

# Thesis Abstract

Multinational firms have played a more and more important role in the world economy with both international trade and foreign direct investment being fast growing economic activities. Multinational firms need to make a series of decisions before and after they enter the world market. There are three major steps in the decision process relating to the productivity of multinational firms that have triggered a lot of research interest. The first step in the decision process is the relationship between a firm's export decision and its R&D investment (productivity) choice – what type of firm will self-select into the export market. The second step of the decision process is associated with the mode choice – exporting, licensing, or foreign direct investment. The third step of the decision process is how to implement FDI or licensing in the host country if a firm has already made its mode choice. In order to set up a foreign direct investment, a firm can choose between greenfield investment and cross-border acquisition. In addition, this parent firm can also choose to acquire a more productive host country (local) firm or a less productive one under this cross-border acquisition choice. As to the licensing implementation choice, a firm also can choose to license its technology to a more productive local firm or a less productive one.

My thesis aims to search for a general method to analyze these three major steps in the decision process (exporting choice, mode choice and FDI or licensing implementation choice) and to relate these to the productivity decision at firm level in a single theoretical framework. I also test some of the theoretical hypotheses derived in the theory chapters empirically.

In the first two chapters, I set up an oligopolistic Cournot competition model in which heterogeneous firms can choose their productivity levels by adjusting their R&D investments before and after trade. I analyze the relationship between the productivity choice and the exporting decision in chapter 1, and discuss the interaction between the productivity choice and the mode choice in chapter 2. Similar to some recent literature, firms are heterogeneous in their ex-ante productivity. But I generalize this by allowing firms to make investment in R&D, with the marginal product of these investments increasing in their ex-ante production parameters. Including this investment choice stage before and after trade, productivity is no longer only a determinant of the export decision and the mode choice. Instead productivity choice interacts with the export decision and the mode choice. After exposure to trade, letting firms adjust their productivity induces a further divergence in their productivity difference and leads to a stronger intra-industry reallocation effect on quantities, price and profits due to this second round ex-post productivity effect.

In the third chapter, I simplify the previous model by fixing firms' productivity levels to analyze the third step in the decision process – a largely unexplored question in the trade literature. An investing firm's optimal FDI or licensing implementation choice depends on the level of heterogeneity among local firms and the average profitability across all firms in the market. There is a trade-off between the fixed FDI set-up cost and the investing firm's ex-post market share under different FDI implementation choices. Greenfield FDI is preferred when the average market profitability is high, while cross-border acquisition of a more productive local firm is optimal when the average profitability is low. The investing firm will choose to acquire a less productive local firm with an intermediate market average profitability. The result for licensing implementation choice is similar, with licensing to a less productive local firm if the average profitability is high and licensing to a more productive local firm if the average profitability is low.

In the fourth chapter, I use Chilean plant-level data to test some theoretical hypotheses proposed in the previous chapters. The data shows that the access to foreign linkages (FDI or licensing) has positive effects on the productivity and the market share of the local firms that establish the linkages, with the effect of FDI greater than the effect of licensing. Empirical support is also found for the theoretical statement that FDI is associated with a larger productivity difference between domestic and foreign firms, while licensing is chosen with a smaller productivity difference.