Available online at www.sciencedirect.com
ScienceDirect
International Business Review 16 (2007) 687–712
INTERNATIONAL BUSINESS REVIEW
www.elsevier.com/locate/ibusrev

Real options and the theory of foreign direct investment

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Received 4 January 2007; received in revised form 17 May 2007, 23 July 2007; accepted 31 August 2007

Abstract

We extend applications of real options theory to foreign direct investment (FDI) research regarding choice of location and choice of market entry mode under uncertainty. Our study is motivated by the regional configuration of multinational enterprises (MNEs), as well as observed deviations from the stages model in internationalization theory. We shed light on these issues using real option modeling and computer simulations. The results suggest that from the standpoint of pursuing business opportunities and generating real options, building a subsidiary in a nonhome region could be more beneficial than in a home region. However, high option exercise cost may reduce the option value of a nonhome-region location. Our models also imply that choice of entry mode depends on the *magnitude* (high vs. low) and the *type* (exogenous vs. endogenous) of uncertainty. When uncertainty is high and endogenous, MNEs may prefer high-commitment entry modes because they contribute to the reduction of uncertainty and provide valuable growth options.

Keywords: FDI theory; Market entry mode; Option modeling; Real options theory; Regional location

1. Introduction

It has been recognized in international business (IB) that uncertainty, which often exposes multinational enterprises (MNEs) to unfavorable conditions or favorable

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0969-5931/$ - see front matter
doi:10.1016/j.ibusrev.2007.08.004

opportunities, plays an important role in their strategic decision making. These challenges and opportunities in the international environment demand a theory, which helps to analyze MNEs' strategies under uncertainty. Real options theory has enriched foreign direct investment (FDI) theory by introducing a new way of thinking—MNEs can strategically benefit from uncertainty because uncertainty is not only associated with downside risks but also with potential future opportunities (Li, 2007). To strategically benefit from uncertainty, MNEs need to *create* real options (such as the option to abandon and the option to grow) to maintain flexibility in adjusting decisions, as well as to *exercise* these options in response to opportunities or challenges. Real options theory, which effectively conceptualizes and quantifies the determinants of real options, has contributed to the development of theories in MNEs' decision making under uncertainty (Buckley & Casson, 1998; Buckley, Casson, & Gulamhussen, 2002; Chi & McGuire, 1996; Kogut & Kulatilaka, 1994; Tong & Reuer, 2007). In this article, we further extend this stream of research by considering MNEs' choice of location and choice of market entry mode under uncertainty.

Since the 1970s, researchers in IB have devoted substantial efforts to analyzing investment behavior of multinational firms. IB researchers have recognized that "where" (choice of location) and "how" (choice of market entry mode) decisions are of primary importance for firms to consider in their foreign investment (Dunning, 1980, 2000). Correspondingly, a bulk of research has theoretically and empirically examined the rationale for locational choice and the conditions under which market entry modes such as licensing, export, joint ventures (JVs), and wholly owned subsidiaries (WOSs) are optimal (e.g., Buckley & Casson, 1976, 1996, 1998; Dunning, 1980, 1998; Madhok, 1998; Rugman, 1981). However, the literature, mainly based on transaction cost economics, has not fully incorporated the role of uncertainty in influencing the where and how decisions of MNEs; in particular, it is not entirely clear how MNEs incorporate the option value of a location or a market entry mode in international investment decisions. Therefore, using real options theory, we intend to derive new insights in this regard.

The first question we address in this study regards MNEs' location choice between home and nonhome regions for market-seeking FDI, motivated by the empirical observation that most MNEs operate within their home regions of the NAFTA–EU–Asia triad by Rugman (2005) and Rugman and Verbeke (2004). Based on sales information of 380 MNEs among *Fortune* Global 500 companies, Rugman and Verbeke (2004) found that only 9 companies are adopting global strategies (defined as MNEs with sales of 20% or more in each of the three parts of the triad). Only 25 companies use bi-regional strategies (defined as MNEs with at least 20% of their sales in each of two regions in the triad, but less than 50% in any one region), while the majority of the companies—320 out of 380 MNEs—use a home region-oriented strategy (defined as MNEs with at least 50% of their sales in their home region). In this paper, we leverage real options theory to provide a theoretical explanation for this regionalization phenomenon. Using real options modeling, we suggest that from the standpoint of pursuing business opportunities and generating real options, building a subsidiary in a nonhome region could be more beneficial than in the home region. However, the option exercise cost is likely to be higher in a nonhome region, which may substantially reduce the nonhome region's option value and in turn the MNE's incentives to build subsidiaries outside its home region.

Second, we enrich the application of real options theory to the IB literature on choice of market entry mode under uncertainty. There are two motivations for our study. The first originates from some debates in internationalization theory, which suggest that MNEs