



# On the genesis of multinational foreign affiliate networks



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## ABSTRACT

Multinational enterprises (MNEs) develop their networks of foreign affiliates gradually over time. Instead of exploring all profitable opportunities immediately, they first establish themselves in their home countries and then enter new markets stepwise. We argue that this behavior is driven by uncertainty concerning a firm's success in new markets. After entry, the firm collects information which is used to update its beliefs about its performance in a market. As conditions in different markets are correlated, the information gathered in one of them can also be used to update beliefs elsewhere – with the degree of correlation depending on issues such as the geographical or cultural distance between markets. This correlated learning may render it optimal to enter markets sequentially – investment in market *A* is only followed by entry in market *B* if the firm was sufficiently successful in *A*. The prediction that firms start their expansion in markets that are closer to their home base and then proceed step by step is supported by our empirical analysis, which features the universe of foreign affiliates held by German multinationals. Based on a rich set of benchmark estimates and sensitivity checks, we identify correlated learning across markets beyond alternative explanations as a key driver of gradualism in the genesis of MNEs' foreign affiliate networks.

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## 1. Introduction

Multinational enterprises (MNEs) tend to pursue a *gradual expansion strategy* of their network of foreign affiliates over time rather than exploring all profitable opportunities *simultaneously*. They typically establish themselves in their home countries and then enter new foreign markets step by step. This paper studies the optimal dynamic behavior of MNEs to explore international growth opportunities. It contributes to the literature on the international organization of firms by investigating sequential versus simultaneous or isolated location decisions.

We propose a model where MNEs face uncertainty concerning their success in new markets and learn about that after entry. Conditions in different markets are not independent, and the information gathered in one country can also be used to

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learn about conditions in other, in particular similar countries. This so-called correlated learning can explain why many firms expand step by step: market entry is associated with considerable costs, and sequential investments help to economize on these costs by reducing uncertainty. The learning model developed in this paper serves to derive a number of testable hypotheses regarding market entry in general and *simultaneous* versus *sequential* market entry in particular. These hypotheses are assessed in a data-set of the universe of German MNEs and their foreign affiliates. The results provide empirical evidence for correlated learning as one main driver behind international expansion strategies.

Our paper is related to recent work on sequential exporting. For instance, [Evenett and Venables \(2002\)](#) point out that initial exports to one market are typically followed by exports to adjacent markets at the product level. [Eaton et al. \(2007\)](#) find that Columbian firms start exporting in a single foreign market and gradually enter additional destinations. They also show that further expansions crucially depend on the export market served initially. Using Russian firm-level data, [Schmeiser \(2012\)](#) identifies a similar pattern and demonstrates that export experience determines export dynamics: a typical firm first enters one destination and then slowly expands. More recently, [Albornoz et al. \(2012\)](#) explore how firms learn about their export profitability. They illustrate that firms use their first export market as a “testing ground” to learn about their export profitability and, subsequently, exit, continue to export, or enter further markets. Hence, the first export decision not only provides information about the export market, it also reveals information about the firm itself (in a given market). We argue that learning is particularly crucial for foreign direct investment (FDI, as an alternative to exporting) which, unlike exporting, definitely involves discrete real investments.

Our study also relates to the literature on the mode and depth of firms' international activities. Models of heterogeneous firms describe how enterprises make decisions depending on the associated costs and their productivity levels. Assuming that fixed costs are higher for exporting than for domestic sales only, and that they are even higher for foreign plant set-up and running a multinational network than for exporting, the most productive firms engage in FDI, less productive companies export, and the least productive firms stay in the domestic market only (see [Helpman et al., 2004](#)). This theoretically predicted pattern has been supported by a number of empirical studies. The results in [Conconi et al. \(2010\)](#) suggest that learning through exporting matters for the decision of how to serve a market, via exports or FDI. [Aizenmann and Marion \(2004\)](#) show that uncertainty is a crucial factor determining the profitability of FDI. They find that a higher uncertainty generally discourages (vertical) FDI. The present paper analyzes the impact of uncertainty on the dynamics of an MNE's investment decisions. Empirically, many MNEs are multi-plant units which are established gradually. It appears that no research on the *genesis of multinational foreign affiliate networks* exists to this date, and it is this paper's purpose to fill this gap.

Given that establishing a multinational network of foreign affiliates is profitable per se beyond other options, further choices are available to the firm. For example, it has to decide on *where* to locate the first foreign entity (location choice). This choice among several alternative first locations may depend on local factor costs, on the accessibility of production factors, or on various measures of proximity to the home market (for empirical investigations on the location choice of MNEs, see [Devereux and Griffith, 1998](#); [Chen and Moore, 2010](#); [Becker et al., 2012](#)). Managers of the firm then have to answer related questions of the following kind. Should the first investment involve high or low capacity levels? Is the first investment the basis for other investments in the region? Given the location choice of the previous investments, where should subsequent affiliates be located? In this context, the present study analyzes foreign location decisions of MNEs, why sequential entry patterns can be optimal, and how decisions depend on earlier location choices.

Our theoretical approach is related to the theoretical learning (or bandit) literature. Early contributions to this literature include [Bellman \(1956\)](#) and [Berry and Fristedt \(1979\)](#), while a learning process similar to ours has been applied by [Bergemann and Hege \(1998, 2005\)](#) and [Keller et al. \(2005\)](#). Specific to our model is the possibility that entry decisions in different countries depend on each other, since market conditions exhibit similarities. How consumer preferences or attitudes of employees differ across countries depends on issues such as geographical or cultural distance. If the correlation between market features is sufficiently high, a firm can make use of the knowledge it gains in one market to learn about conditions elsewhere.<sup>1</sup> Then, a firm may want to enter a second country if it was sufficiently successful in the first one. This leads to one of our main results: even if expected profits in a market are positive, it can be optimal to delay or later on even abandon subsequent entry. The reason is that market entry is costly, and sequential investments can increase expected profits by using information gathered elsewhere. On the other hand, the reduced uncertainty through delayed entry comes at the cost of foregone profits. This result is related to the vast literature on investment under uncertainty (starting with [McDonald and Siegel, 1986](#); see [Dixit and Pindyck, 1994](#) or [Carruth et al., 2000](#) for overviews). If the value of an irreversible investment project follows a stochastic process, the option to wait for a better realization is valuable even if immediate entry was profitable. Our result follows a similar logic. Uncertainty combined with correlated learning creates an option value of waiting, and a sufficient amount of uncertainty must exist to make sequential entry potentially optimal. The main difference is that learning is not induced exogenously but by a firm's activities elsewhere. Thus, the firm can influence the degree of learning by adjusting its investment levels in other markets.

<sup>1</sup> The idea that information obtained from one project can be used to learn about other projects is also captured by [Callander \(2011\)](#), who uses a simpler learning mechanism than we do. He analyzes the optimal search procedure for the one “right” project, whereas in our setting entry into all countries (and, hence, the realization of several projects) can potentially be optimal.

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