The Impact of the 'Scellier' Income Tax Relief on Building Land Prices in France

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Abstract – This study assesses the impact of a tax incentive scheme to boost private rental investment in force in France from 2009 to 2012, called the "Scellier scheme" (after the name of the minister who promoted it), on changes in the price of building land. A difference-in-differences estimation is implemented, drawing on data from the BNDP database covering the period 2004-2010. The definition of the control and treatment groups is based on the boundary between municipalities which are eligible for the Scellier scheme and municipalities which are not. The estimation results suggest that the scheme had an inflationary effect and point to land price capitalisation, with an increase in the price per square metre of around 7 euros in the first year and of 8 to 9 euros over 2009 and 2010, without a significant rise of the phenomenon in the second year, i.e. an increase of 8% in the first year and of 9 to 10% after two years. The regions where the market was the tightest saw the most rapid price increase, particularly the Mediterranean region.

JEL Classification: R28, R32, H31
Keywords: land price, income tax deduction, private rental investment, Scellier scheme

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Tax incentives are one of the main tools used by public authorities to encourage investment in the private sector. The chronic shortage of new rental housing in France – at least in certain areas of the country – has meant that increasing the supply of rental housing has become a major priority for the authorities. One of the key measures designed to put this commitment into practice are the tax incentive schemes implemented by the French government from 1984 onwards and aimed at boosting housing construction in the private rented sector. Between 1984 and 2017, there were 8 successive tax incentive schemes designed to encourage investment in the construction of new rental housing – all named after their promoter: the Méhaignerie scheme (1984-1997), the Périssol scheme (1996-1999), the Besson scheme (1999-2002), the Robien scheme (2003-2006), the Robien *recentré* ("re-centred") and Borloo *populaire* ("popular" Borloo) schemes (2006-2009), the Scellier scheme (2009-2012), the Duflot schemes (2013-2014) and the Pinel scheme (2014-).

These schemes initially granted limited tax relief (Méhaignerie and Quilès-Méhaignerie schemes) allowing investors/natural persons or companies not subject to corporate income tax to claim part of their investment as tax deductible. Since 1996 and the introduction of the Périssol scheme, a logic of property depreciation has been adopted, with depreciation representing a charge resulting in a capped real estate deficit and thus allowing for a reduction of the investor's taxable income.

We focus here on the "Scellier scheme", created under Article 31 of the Amending Finance Law for 2008 of 30 December 2008 in force between 2008 and 2012. The rapid succession of schemes, combined with the fact that they have tended to overlap, have made the task of assessing them very difficult – a task made all the more important by the fact that the public finances have been drawn on heavily under these schemes. According to the parliamentary report by Gilles Carrez (Carrez, 2011), a member of the French National Assembly, the total cost of the scheme for investments made between 1st January 2009 and 31 December 2012 was 11 billion euros, the effect of which will be felt until 2028. However, a small number of geographically limited *ad hoc* studies have been carried out. The Departmental Agency for Housing Information (*Agence départementale pour l'information sur le logement*, or ADIL), in partnership with the Pays de Brest Development and Urban Planning Agency (*Agence de Développement et d'urbanisme du pays de Brest*, ADEUPa-Brest, 2008), set out to assess the impact of new rental housing investment on the rental market and on the number of transactions in the Finistère *département*. Based on a survey of experts conducted in the first half of 2008, the study focuses solely on the Robien scheme and only provides descriptive results. According to the authors, 14% of new housing originates from rental investments. As is often the case with studies based on expert opinion, it is impossible to measure the aggregated local impact of the scheme. Another study sought to assess the impact of the Robien scheme on the real estate market in the Rhône-Alpes region (Rigaud *et al*., 2008). In this study, conducted under the aegis of the Regional Infrastructure Directorate for the Rhône-Alpes Region (*Direction Régionale de l'Équipement Rhône-Alpes*), the authors estimate that between 11 and 17% of the total amount of new housing across the region has benefited from the scheme.

It is unfortunate that French law has made no provision for the creation of a database allowing for a robust statistical assessment of the different schemes. Nevertheless, some government statistics are available. According to official reports (Carrez, 2011), the number of new properties built or purchased under these schemes between 1995 and 2009 is estimated at around 800,000, representing 20% of all new housing, over 50% of new builds intended for the rental housing market and nearly 80% of the construction of housing in the private rental sector. However, the most important counterfactual question remains unanswered by these statistics: how many properties would have been built without these tax incentives?

This study is limited in scope: in contrast to a recent study by Chapelle *et al*. (2018) which aimed to establish the impact of the scheme on several relevant dimensions (price, type of buyer, housing production), we focus on the impact of the Scellier scheme on the price of developed land. The emphasis placed on building land arises directly out of a simple tax incidence analysis. It is well known that any scheme which aims to subsidise demand risks being taken over in part by sellers. The degree of shifting to sellers depends on the elasticity of supply and demand. Land prices were chosen since they capitalise structural changes in the real estate market more quickly than properties. Housing prices often require a little more time to adjust to new legislation. Furthermore, rental investment incentive mechanisms generally involve

a purchase of developed land. At a theoretical level, these mechanisms may be understood as an increase in the demand for land for residential development. In the land market, if the land supply curve remains unchanged because, for example, of town planning schemes, this should be reflected by an increase in land prices. This increase must be greater in the short term than in the long term. This is because, in the short term, the amount of available land is set, while in the medium term land reserved for other purposes (agricultural, commercial or industrial) may be converted into land earmarked for residential development. The increase in the price of such land makes the change of land use more profitable for owners, provided the land-use plan (*plan d'occupation des sols*) and, more recently, the local development master plan (*plan local d'urbanisme*) allow it of course.

It is therefore reasonable to assume that part of the financing of these rental investment incentive schemes disappeared as a result of an increase in the price of building land. The aim of this study is to contribute to quantifying the impact of the Scellier scheme on building land prices. Our estimation may be described as local and uses a specific provision of the scheme not applicable to previous schemes (Robien, Borloo, etc.). The Scellier scheme provides for a zoning plan that excludes part of the territory of metropolitan France from its scope of application. The division into eligible and non-eligible zones allows for a land price comparison procedure to be used based on a difference-in-differences estimation. Such an estimation on either side of a boundary was first implemented by Black (1999) in the United States. In France, Fack & Grenet (2010) use spatial matching: a counterfactual is individually assigned to each transaction on the other side of the boundary to assess the impact of the *carte scolaire* (map of school catchment areas) on real estate prices.

Data extracted from the *Base Nationale des Données Patrimoniales* or BNDP (French National Wealth Data Bank) covering the period 2004-2010 are used to estimate the difference-in-differences coefficients. A strategy is developed for the control and treatment groups that uses the data on either side of the boundary between the zones eligible and notn eligible to the scheme. Overall, the evidence appears to suggest that, at a national level, the implementation of the Scellier act led to an increase in the price per square metre of around 7 euros in the first year and of 8 to 9 euros in 2009 and 2010. In terms of growth rate, this represents a price increase of 8% in the first year and of 9% to 10%, without a significant acceleration, in the second year of implementation (2010). The regions where the market was the tightest saw the most rapid price increases, especially the Mediterranean region, where the Scellier law appears to have been a real boon for building land owners, with an increase of around 25% over two years. These estimates apply on both sides of the boundary delimiting the area of application of the Scellier scheme. They cannot be extended further without precaution. This is a well-known limitation of impact assessment methods, the significance of which should not be underestimated here.

The paper is structured as follows: We begin by describing the main provisions of the Scellier scheme and its geographical scope of application. The estimation strategy and the database (BNDP database) are then presented. The next section presents the results and comments. Robustness tests are then performed and are followed by a brief conclusion.

The Scellier Scheme

Between 2009 and 31 December 2012, the Scellier scheme used income tax relief as a rental investment incentive mechanism, conditional on compliance with a maximum rent limit and a commitment to rent the property for a period of 9 years. A detailed description of the scheme as set out in the Official Tax Bulletin is given in Box 1 below.

One of the chief differences between the Scellier scheme and previous schemes is that it only applies to part of the territory of metropolitan France.[1] France is split into 4 zones. Whereas under the Robien scheme all 4 zones were included, only 3 are eligible under the Scellier scheme. In addition to excluding part of the national territory from its scope of application, the zoning plan allows for rent ceilings to be adjusted according to the local real estate market.

Figure I shows the division of the different zones relating to the Scellier law applicable from 4 May 2009. The municipalities eligible for the Scellier scheme are those located in zones A, B1 and B2. Municipalities in zone A are those

1. The four overseas départements *are excluded from the study since these are covered by a specific scheme known as the "Scellier* outremer*" (overseas Scellier) scheme.*

Box 1 – **The Scellier Rental Investment Scheme**[(a)]

With effect from 1st January 2009, the Scellier income tax relief scheme applies to taxpayers domiciled in France and purchasing or building new properties in certain areas of the national territory characterised by an imbalance between housing supply and demand, which they undertake to rent out unfurnished as a principal residence for a minimum period of nine years. For the same tax year, a single property qualifies taxpayers for the new tax relief. The purchase of the property, or the submission of the building permit application in the case of a property which the taxpayer is having built, must take place no later than 31 December 2012.

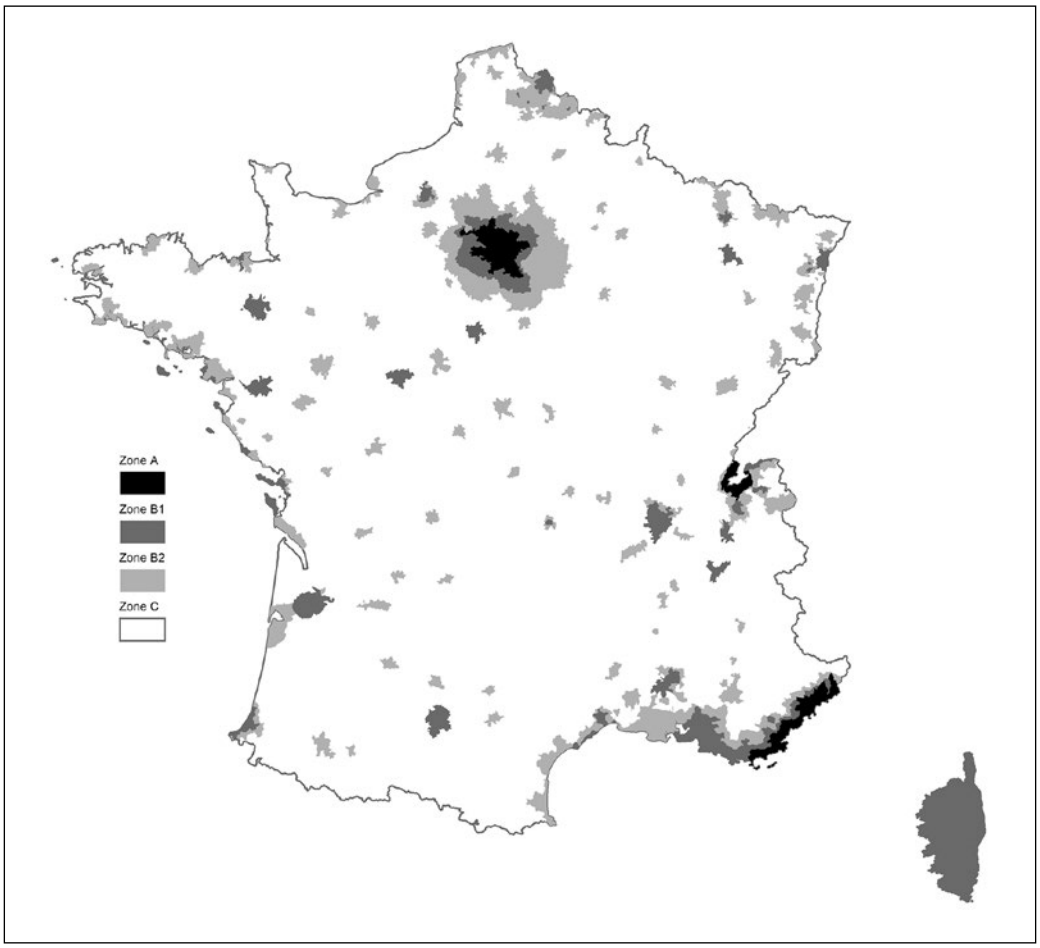
Tax relief also applies to taxpayers subscribing for units between 1st January 2009 and 31 December 2012 in a real-estate investment trust (SCPI) making such investments. Tax relief is calculated based on the cost price or amount of subscriptions, up to an annual limit of €300,000. The rate of tax relief is fixed at 25% for investments made in 2009 and 2010 and at 20% for investments made in 2011 and 2012. The relief is spread over nine years, at a rate of one ninth of its amount per year.

Where the lease is granted in the intermediate rental sector, taxpayers benefit, in addition to tax relief, from a specific deduction fixed at 30% of the gross income earned from the lease of the property. In cases where the property remains leased in the intermediate rental sector after the lease period, taxpayers benefit, in three-year periods and up to a limit of six years, from additional tax relief equal to 2% per year of the cost price of the property.

For investments made in 2009, taxpayers can choose between the "Robien" and "Borloo" schemes and the new tax relief, without, however, having the option of combining these benefits for the same investment.

(a) Translated from Bulletin officiel des impôts n° 52 *(15 mai 2009, 5 B-17-09).*

Figure I
Scellier Zoning



Notes: Each shade of grey corresponds to a zone that is subject to the scheme. The municipalities shown in white are not subject to the scheme.
Sources: Official Scellier zoning.

where the real estate market is the tightest, followed by municipalities in zone B1 and, lastly, municipalities in zone B2. Municipalities in zone C are not eligible. A further minor complication is that between 1st January 2009 and 3 May 2009, the eligible zones were those based on the Robien zoning. We will ignore this complication and the assumption will be that at the time of the implementation of the law, only the Scellier zoning plan existed. The differences between the Robien and Scellier zonings are also relatively limited. In total, 1,068 municipalities changed zones as follows: 18 changes from A to B; 255 changes from B1 to B2; 16 changes from B1 to A; 23 changes from B2 to B1; 36 changes from C to B1; 720 changes from C to B2. No municipalities left the scheme in May 2009 (transfer from zone A, B1, B2 to C), which is an important point.

Table 1 provides an overview of population distribution by zone. Based on the Insee's 2007 census, 40% of the population of metropolitan France is located in zone C. Of the 60% of the population residing in an eligible zone, 16% of the population is located in zone A, while zones B1 and B2 each contain 22% of the population.

Methodology

The dependent variable is the price per square metre applied to sales of building land over a six-month period. The parameter of interest is the impact of the Scellier scheme on that price, i.e. the methodology used involves comparing changes in the average price per square metre between sales of building land belonging to a group of municipalities eligible for the scheme and sales of building land belonging to a group of non-eligible municipalities. Based on the two groups, the change in the average price per square metre before and after the implementation of the Scellier scheme is estimated using difference-in-differences (Ashenfelter & Card, 1985). We further describe, first, the construction of the control and treatment groups and, second, the data source used to construct a statistical series by municipality relating to changes in building land prices over six-month periods. Lastly, the estimation method is presented.

Construction of the Groups of Municipalities

The construction of the two groups of municipalities is a key step in obtaining reliable difference-in-differences estimates. Border effects are used to control for structural effects. Only those municipalities located at the boundary of an eligible zone are included in the treatment group, while only non-eligible municipalities located in zone C adjacent[2] to a municipality in the treatment group are selected for the control group. Two "control group × treatment group" pairs (detailed below) are constructed on this basis.

Groups with Adjacent Municipalities, All Zones

For the treatment group, the first pair of groups is constructed by including all the municipalities eligible for the Scellier scheme (zones A, B1 and B2) adjacent to a non-eligible municipality. For the control group, municipalities located in

2. The notion of adjacent municipality is purely geographical. Two municipalities will be deemed to be adjacent if they share at least one municipal border.

Table 1
Population Distribution by Area

Area	Number of municipalities		Average municipal population	Sum of the population in the zone (% of the total)
A	590	1999 population without double counting	15,162	8 945 692 (15.86 %)
		2007 municipal population	16,220	9 569 783 (16.06 %)
B1	1,636	1999 population without double counting	7,481	12 239 225 (21.71 %)
		2007 municipal population	7,899	12 922 146 (21.68 %)
B2	3,191	1999 population without double counting	4,081	13 022 346 (23.09 %)
		2007 municipal population	4,207	13 423 831 (22.52 %)
C	31,139	1999 population without double counting	712	22 180 644 (39.34 %)
		2007 municipal population	760	23 680 632 (39.74 %)

Sources: Insee, Permanent population census in 2007.

zone C adjacent to an eligible municipality in zones A, B1 and B2 only are selected. This first selection process has the advantage of considering a large number of municipalities for each of the groups. However, it has the disadvantage of keeping municipalities located in all the eligible areas with highly heterogeneous municipal structural characteristics in the treatment group, in particular between the municipalities of zones A and B2. This pair will be termed "Groups with adjacent municipalities, all zones".

On average, municipalities in the treatment group are more populous and more densely populated and have a higher 4-taxes tax potential per resident than municipalities in the control group (Table A1 in Appendix 1). Although these differences in level do not invalidate the difference-in-differences hypothesis relating to a common trend shared by the groups, it highlights the need to be cautious and to introduce control variables. The map below (Figure II) provides an overview of the geographical location of the two groups.

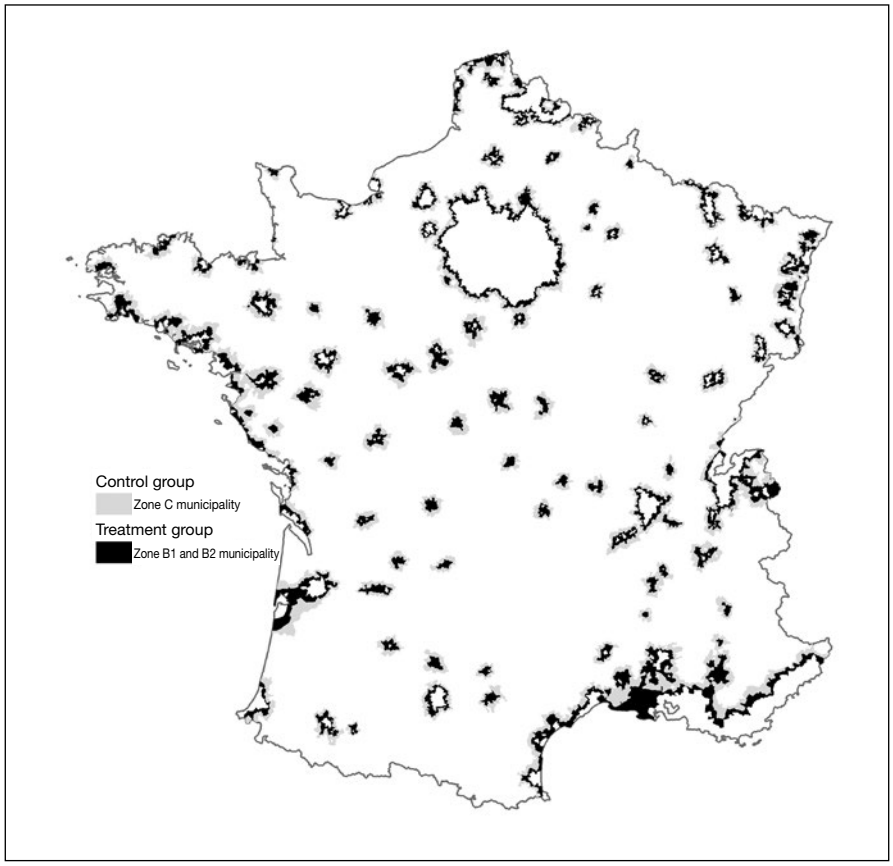
Groups with Adjacent Municipalities, Zone B2 Only

To reduce the structural differences between municipalities, the pair formed of a treatment group and a control group is modified. The treatment group is now composed of eligible municipalities located in zones B2 only which are adjacent to a non-eligible municipality. The control group is composed of municipalities located in zone C adjacent to a municipality in zone B2 only. By only considering municipalities in zone B2 in this pair of groups, the structural differences which can have an impact on land prices are reduced by retaining municipalities in the significantly more homogeneous treatment group. This pair will be termed "Groups with adjacent municipalities, zone B2 only" (Figure III).

From the BNDP Database to the Work Database

This study was made possible by extracting data from the French National Wealth Data Bank

Figure II
Groups with Adjacent Municipalities, All Zones



Notes: The map above illustrates the first definition of the control and treatment groups. The municipalities in black belong to the treatment group while those in grey belong to the control group.
Sources: Treatment by the authors based on the definitions of the Scellier zoning.

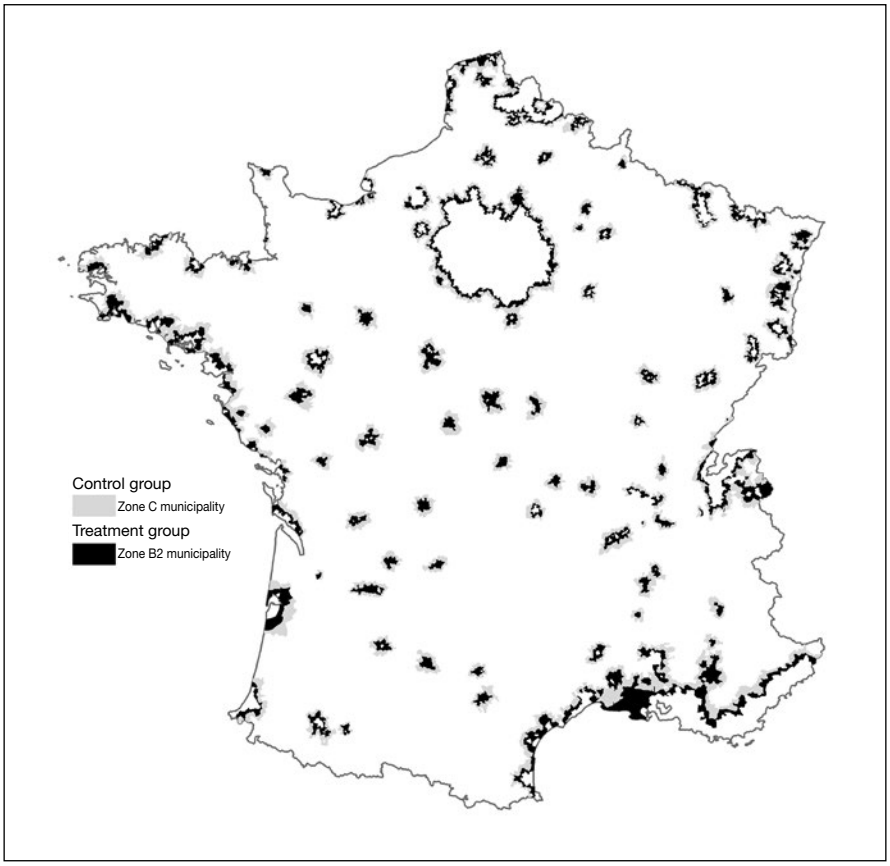
(BNDP) relating to sales of building land over the period 2004-2010. Designed for the purpose of consulting the wealth data of the DGFiP, the tool was implemented in 2005 and is fed by the MAJIC[3] and FIDJI[4] systems in particular. The BNDP application matches data from FIDJI and MAJIC. Matching is performed using a common identifier: the cadastral references of the property. The data retrieved from the BNDP correspond to the status of the property as shown in the cadastral database on the date of the transaction except for VEFAs (off-plan sales), which can be updated at a later stage to show the premises scheduled for construction.

To our knowledge, this study is the first academic study conducted on the basis of an extraction from the BNDP data. The task of statistical analysis was made difficult by the limited amount of information available about the structure of the BNDP database and about the different tables that compose it, as well as the relationships between them. The BNDP database – a reference tool for the revenue authority – was not originally designed for that purpose and so this difficulty is to be expected. We go now into the procedure performed to obtain the working database, i.e. a statistically usable database.

The first task consisted in extracting the data from the BNDP. BNDP is a tax tool and the base unit corresponding to a line of the database is a tax record. Therefore, for one transfer (sale, gift, inheritance, etc.), there are as many lines as there are tax records corresponding to the change of status of the property. For example, if a plot of land is purchased by several buyers, there will be as many lines or groups of lines as there are buyers. In such cases, the difficulty is to reconstruct the total sale price of the land

3. MAJIC: Mise À Jour des Informations Cadastrales *(Cadastral Data Update). This file relates to the management of the cadastre and ownership records, consistent with the property file.*
4. FIDJI: Fichier Informatisé des Données Juridiques Immobilières *(Computerised File of Legal Property Data). This file ensures the maintenance of the property file, intended for the publication of rights in immovable property, as well as the collection of transfer-related taxes.*

Figure III
Groups with Adjacent Municipalities, B2 Zone



Notes: The map above illustrates the first definition of the control and treatment groups. The municipalities in black belong to the treatment group while those in grey belong to the control group.
Sources: Treatment by the authors based on the definitions of the Scellier zoning.

according to the different tax records. We chose to base our analysis on building land. The extraction from the BNDP database therefore concerns all tax records relating to land with a tax regime compatible with a construction between 2004 and 2010. 1.7 million records were obtained. Once the data extracted, several operations were necessary to build the work base; they are described in Box 2. The constructed base, statistically exploitable, contains 454,921 observations including the sale price, the surface area of the land and the municipality of the property.

Comparison of the Information Contained in BNDP and PERVAL

The PERVAL database[5] of the Notaries of France (excluding Île-de-France) is the dataset used by almost all estimates of the impact of housing public on housing prices. Thus, it is worth it to compare the available information in both databases. By carrying out a matching process between the PERVAL database and the

5. *https://www.perval.fr/*

Box 2 – **Construction of the Work Base**

In what follows we detail the key stages leading to the database.
- Elimination of all exact duplicate lines, i.e. lines with the same value for each variable. The database contains a significant number of exact duplicate lines.
- Elimination of observations corresponding to transfers in overseas *départements*.
- Creation of a unique parcel identifier as follows:

Year of sale || Month of sale || municipality code || Section prefix || section code || plan number

A transfer may correspond to several parcels.
- A transfer identifier is created: SAGES code C. H. || publication reference
- The SAGES code is the registration reference. All records with the same transfer code form part of the same transaction.
- The sale price is calculated by adding up all the distinct prices for each transfer identified by the unique parcel identifier.
- All lines with a duplicated parcel identifier are removed. In other words, one line only per parcel sold is retained.
- The surface area of the sale is calculated by adding up all the surface areas of the different parcels included in the same transfer.
- All the lines with a duplicate transfer identifier are removed.
- We therefore have a database with one line per sale with the sum of the distinct sale prices as the sale price and the sum of the surface areas of the different parcels as the surface area. The price per square metre is calculated.
- For each transfer, we associate the code of the Scellier zone.
- Observations with a price per square metre higher than two standard deviations for the same six-month period and for the same zone are removed.

Table A below lists the number of lines and references per year for the raw database (i.e. without any transformation).

Based on volumetrics, we find that out of a total of 1.7 million lines, 552,066 lines are exactly identical (for all the values of each of the variables). These can be removed since they do not contain any additional information, giving a total of 1.2 million different lines. Of these 1.2 million different lines, there are just 470,321 different transfers, i.e. transfers associated with a unique identifier as defined here.

Table A
Volumetry – Raw Database and Work Database

	Number of lines	Without double lines	Number of unique identifiers	Work database
2004	113,151	71,151	33,260	31,921
2005	196,895	125,989	55,705	55,023
2006	258,122	175,416	74,821	73,536
2007	313,965	214,723	87,657	85,859
2008	325,168	220,711	87,390	85,097
2009	249,556	175,432	64,949	62,888
2010	250,549	171,918	67,139	60,597
Total	1,707,406	1,155,340	470,321	454,921

Sources: BNDP/DGFiP database; authors' computation.

BNDP extraction, we were able to better understand exactly what the sale prices contained in the BNDP database correspond to. Based on a comparison with the PERVAL data, we find that a significant number of transactions are carried out without paying taxes, the net price being equal, in such cases, to the gross price. In the BNDP database, the only available price is the gross price, and it is not possible to work back to the net price. Nevertheless, we do not believe that using a gross price will bias the results.

The comparison allows us to identify another difference between the BNDP and PERVAL databases relating to how the surface area of properties is captured. The PERVAL database contains one line per transfer, meaning that there is only one line for transfers involving several parcels. By contrast, in the BNDP database, for each transfer there is a line for easements or other deeds or records relating to a change of ownership. These structural differences mean that surface area is captured differently in each database. Thus, in BNDP, the surface area is generally greater than in PERVAL. These differences are detailed in Appendix 2 along with an example. The average price per square metre across the control and treatment groups varied between 12 and 18 euros over the 6 months immediately preceding the implementation of the Scellier scheme. Two years later, the difference ranged between 27 and 33 euros (Figure IV and Table A1 in Appendix 1).

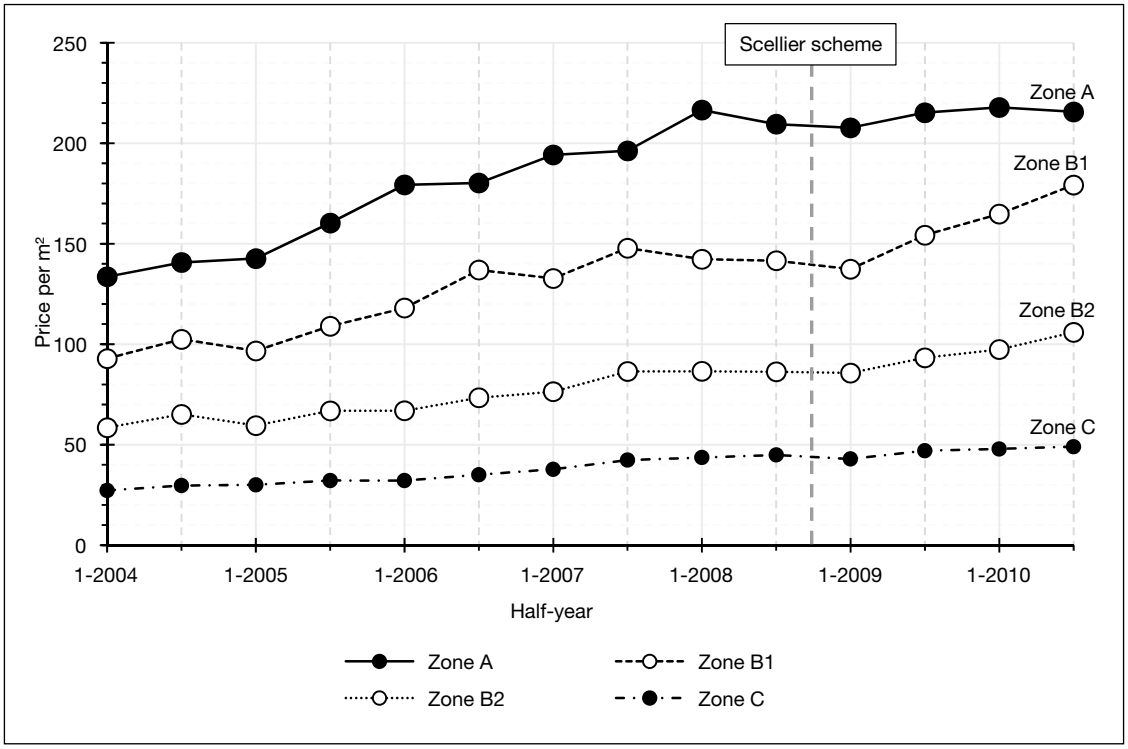
Estimation Method

The methodology used is simply based on two groups (control group sales and treatment group sales) and two periods (before and after the introduction of the Scellier scheme). The difference-in-differences parameters are estimated using a linear regression model. Let P_i be the average sale price of building land. The general regression model estimated by ordinary least squares is:

$$P_i = \beta_0 + \beta_1 T_i + \beta_2 D_i + \beta_3 \left(B_i \times D_i\right) + \sum_{k=1}^{K} \delta_k X_{ki} + \sum_{l=1}^{L} \gamma_l Z_{li} + \epsilon_i$$

T_i is a dummy variable equal to 1 if the sale took place during the second period and

Figure IV
Change in the Average Price per Square Metre by Zone Over Six-Month Periods



Notes: The curves represent the change in the average price per square metre over a six-month period for each of the zones.
Sources: BNDP/DGFiP database; treatment by the authors.

D_i is a variable equal to 1 if the sale belongs to the treatment group. X_{ki} is a control variable measured at the level of the municipality. Z_{li} is a location indicator variable. The parameter of interest is β_3 and is equivalent to the difference-in-differences estimate. ε_i is the error term.

A total of 4 specifications are used (without controls, with controls, with controls and indicator variables of employment zone and, lastly, without controls and with only municipality indicator variables). The five control variables are all measured at the level of the municipality: the population of the municipality, useful for capturing the effects of population size and density and thus allowing for the availability of developed land to be captured: the greater the density of a city, the less available real estate there is and the higher the price. Two variables measure the level of wealth of the population of the municipality where the sale takes place. The "4 taxes" tax potential per resident measures the financial capacity of the municipality to levy local taxes and is an indicator of the density of economic capital. In the medium term, this indicator may be endogenous to the Scellier scheme since additional properties and residents mean additional residence and property taxes. However, in order for this effect to be felt, the programme needs to have been completed, and two years after the launch of the scheme appears to be a sufficiently short period for this to be unlikely to occur in practice. The percentage of taxable households measures the wealth of the residents within the municipality. The ZAUER classification (Insee zoning of rural space into urban areas and employment areas, 1999) is used to characterise the type of municipality.[6] The classification is used to describe the type of municipality (urban, rural, etc.). The variable is dichotomised into 5 dummy variables equal to 1 if the sale takes place in a municipality of the ZAUER classification and 0 if it does not. The modality urban municipality is taken as reference.

For the purpose of the implementation of the difference-in-differences method, the reference period is the second half of 2008. Working on six-month periods enables more detailed price trends to be captured and allows for an assessment of inertia in terms of the response of prices to the introduction of the scheme. The estimated standard deviations of all the estimates take into account the cluster effects at the level of employment zones. Employment zones were selected to serve both as an indicator variable for location and for taking into account cluster effects in the construction of the estimated standard deviations since it is, in our view, the most pertinent division. At a finer level, such as municipalities or the EPCIs (Public Inter-Municipal Cooperation Establishments), there are too many municipalities or EPCIs with too few transfers, which may bias the standard deviation estimates.[7]

Results

The estimation parameter is the average price per square metre of land over 6-month periods. Figures V and VI illustrate the six-month mean of price changes by zone for the two definitions of the control and treatment groups. We find that prior to the implementation of the scheme, the changes in the control and treatment groups are remarkably similar from the second half of 2005 onwards. At worst, there is a slight adjustment of the control group over the treatment group. These similarities are shared by both groups, regardless of the definition of the control and treatment groups.

For the all-zone treatment group, the price increase between the second half of 2008 and the second half of 2010 was 22.30 euros, compared to 6.40 euros for the control group; for the second treatment group (zone B2 only), the corresponding figures are 20.40 euros and 5.40 euros, respectively.

We compare the difference in differences before and after the implementation of the scheme with the expectation of obtaining non-significant estimates prior to the implementation of the Scellier law. Thus, we have a temporal depth of 54 months before (from the first half of 2004), i.e. 4 six-month periods, and a temporal depth of 24 months (until the second half of 2010) after the scheme, i.e. 7 six-month periods.

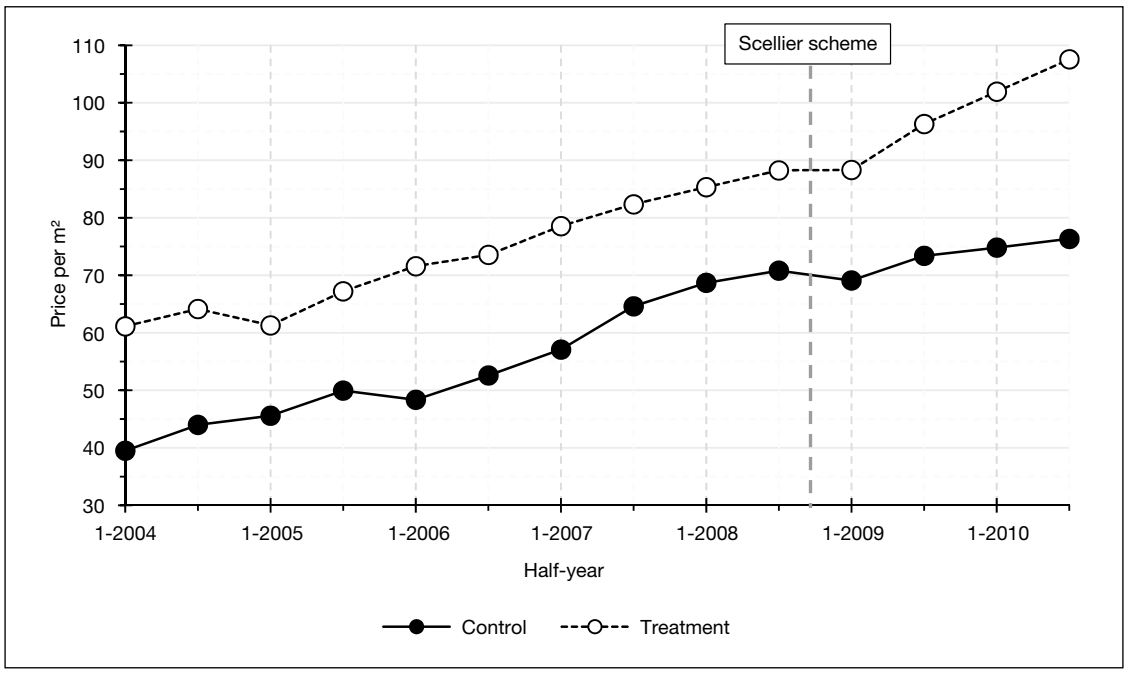
Table 2 shows all the results for the two choices relating to the control and treatment groups and our three specifications with and without control variables. Only the coefficient associated with the impact of the public policy and its standard deviation are reported. For the period following the implementation of the law, these coefficients may be directly interpreted as the impact in

6. In particular, it allows for the phenomenon of peri-urbanisation to be captured by drawing on attractiveness in terms of employment.
7. The tests conducted with the EPCIs yield results similar to those obtained with employment zones.

euros of the inflationary effect of the scheme. For earlier periods, the expectation is that they are not significant.

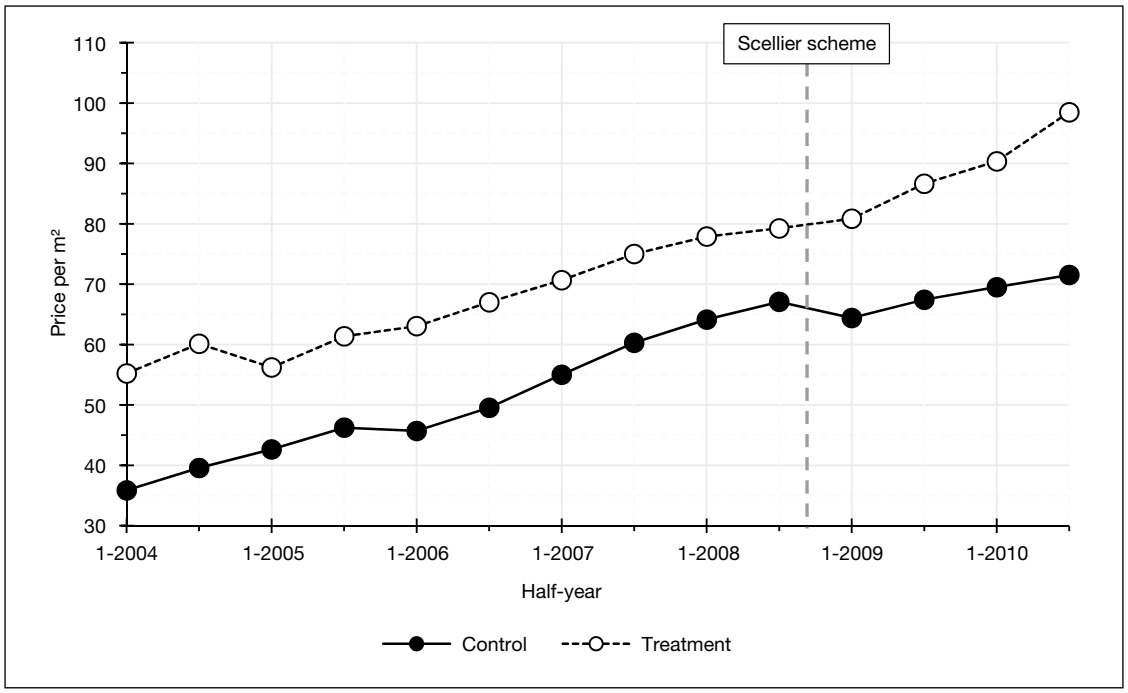
The results are entirely consistent with an inflationary effect of the Scellier scheme on the zone in question. Prior to the implementation

Figure V
Change in the Prices Per Square Meter Over a Six-Month Period for the Control and Treatment Groups, All Zones



Notes: The curves represent the change in the average price per square metre over a six-month period for the control and treatment groups.
Sources: BNDP/DGFiP database; treatment by the authors.

Figure VI
Change in the Prices Per Square Metre Over a Six-Month Period for the Control and Treatment Groups, B2 Zone Only



Notes: The curves represent the change in the average price per square metre over a six-month period for the control and treatment groups.
Sources: BNDP/DGFiP database; treatment by the authors.

of the scheme, the difference-in-differences estimates are not significant and are often close to zero, thus supporting the hypothesis of a common trend shared by the control group and the treatment group. After the implementation of the scheme, the estimates are positive and significant except for the first half of 2009. Two reasons may account for the fact that no effect was observed in the first post-reform six-month period: either we see the effects of the former scheme continuing beyond the date of its repeal, a scheme which, again, applies to the entire national territory, or it may be that some time is needed for the scheme to get underway and for investors to come to the fore. According to our estimates, the inertia effect is half a year. The two explanations are not necessarily contradictory. From 18 months onwards, the estimates are all significant at the 1% threshold.

The results are robust to the addition of control variables and location variables at the level of the employment zones. The estimates with control variables are slightly lower for the all-zone adjacent groups and slightly higher with the B2-only adjacent groups. However, the results remain within the 95% range of the results without control variables. It is with

Table 2
Difference-in-Differences Results Price per Square Metre (Reference: Second Half of 2008)

	Without control		With controls		With control and employment zone indicator variables		With municipality indicator variables	
	All zones	Zone B2 only	All zones	Zone B2 only	All zones	Zone B2 only	All zones	Zone B2 only
- 54 months 1st semester 2004	-4.20 (3.96)	-7.20* (4.30)	-5.08 (3.92)	-5.52 (4.26)	-0.17 (2.71)	-1.30 (2.89)	3.67 (2.96)	4.61 (3.25)
- 48 months 2nd semester 2004	-2.71 (3.14)	-8.40** (3.66)	-3.54 (2.92)	-5.96* (3.44)	1.07 (2.35)	-1.54 (2.53)	2.25 (2.27)	2.02 (2.45)
- 42 months 1st semester 2005	1.73 (3.27)	-1.40 (2.90)	1.15 (3.18)	0.03 (2.96)	1.48 (2.19)	0.02 (2.26)	2.61 (2.26)	3.52 (2.35)
- 36 months 2nd semester 2005	0.18 (2.87)	-2.97 (2.66)	-0.71 (2.87)	-2.46 (2.77)	-0.24 (2.22)	-2.30 (2.04)	-1.54 (2.00)	-1.63 (2.14)
- 30 months 1st semester 2006	-5.80* (3.47)	-5.19** (2.54)	-5.36* (2.96)	-4.35* (2.39)	-2.06 (2.29)	-1.63 (2.04)	0.30 (1.99)	0.79 (2.13)
- 24 months 2nd semester 2006	-3.52 (2.81)	-5.30** (2.63)	-2.56 (2.59)	-3.76 (2.54)	-1.46 (2.08)	-2.96 (1.95)	-1.16 (1.75)	-0.88 (1.92)
- 18 months 1st semester 2007	-4.02 (2.59)	-3.49 (2.81)	-3.81 (2.55)	-2.91 (2.77)	-2.79 (2.10)	-2.03 (2.04)	1.19 (1.74)	1.78 (1.93)
- 12 months 2nd semester 2007	-0.28 (4.49)	-2.53 (4.07)	-0.84 (4.13)	-2.99 (3.65)	-0.58 (2.25)	-1.87 (2.42)	-2.14 (1.93)	-2.71 (2.15)
- 6 months 1st semester 2008	0.82 (4.48)	-1.59 (3.54)	-0.34 (4.16)	-1.40 (3.13)	1.27 (2.18)	0.66 (1.88)	-1.08 (1.69)	-2.02 (1.59)
Six-month reference period (2nd half of 2008)								
+ 6 months 1st semester 2009	1.77 (2.31)	4.27 (2.70)	1.44 (2.37)	3.65 (2.74)	-0.46 (1.79)	0.63 (2.15)	1.06 (1.52)	1.66 (1.77)
+ 12 months 2nd semester 2009	5.47** (2.50)	7.04** (3.05)	4.93* (2.62)	7.13** (2.95)	5.37*** (1.96)	6.88*** (2.22)	6.25*** (1.73)	7.45*** (2.06)
+18 months 1st semester 2010	9.67*** (2.30)	8.67*** (2.66)	9.31*** (2.23)	8.19*** (2.51)	7.88*** (1.87)	6.83*** (2.00)	7.53*** (1.74)	6.47*** (1.95)
+ 24 months 2nd semester 2010	13.79*** (4.03)	14.79*** (4.56)	12.88*** (3.66)	13.73*** (4.09)	9.37*** (2.30)	9.13*** (2.65)	9.28*** (2.17)	7.80*** (2.50)

Note: Standard errors are estimated taking into account clusters at the level of employment zones. *** significant <1%, ** significant at 5%, * significant at 10%.

the location variables that the results differ most significantly, being systematically lower without, however, changing the sign of the effect.

If we focus on the results with the B2 adjacent zone and with controls, which provide the best guarantee, we obtain an order-of-magnitude estimate of around 7 euros after 12 months, and does not vary across the specifications. Over a 24-month horizon, the results are more variable and fluctuate within a range of 8 to 15 euros. A value of 8 to 9 euros is used as the central value, which remains within the confidence interval of the impact after one year and which therefore reflects the fact that the increase was not significantly greater in the second year. If we compare these figures to the price of zone B2 over the second half of 2008, i.e. 89.71 euros per square meter, we obtain a price increase of 8% in the first year and of 9 to 10% during the two years after the implementation of the scheme.

Robustness Checks

In this section, the research protocol is modified to assess the robustness of our results according to the choices made.

The first robustness check involves changing the reference period from the second half of 2008 to the first half of 2008. The results are shown in Table A3-1 in the Appendix 3. The change in reference period does not affect the trend of our prior results or their order of magnitude. The inflationary effect varies between 10 and 14 euros depending on the specification chosen.

The second robustness test involves difference-in-differences estimates between zone B2 and the section of zone B2 adjoining zone C, i.e. the second treatment group, with the second half of 2008 still serving as the pivot period. This placebo-type test is used to determine whether the treatment group in the "B2 adjacent" analysis behaves differently across zone B2 as a whole. Since zone B2 as a whole is treated, the hypothesis tested is that there is no difference, in particular after treatment.[8] The results are shown in Table A3-2 in the Appendix 3. We see that there is no long-term trend towards price divergence between the two zones. However, we see various shocks in given periods, for example during the second half of both 2004 and 2005 and also, albeit less systematically (for example, non-significant with control and employment zone), during the first half of 2009. We investigate now the possibility that the first two shocks are linked to the evolution of another scheme, using the same zoning as the Scellier zoning: the zero interest loan or PTZ (*prêt à taux zero* in French).

And What if the Phasing in of the PTZ Interfered with Our Results?

Introduced by the government in 1995 to boost access to home ownership for low- and medium-income households, the PTZ allows for a reduction in the borrower's affordability ratio and thus ensures effective demand. The appeal of the PTZ increased following the option introduced in 2005 of benefiting from it in order to finance the purchase of an old property without there being an obligation to carry out works. Between January 2009 and June 2010, the amount of the PTZ was doubled for new property purchases as part of the economic stimulus package. This specificity of the PTZ may be a source of bias in our estimates. However, unlike the Scellier scheme, zone C is covered by the PTZ, and the zoning only modifies the loan ceilings. The PTZ exists prior to the Scellier scheme and its eligibility remains unchanged during the period. In order to verify that the PTZ does not lead to a bias in our estimates, we analyse the volume of loans and related trends over time, in particular during the period of analysis, between the various control and treatment groups.

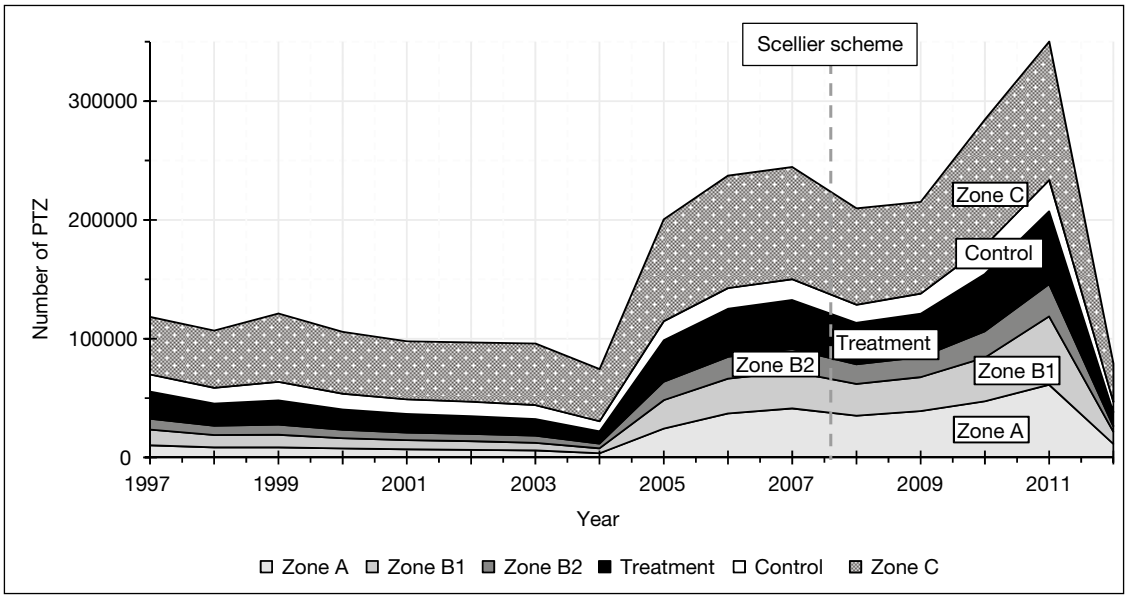
Figure VII shows the trend in the number of loans per zone for the all-zone control and treatment groups. The data here come from French Ministry of housing (CGDD) and provide all the PTZ loans by municipality and year. We see an increase in the volume of loans before and after the implementation of the Scellier scheme. However, this increase is common to all zones. Figure VIII provides the same analysis, but in percentage terms. It is in the rest of zone C, which is outside the control group, that the number of loans relative to the total loans decreases.

However, the distribution of the volume of loans between the control and treatment groups does not appear to change. Indeed, when examining the ratio of the number of loans in the control

8. Another placebo test might have been conducted between zone C adjacent to zone B2 and part of zone C which would have been adjacent to this zone. However, this test was not performed because of a lack of sales in the latter.

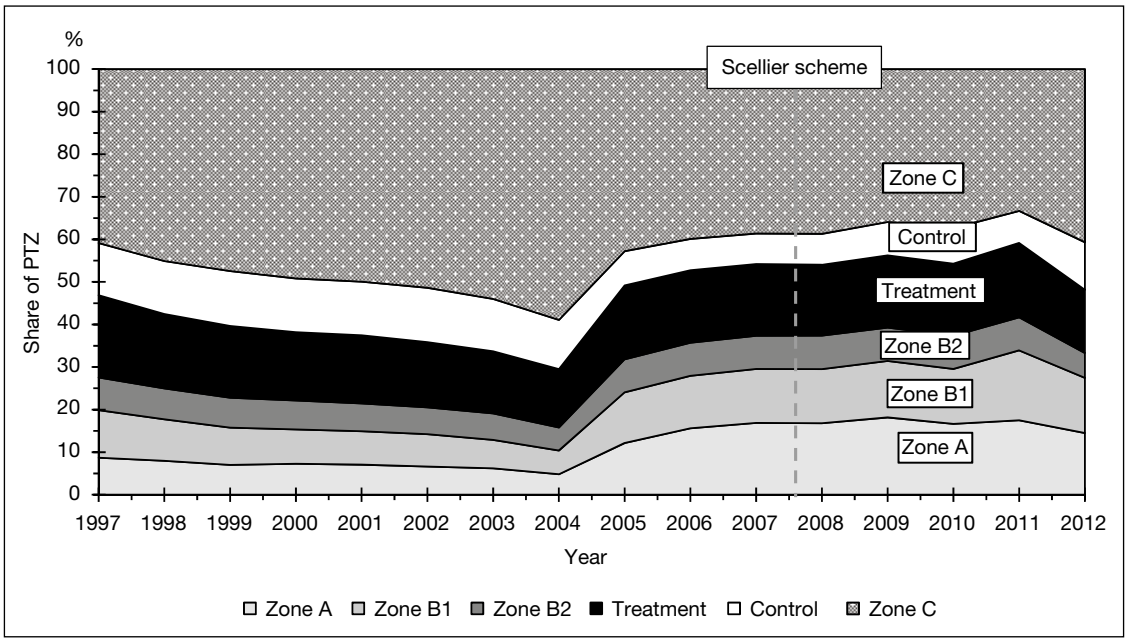
zone to the treatment zone (Figure IX) we find that the ratio increases slightly during the analysis period, meaning that in relative terms the number of loans in the control zone increases relative to the treatment zone. The land pressure resulting from the PTZ is therefore transferred to the control group rather than the treatment group. This phenomenon suggests that any impact that the PTZ may have on our estimations takes the form of a downward bias, reducing the

Figure VII
Number of PTZ Loans by Zone (Adjacent Groups, All Zones)



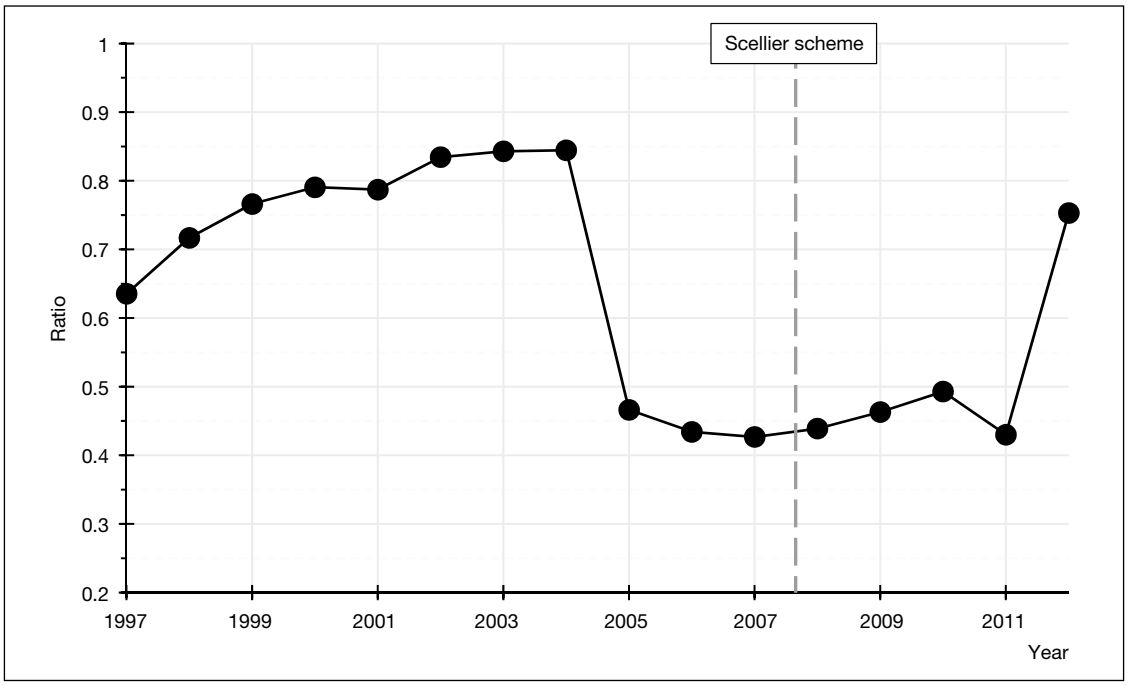
Notes: Each area represents the number of PTZ by zone. Zone C is to be understood without the PTZ located in the zone of the control group and zones B2, B1 and A are to be understood without the PTZ in the zone of the treatment group. No shocks were found in relation to the volume of loans before and after the implementation of the Scellier scheme.
Sources: CGDD; treatment by the authors.

Figure VIII
Share of PTZ Loans by Zone (Adjacent Groups, All Zones)



Notes: cf. Figure VII
Sources: CGDD; treatment by the authors.

Figure IX
Ratio of the Number of PTZ Loans of the Control Group to the Treatment Group (Adjacent Groups, All Zones)



Notes: Annual change in the ratio of the number of PTZ in the control group to the treatment group. No significant change is found before and after the implementation of the Scellier scheme, which could bias our results.
Sources: CGDD; treatment by the authors.

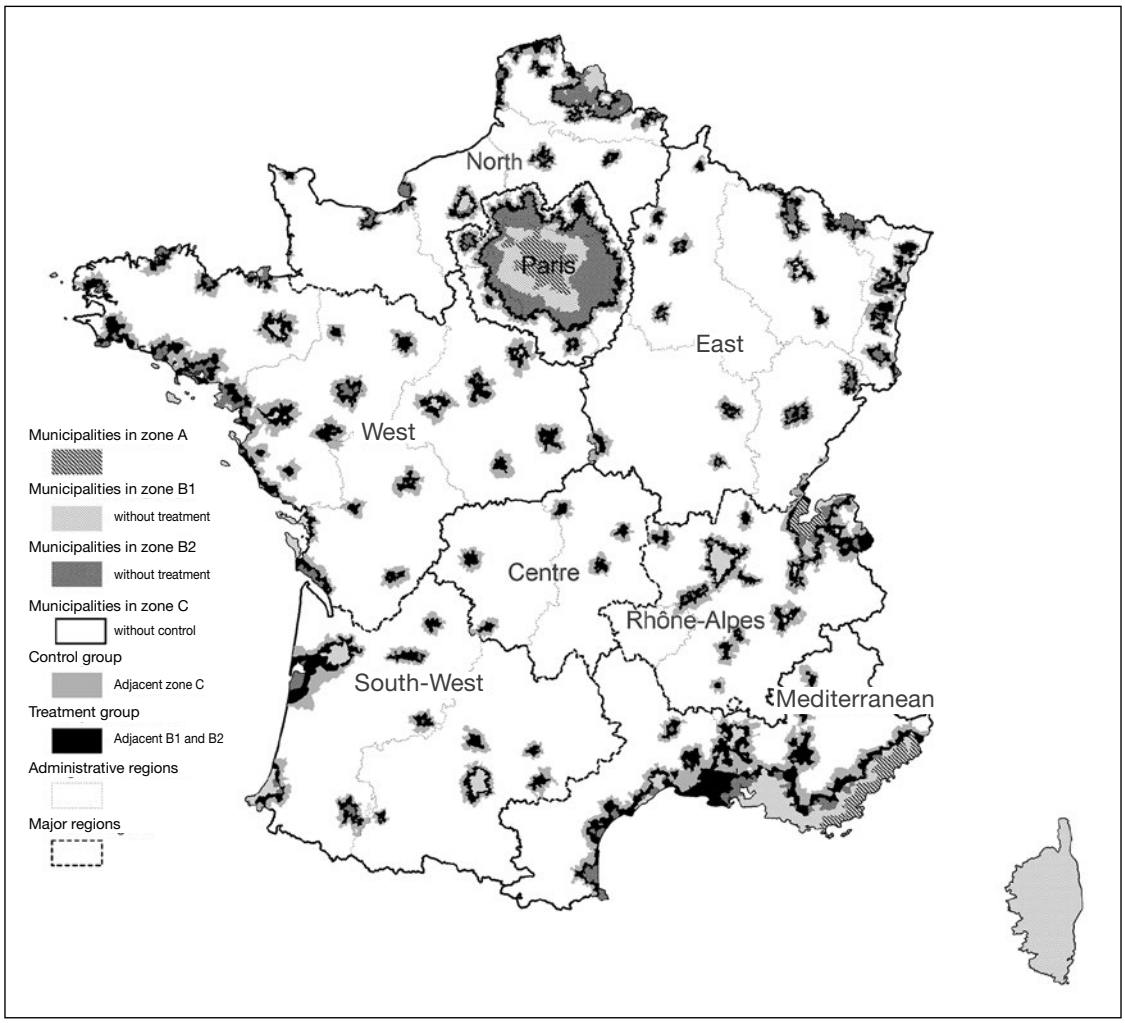
impact of the Scellier scheme rather than the opposite. The finding related to the all-zones control and treatment groups also applies to the definition with the B2 adjacent municipalities only. The corresponding figures are shown in Appendix 4.

Spatial Variability of the Impact of the Scellier Scheme

Lastly, this final subsection focuses on the spatial variability of the effect. We divide the territory of metropolitan France into different major regions based on groupings of historical administrative regions and inspired from the ZEAT (*Zones pour l'étude et l'aménagement du territoire*, a division of the French territory into 8 major regions) except for the Paris region, where we use an *ad hoc* redivision to incorporate the Scellier zoning around the ZEAT of this region. The map in Figure X shows the different major regions, the Scellier zoning plan and the all-zone control and treatment groups.

Two major regions are particularly tight: the Paris region and the region bordering the Mediterranean. These are the only regions to have a large zone A (cf. Figure I), except for the municipalities around Lake Geneva which are part of the Rhône-Alpes region. Combes *et al*. (2016, see their Figure I, panel b) showed that the urban zones with the highest land prices are all located in these 3 regions. This prompts us to attempt a regional estimate, still based on a difference-in-differences approach, specific to these three major regions. The results are shown in Table 3, with only the specification of the common indicator variables being reported. We find that, without the Mediterranean and Paris regions, the estimates of the difference-in-differences coefficients remain significant and positive 6 months after the implementation of the scheme and not significant and close to zero before its implementation. Therefore, the results are consistent with the constant trend hypothesis. However, we find that the inflationary effect is smaller than for France as a whole. The difference amounts to approximately 2 euros per square metre of land compared to France as a whole. The results for the estimates by major region are more contrasted. The impact for the Mediterranean region is very important and significant, amounting to approximately 30 euros per square metre per year compared to 7 euros for France as a whole.

Figure X
Partition into Major Regions - Control Group and Treatment Group, All Zones



Notes: The partition into major regions is based on the administrative regions except for Paris, which takes into account the spread of the different groups outside the administrative regions.
Sources: Treatment by the authors based on the definition of the control and treatment groups.

Table 3
Results for the Major Regions with Municipality Indicator Variables as Control

	Without Paris and Mediterranean region		Mediterranean region		Paris region		Rhône-Alpes	
	All zones	Zone B2 only	All zones	Zone B2 only	All zones	Zone B2 only	All zones	Zone B2 only
- 54 months 1st semester 2004	5.93** (2.94)	6.09* (3.43)	-30.19** (11.53)	-24.03* (12.03)	-24.11* (12.65)	-24.11* (12.65)	15.04 (9.70)	8.41 (7.46)
- 48 months 2nd semester 2004	3.44 (2.27)	3.66 (2.52)	-19.75* (9.77)	-16.76 (11.04)	-9.32 (11.35)	-9.32 (11.35)	-3.57 (5.58)	-8.37* (4.32)
- 42 months 1st semester 2005	2.29 (2.35)	3.53 (2.43)	-12.44 (10.04)	-11.86 (10.35)	-1.78 (11.70)	-1.78 (11.70)	4.19 (6.75)	1.30 (6.25)
- 36 months 2nd semester 2005	-0.51 (1.77)	0.25 (1.84)	-33.38** (12.58)	-30.45** (13.74)	-4.77 (13.07)	-4.77 (13.07)	-5.40 (6.83)	-8.33 (5.24)
- 30 months 1st semester 2006	0.35 (1.66)	0.85 (1.83)	-10.95 (10.84)	-5.71 (10.88)	-16.06 (16.49)	-16.06 (16.49)	-6.18 (7.68)	-7.51 (7.15)

➔

Table 3 (contd.)

	Without Paris and Mediterranean region		Mediterranean region		Paris region		Rhône-Alpes	
	All zones	Zone B2 only	All zones	Zone B2 only	All zones	Zone B2 only	All zones	Zone B2 only
- 24 months 2nd semester 2006	0.03 (1.69)	0.41 (1.81)	-28.54*** (7.99)	-21.96** (7.99)	-7.39 (6.36)	-7.39 (6.36)	-5.45 (5.64)	-5.90 (5.59)
- 18 months 1st semester 2007	0.69 (1.79)	1.78 (1.86)	-1.42 (11.44)	1.70 (12.78)	2.27 (6.36)	2.27 (6.36)	0.97 (5.09)	2.02 (7.17)
- 12 months 2nd semester 2007	-2.71 (1.75)	-3.23 * (1.84)	1.34 (7.06)	-0.04 (8.56)	-0.05 (9.55)	-0.05 (9.55)	-8.92* (5.17)	-6.12 (5.09)
- 6 months 1st semester 2008	-1.57 (1.74)	-2.39 (1.60)	0.04 (7.42)	-0.69 (7.61)	-0.44 (5.16)	-0.44 (5.16)	6.86 (4.83)	1.12 (4.68)
Six-month reference period (2nd semester 2008)								
+ 6 months 1st semester 2009	0.05 (1.42)	0.01 (1.63)	9.03 (7.60)	9.73 (8.31)	9.73* (5.51)	9.73* (5.51)	8.49 (5.86)	12.15** (5.74)
+ 12 months 2nd semester 2009	3.97*** (1.52)	4.79*** (1.80)	32.19*** (6.05)	31.63*** (7.10)	7.67 (5.44)	7.67 (5.44)	8.44 (5.03)	7.88 (5.59)
+18 months 1st semester 2010	5.3*** (1.66)	3.67** (1.69)	30.78*** (8.87)	31.33*** (10.06)	12.21* (5.81)	12.21* (5.81)	8.25 (5.15)	3.53 (6.81)
+ 24 months 2nd semester 2010	6.59*** (1.97)	5.72** (2.19)	29.09** (12.11)	23.89* (13.69)	23.91 (20.24)	23.91 (20.24)	17.20*** (5.97)	17.14** (7.44)

Note: Standard errors are estimated taking into account clusters at the level of employment zones. *** significant <1%, ** significant at 5%, * significant at 10%.

The picture is more mixed for the Paris and Rhône-Alpes regions. While the estimation results are positive, they are not all significant. The results are identical for the two definitions of the control and treatment groups for the Paris region, because in this particular region the two definitions coincide. For the Rhône-Alpes region, an effect at 24 months is significant at the 5% threshold at least and the scale is impressive, at around 17 euros. However, because of the smaller amount of data, these results lack power and are therefore weak.

* *
*

It is hardly surprising that a scheme designed to ensure effective demand for building land in order to boost the construction of rental housing should lead in the short term to an increase in land prices. This result is consistent with both the theoretical proposition and the results of Chapelle *et al.* (2018) using the FILOCOM database. These results may be described as causal impacts. However, the well-known weakness of this type of approach is that the results cannot be extrapolated beyond the border zones studied. To avoid such a result, the building land constraint would have needed to have been loosened first. It is interesting to see that this rather undesirable collateral effect of the policy is significant above all in the Mediterranean region – a region presenting a range of obstacles to an active land policy. In addition to the fact that the urbanised area bordering the coast is generally constrained towards the interior by the relief, another factor is that the area is a wine-growing region with a price per hectare ranking among the highest for agricultural land and has a significant number of second homes, making the public policy task of loosening the supply of land more difficult. Our main conclusion, therefore, is that urban planning policy must come with, and even precede, any scheme designed to boost rental housing construction. In a sense, policies had put the cart before the horse, and it is not certain that substantial progress has been made since then. □

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Table A1
Descriptive Statistics, All Zones

	France			Municipalities extracted from the BNDP					
	Adjacent municipalities, all zones			Adjacent municipalities, all zones			Adjacent municipalities, B2 only		
	Control group (standard deviation)	Treatment group (standard deviation)	*t* stat (p-value)	Control group (standard deviation)	Treatment group (standard deviation)	*t* stat (p-value)	Control group (standard deviation)	Treatment group (standard deviation)	*t* stat (p-value)
Number of municipalities concerned	2795	2027		1880	1472		1646	1212	
Average municipal population in 1999 (Insee)	1283.69 (1579.33)	5180.69 (14674.63)	-13.93 (0.00)	1453.45 (1710.08)	6406.98 (16958.50)	-12.58 (0.00)	1380.22 (1629.53)	5770.74 (15466.60)	-11.43 (0.00)
Average municipal population in 2002 (Insee)	1425.73 (1722.14)	5385.80 (14834.30)	-13.98 (0.00)	1624.53 (1881.64)	6657.09 (17140.75)	-12.63 (0.00)	1531.16 (1771.95)	5970.06 (15470.63)	-11.54 (0.00)
Average population density in 2007 (Inhabitants per hectare)	1.08 (1.06)	3.27 (4.79)	-23.38 (0.00)	1.16 (1.06)	3.72 (5.26)	-20.58 (0.00)	1.13 (1.04)	3.27 (4.60)	-18.25 (0.00)
Average in percentage of taxable households in 2007 (Insee/DGFIP)	59.90 (8.98)	61.06 (9.19)	-4.39 (0.00)	60.08 (8.91)	60.82 (9.17)	-2.35 (0.02)	59.35 (8.86)	59.71 (9.13)	-1.07 (0.29)
Average "4 taxes" tax potential per inhabitant 2008 (DGCL)	488.92 (356.73)	633.68 (461.47)	-12.28 (0.00)	496.83 (379.66)	650.38 (452.62)	-10.68 (0.00)	499.02 (385.97)	630.88 (457.09)	-8.34 (0.00)
Municipalities in an urban cluster (Insee/ZAUER99)	0.02 (0.12)	0.49 (0.50)	-48.28 (0.00)	0.02 (0.13)	0.54 (0.50)	-43.23 (0.00)	0.02 (0.13)	0.47 (0.50)	-35.28 (0.00)
Monocentric municipalities (Insee/ZAUER99)	0.66 (0.47)	0.40 (0.49)	18.71 (0.00)	0.65 (0.48)	0.36 (0.48)	17.79 (0.00)	0.61 (0.49)	0.40 (0.49)	11.63 (0.00)
Multicentric municipalities (Insee/ZAUER99)	0.20 (0.40)	0.07 (0.25)	13.00 (0.00)	0.20 (0.40)	0.06 (0.24)	11.62 (0.00)	0.22 (0.42)	0.07 (0.26)	10.90 (0.00)
Municipalities in a rural employment cluster (Insee/ZAUER99)	0.02 (0.12)	0.02 (0.14)	-1.12 (0.26)	0.02 (0.13)	0.02 (0.14)	-0.62 (0.54)	0.02 (0.14)	0.03 (0.16)	-0.87 (0.38)
Municipalities in the commuter belt of a rural employment cluster (Insee/ZAUER99)	0.11 (0.32)	0.03 (0.17)	10.85 (0.00)	0.11 (0.31)	0.03 (0.16)	9.42 (0.00)	0.12 (0.33)	0.03 (0.17)	8.86 (0.00)
Average price of the zone, second half of 2008 (BNDP)				81.41 (64.11)	99.28 (80.28)	-13.36 (0.00)	78.16 (64.40)	89.71 (73.38)	-8.31 (0.00)
Average price of the zone, second half of 2009 (BNDP)				83.07 (67.38)	108.72 (85.08)	-16.75 (0.00)	78.33 (67.85)	98.55 (79.29)	-12.35 (0.00)
Average price of the zone, second half of 2010 (BNDP)				87.80 (68.36)	121.57 (91.10)	-17.91 (0.00)	83.56 (69.37)	110.11 (82.26)	-13.63 (0.00)

Note: The p-values of the t tests are the p-values for a bilateral test.

APPENDIX 2

BNDP VS PERVAL

We have access to the PERVAL data for the years 2000, 2002, 2004, 2006 and 2008. We therefore have 3 years in common with the BNDP database (2004, 2006 and 2008). To understand how the BNDP database functions, we identified the PERVAL transfers recorded in the BNDP database and vice versa. For this, we created a key for each database as follows:

year of sale || month of sale || municipality code || section prefix || section code || plan number

Since all these variables are found in both databases and identify a single transfer, we were able to match the two databases. There are, of course, a number of input errors or technical differences between the two databases, but on the whole the method works. We found that there were transfers in the BNDP extraction but not in the PERVAL database, while there were also a significant number of transfers in the PERVAL database not found in the BNDP database.

Table A2
Comparison of BNDP and PERVAL Databases

Frequency Percentage in column	2004	2006	2008
Transfers listed in PERVAL and not found in the extraction from the BNDP database	49,687 82.08 %	39,507 62.12 %	25,653 47.79 %
Transfers found in PERVAL and in the extraction from the BNDP database	10,850 17.92 %	24,089 37.88 %	28,023 52.21 %
Total	60,537	63,596	53,676

Sources: BNDP and PERVAL database; treatment by the authors.

82% of the transfers recorded in PERVAL in 2004, 38% in 2006 and 52% in 2008 had no equivalent in our BNDP extraction, meaning that for 2004 and 2006 and, to a lesser extent, 2008, the extraction is far from exhaustive.

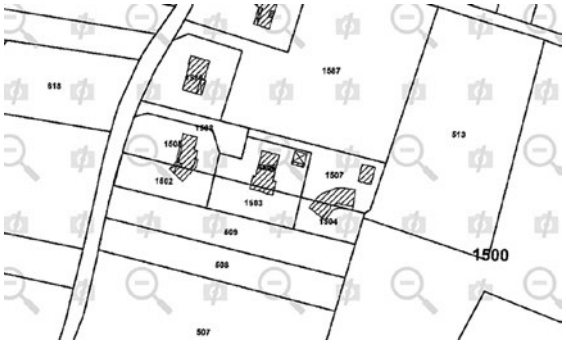
The Surface Area in Question

PERVAL and BNDP capture surface areas differently. First, the very structures of the databases create differences. BNDP contains one (or more) line(s) per parcel sold. To determine the surface area of the sale (which may relate to several parcels), all the surface areas of the distinct parcels included in a sale must be added up. A sale is defined in the BNDP database by a unique identifier which is the concatenation of the "SAGES code C. H." and the "publication reference". The PERVAL database, composed of a single line per sale, includes one cadastral parcel even if the sale relates to several parcels.

For example, consider the sale captured in both PERVAL and BNDP relating to parcels 1504 and 1507 on the following map (Figure A2-I). In PERVAL, only parcel 1504 is recorded. The surface area of the plot of land corresponds to the sum of the surface areas of parcels 1504 and 1507. In the BNDP database, there is one line for parcel 1504 and one line for parcel 1507, but also one line for parcel 1508 (for the right of way up to the house). For each of the lines, the total sale price and the surface area of each parcel are shown. Thus, the total surface area corresponding to the sale is the sum of the surface areas recorded over three lines. For the BNDP, this sum differs from the surface area in PERVAL, where the surface area of parcel 1508 is missing. The difficulty is that it is not possible to systematically determine the parcels corresponding to a right of way. The effect of these differences between the databases is to give a lower average price per square metre for BNDP compared to PERVAL.

Figure A2
Cadastre Corresponding to Parcels 1504 and 1507 and Aerial Photography

A2-A – Cadastre



A2-B – Aerial Photography

Sources: Cadastre (https://cadastre.gouv.fr/scpc/accueil.do) for the plan and Google Maps for the photo.

APPENDIX 3

CHANGE IN REFERENCE PERIOD AND PLACEBO TEST

Table A3-1
Difference-in-Differences Results Price per Square Metre (Reference: First Half of 2008)

	Without controls		With controls		With controls and employment zone indicator variables		With municipality indicator variables	
	All zones	Zone B2 only	All zones	Zone B2 only	All zones	Zone B2 only	All zones	Zone B2 only
- 54 months 1st semester 2004	-5.02 (4.91)	-5.61 (4.90)	-4.92 (4.93)	-4.65 (5.06)	-4.02 (3.10)	-3.77 (3.24)	2.26 (4.30)	1.81 (4.43)
- 48 months 2nd semester 2004	-3.52 (4.59)	-6.81* (3.84)	-3.40 (4.49)	-5.00 (3.95)	-2.55 (2.82)	-4.00 (2.78)	1.22 (3.12)	0.30 (3.08)
- 42 months 1st semester 2005	0.91 (3.90)	0.19 (3.72)	1.36 (3.91)	1.20 (3.82)	-0.98 (2.33)	-1.14 (2.24)	3.34 (2.62)	4.15 (2.53)
- 36 months 2nd semester 2005	-0.64 (4.05)	-1.38 (3.40)	-0.32 (4.00)	-1.05 (3.52)	-1.34 (2.35)	-1.91 (2.32)	3.80 (2.61)	3.15 (2.73)
- 30 months 1st semester 2006	-6.61 (4.38)	-3.60 (4.09)	-4.66 (3.98)	-2.63 (3.85)	-3.89 (2.61)	-2.26 (2.77)	3.20 (2.89)	3.52 (3.17)
- 24 months 2nd semester 2006	-4.34 (4.01)	-3.71 (3.68)	-2.22 (3.93)	-2.27 (3.50)	-2.62 (2.36)	-3.16 (2.28)	0.46 (2.30)	0.34 (2.42)
- 18 months 1st semester 2007	-4.84 (4.45)	-1.90 (3.70)	-3.44 (4.28)	-1.32 (3.70)	-4.47* (2.70)	-2.59 (2.17)	2.32 (2.55)	3.82* (2.26)
- 12 months 2nd semester 2007	-1.10 (2.97)	-0.94 (3.17)	-0.34 (3.02)	-1.39 (3.31)	-1.56 (2.04)	-2.16 (2.17)	-0.82 (1.79)	-1.03 (1.92)
Six-month reference period (1st semester of 2008)								
+6 months 2nd semester 2008	0.82 (4.48)	-1.59 (3.54)	-0.34 (4.16)	-1.40 (3.13)	1.27 (2.18)	0.66 (1.88)	-1.08 (1.69)	-2.02 (1.59)
+12 months 1st semester 2009	2.59 (4.02)	2.68 (3.30)	1.47 (3.79)	2.54 (3.05)	1.99 (2.25)	2.36 (2.10)	2.91 (2.26)	2.87 (2.35)
+18 months 2nd semester 2009	6.29 (4.16)	5.45 (3.61)	4.76 (3.94)	5.94* (3.44)	7.99*** (2.15)	8.64*** (2.07)	7.07*** (2.52)	8.51*** (2.75)
+24 months 1st semester 2010	10.49** (4.98)	7.08** (3.38)	9.11 * (4.63)	7.01** (3.12)	10.09*** (2.50)	8.70*** (2.31)	7.94 *** (2.46)	8.75*** (2.64)
+30 months 2nd semester 2010	14.60** (6.15)	13.20** (5.48)	12.6** (5.70)	12.56** (5.09)	12.80*** (3.30)	12.16*** (3.41)	10.00*** (3.39)	10.59*** (3.80)

Note: Standard errors are estimated taking into account clusters at the level of employment zones.
*** significant <1%, ** significant at 5%, * significant at 10%.

Table A3-2
Difference-in-Differences Results Price per Square Metre (Placebo Effect)

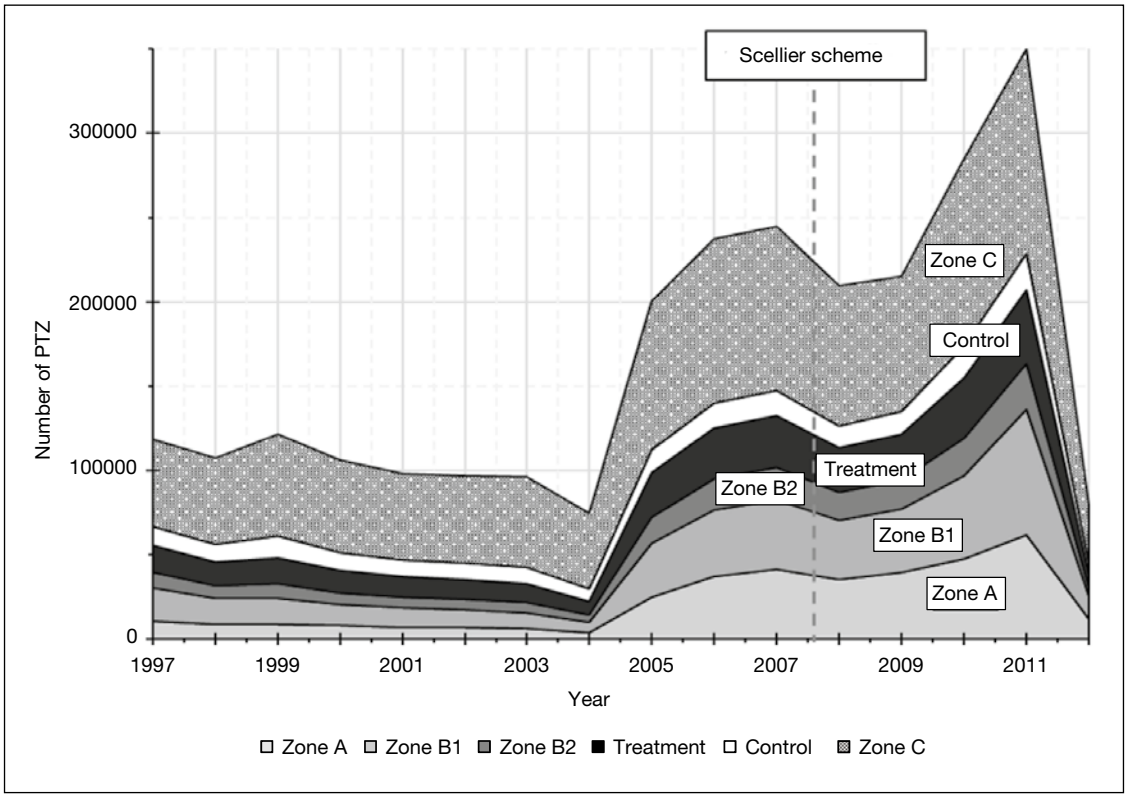
	Without controls		With controls		With controls and employment zone indicator variables		With municipality indicator variables	
	All zones	Zone B2 only	All zones	Zone B2 only	All areas	Zone B2 only	All zones	Zone B2 only
- 54 months 1st semester 2004	-8.87 (6.37)	-11.96* (6.23)	-9.51 (6.28)	-11.47* (6.19)	-7.06 (4.56)	-8.18* (4.51)	-3.61 (5.11)	-4.30 (5.23)
- 48 months 2nd semester 2004	-3.01 (7.78)	-8.00 (7.57)	-4.19 (6.95)	-6.88 (6.71)	-9.22** (4.59)	-11.20** (4.46)	-9.35 (5.83)	-10.45* (5.87)
- 42 months 1st semester 2005	-8.95** (4.17)	-12.86*** (3.80)	-8.73** (3.99)	-11.19*** (3.73)	-9.85*** (3.60)	-10.87*** (3.55)	-5.69* (3.20)	-6.05* (3.24)
- 36 months 2nd semester 2005	-2.99 (3.95)	-6.15* (3.62)	-4.05 (3.81)	-6.59* (3.61)	-6.57** (3.03)	-7.58** (2.91)	-7.14*** (2.72)	-7.31*** (2.73)
- 30 months 1st semester 2006	-11.07*** (4.18)	-11.53*** (3.05)	-11.00*** (4.09)	-11.23*** (3.39)	-10.49*** (3.64)	-9.94*** (3.69)	-8.80*** (2.78)	-8.55*** (2.84)
- 24 months 2nd semester 2006	0.57 (4.40)	-1.89 (3.61)	0.32 (4.06)	-1.90 (3.44)	-3.00 (3.19)	-3.67 (3.18)	-2.79 (2.81)	-2.91 (2.86)
- 18 months 1st semester 2007	-2.45 (4.78)	-3.57 (4.50)	-1.33 (4.72)	-2.23 (4.61)	-0.51 (4.39)	-1.56 (4.35)	2.69 (4.08)	2.30 (4.22)
- 12 months 2nd semester 2007	2.55 (5.12)	0.90 (4.43)	1.26 (4.79)	-1.25 (3.94)	-3.44 (3.52)	-4.30 (3.61)	-0.23 (2.90)	-0.61 (2.95)
- 6 months 1st semester 2008	2.09 (5.28)	0.52 (4.62)	-0.57 (4.87)	-1.60 (4.11)	-1.63 (3.65)	-1.48 (3.64)	-1.92 (2.86)	-2.36 (2.86)
Six-month reference period (2nd semester 2008).								
+6 months 1st semester 2009	6.47** (2.81)	7.99*** (3.00)	5.47* (2.96)	6.78** (3.29)	2.52 (2.56)	3.23 (2.60)	4.87** (2.46)	5.12** (2.56)
+12 months 2nd semester 2009	2.17 (4.82)	1.52 (4.94)	2.07 (5.09)	1.92 (4.93)	1.35 (3.88)	1.38 (3.79)	2.62 (3.21)	2.33 (3.23)
+18 months 1st semester 2010	3.36 (3.98)	0.79 (3.86)	3.44 (4.08)	0.42 (3.77)	-1.03 (3.68)	-2.43 (3.52)	-0.67 (3.37)	-2.37 (3.29)
+24 months 2nd semester 2010	0.71 (6.86)	0.64 (6.77)	-0.28 (7.15)	-0.52 (6.94)	-1.30 (5.01)	-2.93 (4.87)	0.37 (5.77)	-2.14 (5.61)

Note: Standard errors are estimated taking into account clusters at the level of the employment zones.
*** significant <1%, ** significant at 5%, * significant at 10%.

APPENDIX 4

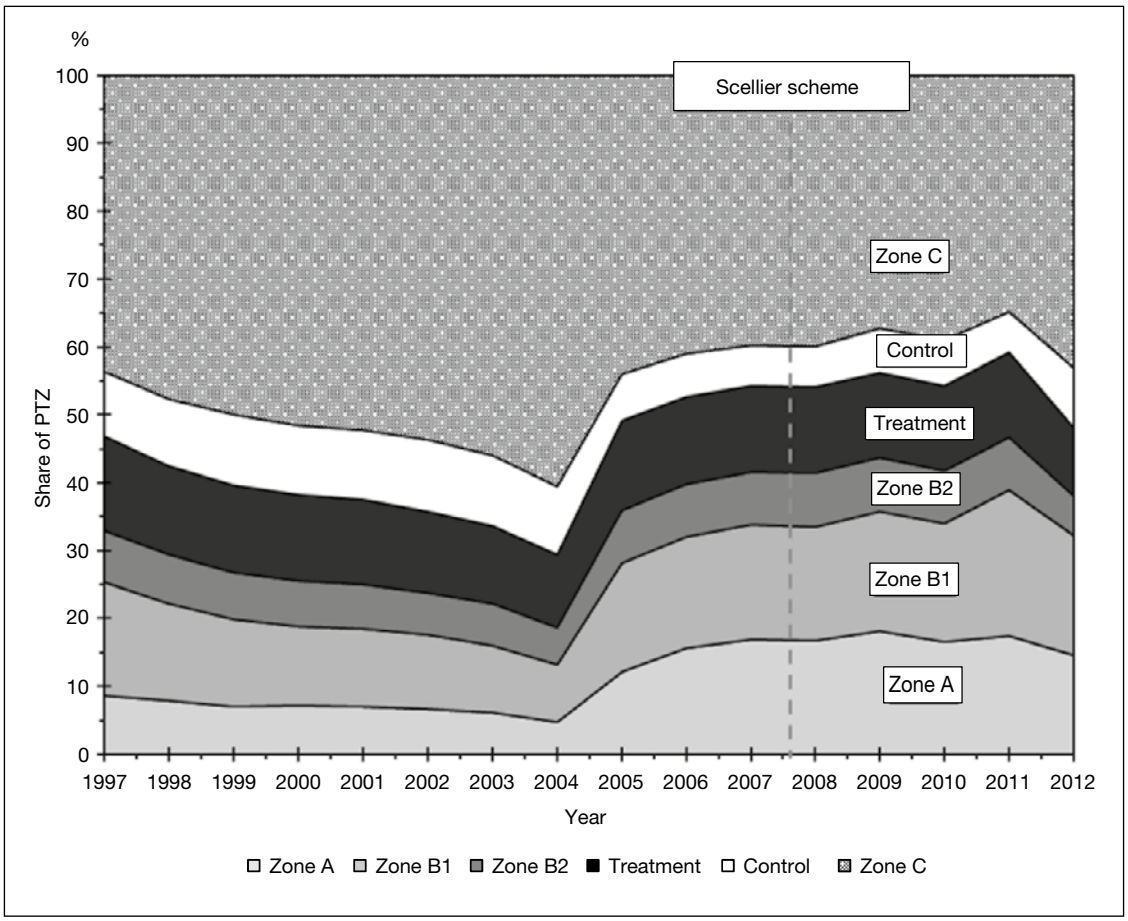
PTZ ZONE B2 ONLY

Figure A4-I
Number of PTZ by Zone (Adjacent Groups, B2 Only)



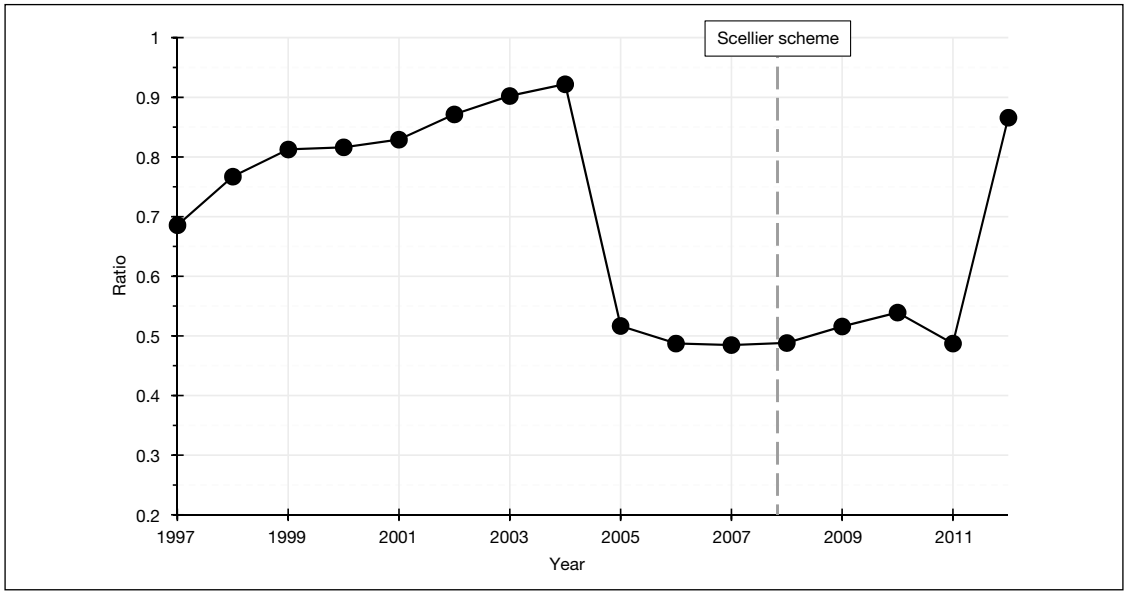
Notes: Zone C is to be understood without the PTZ located in the zone of the control group and zones B2, B1 and A are to be understood without the PTZ in the zone of the treatment group. No shocks were found in relation to the volume or distribution of loans before and after the implementation of the Scellier scheme.
Sources: CGDD; treatment by the authors.

Figure A4-II
Distribution of the PTZ by Zone (Adjacent Groups, B2 Only)



Notes: Zone C is to be understood without the PTZ located in the zone of the control group and zones B2, B1 and A are to be understood without the PTZ in the zone of the treatment group. No shocks were found in relation to the volume or distribution of loans before and after the implementation of the Scellier scheme.
Sources: CGDD; treatment by the authors.

Figure A4-III
Ratio of the Volume of Loans of the Control Group to the Treatment Group (Adjacent Groups Only, B2 Only)



Notes: Annual change in the ratio of the number of PTZ in the control group to the treatment group. No significant change is found before and after the implementation of the Scellier scheme, which could bias our results.
Sources: CGDD; treatment by the authors.