This washes out any contemporaneous shock that would be common to all waves of ZFUs. We finally exploit, as a falsification test, two discontinuities in the eligibility criteria regarding firm size.[5] This controls for shocks that would be specific to second generation ZFUs. All these methods yield qualitatively and quantitatively similar results.

3 Specificities of the French Program

The *Zones Franches Urbaines (ZFU)* were selected among the biggest (more than 10,000 inhabitants) and the most deprived urban areas in France.[6] They were chosen in three waves over time: the first generation (44 ZFUs) in 1996, the second generation (41 ZFUs) in 2004, and the third generation (15 ZFUs) in 2007.[7] Given that we have exhaustive annual data on establishment location decisions and on establishment stocks from 2002 to 2007, ZFUs designated in 2004 are a good fit to conduct an evaluation. Establishments in ZFUs benefit from an important package of tax exemptions. An existing establishment or a newly created establishment in a ZFU is:

- entirely exempted from employer social contributions, both for existing jobs and for newly created jobs, during the first five years, and then at a decreasing rate for a period ranging from three to nine years. This exemption is limited to establishments belonging to firms with less than 50 employees and with a turnover lower than 10 millions euros. It is subject to a local hiring condition, meaning that from the third employee hired by the firm, exemptions apply if and only if one third of firm's employees reside in the ZUS of the urban agglomeration the ZFU is located in.

- entirely exempted from tax on corporate profits during the first five years, and then during nine years at a decreasing rate. This exemption only applies to establishments belonging to firms with less than 50 employees and with a turnover lower than 10 millions euros;

[5] To the best of our knowledge, this method has never been used in the context of enterprise zones. Only Criscuolo, Martin, Overman, and Van Reenen (2012) exploit changes in regions' eligibility rules defined by the EU to estimate the impact of the UK Regional Selective Assistance policy on plant-level employment, productivity, investment and entry/exit.

[6] Based on an index taking into account the number of inhabitants, the unemployment rate, the proportion of population under 25 years-old, the share of population above 15 years-old without any diploma and the tax base in the area. The computation of the index has relied on the availability of data at that time (population census of year 1990 and tax base of year 1996). See Appendix for more details.

[7] ZFUs of the third wave were actually chosen in August 2006, but their exact boundaries were known in December 2006 only, so that treatment in terms of location decisions for this year is less obvious.

- entirely exempted from business tax during the first five years, with possible extensions during the next three to nine years at a decreasing rate, depending on the number of employees. This exemption again applies to establishments belonging to firms with less than 50 employees and with a turnover lower than 10 millions euros ;
- exempted from property taxes on built lands (up to five years)[8];
- exempted from personal social contribution in the case of artisans and shopkeepers during five years.

The ZFU policy is therefore sizable in terms of financial support and this is even more striking when compared to other experiments abroad. In 2007, the French government spent on average 1,800 euros per worker and 360 euros per resident in the ZFU targeted areas. As a matter of comparison, in 2005, 240 dollars (around 200 euros) per worker were spent for enterprise zones in California (see Neumark and Kolko, 2010) and 60 pounds (around 90 euros) per resident in the working-age population were spent for Local enterprise Growth Initiative areas in the UK (see Einio and Overman, 2011). Given that the size of the incentives might partly determine the size of the effects generated by the program, the French ZFU policy deserves particular attention.

We will focus our analysis on ZFUs designated in 2004. A map of the location and distribution of the different waves of ZFUs on the whole French territory is available in the Appendix. In Figure 1, we zoom on the Northern suburbs of Paris, where many ZFUs are concentrated, to show examples of the size, shape and relationship of ZFUs with local unemployment rates (one of the criteria for the area to be treated). Recalling that our identification strategy relies on a comparison within municipalities (borders of which are in black), it is interesting to note that the ZFUs (borders of which are in red) usually occupy a non-negligible, but non-dominant share of the city's area.[9] As to the relationship with unemployment, it is also quite striking that some municipalities, despite quite high unemployment rates, do not feature a treated section. It might be because the other characteristics of the area were less bleak (less "damaged social housing", which entered as a primary criterion, for instance). Finally, note that inside the municipality, the unemployment rate does not seem to be a perfect predictor of treatment.

[8]Even though some of the exemptions concern local taxes (business and property taxes), the funding of these programs entirely relies on national solidarity. Indeed, in France, national transfers compensate the tax resources losses experienced by municipalities following local taxes exemptions decided at the national level.

[9]One can see that in some cases, the boundaries of some ZFUs encompass several municipalities. However, in the empirical analysis, we will prefer working at the infra-municipal level as many factors vary between municipalities (such as local tax rates) and are likely to affect location decisions.

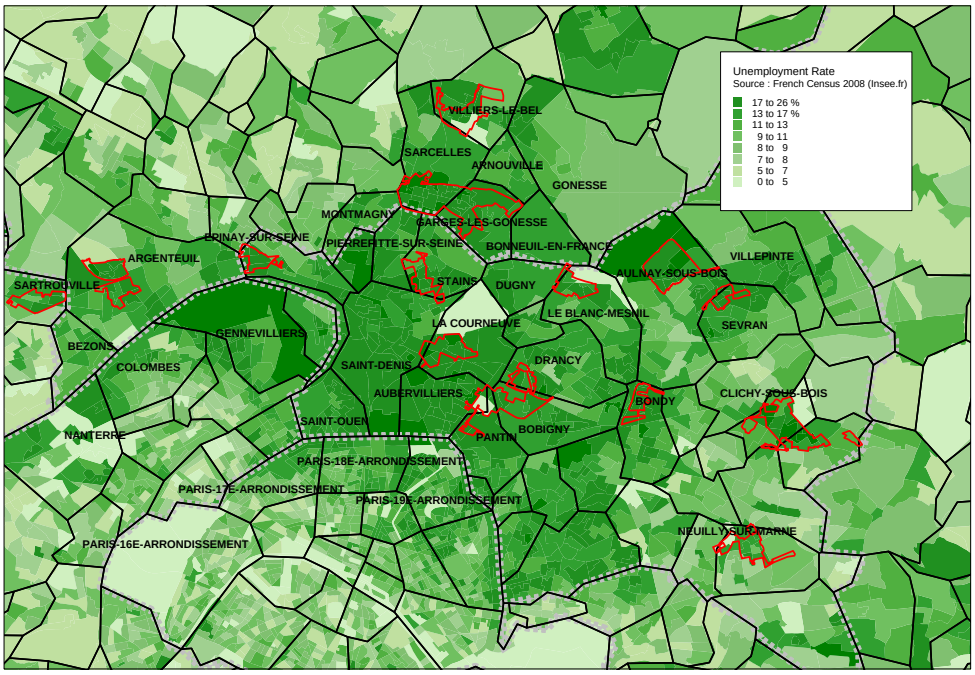


Figure 1: ZFUs and unemployment rate in the Northern suburbs of Paris

4 Estimation Strategy

Our evaluation of the impact of the ZFU policy on establishment location decisions focuses on the ZFUs designated in 2004, i.e. the second-generation ZFUs. In this section, we first present the baseline empirical specification we implement to measure the average effect of the policy on establishment location choices. We then discuss the tests we carry out to further qualify the results we obtain.

4.1 Estimating the impact of ZFUs using spatial and time differencing

Since the ZFU policy targets deprived areas within municipalities, the appropriate level of analysis is infra-municipal. We want to assess whether the implementation of the policy increases the probability that an establishment decides to locate in areas that benefit from the ZFU program.

We propose an estimation strategy close to the one developed by Duranton, Gobillon, and Overman (2011) to study the impact of local taxation on firm entry in the UK. This strategy is based on a spatial differencing approach at the municipality level: we investigate the determinants of the probability to locate in the ZFU part rather than in the non-ZFU part of a municipality, conditioning on the fact that the establishment locates in a municipality with a (future) second-generation ZFU. More precisely, we study how this probability changes over time, i.e. after the implementation of the policy. Note that we do not model how

entrepreneurs choose the municipality they locate in, which amounts to assuming that the ZFU policy does not affect location decisions between municipalities. However, our results validate this modeling strategy since we show that the municipalities hosting ZFUs do not experience any increase in the number of plant creations after the implementation of the policy: the ZFU policy does not affect entrepreneurs' decision on the municipality they locate in.

Focusing on establishment location decisions within municipalities hosting a ZFU has three main advantages. First, working at the infra-municipal level is important since municipalities are the smallest geographical units with administrative boundaries and delegated state's power in France. Municipalities have therefore the autonomy to set a number of local factors (such as local tax rate, price of public transport, etc...), which generates important heterogeneity between them; this municipality-level heterogeneity is neutralized by our spatial differencing approach, as will become clearer in the following. Second, considering the probability to locate in the ZFU part rather than in the non-ZFU part of the municipalities that (will) benefit from second-generation ZFUs reduces the number of observations. For each establishment created between 2002 and 2007 in municipalities that (will) obtain a ZFU in 2004, we have only one observation in our sample, for which we create a variable equal to 1 if the location occurs in the (future) ZFU part, 0 otherwise. Finally, studying the change in the probability to locate in the ZFU rather than in the non-ZFU part of the municipality over time allows us to control for the fact that targeted zones are probably "structurally" less attractive.

We estimate the effect of the ZFU policy on the probability to locate in the targeted zones within municipalities thanks to a logit model. Indeed, we study the decision of establishment i to locate in zone z_1, the ZFU part of municipality m, rather than in zone z_2, the non-ZFU part of municipality m, conditioning on the fact that the establishment locates in municipality m. Assuming that the establishment locates in the zone that yields the highest expected profit, this probability depends on the expected log profit differential $\Delta\pi_{iz_km,t}$ between locating in zone z_1 and zone z_2, which is given by:

$$\Delta\pi_{iz_km,t} = \gamma\Delta \mathrm{y}_{z_km,t} + \Delta\theta_{z_km} + \eta \mathrm{zfu}_{z_1m,t} + \Delta\epsilon_{iz_km,t} \tag{1}$$

where:

- $\pi_{iz_km,t}$ is the log profit of an establishment i which locates in zone z_k in municipality m at time t
- $\mathrm{y}_{z_km,t}$ captures time-varying location characteristics of zone z_k in municipality m at time t
- θ_{z_km} captures time-invariant characteristics of zone z_k in municipality m
- $\mathrm{zfu}_{z_1m,t}$ is a dummy equal to 1 if zone z_1 in municipality m actually benefits from tax exemptions linked to the ZFU scheme at time t

Note that establishment-level characteristics, as well as municipality-level time-varying and time-invariant characteristics do not vary between the ZFU and the non-ZFU parts of a municipality m at time t: given the profit equation, they cancel out and do not appear in equation 1. This would not be the case if such characteristics had heterogeneous effect depending on the part of the municipality we consider. We actually allow for this when we study the heterogeneous effect of the policy. Assuming that $\epsilon_{iz_km,t}$ is an error-term that follows an *i.i.d.* extreme value distribution, the probability that establishment i chooses to locate in zone z_1 of municipality m at time t, P_{iz_1mt}, is logistic. Hence, the probability P of choosing z_1, the ZFU zone, rather than z_2 the non-ZFU zone, conditioning on the fact that i locates in municipality m, can be written as follows:

$$P[i \in z_1 | i \in (z_1, z_2),\ z_1, z_2 \in m] = \frac{1}{1 + \exp[\gamma(\mathrm{y}_{z_1 m,t} - \mathrm{y}_{z_2 m,t}) + (\theta_{z_1 m} - \theta_{z_2 m}) + \eta \mathrm{zfu}_{z_1 m,t}]} \tag{2}$$

The determinants of this probability to locate in ZFUs can be estimated by a logit. They can be classified into three categories.

First, time-varying characteristics, $(y_{z_1,t} - y_{z_2,t})$, that affect the relative attractiveness of z_1 and z_2. To control for this, we introduce the relative stock of establishments between the two zones of the municipality, lagged one year. We first consider the total number of existing establishments in a given location, which is often used to control for unobservable factors that affect the attractiveness of a location. We also consider the ratio of the number of establishments in a given location in the operating industry of the entrant, in order to capture agglomeration effects or unobservable factors that affect the attractiveness of a location for a particular industry.

Second, the attractiveness differential between the ZFU part and the non-ZFU part of a given municipality m, $(\theta_{z_1 m} - \theta_{z_2 m})$, which is fixed over time. This "structural" attractiveness differential is probably always negative since ZFUs are chosen among the less attractive districts within municipalities, but it might vary in size across municipalities. It will be captured by municipality fixed effects.

Finally, the parameter η is our coefficient of interest. It appears clearly now that it is obtained by comparing, within municipalities, the probability to locate in z_1 rather than in z_2 before and after the implementation of the policy, $ZFU_{z_1,t}$ taking the value 1 from 2004 onwards. If we assume that, having controlled for the lagged relative stock of establishments in the two zones, nothing else than the implementation of tax exemptions affects the relative attractiveness of ZFU zones with respect to the non-ZFU part of municipalities over the period, η is an unbiased measure of the impact of the ZFU policy.

In the end, we thus implement a logit estimation with municipality fixed effects. Note that we prefer using a logit estimation on individual location decisions than collapsing the data to study the number or the share of establishment locations in ZFU areas. This approach at the individual level is indeed more tractable for our falsification tests and our analysis of

the potential heterogeneous impact of the policy depending on firm characteristics or zone characteristics.

4.2 Tackling simultaneity issues: double differences and falsification tests

One might worry that policy-makers have chosen the beneficiaries of the policy based on specific information about the evolution of economic conditions in the targeted zones. In this case, the estimation of the impact of the ZFU policy based on the evolution over time of the probability to locate in ZFUs within benefiting municipalities would suffer from a simultaneity issue.

For this reason, we first verify that we do not observe a change in the probability to locate in the ZFU part of municipalities hosting second-generation ZFUs before 2004, replacing the treatment variable by a set of year dummies. However, even if this test is passed, it could be the case that the implementation of the ZFU exactly coincides with a specific shock on the relative attractiveness of targeted zones (other than the policy itself). To rule out such an hypothesis, we adopt two different strategies:

1. A doubles difference approach, comparing the results obtained for municipalities with a ZFU designated in 2004 to the evolution, before and after 2004, of the attractiveness of ZFUs in municipalities benefiting from the policy in 2007 only. The rationale for this test is that the third generation ZFUs are not very different from the second generation ZFUs, because these areas were very close to obtain the label in 2004. They should thus be subject to the same economic conditions except that they do not benefit from tax exemptions until 2007. Moreover, the reason why the ZFUs designated in 2007 have not been designated in 2004 is likely to be exogenous since the designation criterion regarding the size of areas decreased from 10,000 inhabitants in 2004 to 8,500 in 2007. Thus, such an estimation controls for potential trends common to second and third generation ZFUs.

2. A falsification test approach, taking advantage of the existence of two discontinuities in eligibility criteria. First, tax exemptions in ZFUs are limited to establishments pertaining to firms with less than 50 employees. Second, there also exists a limit in terms of turnover (10 millions euros). We check that the policy only affects establishments eligible to tax exemptions, i.e. belonging to firms smaller than 50 employees and 10 millions euros in terms of turnover. These restrictions being completely exogenous to the definition of targeted zones, we can safely assume that all the unobserved time-varying characteristics of the zones are the same for firms eligible and non eligible to ZFU policy. These discontinuities consequently offer a nice potential for a falsification test, which controls for potential shocks affecting specifically second generation ZFUs at the same time as the designation in 2004.

5 Data and descriptive analysis

5.1 Data

To build our dependent variable, we use the uniquely detailed SIRENE dataset provided by the French National Institute of Economics and Statistics (INSEE). This dataset gathers exhaustive information on establishment creations over the period 1995-2007. Valuable for our purpose, the location of each newly located establishment is registered at the "ilot" level, which is the smallest geographical unit used for population census in France. An "ilot", referred to as a city block hereafter, consists of a group of houses or buildings, and is thus very small in terms of surface area. In order to assess whether the establishment is located in a ZFU or not, we use information on the exact geographical boundaries of ZFUs and city blocks, provided by the SGCIV, the French administration in charge of urban policies. Using a Geographical Information System software (Mapinfo), we approximate a ZFU area as a group of city blocks. We consider that a city block belongs to a ZFU as soon as its barycenter belongs to the ZFU.[10] We are thus able to identify municipalities which have a ZFU as well as the generation of the given ZFU. The sample consists of 59 municipalities with a ZFU area designated in 2004 and 24 municipalities with a ZFU designated in 2007.[11] Since for each newly located establishment, we are able to identify whether the establishment locates in a city block pertaining to the ZFU part of the municipality or not, our dependent variable takes the value 1 if the establishment locates in the part of the municipality that is (or that will become) a ZFU and 0 if the establishment chooses to locate in the non-ZFU part of the municipality.

Note that in addition to its exact location within the municipality, we know whether this establishment is newly created or already existed and relocated: the establishments have to give this information when registering administratively; it is thus directly available in the SIRENE dataset. We will use this information when studying potential heterogeneous impact of the policy across establishment characteristics and industries, and also to shed light on the spatial pattern of the effect of the ZFU policy.

In order to measure the effect of area-level characteristics on establishment location decisions, we use the SIRENE database on establishment stocks. The information is available annually from 2002 only. We can calculate the total number of establishments at the city block and industry level. The ratio of the total stock of establishments in both parts of the municipality will be used as a proxy for the time-varying relative attractiveness of the ZFU

[10] As a robustness check, we also considered the case where a city block is said to be part of the ZFU if it has a simple intersection with the actual boundaries of the ZFU. As results were very similar, we present the results with the strict definition of ZFUs only.

[11] 41 ZFUs were created in 2004 and 15 were created in 2007. As stated earlier, the reason why the number of municipalities identified as having a ZFU is higher than the actual number of ZFUs is that the boundaries of some ZFUs encompass several municipalities. However, we prefer working at the infra-municipal level as many factors vary between municipalities (such as local tax rates) and are likely to affect location decisions.

within the municipality.

Finally, we use the BIC-BRN database, which provides balance sheet data for all French firms over the same period, to take into account firm-level characteristics such as size in terms of employees or sales. Note that for the sample of firms locating in municipalities with second and third generation ZFUs, 73% of firms are mono-establishment, 18% have two establishments, and 9% have more than two establishments. Therefore, firm size is also a good proxy for establishment size in our sample of analysis.

Since we have yearly information on both establishment flows and establishment stocks from 2002 onwards only, we choose to limit our study to the evaluation of the ZFUs created in 2004, and to restrict the period of analysis to the years 2002-2007, as other studies on the topic do (Rathelot and Sillard, 2009; Briant, Lafourcade, and Schmutz, 2012).

Our final sample for the benchmark analysis therefore includes all the 172,443 establishments which locate (enter) over the period 2002-2007 in the 59 municipalities where a ZFU is designated in 2004. When turning to the double difference estimations, the sample also includes all the 48,364 establishments which locate over the period 2002-2007 in the 24 municipalities hosting a ZFU designated in 2007.

5.2 Descriptive Analysis

We present in this section a descriptive analysis of the potential effect of the ZFU policy. In this purpose, we first analyze stocks and flows of establishments in ZFUs designated in 2004 and in those designated in 2007, before and after they obtain the ZFU status (third-generation ZFUs were chosen in August 2006, but we consider that the treatment starts in 2007).

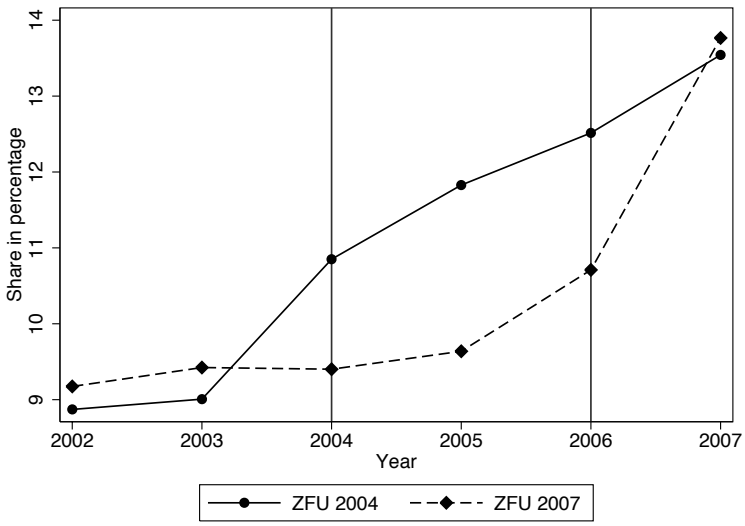
Table 1: Stocks and flows of establishments in the ZFU part of municipalities

			Second generation ZFUs		Third generation ZFUs	
			Year$<$ 2004	Year$\geq$ 2004	Year$<$ 2007	Year$=$ 2007
Stock	Level	Average	199	237	170	191
		Median	160	196	104	117
	Share	Average	14.77	15.61	15.27	15.45
		Median	8.81	9.52	8.53	8.07
Flow	Level	Average	40	62	32	50
		Median	34	47	17	25
	Share	Average	17.11	20.41	16.83	19.57
		Median	11.06	14.79	10.61	15.69

Table 1 reveals that ZFU areas represent a small share of the activities in the municipalities they are located in (around 15% of the total stock of establishments and less than 20% of establishment entries over the period). However, for both waves of ZFUs, the average and the median number of establishments located in targeted areas in terms of stock have increased after the implementation of the policy. In both cases, this growth cannot be attributed to a specific trend at the municipality level, since not only the number of establishments, but also the share slightly increases. This is even more striking for establishment flows, which

share increases on average from 17.11% to 20.41% after the implementation of the policy for ZFUs designated in 2004, and from 16.83% to 19.57% for ZFUs designated in 2007. These simple descriptive statistics cannot be interpreted as causal, but suggest an increase in the attractiveness of ZFU areas for business locations after the implementation of the policy.

Figure 2: Share of establishment entries in ZFU part and non-ZFU part of municipalities



This suggestive evidence is reinforced by the graphical analysis of establishment locations occurring in municipalities that obtain a ZFU in 2004 and in 2007 respectively. Figure 2 plots the evolution of the average share of establishments locating in the ZFU part of the municipality for second and third-generation ZFUs. Several remarks can be made from this graph.

First, in case of a positive impact of the policy, we expect to observe an increase in the share of plants locating in the ZFU part of municipalities after the implementation of the policy (starting in 2004 for second-generation ZFUs and in 2007 for third-generation ZFUs, even though this is less clear in the latter case since third-generation ZFUs are designated in August 2006). Figure 2 shows that this is actually the case. The share of establishments locating in the ZFU part of municipalities hosting a second-generation ZFU increases dramatically from 2004 onwards. For municipalities hosting a third-generation ZFU, this share starts to increase slightly in 2006, and then more neatly in 2007.

Second, one might worry that anticipation about the ZFU designation could play a role in the location decisions of establishments the years before the implementation of the policy. Two cases must be distinguished:

- If establishments are certain about future ZFU status and the boundaries of the zone, we should observe an increase in the number of establishments locating in the ZFU part

before the implementation of the policy, while the number of establishments locating in the non-ZFU area should at best be stagnant.

- In the case of uncertainty about ZFUs and their boundaries, some establishments might decide to postpone their (re)location decision in the municipality, in order to wait for the right information. This should affect disproportionately establishments which would prefer to locate in the non-ZFU part of municipalities in the absence of the policy. For establishments that would have located in the future ZFU anyway, the possibility of benefiting from exemptions will represent a windfall effect but their decisions should not be affected *ex ante*. We should in this case observe, the years before the implementation of the policy, a decrease in the number of locations occurring in the non-ZFU part of municipalities, and at best a stagnation of the number of entries in the ZFU part.

In both cases, the share of establishments locating in the ZFU-part of the municipality should increase before the implementation of the policy. Hence, in case of any anticipation effects, there would be a downward bias in the estimation of the impact of the policy on the probability to locate in the ZFU part rather than in the non-ZFU part of municipalities.

Figure 2 shows that the risk of bias is limited. Indeed, both for municipalities with a ZFU in 2004 and in 2007, the share of establishments locating in the ZFU part of the municipality remains quite constant before the implementation of the policy, and then increases after the implementation of the policy.

Table 2: Business composition of ZFU municipalities in 2002-Share of plants

	Second generation ZFUs		Third generation ZFUs	
	ZFU part	Non ZFU part	ZFU part	Non ZFU part
Manufacturing	6.7	7.8	8.3	8.3
Water/Elec. distrib.	0.4	0.4	0.3	0.3
Construction	14.8	6.9	10.0	9.0
Retail	28.5	28.2	35.4	30.0
Hotels/Restaurants	5.3	8.3	8.6	8.1
Transport/Telecom.	8.0	4.0	7.0	5.4
Real estate/Business serv.	12.6	22.0	11.3	18.6
Adm., educ., household serv.	23.6	22.2	19.0	20.4
Total	100	100	100	100

Finally, the composition of economic activities in municipalities with second and third generation ZFUs seems to be very similar. Table 2 presents the share of plants active in a given industry in 2002 for municipalities obtaining a ZFU in 2004 and in 2007 respectively. These simple statistics show that construction, retail and transport/telecommunication industries tend to be over-represented in ZFU areas as compared to the rest of the municipality they are located in. On the opposite, real estate and business services tend to be under-represented. These differences between the targeted zone and the rest of the municipality they are located in appear for both waves of ZFUs, though they are less pronounced for municipalities obtaining a ZFU in 2007. However, if one compares ZFU areas designated in 2004 with the ones

designated in 2007, they are very similar in terms of industrial composition. While the retail sector tends to be more represented and the industry of construction tends to be less represented in ZFUs designated in 2007 relatively to ZFUs designated in 2004, the representation of the manufacturing industry, of the transport & telecommunication industry and of real estate & business services sector are very similar in both waves of ZFUs. Overall, this first descriptive analysis suggests that the policy coincides with an increase in the probability that establishments locate in the ZFU part of a municipality. The econometric analysis will now allow for a more rigorous assessment and a more precise quantification of this effect.

6 Average impact of the French enterprise zones program

In this section, we assess the average impact of the ZFU policy on establishment location decisions.

6.1 Benchmark analysis

We first assess the average effect of the French enterprise zones program on establishment location decisions by comparing the probability that an establishment locates in the ZFU part of a municipality rather than in the non-ZFU part, before and after the implementation of the ZFU policy. Our sample is composed of all establishments which locate in a municipality which has a 2004 ZFU in its boundaries, over the period 2002-2007. Our dependent variable is equal to 1 if a plant chooses to locate in the ZFU part rather than in the non-ZFU part of the municipality. We focus on the second wave of ZFUs: the treatment variable "ZFU policy" is consequently equal to 1 for years 2004 to 2007, i.e. for years following the implementation of the spatially targeted tax exemptions.

Marginal impacts measured by logit regressions are presented in Table 3. All regressions include municipality fixed effects and standard errors are clustered at the municipality level. Column (1) indicates that the implementation of the policy has a positive and significant impact on the average probability that establishments locate in the ZFU part of the municipality they locate in. The impact of the ZFU policy is sizable, with a marginal effect of 2.75 percentage point. In column (2), we introduce the relative stock of establishments in each part of the municipality, lagged one year. This variable controls for changes in the relative attractiveness between the two zones linked to unobserved factors that could bias our estimation. The coefficient obtained is positive and significant, showing that the probability to locate in the ZFU part of a municipality increases when this ZFU is less different than the rest of the municipality in terms of attractiveness.[12] However, the coefficient on the ZFU policy remains positive and significant. Note that this coefficient should be seen as a lower bound, since the relative stock of establishments might capture part of the dynamic impact

[12]The ratio of establishments' stock being smaller than 1 for all ZFUs.

Table 3: Effect of the policy on the probability to locate in a (future) ZFU

Dependent Variable: Probability to locate in the ZFU part of a municipality logit model (marginal effects)				
	(1)	(2)	(3)	(4)
ZFU policy	0.0275***	0.0221***	0.0241***	0.0233***
	(0.00351)	(0.00319)	(0.00309)	(0.00307)
$\log \frac{\text{Nb of establishments (all ind.) in ZFU}_{t-1}}{\text{Nb of establishments (all ind.) in non-ZFU}_{t-1}}$		0.0747***		0.0116
		(0.0160)		(0.0131)
$\log \frac{\text{Nb of establishments (same ind.) in ZFU}_{t-1}}{\text{Nb of establishments (same ind.) in non-ZFU}_{t-1}}$			0.0470***	0.0469***
			(0.00301)	(0.00302)
Municipality fixed effects	Yes	Yes	Yes	Yes
Cluster (municipality level)	Yes	Yes	Yes	Yes
Observations	172443	172443	172443	172443
Pseudo R^2	0.1596	0.1601	0.1908	0.1908

Standard errors clustered at the municipality level in parentheses, *** significant at 1%, ** significant at 5% and * significant at 10%.

of the policy. In column (3), we control for the relative stock of establishments pertaining to the same 3-digit sector as the new entrant, lagged one year. This variable controls for changes in the relative attractiveness of the two zones that are specific to the entrants' industry. Results indicate that the probability to locate in a ZFU increases when the industry-specific attractiveness differential between the two parts of the municipality decreases. Finally, in column (4), we introduce these two variables simultaneously. Our results indicate that the presence of establishments from the same industry as the entrant is the only one to remain significant. Column (3) is thus our benchmark specification.

Overall, these results indicate that the ZFU policy has a significant and sizable positive impact on establishment location decisions. The probability to locate in the ZFU part rather than in the non ZFU part of the municipality increases by 2.4 percentage points on average once the ZFU part of the municipality legally becomes a ZFU. The average probability of locating in the ZFU part of a municipality being equal to 8.9% in 2002-2003, this marginal impact corresponds to an increase of the average probability to locate in ZFUs by 27%.

6.2 Third generation ZFUs as a control group

Even though we include a proxy for the relative attractiveness of the ZFU the year preceding establishment entry, previous results might overestimate the "true" impact of the policy if a positive trend in the attractiveness of ZFU areas is at play before 2004, or if an unobserved shock in 2004 positively affects the relative attractiveness of ZFU areas. In order to deal with these issues, we first estimate the probability to locate in the ZFU part of a municipality over time. In the absence of any other shock than the policy, we should observe a significant increase in the probability to locate in the ZFU part of a municipality from 2004 onwards for municipalities obtaining a ZFU in 2004, and a significant increase from 2006-2007 only for

Table 4: Probability to locate in a (future) ZFU over time

Dependent Variable: Probability to locate in the ZFU part of a municipality (logit model)				
	ZFU in 2004		ZFU in 2007	
	(1)	(2)	(3)	(4)
year 2003	0.00108	-0.00195	0.000534	-0.00190
	(0.00282)	(0.00279)	(0.00371)	(0.00373)
year 2004	0.0160***	0.0155***	-0.00381	-0.00496
	(0.00327)	(0.00340)	(0.00551)	(0.00591)
year 2005	0.0251***	0.0240***	0.000218	0.000773
	(0.00401)	(0.00394)	(0.00646)	(0.00458)
year 2006	0.0306***	0.0269***	0.0126*	0.0130
	(0.00463)	(0.00413)	(0.00716)	(0.00838)
year 2007	0.0384***	0.0251***	0.0366***	0.0341***
	(0.00430)	(0.00362)	(0.00494)	(0.00866)
$\log \frac{\text{Nb of estab. (same ind.) in ZFU}_{t-1}}{\text{Nb of estab. (same ind.) in non-ZFU}_{t-1}}$		0.0468***		0.0426***
		(0.00305)		(0.00350)
Municipality fixed effects	Yes	Yes	Yes	Yes
Cluster (municipality level)	Yes	Yes	Yes	Yes
Observations	172443	172443	48364	48364
Pseudo R^2	0.1604	0.1911	0.1280	0.1554

Standard errors clustered at the municipality level in parentheses, *** significant at 1%, ** significant at 5% and * significant at 10%.

ZFUs designated in August 2006. We then turn to a proper difference-in-difference estimation, using ZFUs designated in 2007 as a control group for ZFUs designated in 2004.

We first analyze the evolution of the probability to locate in the ZFU part of a municipality over time, replacing the treatment variable by a full set of year dummies in the estimated equation. Results for ZFUs designated in 2004 and in 2007 are presented in Table 4. The year of reference is 2002. For ZFUs designated in 2004, in line with the graphical analysis, columns (1) and (2) show that the probability to locate in the ZFU part of a municipality rather than in the non-ZFU part really starts increasing in 2004 only. The coefficient remains positive and very significant, and even increases after this date. Results for the 2007 ZFUs, for which the sample is composed of all establishments which locate in a municipality which has a ZFU designated in 2007, are presented in columns (3) and (4) and are very similar. We observe a positive and slightly significant coefficient for the year 2006, which increases in 2007, in line with the designation of the third generation ZFUs in August 2006 only. In any case, no pre-treatment trend is detected in the probability to locate in ZFU.

Moreover, the comparison of the results for both waves of ZFUs suggests that the positive impact we measure in our benchmark regression is not linked to a common shock. Indeed, if there were a shock in 2004 common to all waves of ZFUs, it should have affected both generations. However, dummies for years 2004 and 2005 are insignificant and close to zero in the case of ZFUs designated in 2007.

This is confirmed by a proper difference-in-differences estimation, using municipalities with third-generation ZFUs as a control group for municipalities with a ZFU designated in

Table 5: Double differences

Dependent Variable: Probability to locate in the ZFU part of a municipality logit model (marginal effect)		
	(1)	(2)
Dummy post 2004	0.00275	0.00421
	(0.00322)	(0.00364)
Dummy post 2004 × municipality ZFU in 2004	0.0200***	0.0183***
	(0.00459)	(0.00479)
$\log \frac{\text{Nb of estab. (same ind.) in ZFU}_{t-1}}{\text{Nb of estab. (same ind.) in non-ZFU}_{t-1}}$		0.0492***
		(0.00253)
Municipality fixed effects	Yes	Yes
Cluster (municipality level)	Yes	Yes
Observations	181349	181349
Pseudo R^2	0.1530	0.1881

Standard errors clustered at the municipality level in parentheses, *** significant at 1%,** significant at 5% and * significant at 10%.

2004. Results are presented in Table 5.[13] There is an increase after 2004 in the probability to locate in the ZFU part of a municipality in municipalities with a ZFU designated in 2004 as compared to municipalities with a ZFU designated in 2007. The coefficient obtained is close to our benchmark estimate, equal to 1.8 percentage point.

6.3 Falsification test

Our double difference estimation is convincing if and only if one agrees that in case of shocks other than the policy, these shocks should affect both waves of ZFUs identically. However, though not very plausible given the distribution of ZFUs on the whole French territory, one could still argue that the acquisition of the ZFU label is correlated with shocks that affect specifically the ZFUs designated in 2004.

This is why we propose an alternative estimation strategy, which exploits two discontinuities in the eligibility criteria to benefit from tax and social contributions exemptions. All the exemptions (except the property tax exemption on built lands) are limited to establishments belonging to first, firms with less than 50 employees, and second, firms which turnover is below 10 millions euros. We run falsification tests based on these discontinuities. The advantage of this stratification framework is that both time-invariant and time-varying unobserved characteristics of the zones are controlled for since they are common to the two groups of firms. If there were an idiosyncratic shock other than the policy, this should affect identically all firms, and we should observe an increase in the probability to locate in the ZFU part of the municipality for both eligible and non-eligible firms. If however we observe an increase in the probability to locate in the ZFUs for eligible firms only, this confirms that our estimation

[13]We ignore year 2007 in these regressions since municipalities with third generation ZFUs, used as a control group, fully benefit from the policy at this date. In this case, the sample if composed of all establishments which locate in municipalities which have a ZFU designated in 2004 and of establishments which locate in municipalities which have a ZFU designated in 2007, over the period 2002-2006.

captures the impact of the policy.

To carry out these tests, we focus on establishments which locate over the period 2002-2007 in municipalities which have a ZFU designated in 2004 and we create two samples, the sample of eligible establishments (belonging to firms with more than 50 employees and a turnover inferior to 10 millions euros) and the sample of non eligible establishments (belonging to firms with more than 50 employees or a turnover superior to 10 millions euros). The construction of the dataset reveals the existence of a mismatch between the year of registration of establishments in the SIRENE database (on establishment locations) and in the BIC-BRN database (on firms characteristics). We decide to use the employment of the firm the first time it appears in the BIC-BRN database over the period 2002-2007.[14]

Columns (1) and (2) of Table 6 present the results for these two samples of firms. The positive impact of the policy on the probability to locate in the ZFU part of a municipality is positive and significant for eligible firms only. One could worry that firms around the threshold in terms of employment might manipulate their size so as to benefit from the policy. This could bias our results. Such a manipulation would be possible for firms in the neighborhood of the threshold only. Given that the distribution of firms is highly concentrated toward small firms, we run the same regressions eliminating firms between 40 and 60 employees, and with a turnover between 8 and 12 millions euros.[15] Results are presented in columns (3) and (4) and confirm that there is an increase in the probability to locate in ZFUs after the implementation of the policy for eligible firms only.

These falsification tests confirm that our estimation strategy does not suffer from simultaneity bias. Our previous estimates, based on samples mixing eligible and non eligible establishments, actually under-estimated rather than over-estimated the real impact of the policy. The policy increases on average the probability that a plant locates in the ZFU part rather than in the non-ZFU part of a municipality by 2.3 to 3.3 percentage point, depending on the sample retained for the estimation.

[14] Doing so, we match more observations than we do when using the employment of the firm the exact year of its location. We prefer this measure to average employment of the firm over the period, since firm employment might be impacted by the policy.

[15] We also carried out the test by eliminating 10% of firms above and below the thresholds of 50 employees and 10 millions of turnover and the results are similar.

Table 6: Falsification test: Number of employees and turnover eligibility rules

	Dependent Variable: Probability to locate in a ZFU part of a municipality logit model (marginal effects)			
	< 50 employees & turnover $< 10M$ €	> 50 employees or turnover $> 10M$ €	< 40 employees & turnover $< 8M$ €	> 60 employees or turnover $> 12M$ €
	(1)	(2)	(3)	(4)
ZFU policy	0.0332 ***	-0.000623	0.0331***	-0.00130
	(0.00349)	(0.00600)	(0.00346)	(0.00646)
$\log \frac{\text{Nb of estab. (same ind.) in ZFU}_{t-1}}{\text{Nb of estab. (same ind.) in non-ZFU}_{t-1}}$	0.0456***	0.0154***	0.0459***	0.0155***
	(0.00319)	(0.00197)	(0.00322)	(0.00207)
Eligible	Yes	No	Yes	No
Municipality fixed effects	Yes	Yes	Yes	Yes
Cluster (municipality level)	Yes	Yes	Yes	Yes
Observations	82548	8509	81957	7942
Pseudo R^2	0.2037	0.2289	0.2041	0.2288

Standard errors clustered at the municipality level in parentheses, *** significant at 1%, ** significant at 5% and * significant at 10%.

7 Heterogeneous impact of the ZFU policy

The average effect of the policy we measure might hide important variations in the efficiency of the policy along several dimensions: characteristics of the entrants, characteristics of the zones, characteristics of the industries. Measuring and quantifying such a heterogeneity is crucial to understand the mechanisms underlying the effects and to adequately design enterprise zones policies. In this section, we present several results going in this direction.

7.1 Impact of the ZFU policy and firm size

In this subsection, we are interested in the potential heterogeneous impact of the policy depending on firm size. Indeed, from a theoretical point of view, beyond the threshold effect we have already emphasized, Baldwin and Okubo (2006) show that the opportunity cost of relocating in peripheral regions is lower for smaller firms. If enterprise zones policies attract small firms only, this means that the effect of these policies on local employment might be low.

To investigate the heterogeneous impact of French ZFUs depending on entrant size, we thus introduce an interaction term between the treatment variable and establishment size. We proxy establishment size by the total number of employees in the firm (73% of the firms studied being single-establishment). We measure firm size by the number of employees declared the first year it appears in the BIC-BRN over the 2002-2007 period. We focus, as previously, on establishments which locate over the period 2002-2007 in municipalities which have a ZFU designated in 2004.[16]

One difficulty with a logit estimation is that the interpretation of the interaction term is not direct (see Ai and Norton, 2003). Therefore, we use a linear probability model. Results are presented in Table 7. The first column reports the results for the whole sample of firms; again, we show that the policy has a positive effect on the probability to locate in targeted areas. However, the probability to locate in ZFU areas is higher for smaller firms (the coefficient on firm size is negative and significant), and the effect of the policy is stronger for smaller firms (the coefficient of the interaction term is negative). This negative sign on the interaction is likely to be linked to the fact that firms with more than 50 employees are not eligible for tax and social contributions exemptions. However, it might still be the case that eligible firms with different size respond differently to the policy. In columns (2) and (3), we thus repeat the analysis for firms with less than 50 employees, column (2) including firms with 0 employees (self-employed workers), and column (3) excluding them. As shown by the number of observations, the number of establishments with self-employed workers is very high. Whatever the subsample, the coefficient associated with the implementation of the policy is positive and significant, and the coefficient associated with firm size is negative.

[16]The reason why in column (1) the number of observations is smaller than in our benchmark is that information on firm size is missing for some observations.

Table 7: Impact of the policy and firm size

	Dependent Variable: Probability to locate in a ZFU (linear probability model)			
	whole sample	(<= 50 employees)		(> 50 employees)
	(1)	(2)	(3)	(4)
ZFU policy	0.0273***	0.0246***	0.0326***	-0.00510
	(0.00419)	(0.00412)	(0.00582)	(0.0145)
$\log \frac{\text{Nb of estab. (same ind.) in ZFU}_{t-1}}{\text{Nb of estab. (same ind.) in non-ZFU}_{t-1}}$	0.0382***	0.0394***	0.0424***	0.0125***
	(0.00649)	(0.00686)	(0.00667)	(0.00307)
Firm Size	-0.00938 ***	-0.0119***	-0.0148 ***	-0.00121
	(0.00160)	(0.00295)	(0.00289)	(0.00152)
Firm Size × ZFU policy	-0.00182**	0.00294	-0.00140	0.000971
	(0.000898)	(0.00355)	(0.00246)	(0.00199)
Firms with 0 employees	Included	Included	Excluded	Not applicable
Municipality fixed effects	Yes	Yes	Yes	Yes
Cluster (municipality level)	Yes	Yes	Yes	Yes
Observations	124638	117767	54848	6871
R^2	0.0229	0.0207	0.0271	0.0072

Standard errors clustered at the municipality level in parentheses, *** significant at 1%, ** significant at 5% and * significant at 10%.

This means that while the policy has a positive effect on establishment probability to locate in targeted areas, firms locating in these areas are small independently of the policy. Regarding the interaction term between the ZFU policy and firm size, it is non significant. Once we limit the sample to firms eligible to the exemptions in terms of number of employees, no heterogeneity emerges in the impact of the policy. Finally we reproduce the same analysis for the sample of firms with more than 50 employees. As expected, the policy has no influence on the location of big firms that are non-eligible to tax exemptions.

To sum up, these results show that on average, ZFU zones structurally attract smaller firms, independently of the effect of the policy. When the whole sample of firms is considered, smaller firms respond more to the ZFU policy, due to the fact that firms smaller than 50 employees are the only ones to be eligible. However, once all thresholds effects linked to the policy are controlled for, no significant heterogeneity of the impact with respect to firm size emerges.

7.2 Impact of the policy, relative attractiveness of the ZFUs and establishment mobility

A study by Devereux, Griffith, and Simpson (2007) on the evaluation of the Regional Assistance Scheme in the UK shows that firms are less responsive to government subsidies in areas where there are fewer existing establishments in their industry. This result points at the difficulty for (re)location subsidies to counteract the attractiveness deficit of lagging places. We investigate this issue in the context of French ZFUs by introducing an interaction term between the treatment dummy and the relative stock of plants in the operating industry of the entrants.

Table 8: Heterogeneous effect of the ZFU policy - Zones and industry characteristics

	Dependent Variable: Probability to locate in a ZFU (linear probability model)		
	(1)	(2)	(3)
ZFU policy	0.0231***	0.0483***	0.00731**
	(0.00358)	(0.00993)	(0.00311)
$\log \frac{\text{Nb of estab. (same ind.) in ZFU}_{t-1}}{\text{Nb of establishments (same ind.) in non-ZFU}_{t-1}}$	0.0414***	0.0354***	0.0419***
	(0.00706)	(0.00705)	(0.00708)
$\log \frac{\text{Nb of estab. (same ind.) in ZFU}_{t-1}}{\text{Nb of establishments (same ind.) in non-ZFU}_{t-1}} \times$ ZFU		0.00868***	
		(0.00260)	
Mobile industries			-0.0143***
			(0.00387)
Mobile industries × ZFU			0.0336***
			(0.00670)
Municipality fixed effects	Yes	Yes	Yes
Cluster (municipality level)	Yes	Yes	Yes
Observations	172443	172443	172443

Standard errors clustered at the municipality level in parentheses, *** significant at 1%, ** significant at 5% and * significant at 10%.

Table 8 reports the results we obtain, the sample being composed of all establishments which locate over the period 2002-2007 in municipalities which have a 2004 ZFU in their boundaries. Column (1) reproduces our benchmark regression estimated thanks to a linear probability model. We find again a positive and very significant marginal impact of the ZFU policy on establishment location decisions; moreover, the coefficient we obtain is equal to 2.31 percentage point, i.e. reassuringly very close to the effect measured by our logit estimation. The same applies for the relative stock of establishments in the ZFU. In column (2), we interact the treatment dummy with our proxy for relative attractiveness of the ZFU. Results indicate that the effect of the policy is positive and significant, and that establishments are more likely to locate in the ZFU part of a municipality when the attractiveness differential between the two zones of the municipality is low (i.e. when the ratio of the number of establishments in the ZFU part relative to the non-ZFU part of the municipality is high). Regarding the interaction term, it is positive and significant, meaning that the effect of the ZFU policy is magnified when the attractiveness differential between the two parts of the municipality is low. This result suggests that the ZFU policy is less efficient when targeted areas face a very high degree of economic difficulties as compared to the rest of the municipality. Note that the results are very similar when we use the ratio of the total number of establishments in the ZFU and the non-ZFU part of municipalities as a measure of relative attractiveness.[17]

The impact of the policy might also vary with industry-level characteristics. Identifying the sectors that are more affected by the ZFU policy can help policy-makers to redefine targeted policies by taking into account specific response to tax and social contributions exemptions at the industry-level.

[17] Results available upon request.

In particular, sectors are likely to vary in terms of fixed (re)location costs. In sectors where fixed relocation costs are low as compared to fixed location costs, the share of relocations in overall plant creations (relocation+"pure" creations)[18] should be high. We can expect that such sectors are more responsive to location subsidies, since it is relatively easier for establishments in these sectors to change location. For each establishment creation, we know in our dataset whether the new plant corresponds to a "pure" creation or to the relocation of an already existing plant. For a given 3-digit sector, we thus use the share of relocations among establishment creations over the period 1995-2007 in all municipalities in France as a proxy for mobility at the industry-level. In order to avoid any bias in our measure due to the implementation of the ZFU policy, we exclude municipalities obtaining a ZFU over the period for the calculation of the share of relocations in the total number of plant creations. An industry is said to be mobile if the share of relocations in total plants creations is above 25%, the median in the sample.

Column (3) of Table 8 shows that the impact of the policy is clearly stronger for establishments active in mobile industries. Indeed, while the implementation of the policy increases the probability that a plant locates in a ZFU by 2.3 percentage point on average, column (3) shows that this increase is equal to 0.73 percentage point in sectors with high (re)location costs, and to 4.09 percentage point (0.73+3.36) in mobile industries.

In Table A-1 in Appendix, we present the results for each sector separately. They indicate that the probability that an establishment locates in the ZFU part of a municipality increases significantly after the implementation of the policy in most industries. However, there is some sectoral heterogeneity in the response to the ZFU policy. Consistently with the results presented in Table 8, the Health and the Business services sectors, which exhibit on average high shares of relocations in plants' creations, are sectors for which the impact of the policy is the strongest.

In Table 9, we go further in this direction by estimating the marginal impact of the policy separately for "pure" creations and for "relocations", without distinguishing however between sectors.[19] The results show that the impact of the ZFU policy on the probability to locate in the ZFU part of municipalities, measured at the individual level, differs for creations and relocations (columns (1) and (2)). While the marginal impact is positive for both types of establishment location decisions, it is more than 4 times higher for relocations of existing plants than for "pure" creations. Columns (3) and (4) further show that the marginal impact of the policy is not significantly different for relocations within the municipality and for inter-municipal relocations (the municipality of origin being also available in the SIRENE dataset

[18]The total number of plant creations depending on fixed (re)location costs, but also on overall demand addressed to establishments in this sector etc.

[19]Our sample of analysis still includes all establishment locations over the period 2002-2007 in municipalities which have a ZFU designated in 2004, however we separate creations from relocations of existing establishments. Due to missing information, the sum of observations in column (1) and (2) is slightly smaller than in our benchmark case. The same applies to columns (3) and (4) with respect to column (2).

Table 9: Effect of the ZFU policy for creations and relocations

	Dependent Variable: Probability to locate in the ZFU part of a municipality logit model (marginal effects)			
	Creations	Relocation of existing plants		
		all relocations	same municipality	other municipalities
	(1)	(2)	(3)	(4)
ZFU policy	0.0135***	0.0655***	0.0641***	0.0703***
	(0.00282)	(0.00589)	(0.00550)	(0.00859)
$\log \frac{\text{Nb of estab. (same ind.) in ZFU}_{t-1}}{\text{Nb of estab. (same ind.) in non-ZFU}_{t-1}}$	0.0501***	0.0362***	0.0396***	0.0322***
	(0.00354)	(0.00291)	(0.00241)	(0.00497)
	(0.00359)	(0.00264)	(0.00241)	(0.00497)
Municipality fixed effects	Yes	Yes	Yes	Yes
Cluster (Municipality level)	Yes	Yes	Yes	Yes
Observations	133277	38457	20650	16963
Pseudo R^2	0.1894	0.2101	0.1871	0.2265

Standard errors clustered at the municipality level in parentheses, *** significant at 1%, ** significant at 5% and * significant at 10%.

in case of relocation).

Together with the heterogeneous impact of the policy depending on establishment mobility within sectors, these results strongly suggest that an important part of the effect of the French ZFU policy can be explained by already existing establishments re-optimizing the location of their business. This is worrying for the long-run impact of enterprise zones policies, since plants that can easily relocate to benefit from the subsidies, could also easily leave toward a more attractive area once subsidies are not provided anymore.

8 At the municipality level, establishment creation or establishment diversion?

Our results have shown so far that the ZFU policy affects positively (with some heterogeneity) the probability that establishments locate in the ZFU part rather than in the non-ZFU part of municipalities benefiting from the policy. This increase in the number of establishments locating in targeted areas can however have two different origins.

First, the policy might overall generate business creation at the municipality-level. Indeed, it might shift economic activities between municipalities, attracting new establishments that would have been created or stayed, in the absence of the policy, in other municipalities, or also favor the emergence of businesses that would have not emerged at all in the absence of incentives. In this case, the ZFU policy would generate establishment creation not only at the zone level, but also at the municipality level. Second, the policy can also lead to an intra-municipal shift of economic activities, encouraging new establishments, that would have been created in any case in the municipality, to locate in the ZFU part, or encouraging the relocation of existing establishments from the non-ZFU part to the ZFU part of the municipality. In this latter case, the ZFU policy would only generate establishment diversion:

Table 10: Number of establishments in municipalities with a ZFU

	Dependent Variable: number of establishments locations Poisson model (marginal effects)		
	Municipality (overall)	ZFU part	Non-ZFU part
	(1)	(2)	(3)
Dummy Post 2004	0.104***	0.170***	0.0974***
	(0.0145)	(0.0431)	(0.0136)
Dummy ZFU 2004 × Post 2004	0.000195	0.208***	-0.0242
	(0.0175)	(0.0573)	(0.0154)
Municipality fixed effects	Yes	Yes	Yes
Cluster (municipality level)	Yes	Yes	Yes
Observations	415	415	415
Number of municipalities	83	83	83

Standard errors clustered at the municipality level in parentheses, *** significant at 1%, ** significant at 5% and * significant at 10%.

the positive impact we measure for targeted zones would thus entirely be obtained at the expense of the other part of the municipality.

To investigate this issue, we analyze the evolution of establishment flows in municipalities obtaining their ZFU in 2004, taking as a control group municipalities which will have a ZFU in 2007. We thus proceed to difference-in-difference estimations. Since the number of establishment locations is a count variable, we use for our estimations a Poisson model with municipality fixed-effects. One should note that in this case, we turn to an analysis of a count of establishments locations at the municipality level over the period 2002-2007, in municipalities with a ZFU in 2004 and in municipalities with a ZFU in 2007. The number of observation therefore decreases to 415 observations.

Results are presented in Table 10. Column (1) shows that at the municipality level, the size of establishment flows increases after 2004 for both types of municipalities. However, municipalities with a ZFU designated in 2004 do not experience any differentiated increase in the flow of establishments they attract with respect to municipalities obtaining their ZFU in 2007: the coefficient associated with the implementation of the policy (variable taking the value one after 2004 for municipalities obtaining a ZFU in 2004) is indeed not significant and very close to 0. Consequently, the policy does not induce aggregate business creation at the municipality level.

Results are different for the ZFU part of municipalities. Column (2) shows that ZFUs designated in 2004 exhibit a higher increase in the size of establishment flows after 2004 than the ZFUs designated in 2007. The marginal impact is sizable and very significant, equal to 20.8 percentage point on average.

Put together, these results suggest that the policy generates business diversion, i.e. that it shifts towards the ZFU part of the municipalities activities that would have located, in the absence of the policy, in the non-ZFU part. This is confirmed by the results in column (3): comparing the evolution of the number of establishment locations in the non-ZFU part of municipalities treated in 2004 to this same evolution in the non-ZFU part of municipalities

treated in 2007, we find a negative coefficient equal to -0.024, with a p-value equal to 0.11.[20]

As usual in difference-in-differences estimations, our estimations in this section rely on the assumption that municipalities that benefit from third generation ZFUs are a good counterfactual for what would have happened after 2004 in municipalities with second-generation ZFUs; there must not be, in particular, any pre-trend in the evolutions of establishment flows in municipalities that benefit from the policy in 2004. We check for this in Table A-2 in Appendix, and results show that pre-trends cannot be detected in any of the estimations, so that we are confident in the reliability of our results.

To sum up, the implementation of the ZFU policy induces an increase in the probability to locate in targeted zones within municipalities. However, the results in this section show that the policy has absolutely no impact on the number of establishment locations at the municipality-level. This "aggregate" null impact actually hides a significant increase of the number of new locations in the ZFU part and a decrease of the number of new locations in the non-ZFU part of municipalities. Altogether, this points at a diversion effect of the French enterprise zones policy: the incentives divert towards ZFU zones establishment locations that would have anyway occurred in the municipality. In this sense, the positive effect of the policy on the probability to locate in the targeted zones is obtained at the expense of the non-targeted part of municipalities hosting the ZFUs, pointing at displacement effects.

9 Conclusion

In this paper, we evaluate the impact of a French enterprise zones policy, the "Zones Franches Urbaines" (ZFU) policy, on establishment location decisions. In order to deal with endogeneity issues, we first adopt an approach which combines spatial and time differencing and which amounts to assess how the probability to locate in a ZFU part of a municipality, changes after the implementation of the ZFU policy, for establishment locating in a municipality which has a ZFU in its boundaries. We then implement a double difference estimation by taking advantage of the fact that targeted areas have been selected in different waves, making the municipalities hosting a 2007 ZFU an appropriate control group for municipalities hosting a 2004 ZFU. Finally we also exploit two discontinuities in the eligibility criteria of the policy as an exogenous source of variation to estimate the impact of the treatment.

Our results show that the French ZFU policy has a positive and sizable impact on the probability that establishments locate in targeted urban areas: the marginal impact of the policy corresponds to an increase in the pre-treatment probability by 27%. This effect is robust to our different estimation strategies, both in terms of significance and magnitude of the coefficients. However, this positive average impact of the policy has to be qualified. First,

[20]Note that the marginal impacts we find in the three columns are coherent. In our sample, before 2004, the share of establishment locations occurring in the ZFU part of municipalities with second-generation ZFUs is equal to 9%. The overall impact of the policy at the municipality-level should thus be equal to $0.09 \times 0.208 - 0.91 \times 0.0242 \simeq -0.003$, i.e. very close to the null impact we measure in column (1).

we find that the impact of the policy is stronger when the initial attractiveness differential between the two parts of the municipality is low. This suggests that such tax incentives may be less efficient in most distressed urban areas of French municipalities. Second, we find that areas targeted by the policy attract structurally smaller firms. This means than the potential benefits of such program regarding employment creation by new establishments in targeted zones might be limited. Results also show that the effect of the policy varies a lot depending on the considered industry. Finally results reveal that the policy does not create economic activities *per se* at the municipality level; it generates displacement effects and leads to a diversion of economic activity within municipalities towards taregeted zones.

In the current debate about the implementation of place-based versus people-based policies, our empirical analysis gives strong evidence that the ZFU policy succeeded to promote the (re)location of establishments in targeted areas, which was the primary objective of the French program. However, our analysis indirectly suggests that the economic and social benefits of the ZFU policy for zone residents are likely to be low, given the (re)location dynamics at work and the heterogenous impact of the policy regarding area, industry, and firm level characteristics. Finally, in order to have a comprehensive view of the welfare consequences of the policy, some other dimensions would need to be investigated. On the one hand, the entry of establishments in targeted zones might have an impact on the real estate market that could be detrimental to zone residents and to potential future firm entry. On the other hand, by attracting new establishments, the ZFU policy might contribute to improve the image and the quality of life within the zones, which could have a positive social impact beyond economic outcomes. Trying to quantify such effects is an important avenue for future research.

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A-1 Appendix

A-1.1 The French program: ZUS, ZRU and ZFU

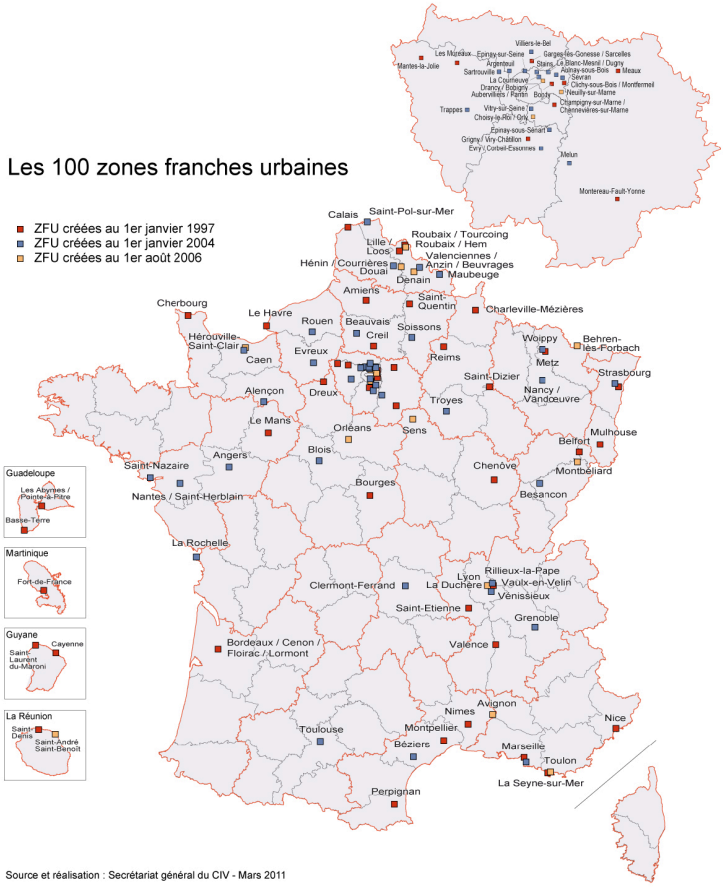
In 1996, the French Government launched the "Pacte de relance de la ville" which defines three types of zones: i) the "Zones urbaines sensible, (ZUS)" (Sensitive Urban Zones), ii) the "Zones de Redynamisation Urbaines, (ZRU)" (Revitalisation Urban Zones) and iii) the "Zones Franches Urbaines (ZFU)" (Urban Enterprise Zones). These zones are facing an increasing degree of economic and social difficulties and benefit therefore from a different package of tax exemptions.

The *Zones Urbaines Sensibles* are infra-municipal urban areas characterized by *the presence of damaged social housing and by a high unemployment rate.* Their selection has thus relied on qualitative criteria. Firms which decide to locate in these areas benefit from corporate tax exemptions if local authorities have agreed on this. The French government designated 751 ZUSs in 1996.

Among these ZUSs, 416 have been classified as *Zones de Revitalisation Urbaine (ZRU).* They face stronger difficulties than the other ZUSs. These difficulties are assessed thanks to an "index" taking into account economic characteristics and social conditions in the zones. This index remains the main criterion for the selection of ZRUs. It is based on the number of inhabitants, the unemployment rate, the proportion of population under 25 years-old, the share of population above 15 years-old without any diploma and the tax base in the area. The computation of the index has relied on the availability of data at that time (population census of year 1990 and tax base of year 1996). An existing establishment or a new establishment in a ZRU is:

- exempted from employer social contributions during twelve months, for any job creation (of a minimum length of one year) that increases the number of employees, up to 50 employees.
- totally exempted from taxes on corporate profits for the first two years and then at a decreasing rate for the next three years. This exemption only applies to firms whose headquarters and plants are located in the targeted zone and excludes firms in banking, finance, insurance, housing and renting, and sea-fishing sectors;
- totally exempted from business tax during five years, with possible extension of the exemption at a decreasing rate during three years. This exemption is limited to establishments with less than 150 employees;
- exempted from property taxes on built lands (up to five years);
- exempted from personal social contribution in the case of artisans and shopkeepers.

Finally, the *Zones Franches Urbaines (ZFU)* were chosen among the biggest (more than 10,000 inhabitants) and the most deprived ZRUs and were designated in three waves. The first 44 ZFUs were created in 1997 and correspond to existing ZRUs. The second generation (41 ZFUs), created in 2004, was also selected among ZRUs, but their spatial boundaries do not necessarily match the ones of ZRUs. The same applies to the 15 ZFUs created in 2007. As detailed in the text, ZFU areas benefit from the highest package of tax incentives.



A-1.2 Additional tables

Table A-1: Effect of the policy by sector

Dependent Variable: Probability of location in a ZFU part (logit model, marginal effects)					
	Manufacturing	Construction	Hotel & Restaurant	Retail & Cars	Transports & Communications.
	(1)	(2)	(3)	(4)	(5)
ZFU policy	0.0285***	0.0190**	0.00470	0.0167***	0.0234***
	(0.00618)	(0.00750)	(0.00386)	(0.00406)	(0.00871)
$log \frac{\text{Nb of estabs (same ind.) in ZFU}_{t-1}}{\text{Nb of estabs (same ind.) in non-ZFU}_{t-1}}$	0.0218***	0.0749***	0.0200***	0.0502***	0.0501***
	(0.00336)	(0.00833)	(0.00355)	(0.00205)	(0.0101)
Observations	11519	27586	16423	57941	9181
Pseudo R^2	0.1780	0.1119	0.2196	0.1929	0.1442

	Business services	Education	Health	Collective services
	(6)	(7)	(8)	(9)
ZFU policy	0.0376***	0.0185***	0.0564***	0.0107**
	(0.00506)	(0.00708)	(0.00755)	(0.00457)
$log \frac{\text{Nb of estabs (same ind.) in ZFU}_{t-1}}{\text{Nb of estabs (same ind.) in non-ZFU}_{t-1}}$	0.0267***	-0.0349***	0.0126	0.0116***
	(0.00285)	(0.0104)	(0.0165)	(0.00381)
Observations	61581	3771	18998	13467
Pseudo R^2	0.1996	0.2108	0.2888	0.1803

All regressions include municipality fixed effects and cluster at the municipality level,*** significant at 1%, ** significant at 5%and * significant at 10%.

Table A-2: Number of establishments in municipalities with a ZFU

	Dependent Variable: number of establishments locations		
	Municipality (overall)	ZFU part	Non-ZFU part
	(1)	(2)	(3)
year 2003 × Dummy ZFU 2004	-0.00192	-0.0135	-0.000662
	(0.0170)	(0.0530)	(0.0174)
year 2004 × Dummy ZFU 2004	0.0100	0.187**	-0.00946
	(0.0272)	(0.0786)	(0.0264)
year 2005 × Dummy ZFU 2004	0.00307	0.241***	-0.0248
	(0.0248)	(0.0885)	(0.0253)
year 2006 × Dummy ZFU 2004	-0.0147	0.175**	-0.0385*
	(0.0212)	(0.0833)	(0.0208)
Year fixed effects	Yes	Yes	Yes
Municipality fixed effects	Yes	Yes	Yes
Cluster (municipality level)	Yes	Yes	Yes
Observations	415	415	415
Number of municipalities	83	83	83

Standard errors clustered at the municipality level in parentheses, *** significant at 1%, ** significant at 5% and * significant at 10%.

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