



The location of domestic and foreign production affiliates by French multinational firms

T. Mayer^a, I. Mejean^{b,*}, B. Nefussi^c

^a Sciences-Po, CEPII, and CEPR. CEPII, 9 rue Pitard, 75015 Paris, France

^b IMF, Ecole Polytechnique and CEPR. Ecole Polytechnique, Département d'Economie, 91128 Palaiseau Cedex, France

^c INSEE, DGTPE, 139 rue de Bercy, 75012 Paris, France

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ABSTRACT

In this paper we combine two traditions in the analysis of firms' location patterns. One led by trade economists who try to understand why do firms invest *abroad*, and another one led by urban/regional economists, who frequently use patterns of *inter-regional* or *inter-city* choices to estimate agglomeration economies. We contribute to the trade-motivated set of papers on location choices by adding the domestic country in the choice set, while accounting for firm's heterogeneity in the choices. Our econometric results using French firm-level data show an important "home bias" in manufacturing investment decisions. A crucial finding, which bridges with our contribution to the agglomeration literature, is that the spatial clustering of affiliates belonging to the same industrial group accounts for the lion's share of this home bias.

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1. Introduction

Location choices by multinational firms have been studied by mostly two groups of researchers, who generally put the emphasis on different aspects of those decisions. Trade economists – the first group – usually focus their attention on determinants of investments *abroad*.¹ By contrast, urban/regional economists often use patterns of *inter-regional* or *inter-city* choices to estimate agglomeration economies.² In this paper, we try to bridge those two literatures and we also propose contributions to both. In a nutshell, our paper adds to the trade-motivated literature by taking into account domestic investments and identifying a "home bias" in location choices. Our contribution to the agglomeration literature is to consider the spatial clustering of firms belonging to the same industrial

group as a determinant of location choices, and to show that it accounts for a large part of the estimated home bias.

The interest for decisions by multinational firms regarding where they locate their manufacturing plants is of course not confined to academia. The extent, determinants and effects of outward investment is a topic of great public interest, in particular in developed countries. While continental Europe is primarily concerned with the possible disappearance of its manufacturing base, the United States and the United Kingdom pay more attention to the offshoring of services. These fears can lead to drastic policy changes. For instance, a survey conducted by Eurobarometer (2005) suggests that the fear of offshoring was the primary reason invoked by the French for rejecting the European Constitutional Treaty in May 2005.³ Behind this fear is the feeling that Foreign Direct Investment (FDI) will substitute for domestic investment, which may partly be behind these countries' low employment rates.

In this paper, we try to address this question by comparing the determinants of domestic and foreign investment. Our intuition is that FDI will be more likely to reduce domestic investment if it allows the firm to serve the same markets at a lower cost. Using firm-level data on French investments, both in France and abroad, over the 1992–2002 period, we investigate the determinants of location choice, and empirically assess whether (and why) the

* Corresponding author.

E-mail addresses: thierry.mayer@sciences-po.fr (T. Mayer), imejean@imf.org (I. Mejean), benjamin.nefussi@dgtp.e.fr (B. Nefussi).

¹ The typical set of questions asked by trade economists relate to whether corporate taxation (Devereux and Griffith, 1998), labour costs (Liu et al., 2010), environmental regulation (Dean et al., 2009), cohesion policy (Basile et al., 2008), and all sorts of variables typically affected by nation-level public policies, matter in location patterns (although they sometimes use sub-national datasets to identify those effects).

² Guimarães et al. (2000), Crozet et al. (2004), Strauss-Kahn and Vives (2009), and Spies (2010) are examples of a large set of papers using firm-level location choice data and logit econometric modeling to estimate the extent of clustering behavior at the sub-national level.

³ Even though the actual relationship between the treaty and offshoring is fairly unclear.

domestic economy has become less attractive over recent years, as is often claimed in the public debate over offshoring in rich countries.

With respect to previous firm-level analysis of FDI decisions, our value-added is the use of data covering both domestic plant creations and investments in a large number of foreign countries, which makes it possible to investigate the decision to invest abroad rather than in France, and the location choice, conditional on having decided to carry out this investment abroad. Previous work has typically focused on only one aspect of this decision process: the choice between exporting and FDI in Brainard (1997) and Head and Ries (2003) for instance, or conditional location choice in, amongst many others, Coughlin et al. (1991), Head et al. (1999), Guimarães et al. (2000) and Head and Mayer (2004). One notable exception is Devereux and Griffith (1998), who model US firms' strategies in European markets as a sequential process involving (i) the choice of serving the European market, (ii) the trade-off between exporting from the USA or investing in Europe, and (iii) the choice of a specific European country, conditional on having decided to invest in Europe.

Our work is close to theirs in spirit, although our data cover a much larger set of foreign locations. Moreover, we add a number of determinants of firms' choices, suggested by a more explicit theoretical model. More specifically, we use a model that builds on Head and Mayer (2004) and Amiti and Javorcik (2008) to derive the determinants of location choices from a New Economic Geography (NEG) perspective. We also integrate results by Helpman et al. (2004) and Markusen (2002) in this framework to explain the choice between domestic and foreign investments. In that respect, our model shares some similarities with Chen and Moore (2010).

In our data, more than 80% of investments involve the creation of an affiliate in France, which strongly suggests the existence of a "home bias" in location choices. While the extent of this home bias tends to decrease over time, it is still very large at the end of the period. We try to explain it by standard, *country-level* determinants of location choices. These variables do explain a substantial part of why French investors continue to invest (so much) in France. However, we also show that the main drivers of the home bias have to be found in *firm-level* determinants. In particular, larger and more productive firms are more likely to engage in FDI.

Finally, our data allow us to account for the worldwide geographical structure of the firm. We build a firm-level network variable describing the strength of financial linkages that a given investor has in each country (including France) due to previous investments there. This turns out to be an important determinant of subsequent location decisions, and also a key factor in explaining the choice between investment at home and abroad. Our results suggest that French firms over-invest in France because they can benefit from agglomeration externalities from affiliates already installed there. In this respect, our paper is also related to the urban economics literature measuring the extent of agglomeration economies. It has been shown that the spatial agglomeration of economic activity improves total factor productivity (Henderson, 2003; Cingano and Schivardi, 2004, being recent examples) and other economic variables like employment growth in Brühlhart and Sbergami (2009), wages in Combes et al. (2008) or export decisions in Koenig (2009). The classical distinction in that literature is between *urbanization economies* where the overall density of economic activity is beneficial, and *localization economies* where what matters is within-industry agglomeration. Many papers find stronger evidence in favor of localization economies (see, among others, Henderson, 2003). Within-industry agglomeration economies have also been shown to matter in the spatial distribution of FDI, Strauss-Kahn and Vives (2009) or Spies (2010) being recent examples. We go one step further and ask whether

agglomeration benefits are also at play *within-firm*. This turns out to be a crucial determinant of location choices, explaining the lion's share of the home bias in investment.

The remainder of the paper is organized as follows. Section 2 provides our theoretical motivation, mostly combining New Economic Geography determinants of location with firm-specific explanations of the FDI decision. Section 3 presents the data used and a descriptive analysis of the proposed determinants of location choice. Section 4 contains the results of our location choice estimates for investment abroad, which enables comparison with those in previous work, and Section 5 adds domestic investment. Finally, Section 6 concludes.

2. Theory and empirical implementation

2.1. Assumptions

Our theoretical framework builds on Head and Mayer (2004) and Amiti and Javorcik (2008). Those papers describe the expected profits of an affiliate in each of the prospective locations to predict the equilibrium number of affiliates in each country (Amiti and Javorcik, 2008) or the probability that a firm invests in a given location (Head and Mayer, 2004). Our innovation is to integrate results by Helpman et al. (2004) and Markusen (2002) in this framework, in order to also explain the choice between domestic and foreign investments. In that respect, our model shares some similarities with Chen and Moore (2010). We however depart from this paper on two major assumptions, detailed below.

Our partial equilibrium model studies the decision for a firm producing a differentiated good to open a new production unit, either in its own country or abroad.⁴ In this context, the arbitrage between alternative locations is explained by the relative attributes of each location. Individual decisions are also sensitive to the firm's productivity, that determines its profitability in each location. As in Helpman et al. (2004), the fixed cost for producing is supposed higher for investing abroad than for producing domestically. This hypothesis accounts for the fact that information on a country is easier to gather when the firm is located there, which reduces the fixed cost of creating a new affiliate.⁵

The production technology is as follows. Each firm f is endowed with a productivity $\theta(f)$, drawn from a common distribution $G(\theta)$.^{6,7} To create a new plant, firms bear a fixed cost, expressed in unit of the numeraire good. Entering the domestic market is less costly than investing in a foreign country: $F_{\text{fdi}} > F_{\text{dom}}$. As in Head and Mayer (2004) and Amiti and Javorcik (2008), but contrary to Chen and

⁴ Helpman et al. (2004) consider the ex-ante decision for a firm to enter the domestic market and, conditional on entry, the decision to serve foreign markets through exporting or FDI. We depart from them and analyze how firms decide where to locate a new production unit, conditional on having decided to create a plant. On the other hand, we are silent on the reason why the firm decides to create the plant. We have in mind a firm that develops a new product which it will produce itself, and that has to be produced in a new facility (because of capacity constraints or of totally different production process). Our focus on the conditional location decision is dictated by the data we use: our sample only contains information on firms that already produce in France and decide to invest in a new plant, either in France or abroad.

⁵ Helpman et al. (2004) also mention plant-level returns to scale associated with the choice of producing domestically rather than abroad. Here, the extra fixed cost for investing abroad cannot be rationalized in that way as the location decision is conditional on the firm opening a new plant.

⁶ Because we focus on location decisions at the firm level, we do not have to specify $G(\cdot)$ here.

⁷ In the following, we assume that the new plant inherits the productivity of the investing firm. This assumption is dictated by the data availability, as we have no information about the ex-post productivity of the plant. We could also argue that firms may invest in a particular country to increase their productivity. We however expect this motive to be picked up by our measures of the host country's factor costs, notably its GDP per capita.

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