Working Papers

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Abstract:
Using count data on Indian joint ventures (JVs) and wholly owned subsidiaries (WOS), we present an empirical analysis of FDI-related ownership choices and their relation with host country characteristics and indicators of transaction costs. Our Negative Binomial regression models offer only weak support for the bargaining perspective, according to which JVs should be more likely if the host countries were particularly attractive in terms of market access or resource endowments. Geographical and cultural distance has ambiguous effects on the choice between JVs and WOS. The composition of FDI projects tends to shift toward WOS where investment risks are contained by bilateral treaties and better control of corruption.

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1. Introduction

The location choices of Indian direct investors have received increasing attention recently. Several studies offer interesting stylized facts on the patterns of India's outward FDI.[1] Bhat and Narayanan (2011) focus on Indian firm characteristics as determinants of outward FDI.[2] More closely related to the objective of our contribution, Pradhan (2011) as well as Nunnenkamp et al. (2012) analyze the driving forces of India's outward FDI, using data on approved outflows. However, important gaps remain. In particular, FDI-related ownership choices and their relation with host country characteristics have been neglected in the literature on India's outward FDI.

The question of whether FDI takes the form of wholly owned subsidiaries (WOS) or joint ventures (JVs) with local partners is relevant for both the host country and India. Host countries typically prefer JVs as this type of FDI tends to offer greater benefits to the local economy in terms of productivity enhancing spillovers (Blomström and Sjöholm 1999; Javorcik and Spatareanu 2008). Foreign firms face a dilemma. On the one hand, they have incentives to mitigate the leakage of technology and know-how by avoiding JVs and, instead, maintaining full control over WOS (Ramachandran 1993; Desai et al. 2004). On the other hand, JVs may be hard to avoid if foreign firms depend on local assets, knowledge, and markets.

From a transaction costs perspective, the preference of multinational enterprises (MNEs) for WOS should be particularly strong if proprietary assets are at stake and the need for control is pervasive (Raff et al. 2009). One would also expect that FDI predominantly takes the form of WOS if MNEs are based in economically and technologically advanced source countries so that they are in a relatively strong position when bargaining with less advanced host countries. By contrast, JVs would become more likely if the host country is particularly attractive, e.g., in terms of market access or resource endowments. Indeed, Dreher

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[1] The contributions in Sauvant and Pradhan (2010) provide an informative recent example.
[2] See also the earlier contributions of Kumar (2007) and Pradhan (2004).

et al. (2013) find that the bargaining position – *inter alia* with respect to relative market size, endowment of human capital, and country risk – affects the ownership choices of foreign direct investors from various source countries in India. Here, we take the opposite perspective by analyzing the ownership choices of Indian direct investors in various host countries. Casual inspection of the regional distribution of Indian JVs and WOS suggests that ownership choices by direct investors based in emerging markets such as India may differ considerably from traditional patterns observed for FDI from more advanced source countries. For instance, the fact that more than 70 percent of India's FDI projects in the United States took the form of WOS seems to conflict with the traditional view on bargaining between the source and host countries of FDI.[3]

Using count data on JVs and WOS, we estimate Negative Binomial regression models to analyze the ownership choices of Indian direct investors in various host countries more systematically. In particular, we assess whether host country characteristics and gravity-type variables that may reflect transaction costs and the bargaining position of Indian firms vis-à-vis the host countries have a different impact on the number of JVs and WOS in a particular host country. Before describing the data and approach in more detail in Sections 3 and 4, we summarize the related literature in Section 2. Section 5 presents our estimation results. Section 6 concludes.

2. Related literature and hypotheses

The literature offers two major concepts to analyze decisions on foreign ownership structures such as the choice between WOS and JVs – the transaction costs approach and the bargaining approach (Asiedu and Esfahani 2001; Görg et al. 2010). Gomes-Casseres (1990: 1) provides an intuitive comparison of the two approaches: "The first argues that MNEs prefer structures that minimize the transaction costs of doing business abroad. The second argues that

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[3] See Section 3 for details on data and stylized facts.

ownership structures are determined by negotiations with host governments." As stressed by Gomes-Casseres, the two approaches complement each other. The transaction costs approach addresses the question "What ownership structure *does the firm want*?", while the bargaining approach addresses the question "What ownership structure *can the firm get*?" (Gomes-Casseres 1990: 2).

The focus of the present paper is on country characteristics that are supposed to reflect transaction costs as well as the host countries' bargaining position vis-à-vis MNEs. This is not to ignore that firm-specific characteristics such as productivity, R&D intensity, experience, size, and export orientation play a major role with respect to both transaction costs and bargaining outcomes. For instance, Raff et al. (2009) find that foreign ownership shares increase with higher productivity of Japanese MNEs. In some contrast, Görg et al. (2010) find that more productive German firms are generally more likely to undertake FDI in India, while firm productivity hardly matters for German ownership shares. Lacking firm-specific characteristics on India's WOS and JVs in various host countries, we cannot account for firm heterogeneity. Nevertheless, we contribute to closing an important gap by assessing the role of host country characteristics for ownership choices of MNEs based in emerging source countries such as India.

The ownership structure is important for MNEs: "Given market imperfections, firm-specific assets, such as technology or the ability to promote differentiated goods, can often be exploited more efficiently through internalization with unambiguous control" (Kobrin 1987: 623). Consequently, MNEs tend to prefer WOS over JVs to prevent the leakage of technology and know-how to local partners (Desai et al. 2004). All the same, MNEs may prefer JVs under specific conditions, in particular when relying on local assets and knowledge available in the host country. As noted by Desai et al. (2004: 371), "joint ventures offer multinational firms the opportunity to make profitable use of market-specific capabilities of joint venture partners." In a similar vein, Raff et al. (2009) argue that MNEs may prefer JVs if

two conditions are met: (i) local partners contribute valuable assets to the FDI project (e.g., distribution networks or local contacts), and (ii) the value of these assets is private information of the local partners.

The governments of host countries have a major say on FDI-related transaction costs. In particular, governments can influence the choice of MNEs between JVs and WOS in several ways. According to Asiedu and Esfahani (2001: 655), the "reliability of institutions" can be regarded as an important country-specific factor in this context. This should imply that WOS are more likely in host countries with stronger institutions, less political discretion, and a more stable and less risky FDI climate. Transaction costs could be reduced if the government tied its hand credibly through bilateral agreements such as bilateral investment treaties (BITs) or double taxation treaties (DTTs). For instance, the conclusion of BITs could render WOS more likely if the host country agreed to effective dispute settlement and independent arbitration.

Host country governments can also reduce "external uncertainty" (or "environmental unpredictability"), to use the terminology of Gatignon and Anderson (1988: 309), by fighting corruption, allowing for easy access to imported inputs and containing economic instability at home.[4] Better governance, openness to trade and economic stability can reasonably be supposed to encourage WOS through reducing transaction costs. Nevertheless, it is open to question whether such factors have strong effects on the ownership choices of MNEs based in emerging source countries, considering that MNEs are quite familiar with similar risks and uncertainties at home (Sosa Andrés et al. 2013).

Other transaction costs shaping ownership choices are more deeply rooted and difficult to overcome by host country governments. Previous literature often refers to geographical and cultural distance in this context. For instance, Gatignon and Anderson

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[4] Asiedu and Esfahani (2001) use governance indicators as well as openness to trade to capture the effects of these factors on ownership choices, as we do below. In addition, we use the rate of inflation as a proxy of economic instability.

(1988) as well as Asiedu and Esfahani (2001) argue that cultural dissimilarity involves higher transaction costs with respect to information needs, managerial control and performance evaluation. Hence, MNEs would be more reluctant to engage with WOS in geographically and culturally distant locations. By contrast, factors such a common language and a large diaspora living in the host country might increase the preference of MNEs for WOS.

Even if MNEs strongly prefer WOS over JVs, the observed foreign ownership share is widely perceived as the result of bargaining between MNEs and the host countries. The bargaining framework can be traced back to Vernon's obsolescing bargain (Vernon 1971).[5] While obsolescing bargains may be particularly intuitive for large-scale FDI projects in extractive industries and infrastructure, Kobrin (1987: 636) argues that "a bargaining framework based on the relative demand for resources and constraints on the implementation of power is an accurate model of MNE-host country relationships in a wide range of sectors." As Eden et al. (2005: 264) have put it, "bargaining power comes from the ability to withhold resources that the other party wants."

While the bargaining process may involve various issues, foreign ownership is widely used to measure bargaining outcomes.[6] The distribution of FDI-related benefits is clearly related to ownership shares. Consequently, Lecraw (1984) assumes that lower (higher) levels of foreign ownership reveal a relatively favorable outcome of the bargaining process for the host country (the MNE). In a similar vein, Asiedu and Esfahani (2001) stress the host country's motivation to restrict the foreign equity share and insist on JVs with local partners in order to appropriate a larger share of FDI-related benefits.

Previous literature has paid most attention to the size and growth of local markets among the factors that may strengthen the host country's bargaining position vis-à-vis MNEs. For instance, Asiedu and Esfahani (2001: 655) consider the "attractiveness of markets and

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[5] Accordingly, the bargaining position of the host country improves once the foreign investor has realized FDI-related sunk costs. The host country could then renege on earlier commitments and appropriate a larger share of FDI-related gains.
[6] According to Svejnar and Smith (1984: 151), bargaining power is "key to understanding JV operations."

growth potential" to be country-specific assets that enhance the productivity of FDI projects. Gomes-Casseres (1990: 4) suspect that "the firm might settle for its second choice [in terms of ownership] in return for access to a lucrative market." This invites the hypothesis that JVs are more likely in large and growing host countries.

The endowment of natural resources represents another attraction that can be expected to strengthen the bargaining position of host countries vis-à-vis MNEs (Kobrin 1987). Consequently, JVs would be more likely in resource-rich countries than in resource-poor countries. However, the importance of resource-seeking motives for outward FDI by emerging source countries such as India is open to debate. Recent studies appear to be in striking contrast to the public perception that resource abundance is particularly important for the location choices of MNEs based in emerging economies.[7] It is thus questionable whether the host country's resource endowment has a significantly stronger impact on JVs, compared to WOS.

Host countries that are economically and technologically advanced, relative to emerging source countries of FDI, may enjoy a favorable bargaining position vis-à-vis MNEs undertaking so-called asset-augmenting FDI.[8] This would suggest that JVs are more likely in high-income countries producing at the technological frontier where Indian direct investors seek access to superior technology.[9] However, a higher per-capita income of host countries may not only reflect the availability of superior technology. At the same time, it may reflect higher labor costs which would discourage cost-oriented (vertical) FDI. Considering the theoretical ambiguity concerning the host country's per-capita income as a determinant of outward FDI by emerging source countries, we follow Nunnenkamp et al. (2012) and attempt

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[7] For details see Sosa Andrés et al. (2013) and the literature given there.
[8] By undertaking this type of FDI, MNEs attempt to strengthen their overall competitive position and expand their existing portfolio of assets by acquiring additional assets from target firms (Dunning et al. 2008).
[9] Likewise, Asiedu and Esfahani (2001) hypothesize that the demand of MNEs for complementary inputs related to the technological capabilities of domestic firms is associated with lower foreign equity shares.

to separate asset-seeking from vertical FDI by introducing the intensity of patenting as an alternative indicator of the host country's technological development.

In summary, the transaction costs and bargaining perspectives offer various reasons – in particular weak institutions, sovereign risk, large local markets, resource endowments, and superior technologies – why India's outward FDI may take the form of JVs rather than WOS. An additional factor is only loosely connected with these approaches – that is the degree to which the host country is generally open to various types of FDI and foreign ownership. Specifically, MNEs are more likely to get their preferred ownership structure where the choice between JVs and WOS is less constrained by government regulations and restrictions (Desai et al. 2004; Görg et al 2010). Openness to FDI may be reflected by a higher ratio of inward FDI stocks from all sources over the host country's GDP. But higher values of this indicator could also render JVs more likely as more attractive host countries enjoy a stronger bargaining position vis-à-vis MNEs from any particular source country. Therefore, we also make use of survey results from the World Economic Forum's Global Competitiveness Report (see Appendix A for details) to assess the effect of liberal FDI regulations on the choice between JVs and WOS.

Previous empirical studies addressing the determinants of ownership choices are largely restricted to US-based MNEs. Prominent examples include Kobrin (1987), Gatignon and Anderson (1988), Gomes-Casseres (1990) and, more recently, Asiedu and Esfahani (2001) and Desai et al. (2004). Some other studies focus on MNEs based in European countries and Japan, including Görg et al. (2010) on German MNEs in India, Blomström and Zejan (1991) on Swedish MNEs, and Raff et al. (2009) on Japanese MNEs. Ramada Sarasola (2009) considers financial sector MNEs from developed countries. To the best of our knowledge, empirical analyses of ownership choices by MNEs based in emerging source countries such as India hardly exist. This leaves an important gap, considering that the driving

forces of FDI from emerging sources are not necessarily the same as those of FDI from traditional sources (Sosa Andrés et al. 2013).

3. Data and stylized facts

There are two major sources of data on India's outward FDI. First, the Ministry of Finance provides data on approved FDI outflows to a large number of host countries.[10] Pradhan (2011) and Nunnenkamp et al. (2012) used approved flows to assess the determinants of location choice by Indian direct investors. Second, the Ministry of Commerce and Industry (various issues) provides count data on the number of Indian JVs and WOS abroad. More precisely, this source reports the accumulated number of JVs and WOS across host countries for selected years; our analysis covers the 2002-2009 period.[11]

As far as we are aware, the count data have not been used in earlier empirical analyses of the choices of Indian direct investors with respect to foreign locations and the mode of entry via JVs or WOS. This may be because the count data do not provide information on the size of JVs and WOS. All the same, there are several advantages of using the count data. In contrast to approved annual outflows, the accumulated counts do not suffer from annual volatility and inflated amounts of India's outward FDI.[12] Furthermore, the count data render it possible to assess whether the determinants of FDI depend on the mode of engagement, i.e., the degree of Indian ownership.

Indian FDI projects, taking JVs and WOS together, are strongly concentrated in a few host countries (Figure 1). The top-5 host countries – the United States, the United Kingdom, Singapore, the United Arab Emirates and Mauritius, in descending order – account for 59 percent of all projects across the world (about 7,000 in 2009). A relatively small sub-group of

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[10] The data are available from: http://finmin.nic.in/the_ministry/dept_eco_affairs/icsection/icsec_index.asp; accessed: April 2013.

[11] During this period data are available for the years 2002, 2004, 2007, 2008, and 2009.

[12] Note that even for traditional and advanced source countries of FDI, annual outflows to particular host countries often fluctuate considerably as a result of a few large projects. At the same time, approved FDI amounts may overstate realized flows considerably.

24 countries (out of 131 countries with at least one project in 2009) each hosts more than 50 projects. As concerns the rest of the host country sample, Indian FDI projects are widely, though thinly, spread across the globe. There are 53 host countries with less than five projects.

Overall it appears that Indian direct investors clearly prefer WOS over JVs. WOS account for 63 percent of all projects in 2009.[13] But this obscures the fact that JVs outnumber WOS in most host countries of Indian FDI. For host countries with very few projects, it is rather arbitrary to compare the composition of India's FDI projects. Therefore, we consider only those sample countries with at least five projects in 2009 in Figure 2. Nevertheless, there are wide variations in the ratio of JVs over WOS within the reduced sample. The ratio exceeds four in some oil and gas exporting countries (Iran, Oman, Kazakhstan, and Saudi Arabia; but also in Egypt). This may reflect a relatively strong bargaining position of these host countries.[14] At the other extreme, the ratio of JVs over WOS is below 0.5 for 15 host countries in Figure 2. Surprisingly, this group includes major OECD countries such as Germany, the United Kingdom and the United States. This seems to be in conflict with ownership choices according to the relative bargaining position of Indian direct investors. Indeed, it appears from Figure 2 that the ratio of JVs over WOS is declining with rising per-capita income of the host countries of India's outward FDI.

4. Estimation approach and explanatory variables

We perform regressions for non-negative count data. It should be noted that the count data on JVs and WOS are strongly skewed to the right (with an accumulation of observations smaller than five) and display considerable over-dispersion (with the variance being greater than the mean). Consequently, we follow Dreher et al. (2013) and employ the Negative Binomial estimator. We estimate the following relationship:

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[13] It should be noted that 44 projects in the database for 2009 (i.e., less than one percent of all projects) are classified as "others" than JVs or WOS. We do not consider these projects in the analysis.

[14] At the same time, FDI-related ownership restrictions tend to be relatively strict in these host countries.

$$\#projects_{it} = F(\boldsymbol{HC_{it}}, \boldsymbol{X_i}, \lambda_t),$$

where *#projects*$_{it}$ represents the accumulated number of Indian JVs or WOS operating in host country *i* in year *t*. $\boldsymbol{HC_{it}}$ represents the vector of time variant host country characteristics supposed to explain the location choices for the two types of Indian FDI projects. $\boldsymbol{X_i}$ is a vector of time invariant gravity-type variables for pairs of India with particular host countries; λ_t are time fixed effects.

We prefer Negative Binomial models over Poisson models since the former offer a more efficient estimator when the dependent variable suffers from over-dispersion (see Cameron and Trivedi, 1986), that is when the conditional variance of the dependent variable exceeds its expected value. In Negative Binomial models the variance is assumed to be a function of the expected value as follows:

$$V\{y_i \mid x_i\} = (1 + \alpha)\, E\{y_i \mid x_i\}$$

Note that if $\alpha = 0$ the variance equals the expected value and the model behaves like a Poisson, meaning Negative Binomial nests Poisson. We tested the hypothesis of $\alpha = 0$ to determine the existence of over-dispersion and therefore the appropriateness of the selected estimator. Indeed, the test statistics always justified our choice of Negative Binomial models.[15]

We run pooled regressions for the two types of FDI projects, JVs and WOS, rather than performing regressions for each type separately. Pooling projects increases our flexibility to statistically test for differences and similarities between JVs and WOS. In the pooled regressions, we introduce a dummy variable set equal to one for WOS. We then interact this dummy variable with all explanatory variables. This mirrors individual regressions for both types of FDI projects. At the same time, this procedure allows us to test for significant

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[15] Detailed test statistics are available upon request.

differences in the impact of our explanatory variables on WOS, with JVs serving as a benchmark. We formally test for differences with a Wald test.

The list of our explanatory variables is largely in line with Nunnenkamp et al. (2012) who used flow data on all types of India's outward FDI to assess the determinants of location choices.[16] The vector of time variant host country characteristics, HC_{it}, comprises the host country's GDP and GDP growth as indicators of the size and growth of its markets; the GDP per capita and patent activity as indicators of the host country's stage of economic and technological development; the natural resource endowment to capture the host country's attractiveness to resource-seeking FDI; inflation as a proxy of economic instability in the host country; and the stock of inward FDI from all sources as an indicator of the host country's integration into global FDI patterns.[17] We also account for institutional conditions in the host country, proxied by control of corruption.

Some additional variables refer to the bilateral relationship of the host country with India. These gravity-type variables are typically time invariant. This applies to the geographical distance between India and the particular host country and the existence of a common language as a measure of cultural distance. Likewise, data on the size of the Indian diaspora in the host countries are available for just one point in time. Finally, the existence of a bilateral tax (or investment) treaty tends to belong to the vector X_i, even though there is some time variation for host countries which concluded a DTT or BIT with India only recently.

It should be noted that offshore financial centers figure prominently among the host countries of India's outward FDI (Nayyar 2008; Pradhan 2011). For instance, Singapore and

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[16] See Appendix A for detailed definitions and sources. Appendix B provides summary statistics. Bivariate correlations between our explanatory variables (available upon request) do not indicate major problems of multicollinearity, while the correlation of the explanatory variables with our dependent variable is highly significant.
[17] As alternative indicators of the host country's openness to world markets, we consider openness to trade and survey results on FDI-related ownership restrictions taken from the World Economic Forum's Global Competitiveness Reports.

Mauritius belong to the top-5 destinations of FDI projects (see Figure 1).[18] The final

destination of projects channeled through offshore financial centers is unknown. Therefore,

we exclude offshore financial centers from some of our estimations below to test for the

robustness of the results for the full sample of host countries.

5. Results

As noted above, we are mainly interested in the differential impact of FDI determinants on the

entry modes of Indian MNEs across the wide spectrum of host countries. Therefore, we pool

two manifestations of the dependent FDI variable, the number of JVs and the number of

WOS, in our Negative Binomial estimations. We enter a dummy variable which is set equal to

one when the number of WOS is the relevant dependent variable. The interaction of the

dummy variable with all other explanatory variables reveals the impact of these variables on

the number of WOS, whereas the estimation results for the explanatory variables *per se* reveal

their impact on the number of JVs. We use Wald tests to show whether the impact of each

explanatory variable differs significantly between the two manifestations of the dependent

variable.

Throughout this section, we report the marginal effects of each explanatory variable

and the corresponding *t*-statistic evaluated at the mean of all other explanatory variables,

instead of the regression coefficients.[19] This is because the coefficient of an interaction term

cannot be interpreted reasonably in a non-linear model (Ai and Norton 2003, Greene 2010).

As Ai and Norton (2003: 123) point out, "the magnitude of the interaction effect in nonlinear

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[18] Mauritius is not listed as an offshore financial center by Eurostat (http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-BK-08-001/EN/KS-BK-08-001-EN.PDF; accessed: April 2013). However, it is well known that India's FDI is often channeled through Mauritius in order to take advantage of the double taxation agreement between Mauritius and India (see, e.g., Milelli et al. 2010). See Appendix C for the list of all host countries.

[19] For the sake of brevity, we do not show the marginal effects over a broader range of variation of explanatory variables.

models does not equal the marginal effect of the interaction term." It can even be "of opposite sign."

Basic estimations for the sum of all FDI projects

Before turning to the estimations with interaction terms, we report the marginal effects of our standard set of FDI determinants by imposing their impact to be the same for both, the number of JVs and the number of WOS. However, given that the two types of FDI are pooled in the same regression, we include the dummy for WOS to account for a different level of WOS, compared to JVs. The results shown in Table 1 underscore the stylized fact above that the number of WOS is not generally higher than the number of JVs. In all estimations, the dummy variable fails to be statistically significant at conventional levels.

Importantly, Table 1 suggests that using the count data on JVs and WOS produces plausible results on the impact of FDI determinants. The findings are largely in line with earlier findings of Nunnenkamp et al. (2012) who used data on approved Indian FDI outflows. First of all, geographical and cultural distance clearly matters when location choices are captured by the number of FDI projects. Depending on the specification, the number of FDI projects declines by 8-9.5 with a one percent increase in the geographical distance between India and the host country (at the mean of other explanatory variables). Host countries sharing a common language with India tend to receive 13-18 more FDI projects. In addition, the size of the Indian diaspora in the host country has a significantly positive impact on the number of FDI projects, though only for the full sample of all host countries (including offshore financial centers).[20]

The evidence is fairly ambiguous with respect to host country characteristics supposed to capture different FDI motives. In particular, we do not find evidence that host countries with better endowments of natural resources attract a larger number of FDI projects from

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[20] Note that a large number of Indians are living in Mauritius and Singapore.

India. Likewise, the per-capita income of host countries and their technological sophistication, proxied by *patents*, enter insignificant in all estimations reported in Table 1. This corroborates Nunnenkamp et al. (2012) who argue that it is hard to find conclusive evidence on the extent to which India's outward FDI is motivated by cheaper labor in lower-income countries and/ or access to superior technologies and managerial know-how in higher-income countries. By contrast, the size of host country markets, though not the growth of these markets, is correlated with the number of FDI projects. Host countries where local markets are 10 percent larger receive 23-34 additional FDI projects (depending on the specification and at the mean of other explanatory variables).

Finally, imposing the impact to be the same for both manifestations of the dependent variable in Table 1 produces statistically weak results for the remaining explanatory variables. Host countries with better control of corruption (i.e., higher values of *corruption*) hardly receive more FDI projects from India. Double taxation treaties seem to induce some additional FDI projects, but no longer once offshore financial centers are excluded from the sample. Sample selection also matters with respect to the host country's overall attractiveness to FDI: *fdistock/gdp* enters significantly positive, at the five percent level, only when offshore financial centers are excluded.[21]

Differences between JVs and WOS

The estimations reported in Table 2 are based on exactly the same set of explanatory variables as before in Table 1. However, we now account for the interactions of the WOS dummy with all explanatory variables. Rather than imposing the impact of explanatory variables to be same for both manifestations of the dependent variable, the pooled estimations now result in two separate marginal effects on the number of JVs and WOS, respectively. In addition, we

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[21] The effect is blurred in the full sample, probably because offshore financial centers are often characterized by disproportionately high values of *fdistock/gdp.*

add in bold the Wald tests for significant differences between the two marginal effects for each explanatory variable.

The previous result on the importance of geographical and cultural distance holds for the number of JVs as well as the number of WOS. The marginal effect of *distance* proves to be significantly negative, at the one percent level, for both manifestations of the dependent variable – independent of the exact specification of the model and the treatment of offshore financial centers. The same applies to the significantly positive marginal effect of a common language. All the same, the Wald tests point to a significantly different impact of these two variables on the number of JVs and WOS, respectively. There is a striking dichotomy. On the one hand, geographical distance tends to discourage JVs more strongly than WOS, which is opposite to the pattern expected in Section 2 above. On the other hand, the Wald tests support the hypothesis that a common language increases the probability that FDI projects take the form of WOS. The evidence on *diaspora* is more ambiguous. The marginal effects are significant, at the ten percent level, only when considering JVs in the full sample (including offshore financial centers). All marginal effects are insignificant after excluding offshore financial centers. Nevertheless, the Wald tests suggest that the presence of a larger Indian diaspora in the reduced sample has a stronger effect on the number of JVs than on the number of WOS – which is again in contrast to the expected pattern, even though the difference is irrelevant in quantitative terms.

The previously noted findings on the host country characteristics supposed to capture different FDI motives are hardly affected when accounting for the interaction terms in Table 2. In particular, neither the number of JVs nor the number of WOS appears to respond positively to the host countries' endowment of natural resources (*natural resources*) or their patenting activity (*patents*).[22] Furthermore, the Wald tests for these explanatory variables do

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[22] At the same time, all marginal effects of *gdp per capita* are insignificant at conventional levels. As argued by Nunnenkamp et al. (2012), it is difficult to disentangle cost motives and so-called asset-augmenting motives of

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not point to any significant differences with respect to the impact on JVs and WOS, respectively. In other words, there is no evidence that a weaker bargaining position of Indian direct investors in host countries offering either natural resources or superior technologies resulted in a shift toward JVs and away from WOS. The bargaining perspective of the choice of ownership is also refuted with regard to the size of host country markets. Rather than shifting the composition of FDI projects toward JVs, larger local markets attract JVs and WOS to essentially the same extent. All marginal effects of *gdp* are significantly positive at the one percent level, and the Wald tests do not point to significant differences.[23]

In contrast to the weak evidence in Table 1, the introduction of the interaction terms in Table 2 offers interesting insights for the remaining three explanatory variables. First, the marginal effects of existing FDI stocks in the host countries (*fdistock/gdp*) prove to be significantly positive once offshore financial centers are excluded from the sample. This is particularly so for WOS whose number increase by 20-25 if FDI stocks from all sources increase by ten percent. All the same, the impact of *fdistock/gdp* is not significantly stronger on WOS than the impact on JVs according to the Wald tests in columns IV-VI.[24] Second, the previous finding that double taxation treaties induce a larger number of FDI projects, at least as long offshore financial centers are kept in the sample, holds for WOS only once the impact of *tax treaty* is no longer imposed to be the same for both manifestations of the dependent variable. The corresponding Wald tests are highly significant, supporting the hypothesis that the reduction of tax-related risks encourages primarily WOS and shifts the composition of FDI projects away from JVs. Third, better control of corruption is significantly associated with a larger number of WOS (except in column IV). By contrast, *corruption* never has a significant impact on JVs. The Wald tests reveal a significantly different impact on WOS and

FDI. The former would suggest a negative correlation of *gdp per capita* with the number of FDI projects, especially with the number of WOS, whereas the latter would suggest a positive correlation.

[23] Similar to Table 1, the growth of local markets (*gdp growth*) does not offer additional insights in Table 2. The same applies to inflation as an indicator of economic instability (*inflation*).

[24] It may be noted that the Wald test in column VI is almost significant at the ten percent level.

JVs (again with the exception of column IV). This is in line with the hypothesis that better governance in the host country encourages WOS through reducing transaction costs.

Robustness tests

In the following, we perform several robustness tests to assess the sensitivity of previous results. For all robustness tests reported in Table 3, we drop *patents* (which was never significant before) and we keep the offshore financial centers in the sample; that is, we use only the specification in column I of Table 2 as the reference point to avoid clutter. The first two robustness tests in columns I and II of Table 3 account for the skewed nature of the dependent variable. In the remaining four robustness tests, we replace specific explanatory variables by alternative measures on institutions (column III), bilateral treaties (IV), and openness in terms of FDI-related ownership restrictions (V) and international trade (column VI).

We redefine the dependent variable by taking logs in column I to account for the concentration of FDI projects in some host countries (see Section 3 above). In column II, we return to the standard count measure of JVs and WOS, but we exclude the United States from the sample, where 28 percent of all Indian FDI projects were located in 2009. The exclusion of the by far most important host country has only minor effects on our results. In particular, the previous findings on our proxies of geographical and cultural distance carry over almost unchanged to column II of Table 3. The same holds for the differential impact of better control of corruption and the conclusion of double taxation treaties. Two notable changes compared to column I in Table 2 relate to FDI motivations as reflected in *gdp* and *gdp per capita*. Not surprisingly perhaps, the per-capita income of host countries enters significantly negative once the particularly rich and attractive United States is excluded. This applies to both manifestations of the dependent variable, and the Wald test reveals that the marginal effect does not differ significantly between JVs and WOS. With respect to *gdp* we now find

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some support for the bargaining perspective according to which it is more difficult for foreign direct investors to realize WOS as their preferred mode of entry when host countries offer large local markets. The marginal effect of *gdp* on JVs proves to be significantly stronger than the effect on WOS, though only at the ten percent level.

The changes compared to column I in Table 2 are more pronounced when taking logs of the dependent variable in column I of Table 3. The marginal effect of a common language on the number of WOS is no longer significantly stronger than the marginal effect on the number of JVs.[25] Likewise, the Wald test for *corruption* becomes insignificant and no longer suggests that better control of corruption induces a shift toward WOS. The conclusion of double taxation treaties remains as the only explanatory variable which impacts more strongly on WOS than on JVs, at the five percent level of significance.[26] The weaker evidence for this robustness test is not really surprising, considering that the Negative Binomial model is not well suited for taking logs of the dependent count variable. This is why we return to the standard definition of the dependent variable in the remainder of this section.

The results also weaken in column III of Table 3 where we replace *corruption* by *investment profile.* The alternative institutional indicator is taken from the International Country Risk Guide and assesses investment risk related to contract viability and expropriation, profits repatriation, and payment delays.[27] However, the choice of this indicator reduces the number of observations. This may explain at least partly why the marginal effects of *investment profile* as well as the corresponding Wald test prove to be insignificant at conventional levels, in contrast to *corruption*. The reduced number of observations seems to

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[25] At the same time, a larger Indian diaspora in the host country now has a significantly stronger impact on JVs, as revealed by the Wald test for *diaspora* in column I.

[26] The marginal effect of *fdistock/gdp* on the number of WOS proves to be significantly positive in column I of Table 3, in contrast to the previous robustness test where the marginal effect on the number of JVs was significantly positive. In both cases, however, the Wald test does not indicate a significantly different impact on JVs and WOS.

[27] Available from: http://www.prsgroup.com/prsgroup_shoppingcart/pc-39-7-international-country-risk-guide-icrg.aspx (accessed: May 2013).

be responsible also for the weaker evidence on *common language* and *tax treaty*, which no longer induce a significant shift toward WOS.

By contrast, the robustness tests shown in columns IV-VI of Table 3 corroborate our previous findings. The marginal effects of the proxies of geographical and cultural distance as well as the corresponding Wald tests closely resemble those in column I of Table 2. The same applies to the explanatory variables reflecting different motivations of FDI, including the size and growth of host country markets, their per-capita income, and the endowment of natural resources. Again, we find that the composition of FDI projects shifts toward WOS when FDI-related risks are contained by better control of corruption and the conclusion of double taxation treaties. In column III, the effect of *tax treaty* is taken over by *investment treaty*. The marginal effect of bilateral investment treaties on WOS (at the mean of all other explanatory variables) appears to be somewhat smaller than the marginal effect of double taxation treaties – about three additional projects in the case of *investment treaty*, compared to about four additional projects in the case of *tax treaty*. However, the corresponding Wald tests are both significant at least at the two percent level, revealing a differential impact of *tax treaty* and *investment treaty* on the number of WOS, relative to the number of JVs.

In the two final robustness tests, we replace *fdistock/gdp* by either *ownership restrictions* (column V) or *trade openness* (column VI). On the one hand, we make use of the World Economic Forum's survey results on the severity of FDI-related ownership restrictions, even though this indicator is available only for a reduced number of host countries. On the other hand, we consider openness to trade (exports plus imports as a percentage of the host country's GDP) which could encourage WOS through reducing trade-related transaction costs. However, the choice of the indicator of the host country's openness to world markets does not help resolve the earlier ambiguity with regard to the effects of *fdistock/gdp*.[28] To the contrary, the evidence on *ownership restrictions* conflicts with the view that more liberal

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[28] Recall that the marginal effects of *fdistock/gdp* varied considerably depending on the specification in Tables 2 and 3. The corresponding Wald tests all failed to reveal a significantly different impact on JVs and WOS.

regulations would favor WOS over JVs; the Wald test suggests the opposite, though the effect is weak for both JVs and WOS. Openness to trade in column VI of Table 3 does not offer any additional insight, compared to *fdistock/gdp* in column 1 of Table 2.

6.   Summary and conclusion

Ownership choices involve a dilemma for foreign direct investors. On the one hand, they prefer wholly owned subsidiaries (WOS) over joint ventures (JVs) in order to prevent the leakage of technology and know-how. From the firms' perspective, the preference for WOS should be particularly strong if proprietary assets are at stake and the need for control is pervasive. On the other hand, WOS tend to be discouraged if host countries are characterized by high uncertainty and poor governance. Furthermore, JVs may be hard to avoid if foreign firms depend on local assets, knowledge and markets. The host countries of FDI typically prefer JVs as this type of FDI tends to offer greater benefits to the local economy by giving rise to productivity enhancing spillovers. Hence, one would expect that FDI predominantly takes the form of JVs if the host country enjoys a relatively strong bargaining position when negotiating with foreign firms interested in penetrating local markets or gaining access to superior technology and raw materials.

We make use of count data on Indian JVs and WOS to perform an empirical analysis of FDI-related ownership choices and their relation with host country characteristics and indicators of transaction costs. Our Negative Binomial regression models offer only weak support for the bargaining perspective, according to which JVs should be more likely if the host countries were particularly attractive in terms of market access, resource endowments, or technological sophistication. Geographical and cultural distance has ambiguous effects on the choice between JVs and WOS. The composition of FDI projects tends to shift toward WOS where investment risks are contained by bilateral treaties and better control of corruption. We also find that sample selection matters for the differential impact of host county characteristics

and indicators of transaction costs on JVs and WOS. For instance, some effects depend on whether offshore financial centers are excluded from the sample.

Deeper insights concerning the ownership choices of foreign investors based in emerging economies such as India may be gained once the data situation improves. For instance, it appears that the composition of FDI projects shifts toward WOS over time, in particular where Indian firms have gained experience. Increasing familiarity with conditions in a particular host country may render Indian firms less dependent on local partners – which could explain why the ratio of WOS over JVs is almost three times as high in host countries where the accumulated number of FDI projects exceeds 50, compared to where this number is below 50. Longer time series on the number of JVs and WOS would also allow for a systematic assessment of the differential impact of FDI determinants within particular host countries (by accounting for country fixed effects). Furthermore, the focus on host country characteristics in the present study should be complemented by major firm characteristics to account for the heterogeneity among Indian direct investors. Finally, it would be interesting to compare the ownership decisions of Indian firms with those of firms based in other emerging source countries of FDI.

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Table 1 –   Negative Binomial estimation results, with and without offshore financial centers

Dependent variable: Total number of FDI projects (WOS and JVs)

VARIABLES	I Marginal Effects	II Marginal Effects	III Marginal Effects	IV Marginal Effects	V Marginal Effects	VI Marginal Effects
wos dummy	0.311	0.470	0.458	0.0314	0.0844	0.103
	(0.587)	(0.703)	(0.700)	(0.468)	(0.550)	(0.550)
distance	-7.965***	-9.134***	-9.155***	-8.260***	-9.462***	-9.501***
	(1.277)	(1.527)	(1.514)	(1.135)	(1.401)	(1.371)
common language	13.46***	15.53***	16.54***	14.06***	16.07***	17.72***
	(4.385)	(5.560)	(6.037)	(4.074)	(5.454)	(5.727)
diaspora	0.308*	0.395*	0.377*	0.0179	0.0226	0.00489
	(0.172)	(0.212)	(0.211)	(0.123)	(0.161)	(0.156)
gdp	2.322***	2.440***	2.545***	2.902***	3.238***	3.352***
	(0.443)	(0.558)	(0.543)	(0.420)	(0.516)	(0.528)
gdp growth	0.00975	0.0891	0.0823	-0.0506	-0.0197	-0.0329
	(0.101)	(0.117)	(0.121)	(0.0592)	(0.0673)	(0.0654)
inflation	-0.0408	-0.0277	-0.0310	-0.0102	0.0200	0.0181
	(0.0494)	(0.0627)	(0.0614)	(0.0389)	(0.0533)	(0.0520)
gdp per capita	-8.63e-05		-7.63e-05	-8.63e-05		-9.42e-05
	(9.19e-05)		(0.000155)	(7.54e-05)		(0.000111)
fdistock/gdp	0.412	-0.0364	0.197	1.623**	1.659**	1.889**
	(0.443)	(0.962)	(1.050)	(0.742)	(0.802)	(0.837)
corruption	1.431	1.418	1.816	0.973	0.928	1.427
	(1.054)	(1.030)	(1.306)	(0.759)	(0.771)	(0.892)
tax treaty	3.017*	3.367*	3.327*	0.748	0.779	0.784
	(1.541)	(1.776)	(1.755)	(1.008)	(1.246)	(1.233)
natural resources	-0.0729	-0.0972	-0.0888	-0.0472	-0.0614	-0.0522
	(0.0503)	(0.0671)	(0.0661)	(0.0316)	(0.0414)	(0.0390)
patents		-0.000831	-0.000319		-0.000951	-0.000345
		(0.00112)	(0.00161)		(0.00105)	(0.00136)
Observations	1,024	900	900	940	826	826
Time FE	YES	YES	YES	YES	YES	YES
Interactions	NO	NO	NO	NO	NO	NO
Offshore centers	YES	YES	YES	NO	NO	NO

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2 – Negative Binomial estimation results, with and without offshore financial centers
Dependent variable: Number of WOS and JVs, with interaction terms

VARIABLES	I Marginal Effects	II Marginal Effects	III Marginal Effects	IV Marginal Effects	V Marginal Effects	VI Marginal Effects
wos dummy	0.315	0.383	0.322	0.259	0.198	0.182
	(0.516)	(0.597)	(0.582)	(0.438)	(0.479)	(0.496)
distance	***0.0001***	***0.0016***	***0.0011***	***0.0001***	***0.0015***	***0.0013***
JVs	-8.725***	-9.778***	-9.781***	-9.007***	-10.08***	-10.09***
	(1.226)	(1.431)	(1.427)	(1.051)	(1.282)	(1.252)
WOS	-6.081***	-7.180***	-7.188***	-6.332***	-7.581***	-7.573***
	(1.231)	(1.531)	(1.488)	(1.132)	(1.435)	(1.387)
common language	***0.039***	***0.0151***	***0.0182***	***0.2998***	***0.2456***	***0.2002***
JVs	6.563***	7.096***	7.221***	6.505***	7.261***	7.597***
	(1.552)	(1.841)	(1.872)	(1.182)	(1.463)	(1.449)
WOS	8.826***	10.38***	11.12***	7.442***	8.417***	8.918***
	(1.906)	(2.382)	(2.618)	(1.386)	(1.772)	(1.772)
diaspora	***0.3954***	***0.5454***	***0.3667***	***0.0062***	***0.0255***	***0.0226***
JVs	0.309*	0.383*	0.377*	0.107	0.110	0.0933
	(0.158)	(0.196)	(0.200)	(0.107)	(0.150)	(0.142)
WOS	0.217	0.298	0.253	-0.117	-0.112	-0.134
	(0.179)	(0.225)	(0.217)	(0.139)	(0.176)	(0.171)
gdp	***0.1378***	***0.1656***	***0.4865***	***0.8877***	***0.7836***	***0.7783***
JVs	2.455***	2.550***	2.592***	2.793***	3.037***	3.147***
	(0.413)	(0.498)	(0.486)	(0.389)	(0.463)	(0.473)
WOS	2.062***	2.170***	2.374***	2.750***	3.128***	3.244***
	(0.447)	(0.558)	(0.561)	(0.440)	(0.541)	(0.552)
gdp growth	***0.3562***	***0.5233***	***0.4586***	***0.5741***	***0.6102***	***0.5687***
JVs	0.0287	0.100	0.0932	-0.0440	-0.0132	-0.0271
	(0.0986)	(0.119)	(0.122)	(0.0512)	(0.0640)	(0.0609)
WOSs	-0.0211	0.0594	0.0472	-0.0679	-0.0374	-0.0543
	(0.0962)	(0.108)	(0.113)	(0.0663)	(0.0705)	(0.0698)
inflation	***0.6303***	***0.7294***	***0.7272***	***0.6994***	***0.6087***	***0.5755***
JVs	-0.0247	-0.0287	-0.0303	0.00115	0.0150	0.0121
	(0.0476)	(0.0623)	(0.0615)	(0.0351)	(0.0507)	(0.0491)
WOS	-0.0456	-0.00887	-0.0100	-0.0114	0.0357	0.0353
	(0.0542)	(0.0711)	(0.0696)	(0.0447)	(0.0595)	(0.0586)
gdp per capita	***0.9557***		***0.1659***	***0.5016***		***0.849***
JVs	-9.64e-05		-3.19e-05	-0.000107		-9.53e-05
	(8.04e-05)		(0.000135)	(6.66e-05)		(9.23e-05)
WOS	-9.37e-05		-0.000152	-7.47e-05		-0.000109
	(9.64e-05)	(1.081)	(0.000170)	(8.17e-05)		(0.000126)
fdistock/gdp	***0.7407***	***0.5206***	***0.1981***	***0.1861***	***0.1309***	***0.1035***
JVs	0.497	-0.254	-0.151	1.096*	0.931	1.162*
	(0.426)	(0.800)	(0.908)	(0.607)	(0.624)	(0.681)
WOSs	0.348	0.133	0.625	2.045**	2.241**	2.469**
	(0.524)	(1.279)	(1.135)	(0.921)	(1.087)	(1.046)
corruption	***0.0224***	***0.0069***	***0.0054***	***0.1592***	***0.0075***	***0.0157***
JVs	0.519	0.305	0.474	0.522	0.0637	0.597
	(0.869)	(0.794)	(1.072)	(0.627)	(0.605)	(0.726)

Table 2 cont.

VARIABLES	I Marginal Effects	II Marginal Effects	III Marginal Effects	IV Marginal Effects	V Marginal Effects	VI Marginal Effects
WOS	2.381*	2.464*	3.219**	1.359	1.614*	2.174**
	(1.242)	(2.113)	(1.542)	(0.891)	(0.940)	(1.039)
tax treaty	*0.0064*	*0.0182*	*0.0158*	*0.1363*	*0.311*	*0.2466*
JVs	1.454	1.831	1.810	0.0789	0.327	0.292
	(1.125)	(1.293)	(1.286)	(0.749)	(0.938)	(0.912)
WOS	4.076**	4.572**	4.541**	1.395	1.285	1.385
	(1.712)	(0.0855)	(2.064)	(1.252)	(1.561)	(1.539)
natural resources	*0.6648*	*0.7652*	*0.8879*	*0.5142*	*0.7456*	*0.7063*
JVs	-0.0687	-0.0973	-0.0928	-0.0457*	-0.0655*	-0.0539
	(0.0468)	(0.0628)	(0.0653)	(0.0270)	(0.0364)	(0.0334)
WOS	-0.0928	-0.117	-0.102	-0.0675	-0.0785	-0.0691
	(0.0668)	(0.00119)	(0.0807)	(0.0434)	(0.0546)	(0.0523)
patents		*0.318*	*0.129*		*0.6969*	*0.695*
JVs		-0.00111	-0.000904		-0.00101	-0.000400
		(0.000994)	(0.00140)		(0.000933)	(0.00114)
WOS		-0.000585	0.000467		-0.000857	-0.000157
		(0.00119)	(0.00180)		(0.00108)	(0.00146)
Observations	1024	900	900	840	826	826
Time FE	YES	YES	YES	YES	YES	YES
Interactions	YES	YES	YES	YES	YES	YES
Offshore centers	YES	YES	YES	NO	NO	NO

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3 – Negative Binomial estimation results – Robustness tests

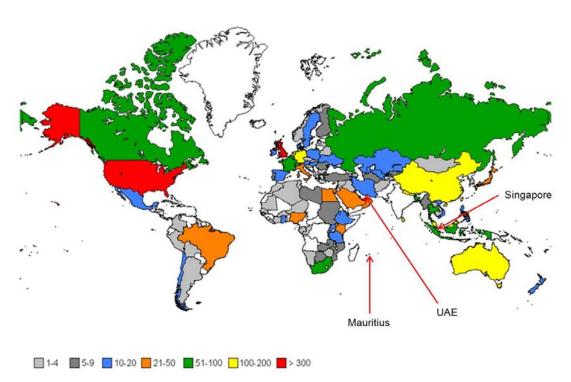Dependent variable: Number of WOS and JVs with interaction terms

VARIABLES	I Log Number of Projects Marginal Effects	II Outliers Marginal Effects	III Institutions Marginal Effects	IV Bilateral Treaties Marginal Effects	V FDI Restrictions Marginal Effects	VI Trade Openness Marginal Effects
wos dummy	-0.0562	0.254	0.266	0.447	0.934	0.238
	(0.0772)	(0.473)	(0.570)	(0.549)	(0.690)	(0.497)
distance	***0.0000***	***0.0002***	***0.0003***	***0.0047***	***0.0416***	***0.0001***
JVs	-1.148***	-8.278***	-9.094***	-9.032***	-12.04***	-8.506***
	(0.142)	(1.078)	(1.717)	(1.259)	(1.850)	(1.189)
WOS	-0.691***	-5.994***	-6.562***	-7.104***	-9.884***	-5.938***
	(0.174)	(1.146)	(1.591)	(1.431)	(2.019)	(1.200)
common language	***0.1386***	***0.0711***	***0.1823***	***0.0179***	***0.011***	***0.0501***
JVs	0.630***	5.026***	6.174***	7.070***	8.320***	6.461***
	(0.169)	(1.325)	(1.597)	(1.725)	(2.395)	(1.505)
WOS	0.787***	6.703***	7.528***	10.72***	13.19***	8.568***
	(0.181)	(1.460)	(1.585)	(2.548)	(3.506)	(1.799)
diaspora	***0.0342***	***0.4131***	***0.0619***	***0.1713***	***0.4816***	***0.4258***
JVs	0.0581***	0.317**	0.307*	0.275*	0.545**	0.290*
	(0.0204)	(0.145)	(0.186)	(0.164)	(0.253)	(0.155)
WOS	0.0246	0.235	0.0577	0.121	0.421	0.203
	(0.0276)	(0.164)	(0.186)	(0.171)	(0.291)	(0.175)
gdp	***0.3027***	***0.098***	***0.8209***	***0.5945***	***0.6567***	***0.1248***
JVs	0.304***	2.095***	2.876***	2.614***	3.284***	2.349***
	(0.0424)	(0.356)	(0.506)	(0.421)	(0.663)	(0.395)
WOS	0.266***	1.695***	2.955***	2.485***	3.120***	1.961***
	(0.0608)	(0.408)	(0.576)	(0.468)	(0.766)	(0.427)
gdp growth	***0.8938***	***0.5468***	***0.4806***	***0.3148***	***0.9981***	***0.3585***
JVs	-0.00438	0.00494	0.132	0.0310	0.111	0.0229
	(0.0101)	(0.0860)	(0.111)	(0.104)	(0.141)	(0.0971)
WOS	-0.00361	-0.0250	0.0903	-0.0284	0.111	-0.0250
	(0.0101)	(0.0849)	(0.0867)	(0.113)	(0.141)	(0.0936)
inflation	***0.5940***	***0.5894***	***0.7858***	***0.4218***	***0.8204***	***0.6062***
JVs	0.00186	-0.0182	-0.0248	-0.0306	-0.0488	-0.0274
	(0.00707)	(0.0422)	(0.0606)	(0.0495)	(0.0951)	(0.0470)
WOS	0.00467	-0.0398	-0.0108	-0.0718	-0.0299	-0.0491
	(0.00782)	(0.0470)	(0.0591)	(0.0633)	(0.105)	(0.0526)
gdp per capita	***0.8173***	***0.7765***	***0.1194***	***0.7154***	***0.6338***	***0.9448***
JVs	-1.99e-05**	-0.000184**	-6.55e-05	-9.30e-05	-0.000108	-8.35e-05
	(9.69e-06)	(7.46e-05)	(6.02e-05)	(7.94e-05)	(0.000115)	(7.60e-05)
WOS	-1.85e-05*	-0.000198**	1.94e-05	-7.54e-05	-0.000145	-8.67e-05
	(1.07e-05)	(8.90e-05)	(8.09e-05)	(9.56e-05)	(0.000145)	(9.10e-05)
fdistock/gdp	***0.3448***	***0.9562***	***0.436***	***0.7174***		
JVs	0.0866	0.779**	0.817*	0.493		
	(0.0690)	(0.313)	(0.457)	(0.437)		
WOS	0.145**	0.755	1.293*	0.312		
	(0.0629)	(0.543)	(0.687)	(0.610)		

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Table 3 cont.

VARIABLES	I Log Number of Projects Marginal Effects	II Outliers Marginal Effects	III Institutions Marginal Effects	IV Bilateral Treaties Marginal Effects	V FDI Restrictions Marginal Effects	VI Trade Openness Marginal Effects
corruption	*0.1889*	*0.0118*		*0.0389*	*0.003*	*0.0152*
JVs	0.129	1.301*		0.489	-0.383	0.566
	(0.0947)	(0.746)		(0.850)	(1.677)	(0.846)
WOS	0.217**	3.166***		2.120*	4.250**	2.426**
	(0.110)	(1.116)		(1.212)	(2.121)	(1.177)
tax treaty	*0.0423*	*0.0091*	*0.1325*		*0.053*	*0.0063*
JVs	0.160	1.263	-0.0674		2.089	1.440
	(0.135)	(1.023)	(1.148)		(1.738)	(1.068)
WOS	0.399**	3.381**	1.573		4.829*	3.958**
	(0.193)	(1.537)	(1.516)		(2.654)	(1.622)
natural resources	*0.4150*	*0.5346*	*0.4292*	*0.5974*	*0.4639*	*0.6954*
JVs	-0.00594	-0.0543	-0.102	-0.0766	-0.128	-0.0614
	(0.00498)	(0.0410)	(0.0665)	(0.0493)	(0.0889)	(0.0468)
WOS	-0.0103	-0.0842	-0.155**	-0.107	-0.183	-0.0831
	(0.00704)	(0.0582)	(0.0748)	(0.0706)	(0.118)	(0.0671)
investment profile			*0.185*			
JVs			0.0742			
			(0.246)			
WOS			0.490			
			(0.346)			
investment treaty				*0.0158*		
JVs				1.016		
				(1.186)		
WOS				2.972*		
				(1.633)		
ownership restrictions					*0.0277*	
JVs					1.855	
					(1.282)	
WOS					-0.156	
					(1.383)	
trade opennes						*0.1234*
JVs						-0.000202
						(0.000301)
WOS						-0.000607
						(0.000421)
Observations	1024	1014	894	1024	804	1032
Time FE	YES	YES	YES	YES	YES	YES
Interactions	YES	YES	YES	YES	YES	YES
Offshore centers	YES	YES	YES	YES	YES	YES

Robust standard errors in parentheses
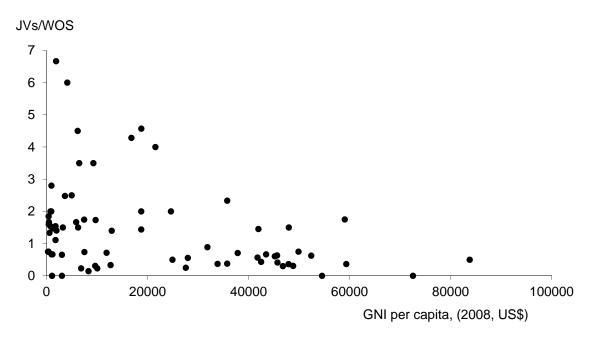*** p<0.01, ** p<0.05, * p<0.1

Figure 1 – Regional distribution of India's FDI projects in 2009 (number of JVs and WOS combined)

Note: countries not colored (white) are not listed in the 2009 issue of the source; it can reasonably be assumed that there are no Indian FDI projects in these countries.
Source: Ministry of Commerce and Industry

Figure 2 – Bivariate correlation between host countries' per-capita income and the
composition of Indian FDI projects (number of JVs/ WOS in 2009)

Note: excluding host countries with less than five FDI projects; missing due to WOS=0:
Liechtenstein, Kuwait, Qatar, Sudan, and Turkmenistan.
Source: Ministry of Commerce and Industry

Appendix A: Definition of variables and data sources

Variable	Definition	Source
fdi projects	Number of Indian joint ventures (JVs) and wholly owned subsidiaries (WOS) abroad by host country	Ministry of Finance of India; http://finmin.nic.in/the_ministry/dept_eco_affairs/icsection/icsec_index.asp
wos dummy	Dummy variable, set equal to one in the case of dependent variable representing WOS	Author's calculations based on Ministry of Finance of India; http://finmin.nic.in/the_ministry/dept_eco_affairs/icsection/icsec_index.asp
distance	Log of distance between India and the host country; based on bilateral distances between the largest cities of the two countries; weighted by the share of the city in the country's total population	CEPII Gravity Dataset; http://www.cepii.fr/anglaisgraph/bdd/distances.htm
common language	Dummy variable, set equal to one in the case of the host country sharing a common language with India	CEPII Gravity Dataset; http://www.cepii.fr/anglaisgraph/bdd/distances.htm
diaspora	Log of estimated size of Indian community in host country as of 2001, in persons	Non Resident Indians & Persons of Indian Origin Division - Ministry of External Affairs of India; http://www.indiandiaspora.nic.in/contents.htm
gdp	Log of GDP of the host country, in US dollars	World Bank, World Development Indicators
gdp growth	Real GDP growth rate of host country in per cent	World Bank, World Development Indicators
inflation	Inflation rate of the host country in per cent, in absolute terms to account for deflation as a manifestation of economic instability	World Bank, World Development Indicators
gdp per capita	GDP of the host country over total population, in US dollars	World Bank, World Development Indicators
fdi stock/gdp	Stock of foreign direct investment in the host country in US dollars over GDP	UNCTAD; http://unctadstat.unctad.org/ReportFolders/reportFolders.aspx
corruption	Score of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption; varying from approximately -2.5 to 2.5, with higher values corresponding to better governance in terms of control of corruption	World Bank Worldwide Governance Indicators; http://info.worldbank.org/governance/wgi/index.asp
tax treaty	Dummy variable, set equal to one in the case of a double taxation treaty ratified between India and the host country	IBFD, Tax Treaty Database; http://www.ibfd.org
natural resources	Natural resources depletion in per cent of gross national income; sum of net forest depletion, energy depletion, and mineral depletion	World Bank, World Development Indicators

Appendix A cont.

Variable	Definition	Source
patents	Patent applications by residents and nonresidents, divided by total population in thousands	World Intellectual Property Organization; http://www.wipo.int/ipstats/en/statistics/patents
investment profile	Risk rating score comprising the sum of three subcomponents: Contract Viability/Expropriation; Profits Repatriation; and Payment Delays, where a score of 4 points equates to very low risk and a score of 0 points to very high risk.	PRS; http://www.prsgroup.com/countrydata_PreparedDatasets.aspx
investment treaty	Dummy variable, set equal to one in the case of a bilateral investment treaty ratified between India and the host country	UNCTAD, http://www.unctadxi.org/templates/DocSearch____779.aspx
ownership restrictions	Score of foreign ownership restrictions prevalent in a country, varying from 1 (highly prevalent) to 7 (very rare).	World Economic Forum; http://www.weforum.org/issues/competitiveness-0/gci2012-data-platform/
trade openness	Sum of imports and exports of the host country in per cent of GDP	UNCTAD; http://unctadstat.unctad.org/ReportFolders/reportFolders.aspx

Appendix B: Summary statistics

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
fdi projects	1,024	20.77	85.20	0.00	1,396.00
wos dummy	1,024	0.50	0.50	0.00	1.00
distance	1,024	8.69	0.58	7.04	9.74
common language	1,024	0.26	0.44	0.00	1.00
diaspora	1,024	6.86	4.34	0.00	14.33
gdp	1,024	24.45	2.14	19.86	30.09
gdp growth	1,024	3.79	4.56	-18.01	27.46
inflation	1,024	7.39	7.13	0.01	48.48
gdp per capita	1,024	9,047.35	11,874.83	130.22	56,624.73
fdi stock/gdp	1,024	0.67	0.94	0.00	8.78
corruption	1,024	0.14	1.08	-1.76	2.43
fdistock/gdp	1,024	0.50	0.50	0.00	1.00
natural resources	1,024	6.59	10.99	0.00	58.84
patents	900	356.40	748.20	0.01	3,990.36
investment profile	894	9.30	2.35	1.00	12.00
investment treaty	1,024	0.37	0.48	0.00	1.00
ownership restrictions	804	5.09	0.78	2.70	6.70
trade openness	1,032	132.29	409.48	22.45	4,407.27

Appendix C: List of host countries

Algeria, Argentina, Australia, Austria, Azerbaijan, Bahamas, Bahrain, Bangladesh, Belgium, Belize, Bhutan, Bolivia, Botswana, Brazil, Bulgaria, Burkina Faso, Cambodia, Canada, Chile, China, Colombia, Congo (Republic), Cuba, Cyprus, Czech Republic, Denmark, Egypt, Ethiopia, Finland, France, Gabon, Georgia, Germany, Ghana, Greece, Honduras, Hong Kong, Hungary, Indonesia, Iran, Ireland, Israel, Italy, Ivory Coast, Japan, Kazakhstan, Kenya, Kuwait, Kyrgyzstan, Laos, Latvia, Liberia, Libya, Luxembourg, Madagascar, Malaysia, Maldives, Mauritania, Mauritius, Mexico, Moldova, Morocco, Mozambique, Namibia, Nepal, Netherlands, New Zealand, Niger, Nigeria, Norway, Oman, Panama,. Peru, Philippines, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Rwanda, Saudi Arabia, Senegal, Sierra Leone, Singapore, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Syrian Arab Republic, Tajikistan, Tanzania, Thailand, Tunisia, Turkey, United States, Uganda, Ukraine, United Kingdom, Uruguay, Uzbekistan, Vietnam, Zambia, Zimbabwe.