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The choice and timing of foreign direct investment under uncertainty

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Abstract

This paper sheds new light on why timing and entry mode should be considered simultaneously in the international investment literature. We derive the profit levels at which it is optimal to switch from exporting to setting up a wholly owned subsidiary, creating a joint venture, or licensing production to a local firm. The preferred entry mode depends on uncertainty about future profits, tax differentials between the home and the foreign country, the cost advantages of local firms, institutional requirements, and the degree of cooperation between partners in a joint venture.
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1. Introduction

The past two decades have witnessed an enormous growth in foreign direct investment (FDI) and a significant rise in the number of multinational enterprises (MNEs). The latest UN World Investment Report reports that the gross product of all MNEs including parent firms comprises roughly a quarter of the world's gross domestic product. There is substantial evidence that most FDI is horizontal

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(Markusen and Maskus, 1999), meaning that firms set up a plant in another country that replicate roughly the same activities as in existing plants.[1] The mode of horizontal expansion seems to vary around the globe. Whereas West-European firms often undertake a greenfield investment in other countries in Western Europe on their own, they often (sometimes necessarily) rely on a local partner when expanding to China. Applying a dynamic optimization model, this paper addresses the question of how and when to expand horizontally.

The literature on investment under uncertainty claims that there is a value of waiting in addition to the net present value (NPV) in investments that are irreversible and subject to an uncertain payoff (McDonald and Siegel, 1986; Dixit and Pindyck, 1994). Empirical evidence of this stream of literature supports this option view of investment (e.g. Leahy and Whited, 1996; Guiso and Parigi, 1999). It is acknowledged that FDI typically involve sunk costs and that their payoff is affected by exchange rate uncertainty (Campa, 1993; Darby et al., 1999) and policy uncertainty (Rodrik, 1991). In an empirical paper analyzing different measures of uncertainty, Brunetti and Weber (1998) found that both institutional uncertainty and volatility in exchange rates have a negative impact on investment.

The way a firm internalizes its advantage over other firms has been subject to numerous studies. The most influential paper within this respect is Buckley and Casson (1981) who use a cost-benefit analysis for the choice between exporting and FDI. Under the assumption that exporting has a low fixed cost and a high variable cost while the opposite holds for undertaking FDI, they find that exporting is optimal when the foreign market is relatively small whereas FDI is optimal when the market is relatively large. At the time they wrote their paper option theory was in its childhood stages and the effect on investment timing of uncertainty surrounding future payoffs was typically ignored.[2]

A small body of literature has paid attention to the creation of joint ventures between a MNE and a local firm when there is a differential taxation between the home country of the MNE and the country in which the MNE intends to set up a joint venture. Svesjnar and Smith (1984) showed that the MNE wants to minimize its share in the joint venture in order to avoid tax payments by the joint venture when taxes are lower in the host country than in the MNE's home country.

The introduction of uncertainty in foreign market entry decisions was first established by Dixit (1989) and Kogut (1991). Dixit shows that uncertainty affects the timing of market entry. Kogut analyzes a joint venture as an option to acquire or expand. In recent contributions on operational flexibility within FDI, Rivoli and Salorio (1996) and Chi and McGuire (1996) discuss the strategic perspectives on the timing of investment and the choice of market entry, respectively, but up to now

[1] FDI is vertical when firms geographically fragment production into stages, typically on the basis of factor intensities, locating labor-intensive activities in labor-abundant countries, etc.

[2] Tang and Yu (1990) and Teng et al. (2001) have subsequently analyzed profit maximizing entry strategies for the multinational enterprise under a particular and a general demand function, respectively.

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