Explaining equity shares in international joint ventures: Combining the influence of asset characteristics, culture and institutional differences

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\textbf{A B S T R A C T}

This paper investigates the determinants of the observed contracted equity share ownership structure in international joint ventures (IJVs). We propose that the inherent intangibility of the assets that partner’s contribute to the IJV, and both formal (legal) and informal (cultural) institutional differences between partners contribute to explaining the negotiated division of the IJV’s equity share. Empirical results from 442 UK-based home-foreign IJVs, indicate that an IJV partner’s equity share ownership is positively correlated with the intangibility of the assets they contribute to the IJV relative to those of the second partner. Both cultural and formal institutional differences exert a moderating influence on the observed asset intangibility-equity share relationship for the foreign IJV partner. We attribute this finding to both risk perceptions and the liability of foreignness.

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1. Introduction

International business scholarship pays significant attention to the factors determining both the formation and subsequent performance of international joint ventures (IJVs). A large literature investigates the considerations influencing the formation of IJVs in preference to other cross border modalities for market entry and development (Kogut and Singh, 1988; Barkema et al., 1996; Hennart and Larimo, 1998; Brothters, 2002, 2013; Brothters et al., 2008; Jandik and Kali, 2009; Meyer et al., 2009; Slangen and Van Tulder, 2009; Demirbag et al., 2010; Georgieva et al., 2012; Maekelburger et al., 2012). Related literature studies those factors at play in partner selection, adopting a relationship management focus towards resolving incomplete contracting problems and mitigating the risks entailed in IJV undertakings (Beamish and Banks, 1987; Madhok, 2006; Bierly and Gallagher, 2007; Yung-Chul, 2008; Gulati et al., 2009). Other studies specifically consider those variables which are influential in determining the performance of IJVs and other forms of alliance (Lavie and Miller, 2008; Merchant, 2005; Lu and Hebert, 2005; Malhotraa et al., 2011).

One aspect of IJVs receiving only limited research attention to date relates to the factors that influence the terms of the initial IJV contract itself, in particular the contracted distribution of equity share ownership negotiated by the partners at IJV formation. This issue is of critical importance issue, as the allocation of equity ownership in the IJV has significant consequences both for the venture’s governance and subsequent implementation of the overall strategic objectives of the partnership. To summarise our position, we conjecture that the distribution of share ownership is likely to be influenced by two types of factor. The first set is internal to the IJV, namely the characteristics of the assets that a partner contributes to the IJV, in particular the degree of asset intangibility. This line of reasoning is informed by the measurement branch of property right theory, and argues that the partner whose asset contribution is responsible for engendering the greatest amount of variability in the IJV’s overall productive performance, will own a larger share of the equity capital. The fact equity is a residual claim, endows it with many of the properties of collateral, as the value of the claim is forfeited in the event the IJV is unsuccessful. The partner who contracts to own a larger share of equity capital, whose value is foregone if the IJV is unsuccessful, is therefore providing a form of performance guarantee to their collaborating partner. The subsequent argument in this paper proposes intangible assets inherently contribute more to the partnership’s performance variability than more generic assets, so the optimal contractual structure allocates a greater share of the equity to the partner providing more of the former class of assets. If the value contributed by a collaborating partner’s assets to the IJVs performance is more easily measured and monitored, this reduces the need for that partner to provide a performance guarantee (Foss and Foss, 2005; Barzel, 1982; Kim and Mahoney, 2005; Chi, 1996; Hart and Moore, 1990). We also maintain that the equity shares negotiated by the IJV partners are influenced by a second set of factors that are external to the IJV, and encapsulate a specifically international dimension of the relationship. These factors reflect how both formal (rule-based) and informal (cultural) institutional differences between the partners’ respective home jurisdictions affect perceptions of risk and vulnerability to opportunism when collaborating through equity sharing ownership arrangements.

The internal dimensions inherent in this conceptual framework underpinning the determinants of equity share ownership are grounded in the notion of the guarantee function of equity capital, and apply equally to both domestic and international JVs. The external determinants of share ownership in an IJV collaboration are those influenced by the perceived risks related to differences in partner nationalities and cultural characteristics (Yamin and Goleasorkhi, 2010) and as such, apply only to IJVs. When the IJV is located in the home market of one of the partners, as represented by the 442 UK-based ‘home-foreign’ IJVs analysed in this paper, it is logical to infer that the institutional differences between countries may have an asymmetric effect, acting to the disadvantage of the foreign partner by enhancing both their perceived risks and relative monitoring costs. This perspective accords

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3 In this paper, we do not address the partner selection issue, per se, but develop a conceptual framework that specifically addresses the determinants of the ownership structure of an IJV, as manifest in the contracted division of equity share ownership between collaborating partners. Our perspective, therefore, complements prior literature that focuses on the importance of partner selection and relationship building in managing IJVs.
Fig. 1. Illustrates the key hypotheses of this paper. Increasing the relative foreign/home partner’s asset intangibility ratio increases the foreign partner’s propensity to own a higher equity ownership share. The strength of this relationship is negatively (−) moderated by the effect of both formal and informal (cultural) institutional differences.

with the emergent consensus in the literature on the liability of foreignness (Hymer, 1976; Slangen and Beugelsdijk, 2010; Zaheer, 1995; Sethi and Judge, 2009). Precisely how the liability of foreignness shapes the asymmetric distribution of monitoring costs in the IJV relationship depends on the perspective chosen to depict the key elements in national differences. The institutional economics encompassed by the distinct (but related) concepts of formal and informal institutional differences appears to be a relevant analytical lens through which to trace the impact of these liabilities faced by the foreign IJV partners (Henisz and Williams, 1999; Williamson, 1985, 2000; Henisz, 2000; North, 1990, 2005).

As noted above, all the IJVs whose initial contracted equity share allocation we empirically investigate are based in the UK and all have a UK partner. To facilitate clarity of exposition, the narrative in the analysis adopts the perspective of the foreign rather than the home (UK) IJV partner. We investigate the influences of both IJV partners' contributed asset characteristics and various proposed measures of the institutional differences between the UK and the foreign partner’s home country in the determination of the initial contracted equity shares.4

The central contribution of this paper to the literature is to enhance our understanding of how the characteristics of the assets contributed to international collaborations interact with formal and cultural dimensions of country level institutional differences in determining the nature of contracting structures in international business relationships. This is undertaken by means of an empirical examination of negotiated IJV contracts to ascertain how such differences may serve to moderate the effect of relative asset intangibility as determinants of the foreign partner’s equity share capital. In the process, the analysis also complements existing literature which identifies these specific factors as critical in determining foreign entry mode choice and partner selection,5 as well as augmenting the limited evidence which addresses the determination of equity share distribution in IJVs (Chadee and Qiu, 2001; Pan, 1996, 2002; Blodgett, 1991). In the process, the paper thereby extends the domain of influence of the concept of institutional difference, both formal and informal, to the structure of negotiated contractual arrangements in international business (Fig. 1).6

4 The analysis acknowledges the possibility that the initial distribution of IJV shares may also depends upon the existence of prior business relationships between the partners. For example, if the partners have previously gained a measure of mutual trust vis-à-vis one another, this may mediate the impact of asset characteristics on equity shares distribution in the IJV. See footnote 6. Indeed, we attempted to capture trust through ascertaining if there had been any prior long-lasting contractual relations between the IJV partners prior to the establishment of the current IJV, but data limitations precluded us constructing any such measure. This is an important area in which to extend this analysis.

5 A selected sample of relevant literature is cited in the opening paragraph of the paper’s introduction.

6 Note that Yamin and Golesorkhi (2010) focus on the influence of cultural distance. To the extent that reciprocal trust relationships are easier to establish when informal institutional differences between the parties are less (a reflection of the fact that the presence of shared norms and values facilitates trust building) then trust (see footnote 4) will also be imperfectly correlated with this variable.
The remainder of the paper proceeds as follows. Section 2 provides a theoretical discussion of measurement costs and the guarantee role of equity capital in JVs. It outlines why relative asset intangibility and institutional differences impact on the equity capital share ownership, and formulates the related testable hypotheses from the perspective of the foreign IJV partner. Section 3 discusses the sample and data sources, clarifies the empirical methodology and presents the empirical proxies utilised to measure the relative intangibility of assets and other firm-level control variables that may influence IJV partner’s equity shares. The empirical results are evaluated in Sections 4 and 5 briefly concludes.

2. Determinants of IJV equity shares: theoretical background and hypotheses development

This section proposes an explanation of the determinants of the negotiated distribution of equity shares in JVs by synthesizing the findings emerging from two strands of research literature. The first focuses upon the role of equity capital as a performance guarantee. The requirement for collateral provision arises from the inability of the joint venture partners’ to devise complete ex ante contracts specifying and enforcing property rights over the productive contributions of intangible assets. We emphasize from the outset that this element of the proposed framework applies equally to domestic and international JVs. The second element in our conceptual framework is specific to international JVs (IJVs), and is built around the notion of the liability of foreignness. This refers to the vulnerability of the foreign partner to the risk of opportunism on the part of the home partner, arising from the foreign partner’s relative lack of familiarity with the formal institutional norms and cultural practices governing business activity within the IJV ‘host’ country. Such vulnerability has been shown to constitute a significant liability faced by foreign firms in international business collaborations. We conjecture that this will reduce the foreign partner’s willingness to commit equity capital to the joint venture.

2.1. Measurement costs and the guarantee function of equity capital in joint ventures

Buckley and Casson (1988) among others, maintain that each partner in a joint venture has an inalienable de facto right to pursue their own interests at the other partner’s expense. Similarly, Barzel (2005) contends that joint ventures are characterised by a ‘double-sided’ moral hazard, with each party liable to be opportunistically exploited by their partner. The potential for such opportunism exists throughout the lifetime of a joint venture collaboration. However, at the initial contract negotiation stage, the time period that constitutes the focus of the present analysis, a major potential for such behaviour arises from the presence of measurement costs.

Measurement costs are a pervasive feature of all transactions, and arise from a lack of homogeneity inherent in virtually all goods and productive services implying that no two units of the “same” product will perform in an identical way (Akerlof, 1970; Barzel, 1997, 1982; Hart, 2001; Hart and Moore, 1990). Barzel’s (1982) analysis demonstrates that differences in the valuation of various units of ostensibly homogeneous goods and services are a property right of the seller (owner) of the product, who may nevertheless choose to put such value in the public domain, either by engaging in a transaction or by means of a collaborative arrangement such as a joint venture. Drawing upon property rights theory, we maintain that certain characteristics of the assets that a partner contributes to a joint venture, in particular their intangibility, make such assets inherently susceptible to encountering problems when attempting to measure the assets’ value-enhancing productive contribution to the joint venture partnership. Anticipation of these subsequent difficulties by the contracting partners will have implications for the outcome of the initial negotiations which establish the terms of the collaboration.

Prior literature analysing this relationship between the intangibility of the assets involved in collaborative corporate arrangements, such as joint ventures, and the firm’s initial organisational governance and subsequent economic performance, is rooted in several schools of thought, notably transaction cost economics and the resource-based perspective on the firm (Barney, 1991; Tsang, 2000; Ainuddin et al., 2007). The contribution to a firm’s profitability provided by intangible assets, such as R&D, brand names and other reputational investments are inherently difficult for third parties to measure and
evaluate. These assets are often specifically tailored to the firm’s strategy and technology, and are less adaptable or re-deployable to other uses compared to more general purpose assets (Vicente-Lorente, 2001). Moreover, their nature implies that property rights to such assets are not easily transferred. Indeed, secondary markets for intangible assets may not exist, compounding the difficulties associated with independent, market-based verification of their value at the initial contract negotiation stage.\(^7\)

To illustrate, if one IJV partner contributes intangible assets to the IJV’s operation (e.g. technological, research or marketing knowledge), while the other provides more generic resources (e.g. standardised equipment, generic technologies and resources) then the former partner’s contribution will be likely to lead to higher levels of measurement and monitoring costs than the latter’s. As IJV, partners share the costs of non-performance, the partner contributing the assets whose productive contribution is more difficult to measure, may have an incentive to act opportunistically by reducing their effort or provide insufficient monitoring of inputs, relative to a situation in which they are the sole owner of the venture.

The intangibility of assets employed in a transaction has a significant impact on the efficiency of alternative governance structures which mediate productive collaborations (Williamson, 1991; Hennart, 1994). Clearly, the informational requirements and measurement costs associated with one potential solution, relying on complete ex ante contracting, are likely to be prohibitive in the present context (Jensen and Meckling, 1976; Luo and Tan, 2003). Such a contract would need to provide a mutually agreed mechanism for reciprocal monitoring with respect to behaviour germane to enhancing joint venture performance. Thus, the task of designing and implementing such a contract is daunting, being particularly subject to problems arising from bounded rationality, asymmetric information and costs of enforcement (Williamson, 1979; Hart, 1995).

On the basis that complete ex ante contracting is not feasible, the joint venture partners’ initial contractual commitment provides a mechanism for allocating rights to residual income (cash flow rights) in accordance with a negotiated share of the equity capital (Teece, 1992). What major determinants should underpin the allocation of partner equity shares? Insights derived from contract theory (Barzel, 1982; Hart, 1995; Grossman and Hart, 1986; Hart and Moore, 1990) demonstrate that in the presence of costly measurement of asset characteristics, the efficient contractual structure which emerges assigns equity share capital to the partner’s in proportion to the impact of their respective assets’ contribution to the variability of the joint venture’s output. Such an allocation of output (payoff) variability is shown to maximise the expected value of the resulting contract.\(^8\)

This designated assignment of residual income (cash flow rights) by means of contracted equity shares, constitutes the optimal way to align joint production incentives and mitigate opportunism by the partners’ in equity joint ventures (Barzel and Suen, 1997). Thus, equity share ownership in the joint venture is equivalent to posting collateral or providing a performance guarantee. As cash flow rights become worthless if the venture fails, allocating such rights in proportion to the ability of the partners to affect the success of the collaboration enhances the partners’ commitment to the venture.

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\(^7\) Intangible assets can be separated into opaque and certain specific asset classes (importantly, not all specific assets are intangible). The productive contribution of opaque resources may arise from complex and ambiguous processes that are difficult, even for insiders, to identify. In the case of opaque assets both the valuation and transfer of such assets is problematic. Contracting difficulties arise both as a result of the difficulties in communicating the relevant information and in third-parties being able to verify the contribution of these resources in the event of dispute. The contracting problems, such as the potential for hold-up, arising from the existence of specific assets are well documented, and alternative resolutions, such as vertical integration, have been extensively discussed (e.g. Williamson, 1985). For a more recent treatment see Maekelburger et al. (2012).

\(^8\) Moreover, such an ‘allocation of variability’ assumes different forms depending on the type of exchange or transaction under consideration. For example, in market transactions between firms as sellers and households as buyers, a seller’s proactive contractual guarantee of the future performance of a durable product is a common feature of market exchanges. Akerlof’s (1970) celebrated discussion of the market for ‘Lemons’ reflects one manifestation of measurement costs arising from informational asymmetry (adverse selection) between buyers and sellers with regard to pre-purchase quality of second-hand goods; ex ante, buyers know less about product quality than sellers. As market prices reflect the average (expected) quality of the available goods, sellers with higher quality items withdraw their goods from the market leading prices to fall further. This process continues until only the lowest quality goods are available, leading to market failure. Interestingly, guarantees are proposed as one potential resolution to this problem.
In the context of the previous discussion, it follows that in order to persuade a potential partner with the more generic assets to commit resources to a joint venture, the partner with the relatively more intangible (higher measurement cost) assets may be required to guarantee their own value-enhancing productive efforts. This is undertaken by the latter partner contracting to provide a larger share of the equity capital investment thereby credibly committing to making their income dependent on the resulting payoff from the venture, and more effectively aligning their incentives to those of the joint collaboration. The contracted distribution of equity shares is determined in response to constraining opportunism through the appropriate allocation of residual rights to income.

As noted earlier, the framework underpinning the analysis to this point applies equally to all joint venture collaborations, domestic or international, irrespective of the nationality of the partners. The subsequent empirical analysis undertaken in the paper examines data from a sample of home-foreign IJVs based in the UK. On the basis of the sample’s composition, we choose to state all our hypotheses from the perspective of the foreign IJV partner. The preceding discussion leads naturally to the first hypothesis, H1, namely:

**H1.** The more intangible the asset contributions of the foreign partner, relative to those of the home partner, the higher the likelihood that the foreign partner will initially contract to own a larger share of the equity capital in the IJV.

The following section introduces an explicitly international dimension to the analysis, which complements the factors underpinning H1. This is undertaken by incorporating additional elements relating to cultural and institutional differences between joint venture partners collaborating across national jurisdictions. As such, the emergent hypotheses in Section 2.2 are relevant only in the context of IJV collaborations.

### 2.2. The international dimension: introducing institutional and cultural differences

#### 2.2.1. Formal institutional differences

An important issue confronting partners in IJV collaborations, particularly the foreign partner, is the extent to which their ability to influence the strategic direction of the collaboration may be impacted by the institutional context of the IJV’s host country. We conjecture that differences in institutional environments between the home and foreign partner’s domiciles may represent an important influence on the contracted equity share ownership of IJV partners with both direct and moderating effects. Nations possess unique institutional environments that include formal and informal constraints on human and organizational behaviour (Scott, 1995). Formal institutions, encompassing regulation, financial and legal systems, establish the rules by which economic actors interact when negotiating and formalising contracts (North, 1990). When investing in an IJV, foreign partners will face additional risks arising from perceived barriers to learning and monitoring difficulties in the context of assessing the market conditions in the venture’s host country location. Increasingly unfamiliar formal institutional environments lead to higher information asymmetries, to a lower propensity to build trust, and to higher transaction and coordination costs between IJV partners (Mahoney, 1992). If the home partner’s organizational structure is designed to accommodate very different formal institution (local rules such as labour market regulations), then their asset’s contribution to the IJV may offer less value to the foreign partner because of higher associated costs of restructuring and adaptation (Kostova and Roth, 2002). Formal institutional differences increase the costs that the foreign partner anticipates incurring to monitor the contribution of the home partner’s assets to the profitability of the IJV and the provision of a stable business environment.9

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9 Note that this paper’s perspective eliminates the need to invoke any ad hoc value judgements as to whether institutional quality in the host or foreign country can be claimed to be “superior” in any sense. We remain firmly agnostic as to the merits of such claims, which as the 2008 financial crisis illustrates, are clearly contestable. The analysis follows insights obtained from extant literature in correlating increase in foreign partner’s contracted risk directly with the extent of institutional distance between themselves and the host (UK) partner. The analysis follows the conclusions of extant literature in correlating increase in foreign partner’s contracted risk directly with the extent of institutional distance between themselves and the host (UK) partner.
In the context of home-foreign IJVs, formal institutional differences is a major liability faced by the foreign partner, arising from their relative lack of familiarity with 'host' country institutions. In turn, this imposes greater monitoring costs (Hymer, 1976; Rangan, 2000). The incidence of vulnerability stemming from formal institutional differences is, therefore, asymmetrically distributed as, *ceteris paribus*, the foreign partner is likely to exhibit greater dependence on the home partner rather than *vice versa* in terms of managing the IJV's interactions with the institutional, business and regulatory networks in the host country location.

In considering the influence of relative asset intangibility deployed in IJV on the foreign partner's equity share, as predicted in hypothesis H1, the impact of increasing formal institutional differences is likely to mitigate the share ownership of the foreign partner, for a given level of relative asset intangibility. Such mitigation arises from two sources. First, it generates an increase in the foreign partner's costs of learning, monitoring and environmental adaptation, which reduces their willingness to hold residual claims in the IJV. Second, given the asymmetry in the distribution of such costs (and associated risks) there is a need for the home partner to enhance their guarantee not to behave opportunistically, by increasing the amount of equity capital they hold. This perspective is summarized in hypothesis H2 which maintains:

**H2.** The positive relationship exhibited between the relative intangibility of the foreign partner's assets and the foreign partner's equity share ownership in the IJV will become weaker as the formal institutional differences between the home and foreign partner increase.

### 2.2.2. Culture and informal institutions

Informal institutions include factors such as societal culture, which are responsible for creating differences across nations in human and organisational cognition, perception, mental models, patterns of behaviour and belief systems (North, 1990, 2005; Hofstede et al., 1990). Informal institutions influence attitudes to work, perceptions of organisational purpose, and approaches to problem solving and conflict resolution that may introduce important barriers to cooperation between IJV partners from different informal institutional environments (Wang et al., 2005). The notion of informal institutions encompasses culture as operationalised by Hofstede (2001), Schwartz (1994) and others (Hofstede et al., 2002; Peng, 2003). Informal rules strongly influence the economic behaviour of IJV partners because they moderate, for instance, the transfer and management of knowledge between collaborating partners (Michailova and Hutchings, 2006). Informal institutions give rise to tacit and elusive differences between IJV partners (Boyacigiller et al., 2004). Such differences are difficult to fully perceive and recognise, and impact upon knowledge sharing, creating barriers in interpreting and understanding the exact contribution of certain resources to the performance of the IJV. Therefore, as Kaufmann and O'Neill (2007) and Yamin and Goesorkhi (2010) suggest, if managers understand and anticipate the implementation problems stemming from inappropriate transfer of practices and knowledge between IJV partners caused by informal institutional differences, this will influence the foreign partner's preference with respect to their equity share in the IJV, making them less willing to contribute equity capital to the venture.

Indeed, the negative influence of informal institutional and cultural differences on the equity shareholding of the foreign partner is an additional vulnerability that affects the ability to combine and leverage such resources as intangible assets contributed to IJV (Harrison et al., 2001). In the context of home-foreign IJVs, we contend greater informal institutional and cultural differences between partners enhances the difficulties associated with cooperating due to an increased perceived threat of opportunism, and/or higher costs of accessing and assessing information on the part of the foreign partner (Björkman et al., 2007; Kostova and Zaheer, 1999). Overall, these considerations suggest hypothesis H3, namely:

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10 In a similar vein to H2, in formulating H3 the contention is that it is the measured extent of the cultural difference between the partners which is critical in this context. This eliminates the need to make contentious value judgements.
H3. The positive relationship between a foreign partner’s relative asset intangibility and the foreign partner’s equity share ownership in the IJV will become weaker as the informal institutional differences between the home and foreign partner increase.

We conclude this discussion with a caveat which serves to focus the emphasis of the preceding discussion. It may argued that there are certain national locations where formal institutional and cultural characteristics are such that host country firms are perceived as inherently more trustworthy, or less susceptible to behaving opportunistically. In these situations, foreign IJV partners may desire, or be willing, to own more equity shares in the venture. If such “trust perception effects” are sufficiently important to overcome the risk perception and liability of foreignness effects that are the central considerations motivating our analysis, the interaction effects we propose are operative in H2 and H3 will be reversed, serving to enhance, rather than as we argue weaken, the positive relationship between relative asset intangibility and foreign partner equity share.11

In response, we note the following. First, the contracting consequence of the presence of “trust perception effects” is to re-assign equity shares away from the domestic partner whose contribution is acknowledged to be critical in terms of mediating the IJV’s relationship with the host country market environment, and therefore to have the greatest impact on the variability of the collaborative outcome. Empirically, these predictions run counter to those derived from property rights contracting theory which underpin the present analysis. We maintain contracts negotiated on a trust perception basis are inefficient, revealed to be sub-optimal and our prediction is they will not dominate in empirical observations. Second, if such “trust perception” effects indeed exist, but are not sufficient to overcome risk perceptions and liability of foreignness considerations, then they have no distinctive empirical manifestations. Third, to have a commonly accepted empirical implication, such perceptions of the inherent host country-firm characteristics must be a commonly acknowledged universal trait, held by all foreign partners. Fourth, in the context of this analysis, we remain agnostic as to why such perceptions should apply to UK-based IJV partners. However, ultimately the resolution to the issue raised remains an empirical one, and as such, more information relating to the “trust perception effect” will be available following the analysis undertaken in Section 4. We now proceed to present our data sample and justify our empirical methodology.

3. Data and empirical methodology

3.1. Sources of data and sample selection

The empirical analysis is conducted on a pooled cross-section dataset of a sample of UK-based IJVs formed by two partners during the period from 1995 to 2000. Data is obtained from the SDC Platinum Alliances/JVs database (Thomson Reuters), the global industry standard for information on JVs. We only consider IJVs based in the UK, and where the home partner is a UK firm and the other a foreign firm. This choice to examine only UK-based IJVs enables us to control for any potential contaminating impact stemming from corporate interactions with the diverse set of regulatory and jurisdictional requirements that arise if we consider IJVs based in more than one country. It also greatly facilitates the reliability and interpretation of our empirical measures of formal and informal institutional difference. After imposing this constraint and further restricting the sample based on the availability of detailed financial information for each IJV partner, our final sample contains 442 UK-based IJVs. The sample captures a broad array of IJV partnerships based in the UK, as illustrated in Table 1 which regionally segments the foreign partners, based on their country of origin, into four regional groupings, namely, North America with 31% of IJV partners, Asia with 37%, Europe with 24%, and 8% from other countries. Accounting and financial data for each partner is extracted from Thomson Datastream.

11 We would like to acknowledge the comments of a referee for motivating this discussion. As discussed in footnote 4, data limitations preclude us from incorporating measures of partner’s mutual trust into our framework.
### Table 1
Sample characteristics: foreign IJVs.

<table>
<thead>
<tr>
<th>Region of origin</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>North America</td>
<td>141</td>
<td>32</td>
</tr>
<tr>
<td>Asia</td>
<td>177</td>
<td>40</td>
</tr>
<tr>
<td>Europe</td>
<td>124</td>
<td>28</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Broad industry sector</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>137</td>
<td>31</td>
</tr>
<tr>
<td>Transportation, communication and utilities</td>
<td>119</td>
<td>27</td>
</tr>
<tr>
<td>Mining</td>
<td>106</td>
<td>24</td>
</tr>
<tr>
<td>Construction</td>
<td>80</td>
<td>18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Foreign partner ownership share</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Minority: less than 50%</td>
<td>141</td>
<td>32</td>
</tr>
<tr>
<td>Equal: 50%</td>
<td>146</td>
<td>33</td>
</tr>
<tr>
<td>Majority: greater than 50%</td>
<td>155</td>
<td>35</td>
</tr>
</tbody>
</table>

The total number of foreign IJV partners in the sample is 442. The top panel identifies the region of origin of the foreign (non-UK) IJV partners, with the last two columns providing the absolute number and percentage of IJVs in the sample. The middle panel provides the broad industry sector of the foreign IJV partner, by number of firms and percentage. The lower panel documents the category of equity share ownership of the foreign partner in the IJV, again by both number and percentage of foreign partners within each category.

### 3.2. Dependent variable

The empirical specification we adopt is motivated by the observation that that the strategic dimensions of contracted IJV equity share ownership are primarily categorical (Pan, 1996). We contend that increasing a partner’s equity share from 49% to 50% has much greater strategic implications than moving from 60% to 80%. The key initial strategic decision is whether to negotiate a minority (less than 50%), equal (50%), or majority (greater than 50%) equity share in the IJV. To reflect this inherent non-linearity, we employ an ordered logit model specification to distinguish between foreign IJV partners holding minority, equal or majority equity shareholdings. The choice of foreign partner reflects the fact H1–H3 are specified from the foreign firm’s perspective. Our IJV partnerships have each firm’s equity shareholding located in the range between 10% and 90%. Using the above classification, the categorical dependent variable (y) in the ordered logit regression specifications takes values of either 1 for a foreign partner minority equity contribution of less than 50%, 2 for a 50% (equal) equity contribution, or 3 for a majority equity contribution of more than 50%. We further justify our approach based on the fact that in prior studies of joint venture ownership rights a logit-type formulation is routinely adopted in the literature (Arregle et al., 2009; Chadee and Qiu, 2001; Gomes-Casseres, 1990; Hennart, 1991; Pan, 1996, 2002).

### 3.3. Independent variables

#### 3.3.1. Explanatory variables

Informed by prior studies (Balakrishnan and Fox, 1993; Brouthers and Brouthers, 2000; Lu and Hebert, 2005; Vicente-Lorente, 2001; Hennart, 1991), we employ two measures of asset intangibility. Specifically, we utilise: (i) R&D intensity defined as the ratio of R&D expenses to total sales and (ii) the ratio of the firm’s intangible assets to total assets. Here, intangible assets include non-monetary assets such as copyrights, patents, trade-marks, proprietary information such as customer lists, and goodwill (Vicente-Lorente, 2001). We calculate these ratios for both the foreign and UK (home) partner, and divide the two, so the final variable captures the relative asset intangibility of the foreign in relation to the home partner. These measures implicitly assume that the relative composition of the partner’s asset contribution to the IJV reflect pre-existing asset structures. This assumption is consistent with the perspective that the inherent comparative advantage bestowed by the partner’s extant asset structure prior to IJV formation underpins the rationale for initiating the joint venture partnership; alternatively stated, firms enter IJVs to exploit the synergies obtained from gaining mutual access to
one another’s existing assets and expertise. We believe this assumption is uncontroversial and reflects extant literature analysing the motives for joint ventures (Brouthers et al., 2008; Gulati et al., 2009). We expect this variable’s coefficient to be positive in tests of H1–H3.

3.3.2. Moderating effects of formal and informal institutional differences

As outlined in Section 3.2.1, formal institutional differences encompass documented laws and rules that influence business strategy and operations. Prior theoretical considerations suggest that a relevant measure of formal institutions to adopt is one focusing on the institutional features that support the market efficiency of IJVs. A number of empirical studies proxy formal institutions by items selected from the economic freedom index (EFI) developed by the Heritage Foundation (Stroup, 2007; Meyer et al., 2009; Berggren and Jordahl, 2005). The EFI provides aggregated annual values including evaluations of a country’s systems in relation to business activity, trade, investment, labour markets, financial freedom, freedom from corruption and property rights. In addition, previous studies have highlighted that the EFI index is highly correlated with other possible alternative proxy measures such as the Global Competitiveness Report (World Economic Forum) or World Bank database indicators (Hanke and Walters, 1997; Berger and Bristow, 2009). Therefore, in this paper we employ the EFI index.12 For each of the foreign partners in our sample we compute our proxy of formal institutional differences by using the absolute value of the average differences between the annual values obtained for the UK and the values for the country of origin of the relevant foreign IJV partners.

The concept of cultural and informal institutional differences between countries encompasses factors such as shared beliefs in organisational practices and processes, norms and beliefs (North, 1990; Hofstede et al., 1990), as discussed in Section 3.2.2. In order to capture these cultural differences, following previous studies we employ the index developed by Kogut and Singh (1988) (henceforth K-S), stemming from Hofstede (1980), work on cultures and organisations. The K-S index is employed in many studies of entry mode decisions (Kogut and Singh, 1988; Slangen and Van Tulder, 2009; Barkema et al., 1996). Our proxy for cultural and informal institutional distance, the K-S index (1988), is defined as:

\[
(Cultural \ distance) = \sum_{i=1}^{4} \frac{(I_{ij} - I_{iu})^2}{V_i} / 4
\]

where \(I_{ij}\) stands for the index for the \(i\)th cultural dimension and \(j\)th country, \(V_i\) is the variance of the index of the \(i\)th dimension, \(u\) indicates the nation from which the cultural differences is calculated (the UK in this paper) and \(Cultural \ distance\) is the cultural distance of the \(j\)th country from the UK.13 We acknowledge capturing the impact of culture and informal institutional differences by using the above construct has been questioned in the literature (Shenkar, 2001; Shenkar et al., 2008). Nevertheless, empirical studies invariably employ this construct and their findings indicate that the various difference proxies are broadly consistent (Drogendijk and Slangen, 2006; Kim and Gray, 2008; Dow and Larimo, 2011; Estrin et al., 2009).

Tests of hypotheses H2 and H3 require the estimation of moderating effects of formal and informal institutional differences in relation to our measure of relative asset intangibility. The variables capturing these moderating effects are constructed by separately interacting our measures of relative asset intangibility with the measures of both formal and cultural differences, as defined above.

12 The index measures ten components of economic freedom, assigning a grade in each using a scale from 0 to 100, where 100 represents the maximum freedom. The ten component scores are then averaged to give an overall economic freedom score for each country. The three items we exclude are fiscal freedom (a measure of the taxation burden), freedom from government (share of government in GDP), and monetary freedom (inflation controls). These do not directly relate to the efficiency of markets and we do not consider them to be a suitable measure of our theoretical construct.

13 China is excluded from Hofstede’s sample. Therefore, the ratings for Taiwan are used as a surrogate measure for China (see also Pan, 1996).
3.3.3. Control variables

We incorporate control variables for those other relevant firm-level factors that may influence the foreign partner’s share of equity capital relative to that of the host country partner. All financial variables are measured at the last reporting date prior to the announcement of the IJV’s formation. With the exception of the dummy variables, capturing value chain location, foreign partner industry and temporal consideration, all variables are defined as the ratio of the relevant value of the variable for the foreign partner in relation to that of the home partner in the IJV. The control variables we employ are as follows:

- **Firm growth options**: R&D intensity is an important indicator of a firm’s investment generated future growth potential. Expected future growth may also have an industry dimension, as firms in growing industries possess more flexibility in their investment choice, generating a preference for IJVs in high growth markets (Brouthers and Brouthers, 2000; Hennart and Larimo, 1998). We measure growth options by the ratio of each partner’s capital expenditure to total assets, a variable commonly used to reflect longer-term growth opportunities (Rajan and Zingales, 1995; Vicente-Lorente, 2001).

- **Firm size**: The ability to commit capital to the IJV may be size dependant, inducing small firms to seek a reduced share of equity ownership (Larimo, 1993). Firm size is measured by the natural logarithm of a firm’s sales (Brouthers et al., 2008; Barkema et al., 1996; Tsang and Yip, 2007).

- **Firm profitability**: Pecking-order theory outlines the inherent advantages of internal project financing (Myers and Majluf, 1984). The availability of internally generated free cash flows, which may influence the extent of equity ownership, is measured by the ratio of operating income to total assets for each partner (Harris and Raviv, 1991; Tsang and Yip, 2007; Barkema et al., 1996).14

- **Value chain location**: In vertical IJVs, a partner’s location in the value chain can affect both their relative measurement costs and their vulnerability to opportunistic behaviour. This asymmetry arises because the upstream partner undertakes their production activities prior to its output being used by the downstream partner. Other things being equal, an upstream partner will incur greater costs in monitoring the quality of the downstream partner’s productive contribution than vice versa. This asymmetry suggests that the requirement to provide a guarantee, *ceteris paribus*, is more likely to lie with the downstream partner. Thus, our expectation is that the downstream partner owns a larger share of equity in the IJV. Following previous studies, we determine the position of the partners in vertical IJVs based upon their 3-digit SIC code (Tsang and Yip, 2007; Pennings et al., 1994). We use a dummy variable to control for a partner’s location in the value chain, which is set equal to one when the foreign IJV partner is downstream, and zero otherwise.

- **Foreign partner industry**: Technological reasons may underpin the determination of equity shares (Brouthers et al., 2008; Anand and Delios, 1997).15 Based on their 3-digit SIC code, we group the foreign partners into four industry sectors, (i) manufacturing; (ii) transportation, communications and utilities; (iii) mining; and (iv) construction. The number of IJV partners in each category is given in both absolute and percentage terms in Table 1.

- **Temporal considerations**: To address time variation in contracted equity shares, we define five time dummy variables denoting the year of IJV formation. Using 1995 as a baseline, the dummy variables take a value of, one for each year of the sample, 1996–2000, and zero otherwise.

3.4. Empirical specification of the model

As outlined in Section 3.2, the empirical specification we employ reflects the fact that the strategic dimensions of contracted IJV equity share ownership are categorical in nature, with the key initial strategic decision being whether to negotiate a minority (less than 50%), equal (50%), or majority (greater than 50%) equity share in the IJV. To capture this strategic dimension, we employ an ordered

---

14 Some measures of profitability use “equity” not assets in the denominator. We believe these measures are potentially misleading as they are susceptible to distortion by differences in corporate leverage ratios.

15 For literature documenting technological reasons why some industries depend more on external financing than others (Hogan and Hutson, 2006).
logit model specification.\textsuperscript{16} The ordered logit model is constructed by utilising a latent variable regression model, in which the unobserved latent variable $y^*$ falls between the range $-\infty$ to $+\infty$. This is mapped onto the discrete observed categorical variable, $y$, which consists of the $J = 3$ categories of the foreign partner’s share ownership; minority equity share = 1, equal equity share = 2, and majority equity share = 3. Essentially, the categorical variable $y$ provides information about the underlying $y^*$ such that,

$$ y_i = m \quad \text{if} \quad \tau_{m-1} < y_i^* \leq \tau_m \quad \text{for} \quad m = 1, \ldots, J $$

(1)

here, the values of $\tau$ represents the thresholds or cut off points for the range of the latent variable $y^*$ given the different categories of $y$. The thresholds, $\tau$'s, are unknown parameters which are estimated using maximum likelihood procedures. If we define $x$ as a row vector with 1 in the first column and the $k$ explanatory variables in the remaining columns, and $\beta$ a column vector with associated parameters, then the latent regression can be expressed as $y^* = x\beta + \epsilon$ where the cumulative density of $\epsilon$ has a logistic distribution. With this formulation, the probability of observing an outcome equivalent to a specific threshold (category) such that $y = m$ given the explanatory variables is,

$$ Pr(y = m|x) = Pr(\tau_{m-1} < y^* \leq \tau_m|x) $$

(3)

Using the estimated value of $x\hat{\beta}$ from (2) (which gives $E(y^*)$), the ordered logit model can be utilised to derive the probability that, given the values of the explanatory variables, the foreign partner’s share ownership, $y^*$ falls within the various threshold limits.

4. Discussion of results

The sample characteristics and a summary of the descriptive statistics are reported in Tables 1 and 2, respectively. Including a number of moderating effects involving a single variable enhances the potential to encounter multicollinearity, so we re-scaled the original variables using the procedures recommended by Aiken and West (1991). The continuous variables are centred by subtracting the corresponding variables mean from its level variable, and dummy variables are re-coded using weighted effects coding procedures (Darlington, 1990). Such re-scaling does not affect the substantive interpretation of the coefficients (Aiken and West, 1991). An examination of the correlation matrix of the re-scaled variables is reported in Table 2. Variance inflation factor (VIF) scores reveal no evidence of model misspecification arising from multicollinearity.\textsuperscript{17}

In terms of the explanatory power of the ordered logit models, the percentage of correctly predicted outcomes ranges from 64% to 76%. Model 8, incorporating the complete set of institutional differences effects, evidences the greatest overall explanatory power. If the primary objective of the ordered logistic regression is to accurately place observations into the correct groups, the model’s success can be judged by its ability to do this relative to the outcome one may expect from random chance (Hair et al., 2006). The randomised model, based on the proportion of IJVs actually found in each of the minority, equal and majority equity share groups, suggests that we require an overall “hit rate” which is significantly higher than 34% to outperform this random benchmark model (Sallis and Deo Sharma, 2009). With reference to Table 3, Model 8 again performs well, with an overall hit rate of 76%.\textsuperscript{18}

\textsuperscript{16} Evidence of non-normality in the distribution of the error term of Eq. (2) led us to reject probit as an estimation method (although the results where qualitatively similar to those reported). To further test the sensitivity of the results to the selection of the modeling procedure, and to ensure their robustness, we also employ both ordinary least squares (with foreign partner equity ownership ranging on a continuum from a minimum of 10% to a maximum of 90%) as well as tobit regressions to account for the censored nature of the dependent variable, the percentage of equity shares. The qualitative nature of the results remains. All results are available upon request.

\textsuperscript{17} VIF values greater than 5 indicate potential misspecification problems (Cohen et al., 2003). Our highest recorded VIF score is 2.22, which is well within acceptable parameter limits.

\textsuperscript{18} The minority and majority share IJV hit rates are 73% and 81% respectively, both significantly in excess of the respective benchmark models where chance is calculated by the proportional by chance method, defined as the sum of squared prior probabilities. The hit rates for the other model specifications are available from the authors on request.
Table 2
Summary of descriptive statistics and correlation matrix.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1.02</td>
<td>0.03</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>2.14</td>
<td>1.25</td>
<td>0.07</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>1.03</td>
<td>0.05</td>
<td>0.26</td>
<td>0.04</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>0.19</td>
<td>0.16</td>
<td>0.06</td>
<td>0.13</td>
<td>0.13</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>13.72</td>
<td>2.52</td>
<td>0.11</td>
<td>0.02</td>
<td>0.15</td>
<td>0.21</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>1.75</td>
<td>1.45</td>
<td>−0.03</td>
<td>0.01</td>
<td>−0.04</td>
<td>−0.12</td>
<td>−0.06</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>2.43</td>
<td>0.59</td>
<td>0.21</td>
<td>0.05</td>
<td>0.22</td>
<td>0.16</td>
<td>−0.07</td>
<td>0.25</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>1.83</td>
<td>0.62</td>
<td>−0.14</td>
<td>0.25</td>
<td>0.14</td>
<td>0.09</td>
<td>−0.11</td>
<td>0.27</td>
<td>−0.26</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>0.42</td>
<td>0.66</td>
<td>−0.02</td>
<td>−0.07</td>
<td>−0.06</td>
<td>0.01</td>
<td>−0.01</td>
<td>0.22</td>
<td>−0.08</td>
<td>−0.06</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>3.38</td>
<td>2.29</td>
<td>−0.09</td>
<td>0.22</td>
<td>0.15</td>
<td>0.14</td>
<td>−0.08</td>
<td>−0.12</td>
<td>0.28</td>
<td>0.31</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>1.31</td>
<td>3.22</td>
<td>−0.05</td>
<td>0.04</td>
<td>0.09</td>
<td>0.14</td>
<td>−0.01</td>
<td>−0.11</td>
<td>−0.17</td>
<td>0.22</td>
<td>0.33</td>
<td>0.29</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>0.36</td>
<td>0.24</td>
<td>−0.11</td>
<td>0.02</td>
<td>0.10</td>
<td>−0.12</td>
<td>−0.13</td>
<td>−0.15</td>
<td>0.18</td>
<td>−0.13</td>
<td>−0.16</td>
<td>0.14</td>
<td>0.14</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Table lists the mean, standard deviation (S.D.) and correlation coefficient between the variables. The letters in the first column refer to the following variables. A=R&D intensity; B=intangible assets; C=growth; D=profit; E=size; F=K-S index; G=informal institution*R&D; H=informal institutions*intangible assets; I= formal institutions; J= formal institutions*R&D; K= formal institutions*intangible assets; L=value chain location.

The columns list the sample mean and standard deviation. The variables have been re-scaled and re-coded using the procedures recommended by Aiken and West (1991) and (Darlington, 1990). Total n = 442.
### Table 3
Hit rate for the full model including main and moderating effects (Model 8).

<table>
<thead>
<tr>
<th>Predicted</th>
<th>Minority IJVs</th>
<th>Equal IJVs</th>
<th>Majority IJVs</th>
<th>Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observed</td>
<td>Minority IJVs</td>
<td>103</td>
<td>15</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Equal IJVs</td>
<td>17</td>
<td>108</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Majority IJVs</td>
<td>11</td>
<td>19</td>
<td>125</td>
</tr>
</tbody>
</table>

Overall percentage of correct predictions is 76%.
The hit rate for our selected specification, Model 8. The hit rate is the number of correct predictions divided by sample size.

#### 4.1. The direct effect of asset intangibility and institutional differences

Table 4 presents the series of estimates from the various ordered logit model specifications. Model 1 incorporates both the proposed measures of relative foreign to home partner asset intangibility, namely the R&D intensity/sales ratio and the intangible/total assets ratio, while Model 2 considers the effects of informal and formal institutional differences between the home and foreign IJV partners. Both specifications relate these variables directly to the foreign IJV partners’ equity share holding. Model 3 examines the combined direct effect of both relative asset intangibility and institutional differences on the foreign partners’ share of equity ownership. All model formulations also include the variables outlined in Section 3.3.3 as controls, but we postpone discussion of their influence until a later section.

### Table 4
Results of the ordered logit analysis with direct effects for baseline models.

<table>
<thead>
<tr>
<th></th>
<th>M1</th>
<th>M2</th>
<th>M3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specific assets</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R&amp;D</td>
<td>2.626 (0.002)*</td>
<td>3.522 (0.014)*</td>
<td></td>
</tr>
<tr>
<td>Intangible assets</td>
<td>1.934 (0.003)*</td>
<td>3.235 (0.006)**</td>
<td></td>
</tr>
<tr>
<td><strong>Institutional variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formal institution</td>
<td>−0.314 (0.007)*</td>
<td>−0.877 (0.013)*</td>
<td></td>
</tr>
<tr>
<td>Informal institution</td>
<td>−0.721 (0.001)**</td>
<td>−3.808 (0.002)**</td>
<td></td>
</tr>
<tr>
<td><strong>Control variables</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth options</td>
<td>0.835 (0.218)</td>
<td>0.618 (0.062)*</td>
<td>1.038 (0.604)</td>
</tr>
<tr>
<td>Size</td>
<td>−2.187 (0.185)</td>
<td>−1.326 (0.137)</td>
<td>−1.835 (0.275)</td>
</tr>
<tr>
<td>Profit</td>
<td>3.232 (0.043)*</td>
<td>2.874 (0.055)*</td>
<td>2.762 (0.128)</td>
</tr>
<tr>
<td>Value chain location</td>
<td>0.803 (0.004)*</td>
<td>0.253 (0.021)</td>
<td>0.157 (0.063)*</td>
</tr>
<tr>
<td>Threshold = 1</td>
<td>0.796 (0.156)</td>
<td>0.162 (0.451)</td>
<td>−0.473 (0.369)</td>
</tr>
<tr>
<td>Threshold = 2</td>
<td>3.535 (0.994)</td>
<td>2.653 (0.041)*</td>
<td>2.042 (0.032)*</td>
</tr>
<tr>
<td><strong>Goodness of fit measures</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pseudo R²</td>
<td>0.260**</td>
<td>0.246**</td>
<td>0.319**</td>
</tr>
<tr>
<td>ΔR² (Model 1)</td>
<td>0.059*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ΔR² (Model 2)</td>
<td>0.073*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X²</td>
<td>50.411***</td>
<td>47.634***</td>
<td>57.021***</td>
</tr>
<tr>
<td>ΔX² (Model 1)</td>
<td>6.610*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ΔX² (Model 2)</td>
<td>9.387*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The ordered logit estimates of Models M1–M3 inclusive. The dependent variable categorises the 442 foreign IJV partners into the three categories by their contracted equity share ownership: minority (40% or less); equal (50%) and majority (greater than 50%). The explanatory variables are defined in Section 3.3 of the text. The threshold parameters are estimated by maximum likelihood. There are 3 possible values for y in each model. The probability y is allocated to the minority share category = prob(y* ≤ Threshold 1); the probability y is allocated to the equal share category = prob(Threshold 1 < y* ≤ Threshold 2); the probability y is allocated to the majority share category = prob(y* > Threshold 2). Coefficient estimates for the (group) industry dummy variable and the time dummy variables are not reported but are available on request. The variables in parentheses are p-values. Estimates obtained using LIMDEP 9.0 software.

* p < 0.10 significance at 10%.
* p < 0.05 significance at 5%.
** p < 0.01 significance at 1%.
The model specifications in Models 1–3 are all significant at the 1% level, and the model’s $R^2$ range from 0.25 to 0.32, providing acceptable explanatory power. In Models 1 and 3, both our measures of asset intangibility (R&D intensity/sales and intangible assets/total assets) have the expected positive sign and are significant at the 1% level except for the R&D intensity/sales ratio in Model 3, which is significant at a 5% level. These initial results are in accordance with hypothesis $H_1$: as the foreign partner contributes relatively more intangible assets to the IJV, this increases the probability that they will be in a higher equity shareholding category.

In Model 2, which tests the direct impact of formal and informal (cultural) institutional differences on the probability of the foreign partner being in a higher equity shareholding category, both institutional differences indicators are negatively signed as expected and significant (at 1% and 5%, respectively). Increasing institutional differences, measured on both dimensions, reduces the probability of a higher category of equity share contribution by the foreign partner. Finally, $\chi^2$ tests reveal that Model 3, which combines the direct effect of both relative asset intangibility and institutional differences, significantly improves the overall specification over Models 1 and 2. All explanatory variables are signed as expected and retain a high level of significance. Its formulation highlights the fact that the IJV equity ownership of the foreign partners is influenced by both the nature of the assets it deploys in the venture and its institutional differences from the home partner.

Overall, the results of Models 1–3 provide support for hypothesis $H_1$. An increase in the relative intangibility of the foreign partner’s assets dedicated to the IJV exacerbates the inherent difficulties in their collaborating partner’s ability to measure the productive contribution of those assets. This leads to an increased demand for the foreign partner to provide guarantees, by means of which they credibly commit to contribute to future IJV performance, thereby ensuring that their intangible assets are not utilised for opportunistic purposes rather than enhancing the profitability of the IJV (Oxley, 1997; Steensma and Lyles, 2000). We argue these guarantees take the form of the foreign partner contracting to own a larger share of the equity capital (Lu and Hebert, 2005; Barzel, 2005).

Our findings can be further contextualised with reference to previous studies that utilise asset intangibility as a central explanatory variable in analysing market entry modes and levels of control in collaborations (Brothersons and Hennart, 2007). In these studies, the problems occasioned by intangible assets emphasise either the contracting costs associated with transferring these assets between collaborating parties, or the well-documented potential for opportunism and hold-up problems arising from the presence of specific assets (Hennart, 1991; Williamson, 1985; Hill, 1990). However, our analysis differs significantly with respect to its theoretical underpinnings. In our context, the positive relationship between the intangibility of a partner’s asset contribution and equity shares reflects an efficient contractual outcome. It arises because the guarantees provided by equity partially substitute for incurring the direct costs of monitoring the productive contribution of the intangible assets to the IJV collaboration, serving to mitigate shirking and problems arising from ex ante incomplete contracts. It is not motivated by a desire to exert control over the IJV and its specific resources, although this may naturally arise as a secondary effect.

4.2. The moderating effect of institutional differences

In Table 5, Models 4–8 examine the moderating influence of our formal and informal institutional differences measures on the relationship between relative asset intangibility and IJV partner equity shareholdings. Models 4 through 7 introduce each of the four interaction variables sequentially, using as a baseline Model 3, which includes the direct effects of both relative asset intangibility and formal and informal institutional differences. Specifically, we introduce the terms in the following order, the term interacting: (i) R&D intensity and formal institution differences, $M_4$; (ii) intangible assets and formal institution differences, $M_5$; (iii) R&D intensity and informal institution differences, $M_6$; (iv) intangible assets and informal institution differences $M_7$. Model 8 incorporates all interaction terms in one specification.

The estimation results in Table 5 show the interaction terms are all significant at a 1% or 5% level, and the coefficients maintain their individual significance when all are included in the same model (M8). Indeed, on the basis of goodness-of-fit tests and its predictive ability (hit-rate) reported in Table 3 this
Table 5
Results of ordered logit analysis with institutional distance interaction terms.

<table>
<thead>
<tr>
<th></th>
<th>M4</th>
<th>M5</th>
<th>M6</th>
<th>M7</th>
<th>M8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Specific assets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R&amp;D</td>
<td>2.533 (0.005)**</td>
<td>2.303 (0.044)*</td>
<td>2.091 (0.062)*</td>
<td>3.693 (0.022)*</td>
<td>2.963 (0.032)*</td>
</tr>
<tr>
<td>Intangible assets</td>
<td>1.289 (0.002)*</td>
<td>5.436 (0.027)*</td>
<td>2.221 (0.003)*</td>
<td>1.178 (0.001)**</td>
<td>4.117 (0.000)**</td>
</tr>
<tr>
<td><strong>Institutional variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formal institution</td>
<td>−0.294 (0.063)*</td>
<td>−0.817 (0.024)*</td>
<td>−0.929 (0.024)*</td>
<td>−0.118 (0.036)*</td>
<td>−0.155 (0.027)*</td>
</tr>
<tr>
<td>Informal institution</td>
<td>−0.882 (0.031)*</td>
<td>−1.147 (0.005)**</td>
<td>−1.598 (0.001)**</td>
<td>−2.641 (0.012)*</td>
<td>−0.698 (0.008)**</td>
</tr>
<tr>
<td><strong>Interaction terms</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formal institution * R&amp;D</td>
<td>−1.287 (0.023)*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formal institution * intangible assets</td>
<td></td>
<td>−0.018 (0.021)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informal institution * R&amp;D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informal institution * intangible assets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Control variables</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth</td>
<td>0.903 (0.999)</td>
<td>1.244 (0.064)*</td>
<td>0.763 (0.042)</td>
<td>1.591 (0.068)*</td>
<td>1.312 (0.077)*</td>
</tr>
<tr>
<td>Size</td>
<td>−3.181 (0.188)</td>
<td>−5.927 (0.181)</td>
<td>−2.595 (0.713)</td>
<td>−4.857 (0.087)*</td>
<td>−1.713 (0.041)*</td>
</tr>
<tr>
<td>Profit</td>
<td>3.650 (0.731)</td>
<td>2.289 (0.052)*</td>
<td>2.599 (0.037)</td>
<td>3.766 (0.676)</td>
<td>1.873 (0.032)</td>
</tr>
<tr>
<td>Value chain location</td>
<td>0.187 (0.022)</td>
<td>2.293 (0.077)*</td>
<td>0.266 (0.001)*</td>
<td>1.025 (0.044)*</td>
<td>0.657 (0.006)**</td>
</tr>
<tr>
<td>Threshold = 1</td>
<td>−0.533 (0.771)</td>
<td>0.891 (0.643)</td>
<td>−1.423 (0.401)</td>
<td>1.211 (0.175)</td>
<td>−1.395 (0.013)*</td>
</tr>
<tr>
<td>Threshold = 2</td>
<td>2.236 (0.056)**</td>
<td>3.278 (0.884)</td>
<td>1.915 (0.068)*</td>
<td>4.682 (0.271)</td>
<td>2.417 (0.528)</td>
</tr>
<tr>
<td><strong>Goodness of fit measures</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pseudo R²</td>
<td>0.336*</td>
<td>0.358**</td>
<td>0.361**</td>
<td>0.388**</td>
<td>0.428**</td>
</tr>
<tr>
<td>ΔR² (Model 1)</td>
<td>0.076</td>
<td>0.098</td>
<td>0.101</td>
<td>0.128</td>
<td>0.168</td>
</tr>
<tr>
<td>ΔR² (Model 2)</td>
<td>0.090*</td>
<td>0.112*</td>
<td>0.115</td>
<td>0.142</td>
<td>0.182</td>
</tr>
<tr>
<td>ΔR² (Model 3)</td>
<td>0.017</td>
<td>0.039</td>
<td>0.042*</td>
<td>0.069</td>
<td>0.109</td>
</tr>
<tr>
<td>χ² (Model 1)</td>
<td>61.563**</td>
<td>63.437**</td>
<td>62.916*</td>
<td>64.536*</td>
<td>72.252*</td>
</tr>
<tr>
<td>Δχ² (Model 1)</td>
<td>11.152**</td>
<td>13.026**</td>
<td>12.505**</td>
<td>14.125**</td>
<td>21.841*</td>
</tr>
<tr>
<td>Δχ² (Model 2)</td>
<td>10.802**</td>
<td>15.802**</td>
<td>15.282**</td>
<td>16.902**</td>
<td>24.618*</td>
</tr>
<tr>
<td>Δχ² (Model 3)</td>
<td>4.542*</td>
<td>6.416*</td>
<td>5.895*</td>
<td>7.515*</td>
<td>15.231*</td>
</tr>
</tbody>
</table>

The ordered logit estimates of model specifications M4–M8 inclusive which incorporate the institutional distance interaction terms. The dependent variable categorises the 442 foreign IJV partners into the three categories by their contracted equity share ownership: minority (49% or less); equal (50%) and majority (greater than 50%). The explanatory variables are defined in Section 3.3 of the text. The threshold parameters are estimated by maximum likelihood. There are 3 possible values for y in each model. The probability y is allocated to the minority share category = prob (y < Threshold 1); the probability y is allocated to the equal share category = prob (Threshold 1 < y < Threshold 2); the probability y is allocated to the majority share category = prob (y > Threshold 2). Coefficient estimates for the (group) industry dummy variable and the time dummy variables are not reported but are available on request. The variables in parentheses are p-values. The Wald-test χ² statistic for the joint significance of the industry dummy variables is 4.593 (probability value, p = 0.035) from our preferred model specification, Model 8. Estimates obtained using LIMDEP 9.0 software.

* p < 0.10 significance at 10%.
* * p < 0.05 significance at 5%.
* * * p < 0.01 significance at 1%.
is the preferred model specification. Moreover, the model’s $\chi^2$ statistics all evidence an improvement over the relevant baseline Model 3, and the $\Delta \chi^2$ statistic suggests including the interaction terms significantly improves our model specification over those formulations, which simply examine the direct effects of asset intangibility and/or institutional differences. These results support the notion that foreign partner’s equity share ownership is moderated by the institutional context in which they operate. Considered collectively, the empirical results from the estimation of Models 4–8 presented in Table 5 provide empirical support for both hypotheses H2 and H3. The model specifications all consistently indicate that the interaction terms involving measures of both formal and informal institutional differences are negatively related to the foreign IJV partner’s equity shareholding. Increases in both formal and informal institutional differences reduce the expected probability (ordered log-odds) of the foreign partner holding a higher category of equity share ownership. These results are consistent with the perspective that the foreign IJV partners may be encumbered with ‘liability of foreignness’ and are inherently unwilling to further enhance their risk exposure by increasing their equity shareholding. Our findings are also consistent with those studies which conclude that the incidence of costs of collaboration in IJVs is asymmetric, with foreign partners incurring higher monitoring and knowledge acquisition costs (Barkema et al., 1996; Barkema and Vermeulen, 1997; Eriksson et al., 1997) and accord with the perspective that increasing cultural differences between two partners generates increased costs of conducting business abroad (Gaur and Lu, 2007; Johanson and Vahlne, 2009; Slageng and Beugelsdijk, 2010). Finally, the results provide no support for the alternative “trust perception effect” we outlined at the end of Section 2.

Although we have not tested for the relative impacts of formal institutional and cultural differences in this paper, we believe that it is reasonable to conjecture that of the two, cultural differences are more likely to generate uncertainty for the foreign partner in IJVs. Our rationale is based on the belief that culture gives rise to more tacit and elusive differences between partners across nations as compared to formal institutions, mainly because formal institutional differences are more explicit and transparent to external observers due to their manifestation in written and tangible form. As such, the influence of culture on partner behaviour is more difficult to detect, recognise and respond to, simply by employing accepted and tested IJV management routines. This implies that its impact will be more difficult to incorporate within standard IJV management protocols in comparison to institutional differences arising from dimensions that are more formal. While this conjecture accords with previous findings linking cultural distance and IJV ownership (Yamin and Goesorkhi, 2010), further empirical investigation of this issue is certainly warranted.

4.3. **Influence of control variables**

We now discuss the influence of the control variables defined in Section 3.3.3. The positive sign on the growth options coefficient is as expected and is significant in Models 2, 5, 7 and 8 (at 10%) and Model 4 (at 5%). A partner will wish to retain a higher equity stake in the venture if they expect the collaboration to result in the future profitable exploitation of growth options (Rajan and Zingales, 1995, 1998). The fact that growth options can also be partially represented by a firm’s R&D intensity suggest they will have a similar impact on equity shares to this variable, although the robustness of both the magnitude and sign and significance of the coefficient in all specifications supports the inclusion of both variables in the specification. The profit variable is positively signed as expected, and significant (at 5%) in Models 1, 4 and 8 and marginally (at 10%) in Model 2. These findings are consistent with the interpretation that profitable foreign firms with additional free cash flows available for investment in IJV collaborations, tend to maintain a higher equity shareholding, possibly for control purposes. The coefficient sign on the size variable is negative in all specifications, albeit significant only in Model 8 (at 5%) and Model 5 (at 10%). To the extent, the findings suggest that a foreign partner’s size negatively affects the extent of their equity shareholding in IJVs, this may be due to the fact that large foreign firms in the sample already have a well-diversified portfolio of international investments. It could also

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19 We noted earlier that tests reveal potential multicollinearity does not appear to be an issue.
reflect an unwillingness to further commit scarce managerial resources to oversee the management of another international venture.

Finally, and importantly from the perspective of the measurement cost arguments presented in this paper, we find support for the proposition that the probability of the foreign partner contracting a higher category of equity shareholding in the IJV is enhanced if that partner is the downstream partner in a vertical IJV. The value chain location dummy variable is positively signed and significant at commonly accepted levels in all models. In vertical IJVs, the differential timing of production activity ensures that the upstream partner cannot easily monitor/measure the output quality of the downstream partner, as the latter performs after the upstream partner has made their contribution. This increases the probability that the downstream partner has to provide equity related guarantees to its respective upstream partner in relation to its provision of capabilities enhancing the IJV’s profitability. This result also corroborates the conjecture that augmenting the equity ownership of the downstream partner can remove their temptation to renege on a rationally negotiated contract (Baker et al., 2002). In addition, the industry dummy variables are jointly significant at the 5% level in Model 8 (based on a Wald test) as reported in Table 5. The time dummy variables, which control for temporal effects on the level of equity shareholding are not significant in any model, and the coefficients are not reported.

5. Conclusion

Several previous studies examine a firm’s choice of organisational form for entering foreign markets (the internalisation perspective and desire for control literatures) as well as the performance and managerial aspects of IJVs. However, the central question we address in this paper, namely what determines the distribution of share of equity ownership by the partners in IJVs, has only rarely been a focal point of analysis. Moreover, while prior studies acknowledge the relevance of equity ownership to the governance of joint venture partnerships, the influence of the nature of the assets contributed by the respective partners on equity shares is not previously analysed in any detail. Equally, the research addressing the interaction between formal and cultural differences and the relative intangibility of each partner’s assets in determining the distribution of equity ownership in IJVs is limited. We undertake a partial synthesis of these important literatures by developing a joint structure, focusing on measurement problems and the vulnerability of foreign IJV partners, and highlighting the guarantee role of equity capital in IJVs.

This paper makes several contributions. First, we refine certain theoretical arguments and provide empirical evidence that we believe illuminates how the relative intangibility of the assets deployed in IJVs and the guarantee role of equity capital, serve as a determinant of the equity share distribution observed in IJVs. Focusing on the foreign partner, the results indicate a positive relationship between the (relative) intangibility of the assets that partner contributes to the IJV and their likelihood of owning a larger share of the IJV’s equity capital. Second, in accordance with the Northian strand of institutional theory, our results confirm the importance of both the direct and moderating effects of formal and informal institutional differences on the ownership structure of IJVs. As such, we respond to recent calls to develop institutional theory more rigorously without blending arguments (Gelbuda et al., 2008; Estrin et al., 2009). Our findings suggest that the moderating effect of institutional differences serves to reduce the effect of relative asset intangibility on the level of equity shareholding by the foreign partner, a finding we attribute to the increased vulnerability of the foreign partner. Thus, this study also contributes to application of institutional economics developed by North and recently applied to multinational enterprises by Dunning and Lundan (2008a, b), as a valuable insight for theorizing about international business strategy.

The analysis has several limitations. We only consider UK-based IJVs where a UK firm is one of the partners, so our findings may not necessarily be generalised to IJVs located in any other country, or formed by partners who are both foreign in relation to the country of the IJVs location. However, we have no reason to believe that the arguments made will fail to hold in more general jurisdictional settings. Further, informal institutional differences proxy by the distance construct is a broad concept that may be further disaggregated, for example by exploring its normative and cognitive aspects (Gaur and Lu, 2007; Xu and Shenkar, 2002; Luo and Shenkar, 2011), incorporating considerations of
psychic distance (Dow and Larimo, 2011), or building upon recent proposals for measuring informal differences dimensions and providing distance scores (Brewer and Venaik, 2011; Tung and Verbeke, 2010; Berry et al., 2010). Future work can develop a conceptual framework that includes interplay between partner- and institution-level determinants of trust and IJV contracting behaviour (Roy, 2012). Research along similar dimensions is also required with specific reference to the relevance of risk and failure perceptions as a cultural trait (Das and Teng, 2001; Tjemskea et al., 2012). This may help further to explain our findings. Furthermore, data limitations mean that we do not capture the strategic objectives underlying IJV formation in our empirical investigation. For example, the objectives of asset-seeking IJVs and market-seeking IJVs may differentially affect the structure of the guarantee provision between partners. Future research that focuses more on such considerations may help to generate a finer-grained understanding of the role of the characteristics of a partner’s contributed assets and the effects of institutional differences on IJV structures.

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References


