



HAL
open science

To what extent do location choices of new and relocating economic establishments differ in terms of preference for accessibility?

Ioannis Baraklianos, Louafi Bouzouina, Ouassim Manout, Patrick Bonnel

► To cite this version:

Ioannis Baraklianos, Louafi Bouzouina, Ouassim Manout, Patrick Bonnel. To what extent do location choices of new and relocating economic establishments differ in terms of preference for accessibility?. 2018. hal-01801448

HAL Id: hal-01801448

<https://hal.science/hal-01801448v1>

Preprint submitted on 29 May 2018

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

To what extent do location choices of new and relocating economic establishments differ in terms of preference for accessibility?

Ioannis Baraklianos¹, Louafi Bouzouina^{1*}, Ouassim Manout¹, Patrick Bonnel¹

¹Transport Urban Planning Economics Laboratory, ENTPE, Lyon, France

*Corresponding author (ioannis.baraklianos@entpe.fr), LAET-ENTPE rue Maurice Audin, 69518 Vaulx-en-Velin Cedex, France

Abstract

Accessibility is one of the most important attributes for a location choice of an economic establishment. However, even though it seems intuitive, the distinction in the literature between creations and relocations regarding its influence is scarce. In this paper, we examine whether new and relocating establishments choose their new locations differently in an intraurban setting. We estimate discrete choice models, using data of more than 43,000 creations and 11,000 relocations, occurred during the period 2005-2011, from 8 different sectors in the Lyon urban area in France. The results demonstrate that the effect of accessibility differs between new and relocating establishments in the same economic sector. This difference depends on the type of economic activity of the sector.

JEL classification: *L2, R3, R4*

Keywords

Firm location choice, discrete choice model, accessibility, creations, relocations, Lyon urban area

1. INTRODUCTION

Duranton and Puga (2001), Holl (2004a) and Manjón-Antolín and Arauzo-Carod (2011) showed that new and relocating firms choose their location differently and they are not attracted by the same location attributes. Nonetheless, accessibility was not the focus of these

articles. In this work, we propose to analyse whether new and migrating economic establishments have different preferences for accessibility using an empirical study in Lyon urban area, France. Policy-making is important at the urban level, as cities are competing each other to attract new businesses. Knowledge on how accessibility can affect the location choices of economic establishment is important for correct policy instruction. Omitting this distinction can lead to biased results and misplaced policy instructions (Manjón-Antolín and Arauzo-Carod, 2011).

The rest of the paper is structured as follows. Section 2 focuses on the role of accessibility for a location choice of new and relocating establishments. Section 3 presents the study area, the data and the applied method and presents the different variables and their measures. Section 4 presents the results of the models. Section 5 summarises the findings along with the conclusions of the paper.

2. DIFFERENCES BETWEEN NEW AND RELOCATING ESTABLISHMENTS: DO THEY APPRECIATE ACCESSIBILITY DIFFERENTLY?

When firms choose a location, either for first implantation or for relocation purposes, they evaluate a variety of location attributes based on their needs. One of the most important attributes is the accessibility of the location. A location must provide some sort of transportation infrastructure in order to reduce the cost for workers, clients, suppliers and distributors (Ellison et al., 2010).

The importance of accessibility is highlighted at a theoretical level in the very first works of urban economists on location choice determinants of economic activities. The bid-rent theory, developed by the works of Von Thünen (1842), reveals the role of accessibility on the spatial distribution of economic establishments. Since then, other theories have implicitly included

accessibility as a location choice factor through a transport minimisation cost process (Weber, 1909), through centrality (Christaller, 1933), localisation (Marshall, 1890) or urbanisation (Jacobs, 1969). Accessibility and transportation infrastructure are considered henceforth as traditional explanatory location attributes with positive effect. Highly accessible areas with well-developed transportation infrastructures can potentially minimise the transportation costs and relative risks for suppliers (input), distributors (output), labour force (production factor) and clients (profit). They also increase the potential market access helping firms to be more specialised and to exploit better economies of scale (Holl, 2012; Maroto and Zoffo, 2016) creating cost efficiencies. However, the theory does not distinguish the importance of accessibility as a location factor between new and migrating establishments.

Both newly created and relocating establishments are searching for locations which are maximising their profits (Barrios et al., 2006). Nevertheless, there are three major differences between them; the local information they dispose, the life cycle stage and the “*eco-system*”. When an establishment is relocating within a geographical area, it has a previous experience and therefore can make an informative evaluation of the different location possibilities (Manjón-Antolín and Arauzo-Carod, 2011) and make the best possible choice for its economic activity. On the contrary, a new business, which enters a new territory, misses local information which can be obtained only by experience. Regarding the life stage of a firm, the creation and the relocation of an economic establishment are two distinct events of the life course of a firm during which its needs can evolve (Holl, 2004a). A location choice made at some point back in time can now be suboptimal pushing the establishment to search for a new one (Van Dijk and Pellenbarg, 2000). Consequently, the criteria for the location choice of a new firm might not be the same between new and relocating establishments (Holl, 2004a; Manjón-Antolín and Arauzo-Carod, 2011). Last, when a firm is already in a geographical area it has an “*eco-system*” (Moore, 1993), meaning the established network with workers,

suppliers and clients from a spatial perspective. This dependency on the pre-existing network poses a restriction; relocating firms do not migrate far from the previous location (Bodenmann and Axhausen, 2012; Van Dijk and Pellenbarg, 2000).

Given these differences, we can assume that a new firm entering a geographical area should be more risk averse but should have more freedom with no particular attachments. It will try to locate in an area where it can minimise all the potential risks with no *a priori* attachments. So, accessibility should be in general positive but its effect should vary in terms of magnitude between creations and relocations. New firms are expected to localise themselves in central areas where accessibility is high and risks are low. On the contrary, a relocating firm can take more risks (Holl, 2004a) but has more constraints because of its “*ecosystem*” and its life stage. Businesses usually relocate because the current premises do not cover their needs but they choose areas which are not far from their previous location (Van Dijk and Pellenbarg, 2000), their established “*eco-system*”.

Differences of preferences for accessibility can vary among its components which are (i) the transport system, (ii) the spatial distribution of land-use, (iii) the individual characteristics (Geurs and van Wee, 2004). A new firm can be more sensitive to accessibility to the local population (spatial distribution) while a relocating one can be more sensitive to transport infrastructure (transport system). These differences can vary across economic sectors that are the individual characteristics of the economic establishments. While accessibility has been the focus of some studies (Bodenmann, 2011; de Bok and Van Oort, 2011), the existing literature focuses either on creations (Baptista and Mendonça, 2010; Buczkowska and de Lapparent, 2014) or relocations (Bodenmann and Axhausen, 2012; Nguyen et al., 2013; Van Dijk and Pellenbarg, 2000).

Existing works have made interesting observations concerning the influence of accessibility either for new establishments or relocating ones. Buczkowska and de Lapparent (2014) found that new industrial and financial establishments are attracted to locations with good motorway connections and commercial and real estate establishments choose locations with good Public Transportation (PT). Holl (2004c) showed that the construction of motorways in Portugal has increased the attractiveness of the locations close to them, with heterogeneous effects across economic sectors. For a Dutch region, de Bok and Oort (2011) found that for the relocating business activities, access to motorways and to train stations is important while accessibility to employment has a negative effect. Nguyen et al. (2013) observed that relocating establishments of the manufacturing and retail sectors are attracted by regions that offer good accessibility in terms of connections with the other regions.

Few studies compared new and relocating establishments. Manjón-Antolín and Arauzo-Carod (2011) examined the location choices of the industrial sector in Catalonia and found that either the location choices of new and relocating establishments have different sensitivity on common location attributes or that they take into account completely different determinants. Duranton and Puga (2001) observed that in France, new firms prefer diversified and central areas where the urbanisation effects are strong while relocating enterprises show a preference for rural areas where the fixed costs are lower and specialisation externalities are stronger. The connection between these preferences for urbanisation/specialisation and accessibility is intuitive. In line with this idea, Holl (2004a) found that in Portugal new establishments prefer local accessibility, migrating establishments prefer locations with good connections to the national market while both are attracted to transport corridors with migrations showing a greater preference for the proximity to motorways.

In this paper we are willing to take a step forward and give some empirical evidence on the difference of the effect of accessibility between new and migrating economic establishments

for various economic sectors. In that respect, we have developed a location choice model at a micro-level having as a case study the Lyon urban area in France, using the discrete choice method. While the majority of previous works are analysing location choices of economic establishments having as alternatives countries (Frenkel et al., 2001), regions (Holl, 2004a) or communes (Manjón-Antolín and Arauzo-Carod, 2011), this work is considering the neighbourhood as a spatial unit. Knowledge in such a detailed level of analysis can highlight the heterogeneities of location attributes emerging locally (Beaudry and Schiffauerova, 2009; Holl, 2004c).

3. THE STUDY AREA, THE DATA AND THE MODEL SPECIFICATION

The Urban Area Of Lyon

The study focuses on the Lyon urban area, which is located in the east central part of France. It is the second largest metropolitan area in France after Paris in economic and population terms. The urban area has surface area of about 3.3 thousand square km and, in 2011, had a population of 1.85 million people. It is considered as a dynamic economic area with an international character due to the proximity of the city to Italy, Switzerland and Germany (Rosales-Montano et al., 2015). The Gross Domestic Product of the metropolitan area in 2011 was almost 73 billion euros (Eurostat), which places the urban area among the 25 top European metropolitan regions in terms of total gross production. Despite the deindustrialisation process of the latest years, Lyon remains one of the most industrialised areas of France (Carpenter and Verhage, 2014). Its economy has a tertiary role, which has been reinforced in the latest years. This diversity and strength of the local economy situates Lyon between the most dynamic European metropolitan cities of this size like Cologne, Turin, Dublin, Helsinki, etc.

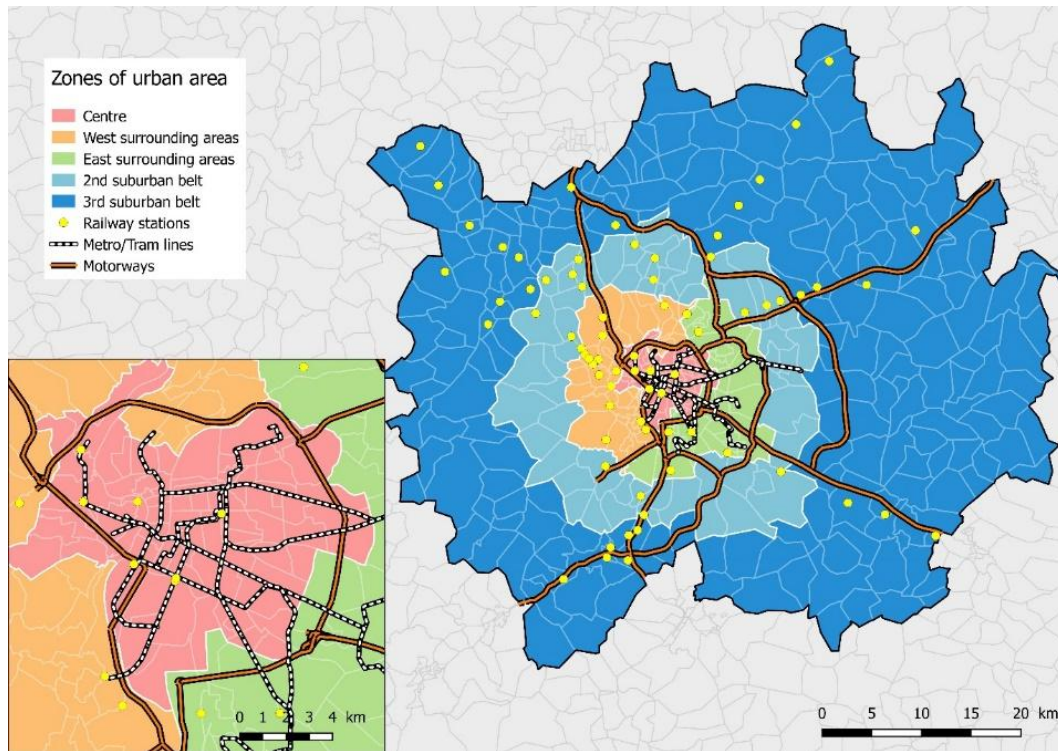


FIGURE 1: The zones and the transportation infrastructure of the urban area of Lyon.

In total, the urban area had more than 850,000 jobs (142,500 establishments - self-employed excluded) in 2011 (INSEE, databases of SIRENE and RGP), of which more than 43% were concentrated in the area's central municipalities (Lyon-Villeurbanne – Centre in figure 1) which covers less than 2% of the surface of the total analysis area. The local economic policy is favouring the entrepreneurship with the creation of poles of competitiveness and innovation in the 90s (Rosales-Montano et al., 2015). During the period 2005 – 2011, the number of jobs increased by almost 13% and the number firms by almost 17%. Evidence from this article can help understanding the behaviour of firms in a city of a medium-large size like Lyon, which can be different from the global European megalopolises like Paris (Buczowska and de Lapparent, 2014; Padeiro, 2013) or other American cities (Sweet, 2014).

Creations and migrations of economic establishments

This work is principally based on the economic establishments register database (SIRENE) enriched by other databases from various sources. SIRENE is a disaggregated database that contains all the companies in France and is provided by the INSEE (Institut National de la Statistique et des Etudes Economiques - French National Institute of Statistics and Economic Studies).

We use the SIRENE database for two time periods, the analysis year of 2011 and the comparison year of 2005. The use of the same database in two time periods permits us to identify the firms created or relocating during this period. For identification reasons, we are focusing only on firms with one or two establishments in 2011. A disadvantage of this method is the non-identification of the inbound firms, which are considered as creations. However, it is expected that newcomers behave similarly to the new firms since they do not have any previous attachment or knowledge in the study area. The advantage of this method is its transferability. It can be applied to any time period and any location for which data is available.

The database contains information for each economic establishment like the economic activity, the location of the firm, the size in number of employees etc. In order to group the firms into economic sectors we use the classification of the INSEE into 20 groups as a departure point. To decrease the number of sectors and to have more homogenous groups in terms of location choices we merge some groups together and recreate some others using a bottom-up approach based on the function of the firm (Table 1). We decompose the Business services into Front Office and Back Office services. This distinction aims at reflecting the firms' need of face-to-face interactions and the presence of structural differences, linked to the degree of final demand orientation of Business Services (Ota and Fujita, 1993).

TABLE 1: Classification of economic establishments by INSEE and modifications

The creation and the relocation rate differs between economic sectors (table 2). Real Estate and Construction activities have the highest rate of new establishments during the analysis period. These two sectors can be related to one another since construction can generate sale offers and thus the Real Estate sector flourishes. On the contrary, Manufacturing and Health have fewer creations than any other analysed sectors with 34%. The mean relocation rate during the analysed period is around 11% and it differs between sectors. The most “mobile” sectors are the Front Office services and Health with 14% of relocation rates. This difference can be related to the difficulty of the migration (specialised premises) or to the relation of the establishment with a specific location (clients).

TABLE 2: Creation and relocation of establishments by sector

The majority of the created and the relocating establishments are establishments with few employees. Between 87.3% to 97.7% of the created establishments and 68.3% to 95.9% of the relocating ones, have 5 employees or less, with the majority of them having zero employees; only the owner is operating the establishment. As a general pattern, the created establishments are smaller than the relocating ones, which is expected. When an establishment is created, at the beginning usually only the owner is operating the business and later he recruits employees based on his needs. On the contrary, the size of migrating firms can vary significantly. Additionally, the distribution is different not only between firm events but also between economic sectors. The sectors with the largest establishments (more than 20 employees) both

of created and relocating are the sectors of Manufacturing (3.9% and 9,3%), Wholesale (1,4% and 6,8%) and Back Office (2,8% and 10,5%).

TABLE 3: Distribution of the establishments' size included into the analysis by sector and creation/relocation

Modelling the location choices of economic establishments

Modelling the location choice of a firm or an establishment involves various choices, ranging from the dependent variable, which can be the jobs, the firms or the establishments (Buczowska and de Lapparent, 2014) to the modelling method. There are principally two methods, the discrete choice models, which model firm location choices and the count data models which model the attraction of locations (how many establishments a location receives) (Arauzo-Carod et al., 2010). Even though the two approaches mostly have the same theoretical bases, like the profit maximisation process (Alamá-Sabater et al., 2011), we use the discrete choice approach given that in our analysis we are searching how an establishment is choosing its location.

One of the most fundamental principles of the discrete choices is the McFadden's (1974) random utility maximisation principle applied to firms as a profit maximisation process. Carlton (1983) demonstrated through an empirical study in the USA that in fact the profit maximisation problem for a firm is a variant of McFadden's random utility maximisation model, applied by McFadden for the households' location choice model. A firm is evaluating all the available location possibilities (perfect information) and then makes the optimal choice which maximises its profits (Arauzo-Carod et al., 2010; Holl, 2004a). In this framework, the profit Π_{in} for a firm i and a location n is composed by a deterministic observable part π_{in} and a random unobservable term ε_{in} (equation 1) (Barrios et al., 2006):

$$\Pi_{in} = \pi_{in} + \varepsilon_{in} \quad (1)$$

Π_{in} : Profit of establishment i at location n
 π_{in} : Deterministic part of the profit
 ε_{in} : The error term

Where the deterministic part of the profit is a vector of location attributes:

$$\pi_{in} = \sum_{k=1}^K \beta_k X_{ink} \quad (2)$$

π_{in} : Deterministic part of the profit
 K : the number of variables
 β_k : parameter to be estimated
 X_{ink} : value of variable for establishment i at location n

Making the assumption that the error term ε_{in} is independently and identically distributed (IID) with type 1 extreme value distribution (McFadden, 1974), the probability of choosing a location takes the logit form:

$$Pn(i) = \frac{e^{\pi_{in}}}{\sum_{j \in C_n} e^{\pi_{jn}}} \quad (3)$$

π_{in} : Deterministic part of the profit at i
 π_{jn} : Deterministic part of the profit of all alternatives in C_n
 C_n : the choice set

The Multinomial logit model is strongly criticized especially for modelling spatial choices. One of its key properties, known as the IIA (Independence of Irrelevant Alternatives) property¹, is highly unlikely to be valid in a spatial context. However, it remains an attractive method due to the ease of computation and the traceability of the results.

In our case, where we are searching for any potential differences between new and relocating establishments, we assume that we have two market segments by economic sector. Thus, we need a utility function which takes into account this separation. Thus, equation 2 becomes:

$$\pi_{in} = \sum_{k=1}^K \beta_k X_{ink} \delta_1 + \sum_{k=1}^K \beta_k X_{ink} \delta_2 \quad (4)$$

π_{in} : Deterministic part of the profit
 K : the number of variables
 β_k : parameter to be estimated
 X_{ink} : value of variable for establishment i at location n
 δ_1, δ_2 : Indicators of created or

¹ IIA means that the probability to choose between two choices is independent to the other irrelevant alternatives.

Where δ_1 and δ_2 are indicators which take the values 0 or 1 depending on whether the observation is a creation or a relocation. Using this joint estimation we are able to compare the results (Ben-Akiva et al., 2015) of the parameters between creations and relocations. In order to verify that this division is explaining better the location choices and to justify our choices, we estimate a model where we do not make the distinction between the firm events and we compare the results using the likelihood ratio test (Ben-Akiva and Lerman, 1985).

The study area is divided into 431 zones² and we use the full choice set for the estimation of the parameters. Even if we focus on accessibility, we integrate other location attributes highlighted by the location choice theory of firms in order to control for their effect. The selected locational attributes can be classified in four groups: accessibility and market trade-off, location externalities, social environment and institutional factors. Table 4 presents the summary statistics of all the independent variables.

The independent variables

Accessibility and market trade-off. This group of variables is the centre of our analysis. We want to capture the maximum information regarding the preference for accessibility using various indicators. At the same time, we want to measure the traditional trade-off between the accessibility of a location and the price. Especially for the relocating establishments, this trade-off also includes the distance to the previous location.

In order to measure accessibility, we use three types of measures: 1) the proximity to transportation infrastructure, which captures the effect of the presence of an infrastructure, 2)

² We are following the zoning system of INSEE based on the « *grand quartier* » zones, which is essentially a census breakdown

the preference for centrality and 3) the potential accessibility indicator, which combines the ease to travel and the spatial distribution of the population. The first and second type of accessibility are easily observable by the firm like proximity or not to a transportation infrastructure or central area or not (de Bok and Van Oort, 2011). The third measure is less intuitive but is a more comprehensive indicator of accessibility.

The proximity to transportation infrastructures includes the stations of PT (metro, tramway and railway) and the motorway. The proximity to these infrastructures is measured as a binomial variable which takes the value 1 when this type of infrastructure is present into the zone. We have not used a continuous measure, like the distance to the motorway, because we want to capture only the local effect of the infrastructure and we want to avoid correlation with the potential accessibility to population.

Many studies have highlighted the importance of centrality of the location (Dubé et al., 2016; Elgar et al., 2009). In order to capture this preference for central areas we introduce a set of dummy variables. We divide the area in five greater zones so that we have: (i) the central zone composed by the municipalities of Lyon and Villeurbanne, (ii) the eastern surrounding zone which is considered as areas with low skilled workers, (iii) the western surrounding zone which is considered as areas with high skilled workers, (iv) the 2nd suburban belt and (v) the 3rd suburban belt. In that way, we capture not only the preference for the central areas, but the preferences, if any, between those different zones.

For the calculation of the potential accessibility, we use generalised times by car and PT and we combine them with the population of the area. The generalised peak times by car and PT were estimated by a four-step transportation model developed at the LAET (Laboratoire, Aménagement, Economie, Transport - Transport, Urban Planning, Economics Laboratory). The data of the household travel survey of 2015 is used for the calibration of the model. Even

though there might be some changes between 2011 and 2015, especially for PT (some new tram stations), they are considered to be marginal in terms of travel times. The population data comes from the general census (RGP) of 2011 provided by the INSEE (www.insee.fr).

The potential accessibility, in its passive form (Cascetta, 2009), measures the population potentially attracted to a given location and can be interpreted as a proxy for the potential market. It allows to verify the role of the interaction level of the economic activities of an area with the population. While there can be some sectors which appreciate better the accessibility to a pool of workers than to population, we observed that accessibility to workers and to population are highly correlated. Thus, from an estimation point of view, the results would be similar either using accessibility to workers or to population. A general form of the measure of accessibility to population using a negative exponential impedance function, is given by the equation 5:

$$A_j = \sum_i P_i e^{-\beta T_{ij}} \quad (5)$$

A_j: Accessibility to population of location *j*
P_i: Population in location *i*
β: parameter to be estimated
T_{ij}: generalised time from *i* to *j*

The parameter β is estimated by local household travel surveys and reflects the sensitivity of individuals to make a trip. We tested several combinations of specific population segments based on socio-demographic and socio-economic profiles, but the results did not vary significantly between measures. For the sake of simplicity and comparability of the results, we chose to use the general population for all economic sectors.

When we have multiple transport modes serving an area, one should consider aggregate the generalised times of these different modes. In this work, we use a composite generalised time, aggregating the values of car and PT, as proposed by Bhat et al. (1999). Given that PT is not available for every Origin-Destination (OD) pair, when PT connection is available, the

composite generalised time T_{ij} is given by the equation 7. When PT connection is not available, the T_{ij} is equal to the generalised time by car (equation 6). This form of the composite generalised time has the advantage that when a zone has more mobility options the estimated accessibility is higher depending on the estimated generalised times of the available modes.

$$T_{ij} = T_{car_{ij}} \quad \text{When there are no PT connections (6)}$$

$$T_{ij} = \left(\frac{T_{car_{ij}}}{1 + \frac{T_{car_{ij}}}{T_{pt_{ij}}}} \right) \quad \text{When there are PT connexions (7)}$$

T_{ij} : Composite generalised time from i to j

$T_{car_{ij}}$: Generalised time for car

$T_{pt_{ij}}$: Generalised time for PT

As the traditional bid-rent theory states, there is a trade-off between the accessibility and the price of a location. In order to capture this, we introduce the price per square meter for different types of premises. The data for the land prices comes from the Callon database (Callon, 2011) which gives an average price per square metre for offices, boutiques, warehouses and industrial premises. This data is combined with data of apartment sales from the database of the notaries of France (Perval). Thus, we were able to estimate different prices for different premises. Each price is used with the corresponding activity sector. We use hedonic models in order to estimate the values for all the zones of our study area. It is expected to have negative influence *ceteris paribus* with higher importance for the relocating establishments.

As a part of this trade-off for the migrating establishments, we are including the distance to the previous location of the establishment. It is measured as the Euclidian distance from the origin zone (previous location) to the destination (new/current location). It is expected to have negative influence.

Agglomeration externalities. Agglomeration externalities or external economies are important determinants for a location choice of a firm, highlighted by the neoclassical approach

(Arauzo-Carod et al., 2010). They arise when firms increase their productivity because of the proximity with other firms without any direct financial exchanges. These agglomeration externalities can be divided in two different types, the localisation and the urbanisation effects (Glaeser et al., 1992). Known as MAR externalities, the localisation externalities emerge from the concentration of an economic sector to a specific geographical area. It is considered as a positive location externality because proximity between firms can favour the labour market pooling, input/output sharing and knowledge spill over (Ellison et al., 2010). It increases the performance of firms and reduces the risk for the implementation of new ones. In empirical applications, localisation effects are measured either by using the location quotient by economic sector or by the density of employment or firms (Beaudry and Schiffauerova, 2009).

In this work, after testing for different formulations, we use the density of firms by location and by sector which gives the best and the most consistent results. The localisation LOC is given by equation 8:

$$LOC_{js} = \frac{n_{js}}{E_j} \quad (8)$$

n: the total number of establishments
s: economic sector
E: surface in km²
j: zone

Localisation effects can be a proxy for accessibility components but are not captured by our accessibility indicators. These effects are closely related to accessibility (de Bok and Van Oort, 2011; Melo et al., 2016) but from a broader firm-to-firm influence point of view without considering the influence of the infrastructure (de Bok, 2007), because it concerns only the physical proximity for companies in the same industry. Additionally, localisation externalities can be a proxy for good suppliers accessibility due to “shared input effects” (Marshall, 1890).

The diversity externalities (Jacobs, 1969) are the result of the collocation of diverse economic sectors into a geographic area (Beaudry and Schiffauerova, 2009). There are economic sectors which value more the diversity than the density of a location while others search for more specialised locations. The diversity effects can be measured by the Gini coefficient or the Hirschman-Herfindahl index (HHI) (Beaudry and Schiffauerova, 2009). We have opted for the HHI, modifying it as $HHI'_j = 1 - HHI$ (see equation 9) in order to have more intuitive results (values between 0 and 1, 1 the most diverse, 0 the more specialised).

$$HHI'_j = 1 - \frac{\sum_s D_{sj}^2}{(\sum_s D_{sj})^2} \quad (9)$$

D: number of jobs
s: economic sector
j: zone

As shown by Duranton and Puga (2001), localisation effects are expected to be stronger for relocating establishments and diversity effects stronger for creations.

Social environment. Even though studies do not include social environment variables very often, we argue that it can influence the location choice of a firm. Firms which offer high quality services and need face-to-face contact are expected to choose areas with high revenue households (Elgar et al., 2009). Additionally, it is expected that firms should in general avoid areas with low-income households due to any possible social problems that can affect the productivity of the firm. Also, high income areas are more attractive from a market potential point of view especially for certain economic sectors. On the contrary, an area with high percentages of poor population can have possible negative local effects to the economic activity while small disposable revenue for spending can impact consuming oriented activities. Buczkowska and de Lapparent (2014) found that the sector of real estate agencies prefers rich neighbourhoods possibly because of their good image. In our study, we are taking into account the effect of the social environment by introducing into the model the percentages of the population belonging to the 1st quantile (the poorest) and the 5th quantile

(the richest) of the revenue of the whole study area. We have used the Filosofi database (INSEE – Localised social and fiscal file), which gives the distribution of the available revenues of each zone, for the year 2011. We expect that some sectors will be positive to the 5th quantile while all sectors will be negatively influenced by the 1st quantile.

Institutional factors. One of the latest advances of the location theory is the understanding that firms are making choices in an environment which is not static, because of agents who are external to the firm like the government. Public incentives can have great influence to the location choices of firms (Barrios et al., 2006). To account for the role of the macro-agent (public authorities, government) we have integrated a binary variable for the Economic Activity Zones (Zones d'Activité Economique – ZAE). A ZAE is a designated geographic area of concentration of economic activity, organised and constructed by a public or private developer, who rents or sells the land and the premises to companies willing to locate their businesses in these areas (Cerema, 2014). The identification of the Economic Activity Zones was made through personal research since there is no official registry. It is expected that this variable has a positive effect. In general, these areas are located near transportation axes and create localisation or diversity effects so controlling for its effect is crucial.

TABLE 4: Summary statistics of the variables used in the model

4. MODELLING RESULTS

We estimate a different model for each economic sector combining the creations and the relocations as described in equation 4. This set of models is called Model I. Then, we include the distance to the last location for the relocating firms and we re-estimate the models. This set of models is called Model II and for the analysis of the results, we only focus on the

variables concerning the relocations, since the variables of the created establishments are not changing.

In this chapter, we only present the results of elasticities calculated for the variables. For the quantitative variables we calculate the mean point elasticities and for the categorical variables we estimate the mean pseudo-elasticities (equations 10 and 11) (Washington et al., 2011). The result of the mean point elasticity suggests the mean effect that an increase of 1% of this variable will have. Accordingly, the result of the mean pseudo-elasticity is the mean effect of a categorical variable when it changes from 0 to 1. Thus, the results between the quantitative and categorical variables can be directly compared. The detailed results of the models can be found in the appendix.

Mean point elasticity	$E_k = \frac{\sum_{i=1}^I (1 - P_{in}) \hat{\beta}_k X_{ink}}{I}$	<p>E_k: Mean elasticity for quantitative variable k</p> <p>I: The number of establishments</p> <p>P_{in}: The probability of establishment i choosing the location n</p> <p>$\hat{\beta}_k$: The estimated parameter for k</p> <p>X_{ink}: The value of k for i at n</p>	(10)
--------------------------	-------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------

Mean pseudo- elasticity	$E'_k = \frac{\sum_{i=1}^I \frac{P_{in}(i X_{ink} = 1) - P_{in}(i X_{ink} = 0)}{P_{in}(i X_{ink} = 0)}}{I}$	<p>E'_k: Mean pseudo-elasticity for categorical variable k</p> <p>P_{in}: The probability of establishment i choosing the location n</p> <p>X_{ink}: The value of k for i at n which can take the values 0 and 1</p>	(11)
----------------------------	-------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------

New and relocating economic establishments choose their locations differently

First, we want to test our assumption that created and relocated establishments have different location choice behaviours. For this reason we use the likelihood ratio test (Ben-Akiva et al., 2015). The restrained model is the model with all the establishments without distinction

between new and relocating ones, and the unrestricted model, is the model with market segments (creations and relocations). The test is given by equation 12. If the test is rejected, then market the segmentation model is better, meaning that the new and relocating establishments do choose their locations differently.

$$LRT = -2 (L(\hat{\beta}) - L_{\delta}(\hat{\beta}))$$

L($\hat{\beta}$): Log-likelihood of the restricted model
L _{δ} ($\hat{\beta}$): Log-likelihood of the unrestricted model
 The test is asymptotically distributed with chi-2 with *K* degrees of freedom (*K*: the difference of variables between the models)

(12)

Table 5 presents the log-likelihood of the models and the results of the likelihood ratio test. For almost all economic sectors, the segmentation between new and relocating establishments is justified. Only creations and relocations of retail establishments seem to have the same preferences in terms of location choices.

TABLE 5: Likelihood ratio test for segmentation between created and relocated establishments

The results show that new and relocating establishments choose their location choices differently can however come from the difference in size observed between them (table 3). In order to control this, we estimate additional models excluding the very small establishments (less than two employees). These additional models confirm our intuition that the differences do not come from the difference in size, since the Likelihood ratio test is still significant.

Different events, different preferences

Adjusted ρ^2 varies between 0.043 and 0.146 (tables A1-A3). These values of the adjusted ρ^2 may seem small but it is due to the high number of alternatives (Guevara and Ben-Akiva,

2013). The high variation of the values means that some sectors have more heterogeneous location choices than others. The addition of the distance to the last location for the relocating firms increases the quality of the model for all sectors. This fact reveals the importance of the last location for the relocating firms. In the rest of the chapter we analyse the results of the estimated mean elasticities and mean pseudo-elasticities in detail by variable groups and by firm event highlighting the differences between creations and relocations. The results are shown in tables 6 to 9.

Accessibility and market trade-off. The influence of the accessibility to population is not significant for all economic sectors and its sign changes between firm creations/relocations and between estimated models. For Manufacturing, while always non-significant, the parameters remain positive between creations and migrations for Model I but they become negative in Model II. For Construction, accessibility to population is not significant and positive for the creations in both Models (I and II). For migrations while it is negative and not significant in Model I, when we add the distance to the last location in Model II it becomes negative with an elasticity of 1.12%. Wholesale has the same positive and significant sensibility to accessibility to population for creations and migrations in Model I with very close elasticities (0.69% and 0.64%) but in Model II its influence becomes non-significant and negative. Retail is the most sensitive to accessibility to population. In Model I, for creations it is positive with an elasticity of 2.12% while for migrations it has a slightly lower elasticity of 1.6%, which is the variable with the biggest positive influence in terms of elasticity. However, in Model II, the integration of the distance to the last location changes the elasticity for migrations to -4.69%. FIRE appreciates good accessibility to population, with high elasticities. Elasticity for migrations in Model I is higher, 1.45%, in comparison to 1.14% for creations. However, in Model II, accessibility to population becomes insignificant. For the Front Office services, in Model I we find the same sensibility as for FIRE. In Model II the

influence of accessibility to population becomes negative and significant with an elasticity of -0.51%. For the Back Office services, the results are similar to the ones of the Construction sector. Accessibility to population for Health has the highest positive influence between the quantitative variables for creations. However, in Model II accessibility becomes negative and significant, a pattern observed in other sectors as well.

Proximity to transport infrastructure has an overall significant and positive effect. Some exceptions are the Retail and the Health sectors. More specifically, proximity to motorways is the most important proximity for almost all sectors with the higher pseudo-elasticity which varies between 30% and 121%. This observation is consistent for both events. Some exceptions are the creations in Manufacturing and creations and migrations in Health, for which the pseudo-elasticity is higher for the proximity to metro/tramway stations. However, there is an emerging pattern between new and relocating establishments. For most of the sectors, we can observe that the pseudo-elasticity for the proximity to motorways increases and it decreases for the proximity to metro/tramway stations between the creations and the migrations for each sector. This observation shows that within the same sector migrating establishments have a stronger preference for proximity to motorways than the creations. Some exceptions are the Wholesale, the Retail and the Health sectors. Last, proximity to railway stations has in general smaller pseudo-elasticity than the other two transport infrastructures and we can observe that for migrations it has higher values. These results do not alter importantly between Model I and Model II.

In general, the premise's price has a negative influence and high elasticity values. Confirming our assumptions, the negative elasticities are higher for the migrations, meaning that the 1% increase of the price is leading to a bigger decrease of the probability to choose a location by a migrating firm rather a newly created one. Some exceptions are the Construction and the

Retail sectors for which the creations are less influenced by the price. In Model II, elasticity becomes more negative than in Model I for almost all sectors.

Generally, the results are confirming our initial hypotheses. Creations appreciate more central areas with good PT infrastructure and high accessibility to population while migrating establishments appreciate more proximity to motorways and avoid high priced areas. However, the negative and not intuitive effect of accessibility to population in Model II can be caused by omitted variables or by a real negative influence. Other studies have found similar results. Elgar et al. (2009) found for Toronto that relocating office firms value positively accessibility (measured by the distance to the city centre as a proxy for accessibility). However, its parameter became negative when they added the distance to the last location. De Bok (2007) included in the location choice model the distance to the previous location and found a non-significant effect of potential accessibility for relocating establishments. He argues that this effect is potentially caused by the accessibility measure. Another study from De Bok and Oort (2011) found in the South Holland (a Dutch region) that the logsum accessibility for trips to work for relocating firms does not have a significant effect for the new location choices, after accounting for the distance to the previous location. An exception is the business and general services. It seems that for relocating firms, the distance to the previous location dominates the decision for the new location (de Bok and Van Oort, 2011; Elgar et al., 2009; Sweet, 2014), due to possible risk aversion of the firm (Van Dijk and Pellenbarg, 2000). A location away for the last location where the firm has already developed its “*eco-system*” involves some sort of risks especially for the mobility habits of clients, labour and suppliers.

Regarding the preference for centrality or other locations of the study area, firms change their preferences between creations and migrations. Migrating establishments in Retail sector are showing a higher preference for central areas than the creations. On the contrary, relocations

in Manufacturing, Construction and Wholesale sectors have a smaller preference for central areas than the creations which is in line with the results of Duranton and Puga (2001). Last, for FIRE, Front Office and Health establishments we cannot find any important differences in terms of preferences for central areas.

Agglomeration externalities. In accordance with the theory, results show that localisation effects always have a positive significant effect (Barrios et al., 2006) for both creations and relocations. Migrating establishments from most of the sectors have a higher preference for localisation than the creations. Nevertheless, migrating establishments from Construction show a marginally smaller preference for localisation. Retail is clearly less attracted to localisation, possibly to avoid local competition.

Diversity is something that migrating establishments prefer less than the new establishments of the same sector. We can observe this trend for Manufacturing, Retail, FIRE, Back Office and Health. Relocating establishments from Construction, Wholesale and Front Office value more diversity than the creations of the same sectors. Globally we can partly confirm the findings of Duranton and Puga (2001) who found that creations prefer more diversity and relocations value better localisation.

Social environment. The differences between new and relocating establishments, regarding the appreciation of the social environment, are more accentuated than the location externalities. Sensibility is not only different in terms of elasticity but also in terms of the effect (positive/negative). For Wholesale, Retail, FIRE and Front Office, creations and relocations are effected in the same way by Q1% and Q5%. There are some differences in terms of elasticities and significance but globally the parameter signs are the same. Observing the other sectors we see significant differences between creations and relocations like sign and significance changes. We can conclude that the social environment is a location attribute that

is appreciated differently from creations and relocations. It is a location attribute which needs time to be evaluated and an establishment which has a previous knowledge of the local area can make a better choice for its economic activity.

Institutional factors. For almost all sectors except Health, relocating establishments have higher preference for Economic Activity Zones than the creations. This means that relocating establishments are in position to take advantage of these zones and all the positive effects that they can have.

TABLE 6: Elasticities for creations and migrations in Manufacturing and Construction

TABLE 7: Elasticities for creations and migrations in Wholesale and Retail

TABLE 8: Elasticities for creations and migrations in R.E Finance & Insurance and Front Office

TABLE 9: Elasticities for creations and migrations in Back Office and Health

5. CONCLUSIONS

The object of this article is to highlight the differences of the location choices between newly created and migrating economic establishments, focusing on accessibility variables. In theory, those two types of location choices should be different in terms of preferences for accessibility because they are at a different firm life stage. They do not have the same local experience based information and they do not have the same “*eco-system*” constraints.

Our results show that the location choices of new and relocating establishments differ. However, the differences are not the same between all the economic sectors. Table 10 summarises the results. We can classify the economic sectors in three groups based on the differences of preferences for accessibility. In the first group, we have the sectors of Manufacturing, Construction and Back Office. These activities have a routine role and they are production oriented. This is why both creations and relocation are indifferent to accessibility to population. However, the migrating establishments of these sectors, are searching for areas with better proximity to motorways and to railway stations. These locations offer better access to national and international markets (Holl, 2004a). In the second group we have the FIRE and Front Office. These activities are high-order services and require daily face-to-face interaction and information exchange (Shearmur and Alvergne, 2002) and accessibility is important for their activity. This is why migrating establishments, which have the previous experience of the area, choose areas that have better accessibility in general (better accessibility to population/better proximity to transport infrastructure). In the third group, which is the most heterogeneous, we have the Wholesale, Retail and Health. The economic activity of each of these sectors is highly specific. However, we can observe that the creations of these sectors have higher preference for accessibility to population. For the other indicators there is no clear pattern.

Last, regarding only the migrations, they are highly sensitive to the distance of the previous location, independently of the economic sector confirming the findings of the literature (Elgar et al., 2015; Holl, 2004a; Manjón-Antolín and Arauzo-Carod, 2011). In order to pay less for a location a firm is willing to sacrifice accessibility to keep small distance from the established “*eco-system*”. This explains why accessibility has a negative influence for relocating firms, a result found in other studies as well (de Bok, 2007).

TABLE 10: Synthesis of the observed differences in preferences for accessibility for all types of accessibility and all sectors

The results of this work are important from a policy perspective. The investments on transportation projects are very costly. Evidence from this paper shows that local authorities must take into consideration the distinction between new and migrating establishments along with the distinction between economic sectors. For some sectors, public transport infrastructure is more important for creations while for others it is more important for relocations. Motorways are more important for relocations. For others, accessibility to population does not make any difference between creations and relocations. Transport policies aiming to attract new firms could provoke relocations from nearby locations rather than firm creations at the expense of nearby areas (Holl, 2004c). Thus, tailor-made policies with clear objectives are needed to attract either creations or relocations of businesses from specific sectors.

This work can have various possible extensions. Future developments can consider applying our methodology in other contexts, using other case studies, another analysis levels (regional, national etc.). Empirical confirmation from various case studies is important for the further development of the theory and the role of accessibility for location choices of economic establishments. Going even further, the methodology can be extended to analyse other themes, like the preferences of firms for social environment, or even the preferences of households.

BIBLIOGRAPHY

- Alamá-Sabater, L., Artal-Tur, A., Navarro-Azorín, J.M., 2011. Industrial location, spatial discrete choice models and the need to account for neighbourhood effects. *Ann. Reg. Sci.* 47, 393–418. <https://doi.org/10.1007/s00168-010-0383-7>
- Arauzo-Carod, J.M., Liviano-Solis, D., Manjon-Antolin, M., 2010. Empirical Studies in Industrial Location: an Assessment of Their Methods and Results. *J. Reg. Sci.* 50, 685–711. <https://doi.org/10.1111/j.1467-9787.2009.00625.x>

- Baptista, R., Mendonça, J., 2010. Proximity to knowledge sources and the location of knowledge-based start-ups. *Ann. Reg. Sci.* 45, 5–29. <https://doi.org/10.1007/s00168-009-0289-4>
- Barrios, S., Görg, H., Strobl, E., 2006. Multinationals' location choice, agglomeration economies, and public incentives. *Int. Reg. Sci. Rev.* 29, 81–107. <https://doi.org/10.1177/0160017605281516>
- Beaudry, C., Schiffäuerova, A., 2009. Who's right, Marshall or Jacobs? The localization versus urbanization debate. *Res. Policy* 38, 318–337. <https://doi.org/10.1016/j.respol.2008.11.010>
- Ben-Akiva, M., Bierlaire, M., Mcfadden, D., Walker, J., 2015. Discrete Choice Analysis. Preliminary draft version.
- Ben-Akiva, M., Lerman, S., 1985. Discrete Choice Analysis: Theory and Application to Travel Demand, MIT Press Series in Transportation Studies. MIT Press, Cambridge, USA.
- Bhat, C.R., Carini, J., Misra, R., 1999. Modeling the Generation and Organization of Household Activity Stops. *Transp. Res. Rec. J. Transp. Res. Board* 1676, 153–161. <https://doi.org/10.3141/1676-19>
- Bodenmann, B.R., 2011. Location choice of firms with special emphasis on spatial accessibility. PhD dissertation. ETH Zürich.
- Bodenmann, B.R., Axhausen, K.W., 2012. Destination choice for relocating firms: A discrete choice model for the St. Gallen region, Switzerland. *Pap. Reg. Sci.* 91, 319–341. <https://doi.org/10.1111/j.1435-5957.2011.00389.x>
- Buczowska, S., de Lapparent, M., 2014. Location choices of newly created establishments: Spatial patterns at the aggregate level. *Reg. Sci. Urban Econ.* 48, 68–81. <https://doi.org/10.1016/j.regsciurbeco.2014.05.001>
- Callon, 2011. La cote annuelle des valeurs vénales immobilières et foncières, Editions C. ed. Surgères, France.
- Carlton, D.W., 1983. The Location and Employment Choices of New Firms: An Econometric Model with Discrete and Continuous Endogenous Variables. *Rev. Econ. Stat.* 65, 440–449.
- Carpenter, J., Verhage, R., 2014. Lyon city profile. *Cities* 38, 57–68. <https://doi.org/10.1016/j.cities.2013.12.003>
- Cascetta, E., 2009. Transportation systems analysis : models and applications.
- Cerema, 2014. Zones d'activité économique en périphérie : les leviers pour la requalification. Lyon.
- Christaller, W., 1933. Die centralen Orte in Suddeutschland. Gustav Fischer, Jena. English edition: Christaller W (1967) Central places in Southern Germany (trans: Baskin CW). Englewood Cliffs, New Jersey.
- de Bok, M., 2007. Infrastructure and Firm Dynamics: A micro-simulation approach. PhD dissertation. TU Delft.
- de Bok, M., Van Oort, F., 2011. Agglomeration economies, accessibility and the spatial choice behavior of relocating firms. *J. Transp. Land Use* 4, 5–24. <https://doi.org/10.5198/jtlu.v4i1.144>

- Dubé, J., Brunelle, C., Legros, D., 2016. Location Theories and Business Location Decision : A Micro-Spatial Investigation of a Non-Metropolitan Area in Canada. *Rev. Reg. Stud.* 46, 143–170.
- Duranton, G., Puga, D., 2001. Nursery Cities: Urban diversity, process innovation, and the life-cycle of products. *Am. Econ. Rev.* 91, 1545–1477. <https://doi.org/10.1257/aer.91.5.1454>
- Elgar, I., Farooq, B., Miller, E.J., 2015. Simulations of firm location decisions: Replicating office location choices in the Greater Toronto Area. *J. Choice Model.* 17, 39–51. <https://doi.org/10.1016/j.jocm.2015.12.003>
- Elgar, I., Farooq, B., Miller, E.J., 2009. Modeling Location Decisions of Office Firms. *Transp. Res. Rec. J. Transp. Res. Board* 2133, 56–63. <https://doi.org/10.3141/2133-06>
- Ellison, B.G., Glaeser, E.L., Kerr, W.R., 2010. What Causes Industry Agglomeration? Evidence from Coagglomeration Patterns. *Am. Econ. Rev.* 100, 1195–1213. <https://doi.org/10.1257/aer.100.3.1195>
- Frenkel, A., Shefer, D., Koschatzky, K., Walter, G.H., 2001. Firm Characteristics, Location and Regional Innovation: A Comparison Between Israeli and German Industrial Firms. *Reg. Stud. J. Reg. Stud. Assoc.* 35, 415–429. <https://doi.org/10.1080/00343400120058424>
- Geurs, K.T., van Wee, B., 2004. Accessibility evaluation of land-use and transport strategies: review and research directions. *J. Transp. Geogr.* 12, 127–140. <https://doi.org/10.1016/j.jtrangeo.2003.10.005>
- Glaeser, E.L., Kallal, H.D., Scheinkman, J.A., 1992. Growth in cities. *J. Polit. Econ.* 100, 1126–1152.
- Guevara, C.A., Ben-Akiva, M.E., 2013. Sampling of alternatives in Multivariate Extreme Value (MEV) models. *Transp. Res. Part B Methodol.* 48, 31–52. <https://doi.org/10.1016/j.trb.2012.11.001>
- Holl, A., 2012. Market potential and firm-level productivity in Spain. *J. Econ. Geogr.* 12, 1191–1215. <https://doi.org/10.1093/jeg/lbr030>
- Holl, A., 2004a. Start-ups and relocations: Manufacturing plant location in Portugal. *Pap. Reg. Sci.* 83, 649–668. <https://doi.org/10.1007/s10110-004-0218-y>
- Holl, A., 2004b. Transport infrastructure, agglomeration economies, and firm birth: Empirical evidence from Portugal. *J. Reg. Sci.* 44, 693–712.
- Holl, A., 2004c. Manufacturing location and impacts of road transport infrastructure: Empirical evidence from Spain. *Reg. Sci. Urban Econ.* 34, 341–363. [https://doi.org/10.1016/S0166-0462\(03\)00059-0](https://doi.org/10.1016/S0166-0462(03)00059-0)
- Jacobs, J., 1969. *The economy of the cities*, Vintage. ed. New York.
- Manjón-Antolín, M.C., Arauzo-Carod, J.M., 2011. Locations and relocations: Determinants, modelling, and interrelations.

- Ann. Reg. Sci. 47, 131–146. <https://doi.org/10.1007/s00168-009-0360-1>
- Maroto, A., Zofio, J.L., 2016. Accessibility gains and road transport infrastructure in Spain: A productivity approach based on the Malmquist index. *J. Transp. Geogr.* 52, 143–152. <https://doi.org/10.1016/j.jtrangeo.2016.03.008>
- Marshall, A., 1890. *Principles of Economics*. Online Libr. Lib. 1–627. <https://doi.org/10.1057/9781137375261>
- McFadden, D., 1974. Conditional logit analysis of qualitative choice behavior, in: Zarembka, P. (Ed.), *Frontiers in Econometrics*. Academic Press, New York, pp. 105–142. <https://doi.org/10.1108/eb028592>
- Melo, P.C., Graham, D.J., Levinson, D., Aarabi, S., 2016. Agglomeration, accessibility and productivity: Evidence for large metropolitan areas in the US. *Urban Stud.* 42098015624850. <https://doi.org/10.1177/0042098015624850>
- Moore, J.F., 1993. Predators and prey: A new ecology of competition. *Harv. Bus. Rev.* 71, 75–86. <https://doi.org/10.1111/gec3.12359>
- Nguyen, C.Y., Sano, K., Tran, T.V., Doan, T.T., 2013. Firm relocation patterns incorporating spatial interactions. *Ann. Reg. Sci.* 50, 685–703. <https://doi.org/10.1007/s00168-012-0523-3>
- Ota, M., Fujita, M., 1993. Communication technologies and spatial organization of multi-unit firms in metropolitan areas. *Reg. Sci. Urban Econ.* 23, 695–729.
- Padeiro, M., 2013. Transport infrastructures and employment growth in the Paris metropolitan margins. *J. Transp. Geogr.* 31, 44–53. <https://doi.org/10.1016/j.jtrangeo.2013.05.007>
- Rosales-Montano, S., Aguilera-Belanger, A., Mignot, D., Terral, L., 2015. L'expérience métropolitaine lyonnaise. FNAU, Paris.
- Shearmur, R., Alvergne, C., 2002. Intrametropolitan Patterns of High-order Business Service Location: A Comparative Study of Seventeen Sectors in Ile-de-France. *Urban Stud.* 39, 1143–1163.
- Sweet, M.N., 2014. Do firms flee traffic congestion? *J. Transp. Geogr.* 35, 40–49. <https://doi.org/10.1016/j.jtrangeo.2014.01.005>
- Van Dijk, J., Pellenbarg, P.H., 2000. Firm relocation decisions in The Netherlands: An ordered logit approach. *Pap. Reg. Sci.* 79, 191–219. <https://doi.org/10.1007/s101100050043>
- Von Thünen, J.H., 1842. *Der isolirte Staat in Beziehung auf Landwirthschaft und Nationalökonomie*, 2nd ed. Rostock.
- Washington, S.P., Karlaftis, M.G., Mannering, F.L., 2011. *Statistical and econometric methods for transportation data analysis*, 2nd editio. ed, *Journal of Chemical Information and Modeling*. CRC Press, New York. <https://doi.org/10.1017/CBO9781107415324.004>

Weber, A., 1909. Über den Standort der Industrie, English translation: Theory of the Location of Industries, The Univer. ed.

TABLE 1: Classification of economic establishments by INSEE and modifications

Classification of INSEE	Modifications
Agriculture	-
Extraction industries	-
Manufacturing	-
Production and distribution of electricity, gas, etc.	Grouped to back office services
Production and distribution of water	Grouped to back office services
Construction	-
Wholesale and retail activities	Divided to retail and wholesale
Transports and storage	Divided to back office (the majority) and front office services
Accommodation and restaurant services	-
Information and communication	Divided to back office and front office services (the majority)
Finance and insurance	Grouped to Finance, Insurance and Real Estate (FIRE)
Real Estate	Grouped to Finance, Insurance and Real Estate (FIRE)
Specialised, technical and scientific activities	Divided to back office and front office services (the majority)
Services and activities of support and administration	Divided to back office and front office services
Public Administration	-
Education	-
Health	-
Arts and recreative activities	-
Other activities and services	-
Extra-territorial activities	-

TABLE 2: Creation and relocation of establishments by sector

Sector	Creations during 2005-2011	Creation rate	Migrations during 2005- 2011	Migration rate
Manufacturing	2,395	34%	755	11%
Construction	6,788	52%	1,460	11%
Wholesale	3,935	47%	1,078	13%
Retail	6,039	48%	911	7%
FIRE	6,050	54%	1,249	10%
Front Office Services	9,981	48%	2,940	14%
Back Office Services	4,130	49%	989	12%
Health	4,304	34%	1,741	14%

TABLE 3: Distribution of the establishments' size included into the analysis by sector and creation/relocation

Sector	0 employees		1-2 employees		3-5 employees		6-9 employees		10-19 employees		20-49 employees		50+ employees	
	Creations	Migrations	Creations	Migrations	Creations	Migrations	Creations	Migrations	Creations	Migrations	Creations	Migrations	Creations	Migrations
Manufacturing	61.6%	40.8%	15.2%	13.6%	10.5%	13.9%	5.1%	10.9%	3.6%	11.5%	2.6%	6.2%	1.3%	3.0%
Construction	70.3%	49.7%	19.4%	17.9%	6.1%	12.9%	2.2%	7.5%	1.1%	6.6%	0.6%	4.2%	0.3%	1.2%
Wholesale	79.0%	47.4%	10.5%	16.5%	4.9%	11.1%	2.2%	8.7%	1.9%	9.5%	1.0%	4.7%	0.4%	2.0%
Retail	72.9%	65.8%	15.8%	18.7%	6.8%	9.2%	2.6%	3.6%	1.2%	1.4%	0.4%	1.1%	0.1%	0.2%
FIRE	83.5%	60.2%	11.1%	19.7%	3.2%	9.1%	1.2%	4.5%	0.7%	3.6%	0.3%	2.2%	0.1%	0.6%
Front Office Services	80.0%	55.3%	10.9%	16.1%	4.4%	11.4%	2.1%	6.3%	1.3%	5.7%	0.9%	3.5%	0.4%	1.7%
Back Office Services	73.8%	50.5%	12.8%	13.2%	5.6%	10.4%	2.6%	6.1%	2.4%	9.2%	1.7%	6.9%	1.0%	3.6%
Health	90.6%	84.8%	4.7%	9.3%	1.9%	1.8%	0.8%	1.2%	0.8%	1.3%	0.7%	1.1%	0.4%	0.5%

TABLE 4: Summary statistics of the variables used in the model

Group	Variable	Description	Mean	Median	Std. dev.	Min	Max
Accessibility and market trade-off	Potential accessibility to population	Accessibility to general population	352.6	267.9	295.0	9.03	986.6
	Motorway	Presence of a motorway into the zone			Binomial variable		
	Metro/Tramway station	Presence of a metro or a tramway station into the zone			Binomial variable		
	Railway station	Presence of a railway station into the zone			Binomial variable		
	Centrality	Preference for the central zone (Lyon Villeurbanne) in comparison to the other 4 zones			Binomial variable		
	Premise's price for industrial use	The mean price per square meter for premises designated for industrial use (euros 2011)	625	598	140	398	1,325
	Premise's price for commercial use	The mean price per square meter for premises designated for commercial use (euros 2011)	1,568	1,454	551	743	4,393
	Premise's price for office use	The mean price per square meter for premises designated for office use (euros 2011)	1,042	1,008	187	731	1,962
	Premise's price for storage use	The mean price per square meter for premises designated for storage use (euros 2011)	502	484	95	348	977
	Agglomeration externalities	Manufacturing localisation		0.14	0.02	0.00	0.00
Construction localisation			0.23	0.04	0.00	0.00	2.54
Wholesale localisation		Density of establishments of each sector group (number of establishments by 100km ²)	0.18	0.02	0.00	0.00	4.36
Retail localisation			0.42	0.03	0.01	0.00	11.18
FIRE localisation			0.34	0.02	0.01	0.00	8.25
Front Office Services localisation			0.64	0.03	0.02	0.00	13.80
Back Office Services localisation			0.16	0.03	0.00	0.00	1.54
Health localisation			0.34	0.02	0.01	0.00	5.75
Hirschman-Herfindahl index (Diversity)		The inversed HHI	0.81	0.84	0.084	0.37	0.92
Social environment		% Q1	The percentage of the population in the 1 st quantile of revenue	0.13	0.10	0.07	0.07
	% Q5	The percentage of the population in the 5 th quantile of revenue	0.22	0.21	0.10	0.04	0.54
Institutional factors	Economic Activity zone	Presence of an Economic Activity Zone			Binomial variable		

TABLE 5: Likelihood ratio test for segmentation between created and relocated establishments

Sector	Manufacturing	Construction	Wholesale	Retail	FIRE	Front Office	Back Office	Health
Log of likelihood (no segmentation)	-18,270	-48,023	-28,411	-39,491	-40,077	-68,833	-29,602	-34,297
Log of likelihood (market segments)	-18,223	-47,930	-28,331	-39,486	-40,049	-68,755	-29,564	-34,266
Likelihood ratio test	94	186	159	10	55	157	75	61
Significant (K=14)	At 99%	At 99%	At 99%	No	At 99%	At 99%	At 99%	At 99%

TABLE 6: Elasticities for creations and migrations in Manufacturing and Construction

Variable	Manufacturing				Construction			
	Model I		Model II		Model I		Model II	
	Creations	Migrations	Creations	Migrations	Creations	Migrations	Creations	Migrations
Localisation [quantitative]	0.35%*	0.49%*	0.37%*	0.66%*	0.38%*	0.17%*	0.38%*	0.21%*
Diversity [quantitative]	1.40%*	0.84%	1.35%*	1.07%*	0.89%*	1.86%*	0.87%*	1.75%*
Accessibility pop. [quantitative]	0.20%	0.28%	0.27%	-0.39%	0.08%	-0.20%	0.07%	-1.12%*
Motorway [categorical]	51%*	92%*	50%*	69%*	39%*	71%*	39%*	61%*
Metro/Tramway [categorical]	55%*	18%	55%*	14%	27%*	11%	27%*	11%
Railway Station [categorical]	14%*	23%*	15%*	34%*	16%*	27%*	16%*	42%*
Centre (Reference)	NA	NA	NA	NA	NA	NA	NA	NA
Eastern Areas [categorical]	11%	58%*	13%	56%*	19%*	88%*	19%*	67%*
Western Areas [categorical]	29%*	10%	30%*	6%	22%*	27%	22%*	4%
2nd Belt [categorical]	52%*	47%	55%*	90%*	24%*	68%*	24%*	75%*
3rd Belt [categorical]	-20%	-63%*	-17%	29%	-34%*	-39%*	-34%*	45%
Q1 % [quantitative]	-0.13%*	-0.33%*	-0.11%	-0.45%*	0.04%	-0.23%*	0.04%	-0.32%*
Q5 % [quantitative]	-0.17%	0.40%*	-0.10%	0.76%*	-0.14%*	-0.35%*	-0.14%*	-0.27%*
ZAE [categorical]	103%*	128%*	104%*	111%*	79%*	70%*	79%*	94%*
Premise's price [quantitative]	-0.96%*	-4.26%*	-1.22%*	-6.61%*	-0.61%*	0.07%	-0.60%*	-0.46%
Distance last loc [quantitative]	NA	NA	NA	-1.70%*	NA	NA	NA	-2.01%*

* significant parameter at 95%

TABLE 7: Elasticities for creations and migrations in Wholesale and Retail

Variable	Wholesale				Retail			
	Model I		Model II		Model I		Model II	
	Creations	Migrations	Creations	Migrations	Creations	Migrations	Creations	Migrations
Localisation [quantitative]	0.21%*	0.27%*	0.21%*	0.34%*	0.64%*	0.10%	0.76%*	0.36%*
Diversity [quantitative]	1.22%*	1.35%*	1.22%*	1.24%*	0.28%	0.08%	0.18%	0.05%
Accessibility pop. [quantitative]	0.69%*	0.64%*	0.69%*	-0.29%	2.12%*	1.60%*	1.72%*	-4.69%*
Motorway [categorical]	44%*	121%*	44%*	112%*	-3%	-4%	7%*	14%
Metro/Tramway [categorical]	27%*	34%*	27%*	29%*	-8%	-5%	5%	3%
Railway Station [categorical]	22%*	00%	22%*	5%	25%*	10%	18%*	17%
Centre (Reference)	NA	NA	NA	NA	NA	NA	NA	NA
Eastern Areas [categorical]	12%	66%*	12%	69%*	26%*	-4%	8%	-12%
Western Areas [categorical]	27%*	64%*	27%*	39%	9%	18%	13%	1%
2nd Belt [categorical]	32%*	16%*	32%*	182%*	32%*	21%	19%	-1%
3rd Belt [categorical]	-43%*	-37%	-43%*	102%*	-10%	-15%	-3%	18%
Q1 % [quantitative]	-0.14%*	-0.40%*	-0.14%*	-0.46%*	-0.12%*	-0.03%	-0.05%	-0.01%
Q5 % [quantitative]	0.18%*	0.17%	0.18%*	0.20%	0.29%*	0.07%	0.12%*	0.03%
ZAE [categorical]	117%*	237%*	117%*	214%*	28%*	42%*	24%*	20%
Premise's price [quantitative]	-0.87%*	-1.75%*	-0.87%*	-2.65%*	-2.41%*	-0.42%	-2.58%*	-0.09%
Distance last loc [quantitative]	NA	NA	NA	-1.76%*	NA	NA	NA	-3.12%*

* significant parameter at 95%

TABLE 8: Elasticities for creations and migrations in R.E Finance & Insurance and Front Office

Variable	R.E Finance & Insurance				Front Office			
	Model I		Model II		Model I		Model II	
	Creations	Migrations	Creations	Migrations	Creations	Migrations	Creations	Migrations
Localisation [quantitative]	0.57%*	0.96%*	0.57%*	0.98%*	0.86%*	1.26%*	0.86%*	1.29%*
Diversity [quantitative]	0.87%*	0.44%	0.87%*	0.52%	1.48%*	1.67%*	1.47%*	1.72%*
Accessibility pop. [quantitative]	1.14%*	1.45%*	1.14%*	0.06%	1.24%*	1.35%*	1.23%*	-0.51%*
Motorway [categorical]	31%*	52%*	31%*	57%*	30%*	62%*	30%*	64%*
Metro/Tramway [categorical]	20%*	10%	20%*	14%	19%*	16%*	19%*	30%*
Railway Station [categorical]	31%*	42%*	31%*	50%*	30%*	48%*	30%*	48%*
Centre (Reference)	NA	NA	NA	NA	NA	NA	NA	NA
Eastern Areas [categorical]	-22%*	-23%	-22%*	-7%	-45%*	-38%*	-45%*	-12%
Western Areas [categorical]	30%*	27%	30%*	20%	2%	0%	2%	0%
2nd Belt [categorical]	-15%	-12%	-15%	30%	-39%*	-51%*	-39%*	0%
3rd Belt [categorical]	-57%*	-68%*	-57%*	-4%	-72%*	-85%*	-72%*	-4%
Q1 % [quantitative]	-0.29%*	-0.37%*	-0.29%*	-0.42%*	-0.15%*	-0.20%*	-0.15%*	-0.24%*
Q5 % [quantitative]	0.72%*	0.98%*	0.72%*	0.89%*	0.84%*	0.81%*	0.84%*	0.72%*
ZAE [categorical]	98%*	99%*	98%*	102%*	80%*	97%*	80%*	105%*
Premise's price [quantitative]	-3.01%*	-4.58%*	-3.00%*	-4.55%*	-4.06%*	-4.39%*	-4.01%*	-4.46%*
Distance last loc [quantitative]	NA	NA	NA	-1.59%*	NA	NA	NA	-1.45%*

* significant parameter at 95%

TABLE 9: Elasticities for creations and migrations in Back Office and Health

Variable	Back Office				Health			
	Model I		Model II		Model I		Model II	
	Creations	Migrations	Creations	Migrations	Creations	Migrations	Creations	Migrations
Localisation [quantitative]	0.36%*	0.47%*	0.37%*	0.52%*	0.55%*	0.78%*	0.55%*	0.78%*
Diversity [quantitative]	0.57%*	0.11%	0.57%*	0.18%	0.35%	0.29%	0.36%*	0.39%
Accessibility pop. [quantitative]	0.13%	0.11%	0.15%	-0.92%*	0.83%*	0.78%*	0.90%*	-0.56%*
Motorway [categorical]	56%*	64%*	56%*	53%*	3%	-5%	03%	-7%
Metro/Tramway [categorical]	19%*	16%	19%*	13%	43%*	34%*	42%*	41%*
Railway Station [categorical]	13%*	-13%	13%*	1%	16%*	26%*	17%*	25%*
Centre (Reference)	NA	NA	NA	NA	NA	NA	NA	NA
Eastern Areas [categorical]	15%	74%*	17%*	58%*	-5%	-5%	-4%	7%
Western Areas [categorical]	19%*	38%	21%*	18%	71%*	71%*	73%*	64%*
2nd Belt [categorical]	14%	77%*	17%	102%*	31%*	11%	32%*	63%*
3rd Belt [categorical]	-45%*	-51%*	-43%*	46%	-37%*	-64%*	-36%*	34%
Q1 % [quantitative]	0.01%	-0.40%*	0.01%	-0.43%*	-0.08%	0.21%*	-0.07%	0.21%*
Q5 % [quantitative]	-0.10%	0.01%	-0.11%	0.17%	0.16%*	0.56%*	0.16%*	0.57%*
ZAE [categorical]	101%*	146%*	101%*	120%*	55%*	48%*	55%*	50%*
Premise's price [quantitative]	-1.00%*	-2.00%*	-1.02%*	-2.80%*	-2.22%*	-3.84%*	-2.36%*	-3.98%*
Distance last loc [quantitative]	NA	NA	NA	-1.94%*	NA	NA	NA	-2.03%*

* significant parameter at 95%

TABLE 10: Synthesis of the observed differences in preferences for accessibility for all types of accessibility and all sectors

Accessibility type		Sector							
		Manufacturing	Construction	Back Office	Front Office	FIRE	Wholesale	Retail	Health
Accessibility to population		ND	ND	ND	M+	M+	C+	C+	C+
Motorway	Between Creations and Migrations, it influences more the location choice of:	M+	M+	M+	M+	M+	M+	ND	ND
Metro/Tramway		C+	C+	C+	C+	C+	M+	ND	C+
Railway Station		M+	M+	C+	M+	M+	C+	C+	M+
Eastern Areas		M+	M+	M+	C-	C-	M+	C+	ND
Western Areas		C+	C+	C+	ND	C+	M+	ND	ND
2nd Belt		C+	M+	M+	M-	ND	C+	C+	C+
3rd Belt		M-	M-	M-	M-	M-	C-	ND	M-

Note: C: Creations, M: Migrations, ND: No difference, +: Positive influence, -: Negative influence. Lecture example: For the Manufacturing sector, the influence of accessibility has No Difference (ND) between creations and migrations, it has a non-significant effect for both. For the Construction sector, proximity to Motorway influences more the location choices of the Migrating (M) establishments in a positive way (+). For the Back Office, areas at the 3rd belt influences more the location choices of Migrating (C) establishments in a negative way (-).

APPENDIX

TABLE A1: Model results of manufacturing, construction and wholesale sectors

	Manufacturing				Construction				Wholesale					
	Model I		Model II		Model I		Model II		Model I		Model II			
	Coeff.	T stat.	Coeff.	T stat.	Coeff.	T stat.	Coeff.	T stat.	Coeff.	T stat.	Coeff.	T stat.		
Creations	Localisation	1.07	7.56	1.13	7.94	0.83	20.56	0.83	20.56	0.48	8.28	0.48	8.27	
	Diversity	1.70	5.61	1.65	5.46	1.09	6.09	1.07	5.99	1.49	6.37	1.49	6.37	
	Accessibility pop.	0.40	1.34	0.53	1.78	0.15	0.90	0.15	0.88	1.25	5.98	1.24	5.95	
	Motorway	0.41	8.80	0.41	8.65	0.33	11.87	0.33	11.89	0.36	10.17	0.36	10.17	
	Metro/Tramway	0.44	6.20	0.44	6.22	0.24	6.04	0.24	5.97	0.24	4.45	0.24	4.45	
	Railway Station	0.13	2.75	0.14	2.81	0.15	5.03	0.15	5.03	0.20	5.40	0.20	5.39	
	Centre (Reference)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Eastern Areas	0.10	1.10	0.12	1.31	0.18	3.34	0.18	3.33	0.11	1.64	0.11	1.64	
	Western Areas	0.26	2.32	0.27	2.40	0.20	3.15	0.20	3.11	0.24	3.02	0.24	3.01	
	2 nd Belt	0.42	3.02	0.44	3.20	0.21	2.60	0.21	2.56	0.28	2.68	0.28	2.68	
	3 rd Belt	-0.22	-1.30	-0.18	-1.08	-0.41	-4.00	-0.41	-4.04	-0.56	-4.18	-0.56	-4.19	
	Q1 %	-0.93	-2.16	-0.77	-1.80	0.22	0.96	0.22	0.92	-1.02	-3.02	-1.02	-3.02	
	Q5 %	-0.79	-1.68	-0.47	-0.99	-0.71	-3.13	-0.72	-3.16	0.77	2.71	0.77	2.71	
	ZAE	0.71	12.74	0.71	12.85	0.58	17.41	0.58	17.40	0.77	18.61	0.77	18.61	
	Premise's price	-1.39	-2.15	-1.76	-2.70	-0.91	-4.31	-0.91	-4.29	-1.55	-3.01	-1.55	-3.02	
	Migrations	Localisation	2.07	7.01	2.79	9.11	0.56	5.04	0.66	5.77	0.76	6.15	0.96	7.63
		Diversity	1.03	1.94	1.31	2.43	2.27	5.38	2.13	5.10	1.64	3.43	1.51	3.21
Accessibility pop.		0.59	1.15	-0.83	-1.58	-0.45	-1.29	-2.50	-6.95	1.24	3.17	-0.55	-1.40	
Motorway		0.65	7.80	0.53	6.12	0.54	9.04	0.47	7.79	0.79	11.17	0.75	10.43	
Metro/Tramway		0.17	1.45	0.13	1.16	0.10	1.23	0.10	1.25	0.29	2.94	0.26	2.64	
Railway Station		0.21	2.43	0.29	3.32	0.24	3.80	0.35	5.42	0.00	-0.04	0.04	0.62	
Centre (Reference)		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Eastern Areas		0.46	2.91	0.44	2.75	0.63	5.27	0.52	4.28	0.51	3.85	0.53	3.99	
Western Areas		0.10	0.50	0.06	0.29	0.24	1.66	0.04	0.31	0.49	3.12	0.33	2.09	
2 nd Belt		0.38	1.62	0.64	2.69	0.52	2.96	0.56	3.14	0.77	3.89	1.04	5.24	
3 rd Belt		-1.00	-3.30	0.25	0.84	-0.50	-2.28	0.37	1.66	-0.46	-1.77	0.71	2.71	
Q1 %		-2.39	-3.27	-3.23	-4.25	-1.58	-2.81	-2.24	-3.80	-3.06	-4.52	-3.50	-5.09	
Q5 %		1.86	2.18	3.54	3.95	-1.70	-3.51	-1.31	-2.59	0.73	1.24	0.84	1.39	
ZAE		0.82	9.00	0.75	7.95	0.73	10.92	0.66	9.73	1.21	16.69	1.14	15.52	
Premise's price		-6.41	-4.77	-9.95	-6.76	0.11	0.21	-0.72	-1.24	-3.21	-2.67	-4.86	-3.80	
Distance last loc.		NA	NA	-0.27	-31.73	NA	NA	-0.28	-45.73	NA	NA	-0.24	-33.95	
Observations (segment - new)		2395		2395		6788		6788		3935		3935		
Observations (segment - relocations)	755		755		1460		1460		1078		1078			
Observations (total)	3150		3150		8248		8248		5013		5013			
Likelihood zero	-19108		-19108		-50033		-50033		-30409		-30409			
Log of Likelihood	-18224		-17407		-47930		-46075		-28331		-27530			
Adjusted ρ^2	0.048		0.091		0.043		0.080		0.069		0.096			

TABLE A2: Model results of retail, R.E Finance & Insurance and Front Office sectors

	Retail				R.E Finance & Insurance				Front Office				
	Model I		Model II		Model I		Model II		Model I		Model II		
	Coeff.	T stat.	Coeff.	T stat.	Coeff.	T stat.	Coeff.	T stat.	Coeff.	T stat.	Coeff.	T stat.	
Creations	Localisation	0.38	23.37	0.45	33.56	0.39	17.32	0.39	17.32	0.27	30.82	0.27	30.90
	Diversity	0.34	1.95	0.22	1.24	1.06	5.91	1.06	5.92	1.80	12.19	1.79	12.14
	Accessibility pop.	3.49	23.46	2.84	18.43	1.85	10.90	1.86	10.91	1.88	13.93	1.85	13.72
	Motorway	-0.03	-1.16	0.07	2.63	0.27	9.08	0.27	9.07	0.26	11.06	0.26	11.05
	Metro/Tramway	-0.08	-1.97	0.05	1.14	0.18	4.04	0.18	4.03	0.17	4.88	0.17	4.84
	Railway Station	0.23	7.62	0.16	5.27	0.27	9.31	0.27	9.31	0.26	11.17	0.26	11.20
	Centre (Reference)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Eastern Areas	0.23	4.36	0.08	1.47	-0.25	-4.10	-0.25	-4.10	-0.59	-11.91	-0.59	-11.88
	Western Areas	0.08	1.33	0.13	1.92	0.26	4.11	0.26	4.10	0.02	0.48	0.02	0.45
	2 nd Belt	0.28	3.07	0.17	1.92	-0.16	-1.79	-0.16	-1.80	-0.50	-6.93	-0.50	-6.94
	3 rd Belt	-0.11	-0.99	-0.03	-0.29	-0.85	-7.38	-0.85	-7.37	-1.28	-13.61	-1.28	-13.61
	Q1 %	-0.78	-3.26	-0.32	-1.36	-2.29	-6.82	-2.28	-6.80	-1.10	-4.39	-1.10	-4.40
	Q5 %	1.33	9.92	0.54	3.36	2.74	12.16	2.74	12.16	3.23	18.72	3.22	18.71
	ZAE	0.24	5.93	0.22	5.12	0.68	18.93	0.68	18.92	0.59	20.14	0.59	20.12
	Premise's price	-1.16	-14.28	-1.24	-18.02	-2.42	-9.60	-2.41	-9.58	-3.17	-18.68	-3.14	-18.53
	Migrations	Localisation	0.08	2.05	0.28	5.23	0.54	10.83	0.55	11.29	0.33	21.50	0.33
Diversity		0.09	0.22	0.06	0.14	0.54	1.39	0.64	1.66	2.03	7.16	2.10	7.36
Accessibility pop.		2.80	7.29	-8.19	-20.44	2.24	5.96	0.09	0.23	1.89	7.55	-0.71	-2.79
Motorway		-0.05	-0.63	0.13	1.74	0.42	6.35	0.45	6.68	0.48	10.63	0.49	10.69
Metro/Tramway		-0.05	-0.46	0.03	0.30	0.10	0.97	0.13	1.30	0.15	2.33	0.26	4.04
Railway Station		0.10	1.27	0.15	1.84	0.35	5.50	0.40	6.16	0.39	9.17	0.39	9.07
Centre (Reference)		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Eastern Areas		-0.04	-0.27	-0.13	-0.76	-0.26	-1.89	-0.08	-0.55	-0.47	-5.31	-0.12	-1.35
Western Areas		0.17	1.09	0.01	0.08	0.24	1.71	0.18	1.35	0.00	-0.05	0.00	0.04
2 nd Belt		0.19	0.85	-0.01	-0.07	-0.13	-0.66	0.26	1.32	-0.72	-5.15	0.00	0.00
3 rd Belt		-0.16	-0.57	0.16	0.56	-1.15	-4.40	-0.04	-0.16	-1.88	-10.11	-0.04	-0.22
Q1 %		-0.17	-0.26	-0.08	-0.11	-3.00	-3.85	-3.34	-4.18	-1.50	-3.22	-1.80	-3.78
Q5 %		0.33	0.98	0.12	0.54	3.54	7.08	3.19	6.33	3.04	9.54	2.69	8.25
ZAE		0.35	3.47	0.18	1.82	0.69	8.57	0.70	8.60	0.68	12.89	0.72	13.49
Premise's price		-0.22	-1.35	-0.05	-0.19	-3.57	-6.19	-3.54	-6.28	-3.31	-11.30	-3.36	-11.35
Distance last loc.		NA	NA	-0.47	-35.79	NA	NA	-0.29	-35.53	NA	NA	-0.32	-49.69
Observations (segment - new)	6039		6039		6050		6050		9981		9981		
Observations (segment - relocations)	911		911		1249		1249		2940		2940		
Observations (total)	6950		6950		7299		7299		12921		12921		
Likelihood zero	-42159		-42159		-44277		-44277		-78380		-78380		
Log of Likelihood	-39541		-39175		-40055		-39103		-68760		-67001		
Adjusted ρ^2	0.063		0.071		0.096		0.117		0.123		0.146		

TABLE A3: Model results of back office and health sectors

	Back Office				Health				
	Model I		Model II		Model I		Model II		
	Coeff.	T stat.	Coeff.	T stat.	Coeff.	T stat.	Coeff.	T stat.	
Creations	Localisation	1.19	10.25	1.20	10.33	0.53	18.41	0.53	18.31
	Diversity	0.70	3.22	0.70	3.23	0.43	2.10	0.44	2.15
	Accessibility pop.	0.25	1.20	0.29	1.39	1.40	6.83	1.52	7.39
	Motorway	0.45	12.41	0.44	12.34	0.03	0.90	0.03	0.83
	Metro/Tramway	0.17	3.55	0.17	3.56	0.35	6.97	0.35	6.97
	Railway Station	0.12	3.36	0.12	3.29	0.15	4.04	0.15	4.10
	Centre (Reference)	NA	NA	NA	NA	NA	NA	NA	NA
	Eastern Areas	0.14	2.10	0.15	2.33	-0.05	-0.65	-0.04	-0.60
	Western Areas	0.17	2.19	0.19	2.42	0.54	7.28	0.55	7.35
	2nd Belt	0.13	1.26	0.16	1.52	0.27	2.59	0.28	2.66
	3rd Belt	-0.59	-4.63	-0.56	-4.36	-0.46	-3.40	-0.45	-3.34
	Q1 %	0.09	0.32	0.03	0.12	-0.53	-1.67	-0.50	-1.62
	Q5 %	-0.53	-1.70	-0.54	-1.74	0.70	2.71	0.69	2.67
	ZAE	0.70	16.92	0.70	16.90	0.44	9.24	0.44	9.33
	Premise's price	-1.88	-3.75	-1.91	-3.82	-1.87	-8.75	-1.98	-9.20
	Migrations	Localisation	1.77	6.77	1.99	7.51	0.70	15.51	0.69
Diversity		0.14	0.31	0.22	0.51	0.35	1.10	0.48	1.47
Accessibility pop.		0.22	0.52	-1.86	-4.38	1.28	3.98	-0.92	-2.76
Motorway		0.50	6.72	0.42	5.67	-0.05	-0.82	-0.07	-1.11
Metro/Tramway		0.15	1.51	0.12	1.21	0.29	3.83	0.34	4.41
Railway Station		-0.14	-1.75	0.01	0.11	0.23	3.96	0.23	3.63
Centre (Reference)		NA	NA	NA	NA	NA	NA	NA	NA
Eastern Areas		0.56	3.99	0.46	3.27	-0.06	-0.51	0.07	0.61
Western Areas		0.32	1.91	0.17	1.01	0.54	4.66	0.50	4.31
2nd Belt		0.57	2.73	0.71	3.35	0.10	0.60	0.49	2.77
3rd Belt		-0.71	-2.62	0.38	1.39	-1.03	-4.74	0.29	1.20
Q1 %		-2.72	-4.21	-2.94	-4.47	1.39	3.15	1.36	3.00
Q5 %		0.03	0.05	0.83	1.28	2.44	6.28	2.48	6.17
ZAE		0.90	11.15	0.79	9.61	0.39	5.19	0.41	5.18
Premise's price		-3.79	-3.35	-5.31	-4.38	-3.21	-9.29	-3.33	-9.35
Distance last loc.		NA	NA	-0.27	-35.60	NA	NA	-0.44	-50.90
Observations (segment - new)	4130		4130		4304		4304		
Observations (segment - relocations)	989		989		1741		1741		
Observations (total)	5119		5119		6045		6045		
Likelihood zero	-31052		-31052		-36670		-36670		
Log of Likelihood	-29564		-28541		-34264		-31746		
Adjusted ρ^2	0.049		0.082		0.066		0.135		