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Modeling the transitional dynamics of international joint venture policies: An option pricing approach

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ABSTRACT

Real option analysis has been applied to strategies of market entry and global expansion, predominantly in combination with the formation of alliances and joint ventures. Albeit joint venturing based on option pricing theory is studied in both disciplines, financial economics and international business, the link between these strains of literature is not well developed. We use a compound option framework to analyze the impact of decision contingency and learning on formation and duration of joint ventures. Critical thresholds are presented which allow to characterize the conditions under which termination takes place and to estimate the duration of international joint ventures revealing a novel perspective on existing empirical findings. In particular, we find that exchange rate uncertainty and learning have ambiguous effects on investment. While the model also provides a number of new testable predictions the presented closed-form solution can help managers to structure explicit option clauses in JV contracts more efficiently.

1. Introduction

Market globalization has transformed the nature of corporate operations. Scholars have recently called this period an era of alliance capitalism indicating the importance for firms to lever the assets, skills, and experiences of globally dispersed partners (see e.g. Dunning, 1997). Besides their widespread use alliances and joint ventures (JVs) in particular, however, show great heterogeneity regarding their instability rates. While some JVs last considerably long, e.g. DowCorning is more than 50, Fuji Xerox more than 30 years old, others are terminated shortly after their foundation. Yet the management literature has acknowledged that equating instability with failure may be inaccurate. For example, more than 80% of the international alliances studied by Bleeke and Ernst (1991) ended in acquisitions and not in abandonment. However, models that address the decision to enter a JV have been too static and thus fail to take proper account of the strategic intent, i.e. to expand subsequently in the host country. Moreover, important key parameters, e.g. the uncertainty that is created by the volatility in the international business environment or the irreversibility issues of most foreign resource commitments, have been neglected. In particular, there is a lack of in-depth research in the international business and management literature concerning the following questions. First, what triggers the switching of modes and under which circumstances does the firm expand an international joint venture (IJV) from a dynamic viewpoint? Second, while there is still a debate ongoing with respect to the choice of optimal degree of foreign ownership, current research fails to provide clear answers about how this choice is affected by uncertainty and its future resolution due to learning and knowledge accumulation.

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2. Literature review

A joint venture (JV) is an agreement between two or more legally independent entities which pool their capabilities and resources to form a shared business. The JV becomes an international joint venture (IJV) if at least one foreign partner is involved. While factors affecting JV formation have received abundant attention, the processes of JV evolution have received relatively scant attention.[1] By JV evolution we mean a JV's development along its life cycle, i.e. formation, operation, and termination (Child, Faulkner, & Tallman, 2005). Given this context, the bulk of literature has investigated JV evolution by means of empirical methods. In particular, those studies have mainly taken on an outcome oriented perspective and used instability, i.e. termination as suitable.[2] In general, the primary question is, how long do JVs survive beyond their formal announcement and which factors affect their instability. Some common factors exist that appear to be conducive to the transitional phenomenon of JVs and IJVs in particular. These are e.g. equity structure, uncertainty in the external economic environment, cultural distance, experience and learning capabilities among others. Great heterogeneity, however, exists with respect to whether these factors influence stability in a positive or negative way. Exemplary, the findings remain to a great extent ambiguous whether parity or majority/minority equity partnerships are more stable (see e.g., Blodgett, 1992; Dhanaraj & Beamish, 2004). Likewise, there is a lack of clarity whether external uncertainty has an enhancing effect on the survival of JVs (see, e.g., Hennart, Kim, & Zeng, 1998; Kogut, 1991; Luo & Park, 2004).

Viewing JVs in terms of their ability to generate subsequent managerial choices brought about that looking at JVs from a real option perspective has surged in recent years.[3] Real options are generated when existing assets, resources or capabilities allow preferential access to subsequent investment opportunities, may they be immediately born out of the initial commitment or generated in the future (Bowman & Hurry, 1993).[4] The literature has revealed that those real investment options are economically valuable when investments are made under condition of considerable uncertainty and when they are (partial) irreversible, i.e. their initial pecuniary value cannot be fully recovered once in use (see, e.g. Clark, 1997; Wong, 2007, 2009; Xie, 2009). Given such a setting, it is well recognized that a real option perspective greatly advances the understanding of the economic logic behind the behavioral process of incremental resource commitments and market entry respectively.[5]

Kogut (1991) was among the first to apply this concept to the theory of foreign direct investment and JV initiation, in particular.[6] Hence, a JV can be understood as a call option that limits the downside risk of the firm while allowing managers to benefit from positive developments in the future once they materialize. Consequently, the termination of an IJV does not indicate its failure but the exploitation of its flexibility; results that have found great empirical support lately. For instance, Kogut (1991) and Folta and Miller (2002) find empirical evidence that uncertainty is an important driver in timing the partner buyout and terminating the JV in order to capitalize on the growth option.[7] In particular, buying out the partner is more likely the lower the initial equity stake which challenges classic findings that have so far predicted that most majority-owned JVs became wholly-owned subsidiary (WOS) later on (see, e.g. Gomes-Casseres, 1987). Moreover, the diffusion of the real option logic has advanced JV contract design by originating explicit buyout/divestment clauses (Chi & Seth, 2002). Surprisingly, however, the number of reported incidents of explicit option clauses in studies concerning JVs is almost negligible. Option-to-acquire clauses accounted only for 1% of the sample size and this fraction was almost constant over time (Reuer & Tong, 2005). This can be an indicator of the difficulties of management to determine a fair option premium especially because there are no closed form solutions like the Black–Scholes formula at present to value such complex investments.[8]

While these empirical studies are more concerned with the implications for outcome and performance respectively few have approached the real option features of JVs in terms of rigorous theoretical modeling. Pennings and Sleuwaegen (2004) design an option model where both the timing of market entry and the entry mode are determined simultaneously. The main focus lies on the timing decision whether to form a JV or a (WOS) which is impacted by transfer prices, amount of equity share, market structure, and the degree of governmental regulation. The transitional nature of JVs is, however, not addressed. Chi (2000) extents the setting of JV specific real option rights by implementing explicitly two termination options. Hence, the presented model is a first attempt to capture the transitional nature of JVs.[9] In addition, he assumes that continued collaboration lowers the degree of uncertainty in the partner's JV valuation. However, in his framework the impact of learning is only discussed in the context of

[1] For a comprehensive primer on the research on strategic alliances see e.g. Contractor and Lorange (1988) or Todeva and Knoke (2005).

[2] Instability may also arise due to reasons other than termination. Some scholars take on a process oriented perspective. Here, changes in the ownership structure, e.g. due to contractual renegotiation are viewed as sign of instability. For a detailed discussion see e.g. Reuer and Miller (1997).

[3] This has also facilitated a paradigm shift in the domain of JV research namely that the objective in governance choice is not motivated by minimizing transaction cost but maintaining flexibility.

[4] Put it differently, real option theory suggests viewing real investments as options that buy the firm the right to make investments later, the right to defer or alter the scale or to initiate subsequent investments. A detailed introduction to real options is given by Trigeorgis (1996) and Dixit and Pindyck (1994).

[5] Buckley and Casson (1998) have drawn the attention on this by arguing that the existing models are predominantly static in nature and value market entry decisions only with respect to their immediate effects rather than in terms of possible subsequent investment opportunities. Only recently, researchers have highlighted that these growth options are responsible for the ambiguous effect of uncertainty on foreign direct investment (see e.g. Gilroy & Lukas, 2006; Fisch, 2008). For a general discussion of the decision complexities and contingencies managers have to face in a cooperative venture see e.g. Tallman and Shenkar (1994).

[6] See also Kogut and Kulatilaka (1994a).

[7] See also Reuer and Leiblein (2000) and Dyer, Kale, and Singh (2004).

[8] See, e.g. Graham and Harvey (2001). For an overview on the obstacles to real option valuation in a management context see, e.g. Lander and Pinches (1998) and Miller and Shapira (2004).

[9] See also Chi and McGuire (1996).