

## **MORAL HAZARD IN INTERNATIONAL JOINT VENTURES**

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### **Abstract**

This paper studies the information asymmetries in IJVs due to different objectives and efforts induced in the course of the management of a joint enterprise. Even though the IJV is considered as a means of adding value to a joint product or production process, the tension in IJVs arises because of the self-interest of the players to make profits in their own firms and to work together with potential competitors. The analysis of the problem shows that an abstract model of moral hazard should lead to offering appropriate incentive schemes to prevent the players from cheating (embezzling, inducing a low effort into the joint enterprise or shirking). The moral hazard problem in an international co-operative setting was developed on the basis of a formal approach.

Keywords: International Joint Ventures, Hidden Action, Effort levels, Moral Hazard, Incentive schemes

## INTRODUCTION

Over the past three decades research on International Joint Ventures (IJV) has, more or less, focused on success factors, performance measures, stability and control issues based on qualitative and quantitative studies. The insights gained from exploring such a phenomenon showed its complexity and tension due to information asymmetries between the firms involved. These asymmetries can be derived from the players' geographical, corporate and cultural distance. International Joint Ventures (IJV) represent an inherently problematic organizational form. Designed as a hybrid of two firms from two countries, the strategic configuration implies tension between the parent firms and the IJV itself, which is set up with managers from both founding parties. In a comparatively simple case, the IJV is founded as a business with three players - the foreign firm, the local firm and the IJV.

Considering the tension between these firms, Osland and Cavusgil (1998) introduced a multiple-party approach to deal with the objectives and perceptions of all kind of managers involved in the IJV business, such as the manager of the local and the foreign firm as well as the local representative and the foreign expatriate in the IJV. The authors focused on US-China joint ventures and showed that it is important to seek information from all parties to joint venture. The authors found evidence of foreign parent companies not acting in the best interest of the IJV by selling components and materials to the IJV at high prices and local parents were interested in increasing worker productivity as to increase the dividends that they received from the IJV. Insights gained show that US parent company manager use more likely return on investment or internal rate of return, while Chinese parent company managers focus on dividends or dividends plus taxes. Since the short-term perspective on profit of Chinese parent firms triggers a different approach of US IJV directors towards managing the IJV.

Thus, the objectives of each managerial group differ and the outcome of the joint venture depends on the proneness to co-operate.

To predict behavior in a multiple party decision making scenario, it is advisable to use the empirical insights gained over the past decades as a starting point and to develop an abstract tool of reasoning in order to predict future behavior. Based on a game-theoretical framework, the paper deals with the special application of moral hazard problems to the organizational design of an IJV.

### **THEORETICAL UNDERPINNING**

Information asymmetries and uncertainties in general are part of the international joint venture management process. It can be stated that this issue has been addressed by various disciplines. This paper uses therefore a formal approach. The focus lies on the game theoretical development and its applications in economic theory (Fudenberg and Tirole, 1991; Myerson, 1991; Rasmusen, 1995). Therefore, the theoretical underpinning is based on the seminal work of Harsanyi (1968), which can be seen as the introduction to information economics such as problems of adverse selection, signalling and moral hazard (Guesnerie and Laffont, 1984; Macho-Stadler and Perez-Castrillo, 1997; Myerson, 1981). This brief overview on robust theoretical frameworks shows the bridge between the early days of game theory and modern economic theory, especially information economics. Since international business can be considered as a hybrid of economics and management, it might be worth to derive methods from tools based on a well-established discipline and apply it to real life problems in international business. The advantage of such a procedure lies in gaining insights about the mechanism on an abstract level and finding solutions for managerial issues.

The IJV-literature in mainstream international business journals itself did not focus on these topics, though the problem of performance verifiability occurs in all major articles of this stream of literature. Besides the article of Woodcock and Geringer (1995), there could not be found a body of research dealing with agency problems in the IJV literature and even further it did not really lead to a formal or theoretical discussion in the international business literature. For this reason, the following section will stress the impact of principal-agent relationships in equity IJVs. This article introduces a formal framework to problems in an IJV. This paper therefore addresses the moral hazard problem in the case of an IJV in which the parent-principals offer the IJV-management-agent an incentive scheme.

### **THE PROBLEM**

Given the different objectives of the reference groups mentioned above, we have to consider a moral hazard case for the managers. Suppose we have the crucial three player (manager) setting in which the manager of the local firm  $P_{Loc}$ , the manager of the foreign firm  $P_{For}$  and the manager of the IJV called  $A_{IJV}$  are related to each other in a multi-person decision making scenario. Thus, the incentives offered should consider the information asymmetries occurring because of the different background of corporate culture. The objectives would be different and the tension in the IJV could be strengthened or weakened.

Under the assumption that the local parent contributes market knowledge, market entry and marketing channels, the local firm wants an optimal level of effort from his representative, but also from the other parent's agent. The foreign firm is supposed to provide technology, financial resources or, in general, management knowledge. Both partners have complementary skills and the outcome of the joint enterprise should be besides shares of the profit, returns on investment or equity as well as a learning process with respect to the skills

gained through the IJV. For this reason, the principals want the agent to extract an appropriate effort to the tasks involved. The local firm has to offer the IJV-management a contract, which induces the agent to put in this project the optimal level of his technical skills. Complementary, the foreign parent has to offer incentives with respect to the level of market knowledge or marketing skills. To enhance mutual truth-telling mechanisms, the contracts need to be incentive compatible and individually rational. Let the output  $q$  of the joint enterprise be either  $q_{Loc}(e)$  or  $q_{For}(e)$ , which means the parents expect a technological output and an output in sales terms dependent on the relevant efforts. The agent can embezzle by using his own skills not to the optimal extent, since he is only interested in gaining the other player's capabilities. The agent contributing technological know-how providing only a low level of effort, but trying to gain market access, knowledge or even marketing skills. The aim could be to derive a better position in the parent's enterprise after the termination of the IJV. Sometimes, the parents connect their representative's efforts to promotion in the firm after finishing the IJV, especially in projects with determined endgame cases. The agent could learn the technological know-how or managerial skills of the partner by providing a low level of effort himself. This case of embezzling could occur in situations in which monitoring is difficult. The hybrid of an IJV shows in those cases the difficulties to manage co-operation and conflict.

The agent has to report to the parents about managerial and technological details of the project. Since 'hard' information can be controlled easily, the incentives should be targeted to cover truth-telling with regards to the soft information involved, too. In this case, 'soft' information can comprise information about quality of the production process and the product as well as the marketing efforts.

Incentive schemes can have fixed components as well as variable elements dependent on the output, profit, market share, and may either cover money rewards and punishment or even property rights (management buy-outs), promotion, royalties, salary increments. In the following chapters, the information economics approach leads to a framework for offering contracts in an IJV under moral hazard.

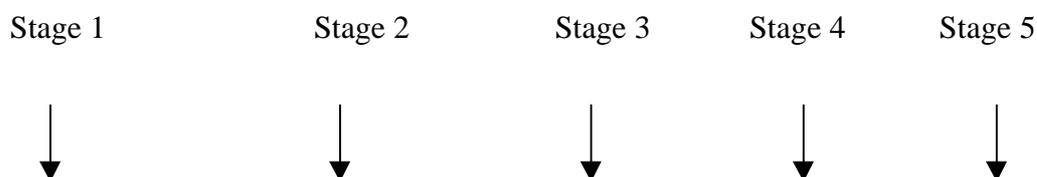
## TIMING

Consider now the management of an IJV as the agent,  $A_{IJV}$ , the parents will be called principals and get the notation  $P_{Loc}$  and  $P_{For}$  to distinguish between the foreign and local firm. The following order of the play shows the general game theoretical structure of the above-mentioned archetypes and it introduces the players, the plan of actions and the payoffs on an abstract level. Since the different cases have special features, the conceptualization of the IJV common agency problem provides a tool of analysis.

*Order of the play:*

- (1) The principal  $P_{Loc}$  and  $P_{For}$  offers a menu of contracts to the agent.
- (2) The agent may either accept or reject one of the contracts or both.
- (3) The agent will choose his effort level either shirk or do not shirk.
- (4) Nature picks the state of the world to be success or failure with a certain probability.

Figure 1: Moral hazard problems in an IJV - the agent's action is not verifiable



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$P_{Loc}$ and $P_{For}$ offer contracts either co-operatively or non-cooperatively	$A_{IJV}$ accepts or rejects both or one of each principal	$A_{IJV}$ supplies non-verifiable effort	Nature determines the state of the world	Outcome and payoffs
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In the moral hazard problem the players have the same information when the relationship is established, and the informational asymmetry arises from the fact that, once the contract has been signed, the principal cannot observe (or cannot verify) the action (or the effort) of the agent, or at least, the principal cannot perfectly control the action.

Stage 1. The parents or principals can either choose whether they want to offer a cooperative incentive scheme or individual contracts non-co-operatively. Since both principals pursue different objectives, we assume that they offer separately.

Stage 2. There exists an agent who is the management of the international joint venture with the notation  $A_{IJV}$ . This management has special knowledge about the cost structure and other managerial details in the IJV itself. Thus, the principals' offer should be either accepted or rejected.

Stage 3. The agent supplies the non-verifiable effort.

Stage 4. The game needs at that stage a dummy player to cover uncertainty about the failure and success. Thus, the game theoretical player 'Nature' is introduced which means that with a certain probability due to the agent's behavior the state of the world (joint venture) could either be success or failure. In the last stage the payoffs will be determined.

Stage 5. The outcome and pay-offs of the players are determined. Since the timing reflects a game tree, the backward induction of the game starts with the final stage.

The game theoretical solution concepts are based on backward induction, which implies that the reasoning starts considering the last stage first and going backwards through the game tree (timing).

Some moral hazard problems arise when the agent, before carrying out the effort for which he has been contracted, observes the result of Nature's decision but the principal does not. All players have the same uncertainty when the contract is signed, but before the actual contracted action is taken, the agent will have some sort of informational advantage by privately observing a relevant variable. This might occur as well in an IJV, especially when dealing in unknown local markets and the agent gets information which might alter the action profile. Stage 3 and 4 of the above-mentioned timing have to be exchanged in that case.

### **MECHANISM DESIGN IN IJVS**

Designing a mechanism for the special management process in an IJV, it was, therefore, the first step to show the timing of the play. The formal framework is a representation of the previous section.

Suppose now that there are two principals,  $P_{Loc}$  and  $P_{For}$ . Principal  $i$ ,  $i = P_{Loc}, P_{For}$  is interested in decision  $c_i$  and has utility

$$U_i = V_i(c, t) - I \tag{1}$$

$$U_{\text{For}} = V_{\text{For}}(c, t) - I$$

$$U_{\text{Loc}} = V_{\text{Loc}}(c, t) - I$$

The agent  $A_{IJV}$  has the utility

$$U_{A_{IJV}} = V_{A_{IJV}}(c_{\text{PLoc}}, c_{\text{PFor}}, t) + I_{\text{PLoc}} + I_{\text{PFor}} \quad (2)$$

A Nash equilibrium in contracts is a pair of incentives either dependent on the decisions of the players ( $P_{\text{Loc}}$  and  $P_{\text{For}}$ )

$$\{I_{\text{PLoc}}(c_{\text{PLoc}}), I_{\text{PFor}}(c_{\text{PFor}})\} \quad (3)$$

or dependent on the decisions of the players under the condition of the reported types

$$\{(I_{\text{PLoc}}(t_{IJV}), c_{\text{PLoc}}(t_{IJV})), (I_{\text{PFor}}(t_{IJV}), c_{\text{PFor}}(t_{IJV}))\} \quad (4)$$

where  $t_i$  is the agent's announcement of type to principal  $i$ , such that each principal maximizes the expected payoff, given the other principal's contract and the agent's optimal reaction to contract offers. Principal  $i$  observes only the report  $t_i$  or the decision  $d_i$  meant for him. In the next section the solution concepts are based on the moral hazard models with discrete and continuous types (Macho-Stadler and Perez-Castrillo, 1997).

Let us now look at the two ways of dealing with efforts (the decision in the above-mentioned abstract framework) in a moral hazard setting: discrete and continuous efforts. The former distinguishes between high and low efforts in general, whereas the latter considers efforts as values between 0 and 1 or  $e \in [0,1]$ . Applying our framework to IJVs we could, furthermore, assume that the discrete types of effort are used for the relationship between the principals and the local representative and continuous types for the foreign expatriate's level of effort. This means that local knowledge and the efforts induced by the hosts can be seen as high or low and the foreign part's technological contribution as continuous, which might better reflect a

real life setting. For the scope of the paper, it is assumed that the difficulty to observe efforts lies in the local setting due to geographical distance between the parents. The foreign parent will therefore offer incentives for the local agent manager to induce a high effort. The case of inducing the foreign agent to induce a high effort in technological terms could be studied in a separate paper.

### *The General Model with Discrete Types of Effort*

Taking a simple moral hazard model into account, we assume that effort can only take two possible values  $e \in \{e^H, e^L\}$ . A high level of effort means that the IJV management works hard, while a low level of effort means the agent is lazy or slacking. Thus, the disutility of effort is higher when the agent works hard  $v(e^H) > v(e^L)$ . Let  $p_i^H = p_i(e^H)$  be the probability that the result will be  $q_i$  when the agent offers high effort, for all  $i \in \{1, 2, \dots, n\}$ , since the set of results is ordered from worst to best  $q_1 < q_2 < \dots < q_n$ . Let  $p_i^L = p_i(e^L)$  be the probability for cases in which the agent offers a low level of effort. For all results these probabilities are greater than zero. The principal prefers high effort to low effort. If the principal demands high effort  $e^H$  (which will be the case when  $q_i$  is large for large  $i$ ), the problem becomes interesting since any fixed payment would only get the agent to choose  $e^L$ . Thus, the principal needs to offer a contract under which his pay-off depends on the final result. The incentive compatibility constraint is, therefore, the following:

$$\sum_{i=1}^n p_i^H u(I(q_i)) - v(e^H) \geq \sum_{i=1}^n p_i^L u(I(q_i)) - v(e^L) \text{ which can be rewritten as:} \quad (5)$$

$$\sum_{i=1}^n [p_i^H - p_i^L] u(I(q_i)) \geq v(e^H) - v(e^L) \quad (6)$$

Thus, if the expected utility gain associated with high effort is greater than the implied costs, the agent will choose  $e^H$ .

The principal must solve the problem to get the agent choose a high effort in the optimal contract:

$$\max_{\{w(q)\}} \sum_{i=1}^n p_i^H [q_i - I(q_i)] \quad (7)$$

$$\text{s.t. } \sum_{i=1}^n p_i^H u(I(q_i)) - v(e^H) \geq \underline{U} \quad (8)$$

$$\sum_{i=1}^n [p_i^H - p_i^L] u(I(q_i)) \geq v(e^H) - v(e^L) \quad (9)$$

The Lagrangian for this problem is:

$$Z = \sum_{i=1}^n p_i^H [q_i - I(q_i)] + \mathbf{I} \left[ \sum_{i=1}^n p_i^H u(I(q_i)) - v(e^H) - \underline{U} \right] + \mathbf{m} \left[ \sum_{i=1}^n [p_i^H - p_i^L] u(I(q_i)) - v(e^H) + v(e^L) \right]. \quad (10)$$

$$\frac{\partial Z}{\partial I(q_i)} = -p_i^H + \mathbf{I} p_i^H u'(I(q_i)) + \mathbf{m} [p_i^H - p_i^L] u'(I(q_i)) = 0 \quad \forall i = 1, \dots, n. \quad (11)$$

We get the following relationship:

$$\frac{p_i^H}{u'(I(q_i))} = \mathbf{l}p_i^H + \mathbf{m}[p_i^H - p_i^L] \quad \forall i = 1, \dots, n. \quad (12)$$

$$\frac{1}{u'(I(q_i))} = \mathbf{l} + \mathbf{m}\left(1 - \frac{p_i^L}{p_i^H}\right) \quad (13)$$

The result implies that the participation constraint binds and the multiplier  $\mathbf{m}$  related to the incentive compatibility constraint must be non-negative.

## CONCLUSION

The intention of this paper was to show the tension in an IJV setting of multi-person decision-making. This approach considered information asymmetries based on the distance of the players either in geographic, corporate or cultural terms. The complexities of the IJV were analyzed and related to a variety of groups being present in an IJV. Thus, the literature should focus much more on solving complex strategic issues than to list factors and motives of founding IJVs.

Firstly, the paper showed the importance of using an abstract approach towards the complexities of the IJV. The problem of different parent strategies in combination with the IJV management strategies was embedded in information economics. The theoretical tools applied in the paper were introduced and the incentive theoretical perspective was related to earlier literature.

Secondly, the problem was analyzed and the link between the real life scenario and the theoretical framework was developed.

Thirdly, the formalization of the problem showed the game theoretical nature of an. Thus, the timing of the game indicated towards the inherent structure of the play and the IJV complexity. It was important to show the order of the play to provide the reasoning for the mechanism design. This lead to the development of the formal solution concept.

Finally, the core situation of hidden action and the problem of free-riding on the partner's ability and effort by providing a low effort oneself could be linked to the players and incentive schemes were developed to induce truth-telling. The optimal contracts showed the importance of incentive contracts in which the induced effort was important.

Further research has to be considered in the sense of appropriate incentive schemes for the different cultures and the sensitivity to consider special treatment in a culturally diverse setting. The refinement of the problem might need to deal with multitask in a discrete effort space and multiagent scenarios, too. Further research should furthermore consider formal models in the international business literature.

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