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Adoption of new technology and joint venture instability

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Abstract

We consider a joint venture between a local firm from a less developed country, and a foreign multinational. In a dynamic two period model, we demonstrate that the availability of new technology can trigger a joint venture breakdown, a result that is consistent with the empirical evidence. We find that such breakdown is more likely if the MNC is relatively patient, or, in contrast to the existing literature, there is an increase in the level of demand. Moreover, our results are robust to alternative assumptions regarding bargaining power and control.

JEL Classification: F2; L1; O3

Keywords: Joint venture breakdown; Technology; Subsidiary; Bargaining; Control

1. Introduction

In the recent years, there has been a large increase in the number of international joint ventures (JVs). Joint ventures play an important role as a vehicle for bringing in foreign direct investment, something that is critical for improving the performance of the host country.[1] At the same time, however, joint ventures appear to be quite unstable (see Yan and Zeng, 1999, for a survey of this phenomenon). This has been documented by several authors, including Kogut (1989). Kogut

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[1] The role of foreign direct investment in enhancing the performance of domestic industries has been emphasized, among others, by Kippenberg (2005).

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(1989), for example, finds that out of a sample of 92 US-based JVs, about one-half had terminated their relationships by the sixth year. In the Indian context, Ghosh (1996) and Bhandari (1996–1997), among others, document cases of JV breakdown and instability in India. While there has been some recent works on joint venture instability, several aspects of this phenomena remain ill understood.

This paper is motivated by one such aspect of joint venture instability, the fact that such instability may be triggered by technological issues. Miller et al. (1996) point out that firms cite conflict over technology as one of the main reasons behind joint venture instability. Lyles (1988) reports that adoption of new technologies by joint ventures led to conflicts later. In Ghosh (1996), the MNC partners often open up subsidiaries to safe guard their new technologies. For example, Unilever did set up a wholly owned subsidiary even though it had controlling rights in Hindustan Lever. Even when subsidiaries are not actually opened, this may be used as a threat to renegotiate the joint venture contract. This indeed was the case in the joint venture between GEC and Alsthom (see, Ghosh, 1996).

Given the importance of joint ventures as an emerging form of business organization, we feel that this link between technology and joint venture instability deserves serious investigation. In this paper, we try to build a framework that is capable of modelling this link formally.

To this end we consider a dynamic two period model of joint venture between an MNC and a local firm from a less developed country (LDC). Joint venture formation involves synergy whereby the MNC supplies the technology, whereas the domestic firm supplies knowledge of local inputs. Since the MNC has better access to technology, whereas the LDC firm has better knowledge of local conditions, such synergy implies that the joint venture has lower production costs compared to either of the parent firms (see, for example, Miller et al., 1996). We also assume that there is organizational learning (see, e.g., Beamish and Inkpen, 1995; Hamel, 1991). Thus, once a new technology is adopted by the joint venture, the LDC firm can learn this technology quite quickly.

To begin with we assume that there is an existing joint venture. We then examine what happens if a new technology, that can be either adopted by the joint venture, or by the MNC in a new subsidiary, becomes available. In case the technology is adopted by the MNC in a new subsidiary, there is JV breakdown in the sense that the JV is competed out of the market.

We then provide a summary of our main results. We find that if the discount factor is large and the cost of acquiring the new technology is small, then the equilibrium outcome involves joint venture breakdown, i.e., subsidiary formation by the MNC. If, however, the cost of acquiring the new technology is at an intermediate level, then the new technology is likely to be adopted in the existing JV, whereas if it is high, then status quo is the likely outcome, i.e., the new technology is not adopted at all.

The intuition behind subsidiary formation is as follows. The efficient outcome is to bring the new technology to the joint venture. But in this case there is going to be one-sided learning, leading to the domestic firm appropriating all the surplus in the second period. The MNC, by subsidiary formation, can prevent this learning from taking place. Note that a higher discount factor increases the MNC's payoff from subsidiary formation. This, however, has no effect on the MNC's payoff from the joint venture, since the MNC gets no payoff in the second period. Hence, an increase in the discount factor makes subsidiary formation more attractive.

We then examine the robustness of our results to bargaining power and control. To this end we study two versions of the basic model, one where the MNC has control, but no bargaining power, and another where the MNC has bargaining power, but not control. We find that the incentive for JV breakdown does not depend on either factor. The intuition is as follows. Whether a JV breaks up or not depends on the MNC's payoff from subsidiary formation, and first period joint venture