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# Home-field advantage: location decisions of Portuguese entrepreneurs

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## Abstract

An investor's home bias in industrial location decisions may stem from personal factors, social capital, other non-transferable assets, and imperfect information about the urban and regional environment. This paper explores the distinction between home-base and non-home location decisions in Portugal. We reach two important conclusions. First, the introduction of a variable accounting for prior base of economic activity significantly improves the statistical results. Second, we find that the weighting of distinct location attributes differs between home and non-home locations. Notably, non-home location choices are strongly governed by agglomeration economies and proximity to major urban centers, possibly replicating prior location decisions to economize on search costs. The results also enable us to quantify the investor's willingness to opt for a possible home-field advantage; for example, entrepreneurs accept over three times higher labor costs to compete in their resident area of business. © 2002 Elsevier Science (USA). All rights reserved.

*Keywords:* Domestic location; Conditional layout model; Portugal

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## 1. Introduction

The influence of an entrepreneur's pre-existing area of economic activity—the preference for the home base—has been largely neglected in recent urban and regional empirical research on industrial location. Home bias, however, figures prominently in the trade, migration, and portfolio choice literature.<sup>1</sup> This paper's intent is to explore the distinction between home and non-home location decisions as a way to measure the firm's spatial behavior with greater accuracy and, hopefully, more insight.

It is rarely possible to find data to test for home-bias effects on location. Fortunately, Portugal maintains precise micro data on firms that can identify entrepreneurs' "prior locality of economic activity," opening up a way to explore the subject. This bias could result from many factors. To begin, there are obvious personal factors involved in location, as stories from Henry Ford to Bill Gates attest. Sometimes even well-informed investors are reluctant to relocate away from well-known surroundings. Tangible, non-transferable assets may also tether entrepreneurs to a particular locale. In addition, social capital may play a role in location preferences. Social capital signifies networks of institutions and relationships of trust among economic actors that develop within local cultures. Such social institutions and relationships cannot be replicated outside the home base. All these factors bind entrepreneurs to their community—and help explain the potential strength of investor preferences for the home environment.

Thus, this study of Portuguese entrepreneurs' domestic location extends recent research in a new direction. Previous empirical work has attempted to model the site selection decision as a function of specific area characteristics like markets, agglomeration economies, and factor costs (Bartik [4], Carlton [5], Coughlin and Segev [6], Coughlin et al. [7], Guimarães et al. [8], Hansen [9], Head et al. [10], Luger and Shetty [11], and Woodward [12]). These approaches treat industrial location as an unconstrained decision that, once taken, reveals the decision-maker's preference for the area's attributes. The probability of a new plant being opened at a particular site depends on the relative level of profits that can be derived at this site and hence on the site's attributes compared with those of all other alternatives.

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<sup>1</sup> Obstfeld and Rogoff [1] assert that home bias in trade (the preference for the consumption of home goods) represents a major "puzzle" in international macroeconomics. In this vein, McCallum [2] found that trade among Canadian provinces was twenty times greater than trade between Canadian provinces and US states. While recent articles have found less dramatic results, Obstfeld and Rogoff [1] conclude that international empirical research reveals significant home bias in trade. The article also reviews the "puzzle" of home bias in stock market portfolios. Here equity investors exhibit strong preferences for home assets, despite the increasing openness of international capital markets. The home-bias portfolio puzzle, first posed by French and Poterba [3], has received considerable attention.

Carlton [5], in one of the first attempts to model location selection using discrete choice models, established the importance of localization economies (savings resulting from existing spatial clusters of the same industry which are internalized by firms of that specific industry) in explaining domestic branch plant location across the US metropolitan areas. Bartik's [4] approach to domestic plant location across US states found that higher urbanization economies (i.e., savings that accrue from the agglomeration of general economic activity and are picked up by all firms) as well as lower labor costs and taxes attract new investment. Using Brazilian data for the São Paulo region, Hansen [9] confirmed the relevance of localization and urbanization economies, while failing to show the importance of land, labor and transportation costs. In all studies, the home base was never explicitly considered.

Foreign-owned firms' location decisions within a host country represent another strand of empirical work based on discrete choice models. The foreign investor decision is relevant because it implies location choice outside the existing home base of the business. Some authors have confirmed the attractiveness of agglomeration economies (Luger and Shetty [11], Coughlin et al. [7], Woodward [12], Smith and Florida [13], Head et al. [10], and Guimarães et al. [8]) and provided mixed evidence on the importance of cost factors. Additionally, Coughlin et al. [7], Woodward [12], and Smith and Florida [13] indicate that better accessibility to input and output markets has a positive influence on the location of foreign-owned businesses within the United States.

One virtue of recent empirical work is that the discrete choice problem is modeled as a process of "random profit maximization." Implicitly, however, this assumes that the decision-maker evaluates the potential profit at every possible location with the same view to the cost of acquiring local area information. While this seems to be a reasonable assumption in analyzing the behavior of a first-time outsider (a foreign investor case), it is a less plausible assumption for domestic investors. Domestic investors will have quite different expectations about profitability depending on their knowledge with respect to the pool of available sites. Particularly, when the domestic investor evaluates potential profits, and compares the home environment with that of all others sites, it is unlikely that there is equal information cost concerning the characteristics of the sites. This is because the investor has an accumulated stock of knowledge of home site's attributes. Thus, lower labor costs, higher agglomeration economies, or better accessibility to input and output markets in a given non-home area may be insufficient to counterbalance information and search costs associated with non-home locations.

This paper's main contribution is to model the location decision of profit-maximizing firms where the home base is clearly identified. The empirical tests involve two new specifications. In one test, we examine the coefficients of the profit function with a dummy variable added for the investor's prior loca-

tion of economic activity. In the second specification, we test for the interaction of the home/non-home dichotomy on the weighting of different location attributes.

Agglomeration is analyzed through this interaction specification. Given higher information costs at distant locations, agglomeration offers a special advantage for non-local firms. This hypothesis follows from the theory of foreign direct investment, which poses a similar distinction between local and non-local firms. In making a decision to move abroad, foreign investors face competitive disadvantages vis-à-vis domestic rivals. New entrants lack knowledge about the peculiarities of local product and factor market conditions compared with domestic competitors, especially first-time investors. According to a well-known review of multinational enterprise, foreign firms face what Caves [14] called a “disadvantage of alien status.” The theory of multinational enterprise starts with the notion that home investors hold geographically specific information. Caves [15, pp. 57–58] contends that “. . . [the] typical entrepreneur, a native of some particular country, brings to his or her business activities a general knowledge of its legal and social system and its peculiar ‘ways of doing things.’” This assertion parallels the external economy argument behind agglomeration; in this case, home firms “. . . access that social and cultural milieu as a spillover without explicit costs” (Caves [15, p. 58]). When the investor extends the firm’s operations beyond the familiar boundaries of the business he or she incurs fixed transaction (learning) costs. Nevertheless, the foreign (non-home) investor may compete in distant markets with compensating firm-specific proprietary assets developed in the national (local) market. They may also be more prone to seek the advantages of agglomeration economies and proximity to core regions as a countervailing advantage to the informational advantage of home.

The logic of foreign direct investment conforms with Pascal and McCall’s [16] notion that higher information costs of non-home investors lead to clustering. Information costs add to the centripetal force of agglomeration, beyond the standard argument about external economies. In the urban and regional literature, the issue raised by information costs and agglomeration is also considered in Webber [17], the only comprehensive treatment of uncertainty and location. Webber’s essential argument is that investors, when moving, will value factors that reduce uncertainty; in particular, agglomeration economies and proximity to the large markets. Interestingly, Webber suggested that uncertainty is not a separate location influence, but should be understood as how it affects (reinforces) the external economies of agglomeration. The friction of distance increases uncertainty, thus increasing the tendency toward agglomeration. In a comprehensive regional economics literature review, Richardson [18, p. 62] echoed Webber’s view, noting that uncertainty reinforces agglomeration “. . . because of the risks of peripheral locations and the greater incentive to co-ordinate decisions.” Thus, we argue that information costs will favor agglomeration.

In short, the analysis measures the contribution to the firm's profit function from home bias and from different location attributes like agglomeration and wages. Specifically, we apply a discrete choice model to the location choices of newly established domestic plants in the Portuguese manufacturing sector for 1995–1997. The rest of the paper is organized as follows. In the next section we present our model and data. In Section 3 we discuss the traditional location determinants and those tested in this research. Section 4 presents empirical findings, while the last section (Section 5) summarizes the main conclusions of the paper.

## 2. Model and data

### 2.1. Model

Given its sound theoretical underpinnings, McFadden's conditional logit formulation has been the preferred econometric technique used in empirical industrial location studies. The basic approach, developed by Carlton [5], consists in treating the location decision problem as one of random profit maximization. Given a set of mutually exclusive regions, investor  $i$  weighs in all the regional characteristics of the available spatial choice set and selects the one that will potentially give him the highest profit. More formally, he assigns to each region  $j$  a potential profit of

$$\pi_{ij} = \varpi_{ij} + \varepsilon_{ij}$$

and elects to place his new investment in the region  $m$  such that

$$\pi_{im} > \pi_{ij}, \quad \forall j, j \neq m.$$

The two components of his profit are quite different. The first is the systematic part and consists of a deterministic function of all observable characteristics that impact on profit. The second,  $\varepsilon_{ij}$ , captures the stochastic nature of the process by absorbing all non-observed heterogeneity as well as the intrinsic randomness associated with the investor and the choice *per se*. Typically, one specifies  $\varpi_{ij}$  as a linear combination of the area characteristics and estimates a set of coefficients that transmit how different factors affect potential profits. In this case

$$\varpi_{ij} = \sum_{r=1}^k \beta_r X_{rj}, \quad (1)$$

where the  $X$ s are explanatory variables related to the choice characteristics.

Usually, the conventional approach treats all the choices in an equal footing, disregarding the fact that in the case of domestic firms' location decisions there exists a home base for the economic activity. An investor may have a strong

incentive to locate the investment in the home environment for the reasons mentioned in the introduction, including personal factors, social capital, and lower information costs. To address this potential problem, we included an explanatory variable that allows the investor to value differently the potential profit associated with each choice. The variable is introduced as an alternative specific constant set to one if that area coincides with the investor’s prior locality of economic activity and zero otherwise.

We will test two specifications. The first is of the type

$$\varpi_{ij} = \sum_{r=1}^k \beta_r X_{rj} + \gamma D_{ij}, \tag{2}$$

where  $\gamma$  is a coefficient associated with the alternative specific constant. The estimated parameter will be positive if there are lower costs (and higher profits) associated with the prior locality of economic activity of the investor.

An alternative specification admits that the investor values differently the impact of relevant factors in accordance with the local/non-local nature of the choice. Actually, it is credible that those factors that affect potential profit by reducing information costs are not as significant when the choice under consideration is the investor’s home base. In contrast, for other locations, the investor will have higher information costs and thus may value agglomeration economies and proximity to core regions where more and better quality information is available.

To explore the interaction of the home/non-home dichotomy with area characteristics that affect the profit function, we will test another specification, where we let

$$\varpi_{ij} = \sum_{r=1}^k \beta_r X_{rj} + \sum_{r=1}^k \gamma_r X_{rj} D_{ij} + \gamma D_{ij}. \tag{3}$$

For any region other than the investor’s prior locality of economic activity ( $D_{ij} = 0$ ), the potential profit is given by the first summation term of the above equality and the associated coefficients are  $\beta_r$ . For the region coinciding with the investor’s prior locality of economic activity  $D_{ij} = 1$ , and then the coefficients in the profit function become  $\beta_r + \gamma_r$ .

The relevance of any of the above formulations can be easily tested because they nest the simpler model [Eq. (1)] as a special case. The model is easily operationalized by defining a distributional assumption for the stochastic terms. As McFadden pointed out, if we assume the error terms to be distributed independently and according to an extreme-type-value I distribution we end up with the logistic formulation. In our case, we admit that each investor chooses

from a set of 275 spatial alternatives, consisting of all the existing *concelhos* in Portugal.<sup>2</sup>

## 2.2. Identification of greenfield plants and the investor's home base

We use a yearly survey, *Quadros do Pessoal*, collected by Portugal's Ministry of Employment for all the existing companies operating in the country (except family businesses without wage-earning employees). This survey consists of data on every worker as well as some basic information on each company such as location, sector of activity, and number of employees. Most importantly, since 1995, firms have been required to provide information on the year they started their activity. Consequently, as a first step, we exactly identified all newly created manufacturing companies in continental Portugal from 1995 to 1997, the last available year in the data set. Because our focus was on private domestic investment we excluded companies that were totally or partially owned by foreign or public investors.

For each company we have available detailed information on every worker including their professional status,<sup>3</sup> birth date, and social security number. So, in a second step, we restricted our sample to those newly created companies that had an entrepreneur running the business. From a total of 6711 newly created companies from 1995 to 1997 we retained only 3434 that had workers with a professional status of "owner."

Next, we merged the owner information with the records for all the existing workers in the *Quadros do Pessoal* data set for the previous years using worker data from 1992 to 1996. We used as a matching key the worker's social security number as well as his birth date. Thus, we were able to find the *concelho* where they were exerting their economic activity prior to creating the new firm (the investor's "prior locality of economic activity").<sup>4</sup> Our final data includes 1246 start-ups that fully satisfied the above-mentioned criteria.

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<sup>2</sup> The *concelho* is a small administrative region in Portugal. The 275 Portuguese *concelhos* (mainland) have an average area of 322.5 km<sup>2</sup>.

<sup>3</sup> Each worker is uniquely classified as owner, non-wage-earner family worker, wage earner and a residual category comprising rare special situations.

<sup>4</sup> A substantial amount of information was lost due to several factors. First the data set does not allow us to identify investors which previous activity was on family businesses without wage earning employees or on the public administration, because these activities are not represented in the survey. Second, those who were not before in the labor force can not also be identified. Finally, the information on social security numbers is not validated because it is not used for the production of official statistics and consequently there are some coding errors and missing observations. That is why we also used as a matching key the birth date of investors. We dropped those observations where we could not successfully track all company owners. These are rather restrictive criteria but they ensure the quality of our data.

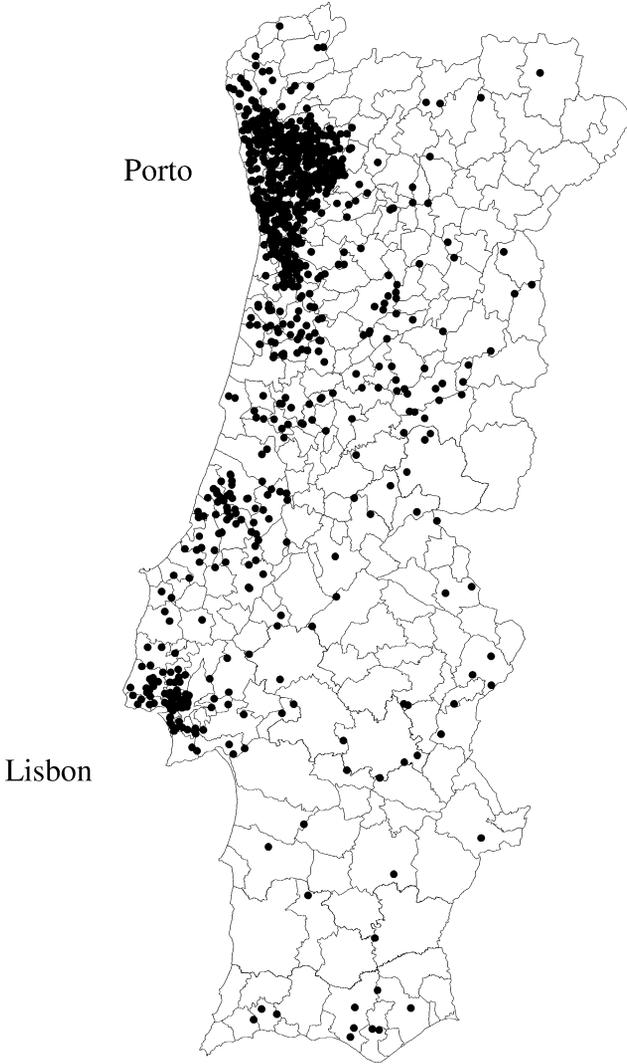


Fig. 1. Home investments: spatial distribution of new manufacturing plants created in the investor's "prior locality of economic activity" (1995–1997). (Each dot is equal to one investment. Source from D.E.M.E.S.S., "Quadros do Pessoal.")

The spatial distribution of these investments is displayed in Figs. 1 and 2. As can be seen, both figures indicate a strong concentration in the more urbanized western side of the country and particularly in the coastal corridor within and between Porto and Lisbon, Portugal's largest cities. A closer examination of the two distributions, however, reveals a higher concentration

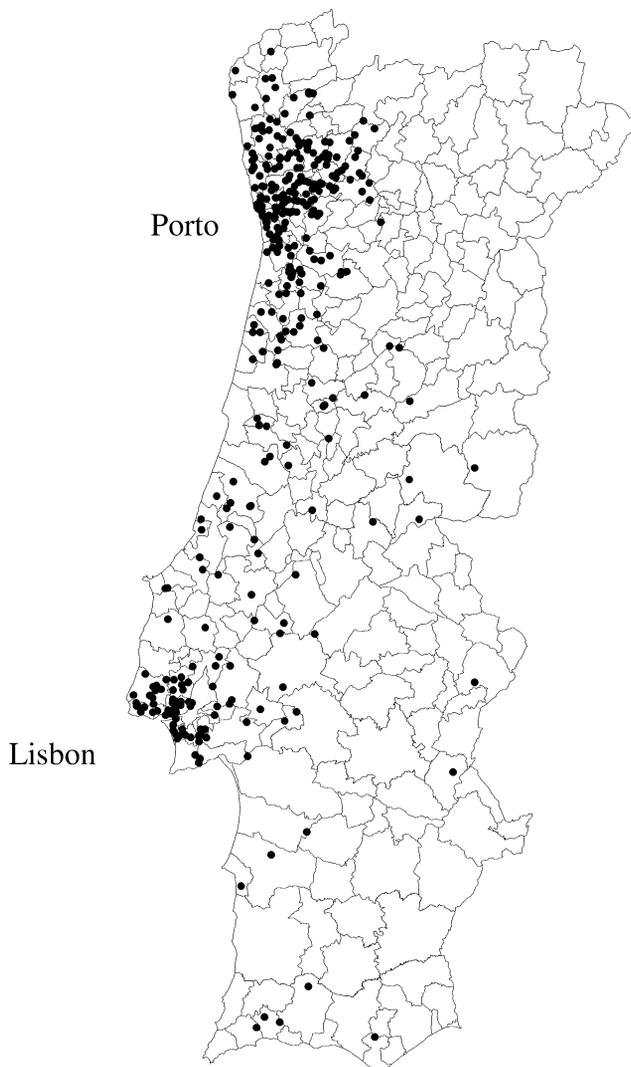


Fig. 2. Non-home investments: spatial distribution of new manufacturing plants created outside investor's "prior locality of economic activity" (1995–1997).

in the Porto–Lisbon corridor for plants created outside the investor's home base (Fig. 2).

Table 1 gives descriptive values concerning the number of non-home plants (created outside an investor's "prior locality of economic activity," as shown in Fig. 2) versus home (inside the investor's "prior locality of economic activity," or Fig. 1). Note that most investments are home-based. The high number of

Table 1  
Distribution of home base and non-home investments

	Number		Percent	
	Non-home <sup>a</sup>	Home <sup>b</sup>	Non-home <sup>a</sup>	Home <sup>b</sup>
Porto ( <i>distrito</i> )	99	231	28.61	25.67
Lisbon ( <i>distrito</i> )	48	71	13.87	7.89
Others	199	598	57.51	66.44
Total	346	900	100.00	100.00

<sup>a</sup> Spatial distribution of new manufacturing plants created outside investor's "prior locality of economic activity" (1995–1997).

<sup>b</sup> Spatial distribution of new manufacturing plants created in the investor's "prior locality of economic activity" (1995–1997).

new plant births found in the entrepreneur's home environment (900 of 1246 investments, or 72% of the total) should be accounted for in any empirical work. Also, note that in Table 1 the distribution of non-home investments is more concentrated in the main urban areas (the Porto and Lisbon *distritos*<sup>5</sup>) when compared with home. This suggests that urban (agglomeration) economies may attract non-home investments.

### 3. Location determinants

Table 2 displays the independent variables used in the location analysis of home and non-home investments. Previous empirical research emphasizes three different sets of location determinants: agglomeration, or external economies; costs of production factors like wages and land, and market distance/accessibility. We also test these factors and examine how they differ for investments made inside and outside the owner's "prior locality of economic activity."

A primary interest of this investigation is agglomeration, well established as a location determinant. Reflecting external economies that lead to industrial clustering, it is hypothesized that non-home investors face information costs (analogous to foreign investors, as mentioned earlier) and they may want to economize through clustering. Outside of the empirical location research some authors have previously contended that imperfect information about location attributes may lead firms to imitate existing patterns of industry and reinforce agglomeration tendencies (Pascal and McCall [16]). This is one of many examples of convergent behavior, or informational externalities, now investigated in the economics literature (Bikhchandani et al. [19]).

<sup>5</sup> The *distrito* is a higher administrative region level, which is composed by several adjacent *concelhos*. The Portuguese mainland is divided in eighteen *distritos* with an average area of 4926.7 km<sup>2</sup>.

Table 2

Independent variables: definitions, expected effects, sources, means and standard deviations

Variables	Definition	Expected effect	Data source	Mean	Standard deviation
Localization economies	Share of manufacturing employment in the same 3 digit SIC as the investor	Positive	Ministry of Employment, Lisbon, Portugal, 1995	0.051	0.120
Urbanization economies	Log of Total Manufacturing Employment per square km	Positive	Ministry of Employment, Lisbon, Portugal, 1995	0.961	2.240
Labor costs	Log of average manufacturing wage	Negative	Ministry of Employment, Lisbon, Portugal, 1995	11.214	0.209
Land costs	Log of population density	Negative	National Institute of Statistics (INE), Lisbon, Portugal, 1991	4.375	1.354
Major urban accessibility	Log of distance by road in time to Porto and Lisbon	Negative	Unpublished data <sup>a</sup>	5.632	0.345
Minor urban accessibility	Log of distance by road in time to the <i>distrito</i> administrative center	Negative	Unpublished data	3.390	1.034
Investor's home base	Dummy: 1 if that <i>concelho</i> coincides with the investor's "prior locality of economic activity" and 0 otherwise	Positive	Ministry of Employment, Lisbon, Portugal, 1992 to 1997	0.004	0.062

<sup>a</sup> We would like to thank Adelheid Holl for providing unpublished data for the road travel times based on the 1996 Portuguese road network. The road network data has been compiled from road maps (ACP 1998/9; Michelin 1999) and detailed information from the Portuguese Road Institute (Instituto Português de Estradas).

From urban theory, the role of the two types of agglomeration is familiar. First, *localization economies* result from the spatial concentration of firms of a particular sector. Intra-sectoral spatial clusters serve as a pool of favorable conditions (e.g., output and input intermediate markets, natural resources, specialized labor, knowledge spillovers). Firms of a specific industry internalize the cost savings involved in location. To measure *localization economies*, we use the share of manufacturing employment in the same three-digit standard industrial classification (SIC) as the investor.

Table 2 shows the prior expectations regarding *localization economies*. The theoretical and empirical work to date strongly suggests that intra-industry

economies will strongly and positively influence profits and thus location decisions (see Table 2, expected effects column). Indeed, external economies of localization should affect both home and non-home investors. Decisions to invest by entrepreneurs in their home base will reflect localization since an industrial cluster is likely to be their existing base. In other words, *localization economies* reflect the likelihood that firms are already found in dense intra-industry clusters, especially for the relatively small firms considered in the Portuguese case, which require external economies.<sup>6</sup> Henderson [20] even argues that localization benefits single plant firms more than corporate firms since single firms (like small firms here) do not have internal information networks and thus depend on the external local milieu. Beyond external economies, however, localization attracts non-home firms economizing on information. As Pascal and McCall [16] point out, when there is imperfect information involved in search, firms will mimic the location of firms already in the industry.

*Urbanization economies* should also strongly affect firms operating in an uncertain environment. *Urbanization economies* are inter-sectoral externalities accruing from the clustering of general economic activity and benefit all plants locating in a particular area. Woodward and Glickman [21] found that urbanization was statistically significant in a logit regression of new foreign plant start-ups in US counties. In Portugal, foreign firms (presumably unfamiliar with local conditions) exhibit a strong preference for domestic business services in making location decisions (Guimarães et al. [8]). Similarly, urbanization should strongly and positively influence new non-home domestic manufacturing births in Portuguese *concelhos*, given a need to benefit from the greater variety of business and financial services. Moreover, imperfect information related to search costs should enhance the attraction of *urbanization economies*. As in Bartik [4] and Coughlin et al. [7] we measure *urbanization economies* as the total manufacturing employment per square kilometer.

The existing evidence concerning the impact of factor prices on location, i.e., the cost of labor, land and capital, is mixed. Most studies have tested for the relevance of *labor costs*, but only a few were able to statistically validate this variable. In the case of domestic location, Bartik [4] found that higher wages deterred investment, a conclusion not met by others studying the same phenomena (Carlton [5] and Hansen [9]). Similar ambiguous evidence was found for the foreign-owned firms location decisions within the host country. While Woodward [12] did not find a significant relationship, Luger and Shetty [11] and Coughlin et al. [7] provided evidence on the relevance of this factor to explain industrial location decisions. In our study, *labor costs* are measured by the *concelho's* average manufacturing base wage rate. This variable should

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<sup>6</sup> The average employment size is 7.5 (9.9 standard deviation) and 9.2 (30.5 standard deviation) for non-local and local plants, respectively.

negatively influence the probability of investment in any case. There is no reason *a priori* to believe that they should distinctly affect non-home compared with home decisions.

Besides labor, land represents another major cost facing investors. Despite the prominence of *land costs* in the neoclassical economic theory of location, previous empirical research failed to establish its relevance. This failure was partially credited to the unavailability of reliable data by Bartik [4], who used state population density to “proxy” industrial land prices, arguing that population density should reflect the price of this factor, because residential and industrial users compete for land. However, Hansen [9], using data on prices for unserved industrial land, was also unable to confirm the relevance of this factor. Because we did not have such data available for the Portuguese *concelhos*, we followed Bartik’s suggestion for capturing *land costs* in the model, which is much more relevant for the present study, given the small spatial dimension of the areas in the choice set.

Capital represents another cost sometimes considered in location. In the Portuguese case, we do not consider the cost of capital because it is almost invariant across alternatives. Interest rates do not differ across *concelhos*, and despite some minor differences in municipal taxes, the overall tax burden on manufacturing activity comes mostly from taxes set at the national level.

Urban (market) accessibility is another fundamental factor that must be taken into any account of manufacturing location decision making. An independent variable commonly used to measure the dimension of consumer markets is *per capita* regional income. As pointed out in the introduction, Coughlin et al. [7] and Woodward [12] found a significant relationship between this variable and the location of investment across US states. As also suggested by Coughlin et al. [7], from a theoretical point of view, one must however take into account that the market targeted by the firms can take many configurations that deviate from the area boundaries considered in the model. In particular, when the analysis is performed at a small regional level, as it is in our study, the explanatory performance of this indicator must be low. First, firms can easily gain market access to neighboring *concelhos*. Second, the dimension of the *concelho* market seems to be too small to attract industrial investments.

To account for urban (market) accessibility, and address the above concerns, we enter two variables in the model. The road time distance to the Porto–Lisbon corridor (the more urbanized coastal side of the country) measures *major urban accessibility*, i.e., access to the largest markets. *Minor urban accessibility*, i.e., access to regional markets, is proxied by the distance in time by road from each *concelho* to the administrative center (the capital) of the related *distrito*. As indicated before, besides the 275 *concelhos* that form the main spatial choice set, Portugal is divided into 18 larger *distritos*. The two accessibility variables also pick up transportation costs, the availability of regional and national road infrastructure in each *concelho*, and access to core regions where more and better

quality of information is available. Since information costs are lower in core regions, it was believed that urban accessibility, and particularly *major urban accessibility*, should be strongly associated with non-home decisions.

Finally, as argued before, we include an additional explanatory variable, the *investor's home base*. While the home/non-home variable is rarely tested, it has appeared in location studies as an explanation with an underlying economic justification consistent with profit maximization. For example, Pred [23] argued that site selection decisions made with imperfect knowledge may lead an entrepreneur to select a familiar home location because it maximizes “access to relevant information needed for profitable production” (see also Richardson [18, p. 64]).

Potentially, the *investor's home base* (the “prior locality of economic activity”) reflects personal factors (community ties and friendships as well as proximity to home and family) on the part of the entrepreneur. The location literature is unclear about the importance of personal factors compared with strictly economic decision-making criteria. The issue has not been considered since the late 1950s and early 1960s, and even then only through survey research of limited scope (Richardson [18]). In one of the more thorough studies, Greenhut [24] surveyed location decision-makers in Florida and found that demand and cost factors were dominant, while purely personal factors (without economic advantages) were not important to inducing location. However, as showed in this latter study, decision-makers sometimes favored a location when there were personal relationships with economic advantages (friendships with customers, suppliers, or bankers).

While the recent location literature has been silent about personal factors in location, a growing body of work on social capital may be relevant to understanding the home/non-home distinction. Social capital encompasses a set of norms, networks, and other forms of local social connections (Woolcock [25], Glaeser et al. [26], and DiPasquale and Glaeser [27]). Recent interest in the subject picked up following Putnam et al. [28], who argued that relatively high levels of social capital in northern Italy correlated with greater economic growth. Seen through the lens of social capital, personal ties and trust are intangible benefits that develop only through long-term relationships in an individual's home community. In Portuguese *concelhos*, like the Italian communities Putnam describes, entrepreneurs are engaged in civic activities and frequently meet in work and non-work related organizations.

Thus, entrepreneurs' localized social capital may have an influence on new site selection decisions. The literature suggests that an entrepreneur's social capital is often particular to the home location. If so, social capital connections can generate positive returns for the entrepreneur and constitute an important asset that could not be easily replicated outside the investor's home base. We believe that the *investor's home base* variable tested in our model may capture entrepreneurs' considerations of localized social capital investment. Social capital helps explain the high number of new plant births found in the entrepreneur's home environment (as displayed in Table 1) as well as some of the findings reported in the next section.

#### 4. Empirical results

Table 3 presents the results of our estimations. The model performed well as can be seen from the chi-square statistics for the likelihood ratio tests of overall significance. Both specifications used for the traditional model (1) show that the location factors tested in earlier empirical studies are also appropriate to explain the location determinants of domestic start-ups in Portugal. In fact, when compared with other studies we find stronger evidence of their relevance. Both measures of agglomeration economies are statistically significant and have the

Table 3

Regression results: factors affecting potential profit for new plants locating in Portuguese *Concelhos*

Independent variables	Eq. (1)		Eq. (2)	Eq. (3) <sup>a</sup>	
	Specification 1	Specification 2		$D_{ij} = 0$	$D_{ij} = 1$
Localization economies [share of manuf. employ. in the same industry as the investor]	4.129 <sup>b</sup> (27.722)	4.465 <sup>b</sup> (28.048)	2.904 <sup>b</sup> (10.367)	3.819 <sup>b</sup> (12.616)	1.520 <sup>b</sup> (3.335)
Urbanization economies [ln (total manuf. employment per sq. km)]	0.810 <sup>b</sup> (22.611)	0.843 <sup>b</sup> (21.087)	0.514 <sup>b</sup> (9.502)	0.483 <sup>b</sup> (6.913)	0.054 (0.500)
Labor costs [ln (average manuf. wage)]	-0.460 <sup>b</sup> (-2.958)	-0.936 <sup>b</sup> (-5.506)	-1.204 <sup>b</sup> (-5.017)	-0.429 (-1.442)	-2.087 <sup>b</sup> (-5.127)
Land costs [ln (pop. density)]	-0.287 <sup>b</sup> (-5.574)	-0.449 <sup>b</sup> (-8.206)	-0.305 <sup>b</sup> (-4.070)	0.030 (0.314)	-0.262 <sup>c</sup> (-1.960)
Major urban accessibility [ln (dist. in time to Porto and Lisbon)]	-	-0.742 <sup>b</sup> (-4.199)	-0.514 <sup>c</sup> (-2.269)	-1.183 <sup>b</sup> (-3.430)	0.622 (1.265)
Minor urban accessibility [ln (dist. in time to the <i>distrito</i> administrative center)]	-	-0.266 <sup>b</sup> (-10.432)	-0.031 (-0.794)	-0.019 (-0.348)	-0.067 (-1.162)
Investor's home base [dummy variable]	-	-	5.669 <sup>b</sup> (76.001)	-	18.567 <sup>b</sup> (2.619)
Log-likelihood	-5597.642	-5538.465	-2507.128	-2317.493	
$\chi^2$	2801.71 <sup>b</sup>	2920.06 <sup>b</sup>	8982.74 <sup>b</sup>	9362.01 <sup>b</sup>	
McFadden $R^2$	20.02%	20.86%	64.18%	66.89%	

<sup>a</sup> In this equation, while the first column shows the estimates of the  $\beta_r$  coefficients, the second column indicates the sum of the coefficients ( $\beta_r + \gamma_r$ ) and their associated t-values.  $D$  is a dummy variable equal to one if the entrepreneur originates from that area and zero otherwise. See Section 2.

<sup>b,c</sup> Denotes statistical significance at 1% and 5%, respectively, with t-values in parentheses.

correct sign, confirming Hansen's [9] results on domestic firm creation in São Paulo, Brazil; and Guimarães et al. [8] study on FDI location decisions within Portugal. We also find evidence that for domestic investors *labor costs* are a relevant factor. While similar results for the sign of the coefficient associated with this variable were obtained on the studies reviewed earlier, only Bartik's [4] US state analysis was able to statistically confirm the significance of this factor for domestic decision location. As pointed out before, previous empirical research failed to confirm the importance of *land costs*. The proxy used for *land costs* in this study had the expected sign and was statistically significant, most likely because we were operating with small-area choice sets. The inclusion of *urban accessibility* variables in specification 2 increased marginally the explanatory power of the model.<sup>7</sup> Road time to the Porto–Lisbon corridor has the expected sign, and the coefficient associated with this variable is statistically different from zero. The same is true for road time to the *distrito* administrative center, or *minor urban accessibility*. Thus, in specification 2 the evidence is statistically significant for *major* and *minor urban accessibility*.

In Eq. (2) we extend beyond previous work by including the *investor's home base* as an alternative specific constant. The significance of our estimates increases substantially as shown by the jump in the log-likelihood value. Notwithstanding, the estimated coefficients of the remaining variables maintain their signs and magnitude, and practically all are still statistically significant. Consequently, the inclusion of this additional variable picks up a significant amount of variability unaccounted for in earlier specifications. The identified effect may be associated, as argued before, with information costs that diminish the potential profit of alternative choices in relation to the investor's home base. Localized social capital networks (and related informational advantages found in the entrepreneur's home environment), as well as personal factors, may also help explain the strong local preferences of investors, since these factors can also increase the costs of relocating. In fact, the coefficient associated with this variable clearly indicates that for equal levels of the other variables across choices there are potential lower costs (and potential higher profits) associated with the investor's home. At the same time, showing a strong bias, the odds of choosing the home base over another *concelho* are overwhelming, amounting to 289.7. Other things equal, the investor's probability of moving is quite small (48.6%).<sup>8</sup>

Moreover, when we consider the possibility of interaction effects between traditional variables and the investor's "prior locality of economic activity" we find evidence that investors weigh differently the importance of conventional

<sup>7</sup> The log-likelihood ratio test has a chi-square value of 118.354, significant at 1%.

<sup>8</sup> Let  $j$  be the *concelho* where the investor is based and  $k$  an otherwise identical *concelho*. The odds of choosing  $j$  over  $k$  are  $P_j/P_k = \exp(5.669) = 289.7$ . If we further assume that all *concelhos* are equally attractive then  $P_j + 274P_k = 1$  and  $P_j = 51.4\%$  and the probability of moving,  $1 - P_j$ , equals 48.6%. Note that the same probability computed from Eq. (1) would amount to  $274/275 = 99.6\%$ .

location factors in accordance with where they plan to invest. This effect can be seen in the estimates for Eq. (3). In this equation the *investor's home base* variable is introduced as an interaction term. Again, once we add this new set of variables, the log-likelihood experienced a significant improvement, supplying evidence of differentiated profit functions in accordance with the environment where investors plan to invest.

Next consider home versus non-home differences given in Eq. (3) of Table 3. When the choice under consideration is any region other than the investor's home base, the non-home investor will favor areas that minimize the expected information costs. *Urbanization economies* attract non-home investors ( $D_{ij} = 0$  column), but are not relevant for home investors ( $D_{ij} = 1$  column). This supports the notion that the higher information costs that non-home investors have to incur may lead them to access the variety of business services that major cities possess, strengthening urbanization tendencies. In contrast, *localization economies* attract both new home and new non-home manufacturing start-ups in Portugal, but this variable has also a higher impact on the location decisions of non-home investors when compared with home. Everything equal, a 10% increase in localization economies in the investor's home base leads to an 0.06% increase in the probability of locating in that area, while if the same change occurs in any other area, then the probability of locating experiences a 1.89% increase.<sup>9</sup>

The other notable result found in Table 3 concerns *major* and *minor urban accessibility*. Since information costs are lower in the core regions, those investors who plan to invest in any region other than their "prior locality of economic activity" tend to value accessibility to the major urban areas of Portugal (but not accessibility to the minor markets). A 10% decrease in time distance to major urban areas in any region other than the investor's home base leads to an 11.5% increase in the probability of locating in that particular region—the statistically significant factor with the highest elasticity for "movers" from the home base.<sup>10</sup>

In contrast, those who invest in their own business geographical environment are particularly concerned with the production factors costs. Actually, among the conventional cost factors considered in our study, both the costs of labor and land significantly influences on the local investment decision. The decision to locate in the home *concelho* is much more responsive to changes in the cost of labor. The reported elasticity is  $-0.15$ , against a value of  $-0.02$  for land costs. One might also try to express the odds of choosing the home base over another *concelho* in

<sup>9</sup> Again, let  $j$  be the *concelho* where the investor is based and  $k$  any of the otherwise identical (or equally attractive) *concelhos*. The elasticity of the probability with respect to localization economies  $x$  is given by  $\partial \ln P / \partial \ln x = b \times x \times (1 - P)$ , where  $b$  is the coefficient associated with  $x$  and  $P$  is the probability of locating in a *concelho*. The estimates for  $P$  are computed at the mean value of the variables ( $P_j = 92.8\%$  and  $P_k = 0.03\%$ ),  $x$  is also evaluated at the mean and the values for  $b$  are taken from Eq. (3).

<sup>10</sup> The comparable elasticity for urbanization economies is 0.47.

terms of the extra labor one would be willing to pay in order to stay in the home base. From the coefficients in Eq. (3) of Table 3, we can estimate that, everything else constant, the investor is willing to accept wages 3.4 times higher at his home base to become indifferent between moving or staying.<sup>11</sup>

## 5. Conclusions

This paper adds home base as a crucial consideration in location modeling, filling a void left in recent empirical work. Simply including the investor's home can substantially improve the overall explanatory power of location modeling in a discrete choice framework. In the Portuguese case, the evidence is compelling that a home/non-home distinction makes sense. After all, most investment takes place in the investors' existing area of economic activity. Clearly, econometric location analysis must control for this phenomenon.

We argue that home matters for a variety of reasons. First, there are personal factors, encompassing everything from the upheaval of relocation to the personal ties and friendships that attach investors to their existing business locality. An alternative explanation could be derived from the concept of social capital. As social capital involves non-transferable economic advantages inherent in webs of local relationships, it is compatible with our home-bias hypothesis. Moreover tangible, but illiquid assets may tie investors to a particular location.

At the same time, we argue that firms maximize profits with geographically varying information costs. These costs arise from the home location familiarity and imperfect information about the urban and regional environment elsewhere. This home bias of investors can clearly be seen in the differences in expected profit derived from selecting Portuguese *concelhos*.

Agglomeration, especially urbanization economies, can apparently help offset the information costs and other disadvantages associated with non-home investment decisions. Localization economies influence both home and non-home investors, but have more impact on non-home investors. The reasons are in line with other papers pointing to more agglomerative tendencies than implied by externalities alone (DeCoster and Strange [22] and Pascal and McCall [16]). Agglomeration compensates for the lack of local knowledge about production and market conditions, leading firms to cluster in urban areas even as they expand geographically. This represents a case of informational cascading (Bikhchandani et al. [19]), where firms flock into cities imitating prior location decisions to economize on search costs. In addition to agglomeration, the findings here indicate that

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<sup>11</sup> Assuming all variables at their mean values we would need an increase of 1.225 in the log of wages (a discrete increase of 240%) to achieve a value of 50% for the probability of an investor locating on his home base. This number was computed by simulation.

accessibility to major urban areas (as measured in time) can influence non-home decisions.

Accordingly, this paper points to a common theme in the urban and international literature. In the theory of multinational enterprise, foreign firms face higher information and other transaction costs compared with domestic investors. Domestic firms face a similar problem when investing outside their home region. The common notion is that the home environment gives domestic firms a competitive advantage (along with potentially higher profit). For foreign or non-home investors, agglomeration and urban accessibility can offset the profit derived from home-field advantages, offering countervailing returns to the profit function.

The empirical findings presented in this paper attempt to quantify the home-field location advantage. It appears that investors willingly pay a premium to stay home. The results suggest home investors' profits rise (and firms start new plants) where labor costs, land costs, and localization economies are favorable. At the same time, entrepreneurs apparently accept higher costs to compete on the home field. We find that, everything else constant, investors are willing to accept wages more than three times higher before becoming indifferent between moving or staying.

In sum, the paper maintains that there is an often-unrecognized bias that influences investment decisions regarding new plant locations. These results point to the need for micro data sets that identify the decision-maker's home, or "prior locality of economic activity." The findings, however, need to be confirmed through further research. Over time, more high-quality Portuguese data will become available and enable direct extensions of this study. Yet the results need to be confirmed in other countries as well. Additionally, case study research should explore how personal factors, social capital, and problems posed by imperfect information operate in specific contexts and affect investors' location decisions.

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