

**THE IMPACT OF FOREIGN FIRMS' KNOWLEDGE CREATION ON HOST COUNTRIES:  
THE CASE OF INDIA**

**ABSTRACT**

To what extent MNCs achieve the outcomes desired by host country stakeholders is yet to receive the attention it deserves in the mainstream international business literature. There is much ambiguity regarding how to deal with cooperative global innovations as they evolve from being subpatentable learning experiments to commercially viable patents with potentially large social impact. Our research shows that the contribution of MNCs in the form of exports and royalties is significantly lower than the contribution made by local firms. Insufficient attention to local subsidiary interests may undermine the motivation of subsidiary managers to discover new sources of advantage for the MNC. It may also discourage subsidiary country governments from offering incentives to MNCs for inward FDI.

*Keywords – HQ-subsidiary roles, knowledge creation, innovation, R&D, emerging economies*

**Track 5: Managing knowledge and innovation in international Business**

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## INTRODUCTION

In past few decades, international business studies have evolved from examining multinational companies (MNCs) from an ethnocentric MNC-parent oriented perspective to that of a more geocentric global perspective. Under the former view, innovations first created by MNCs in developed countries were later transferred to and progressively exploited in other developed and developing countries under (Vernon, 1966) hierarchical modes of governance, deemed as more efficient than market mechanisms (Buckley and Casson, 1991; Caves, 1996). Dunning's (1988) ownership, location and internalization (OLI) framework enriched the rationale for FDI by supplementing the transaction cost based *internalization* and industrial organisation based *ownership*-based explanations with the trade based *location*-based advantages of the host country. MNCs with O advantages seek locations where they can combine their O advantages with the location specific advantages internally in order to maximize the gains for the MNC as a whole. In addition, MNCs were seen as a significant source of positive externalities for the host country, with their ownership advantages (a private good), contributing knowledge to, and interacting with the host country's locational advantage (a public good), in a virtuous cycle of innovation and renewal. Yet, the perspective continued to be MNC-parent centric. The subsidiary and the host country were viewed mainly as mechanisms for internalising the location specific externalities in the parent or the MNC network as a whole to create competitive advantage for the MNC's global network. There was little interest in understanding and fulfilling the requirements of the MNC subsidiary's local stakeholders, beyond product and marketing adaptation.

The new literature on MNCs looks at multinational firms from the second perspective of the overall MNC network, and focuses on differentiated roles and responsibilities for the MNC subsidiaries (e.g., Bartlett and Ghoshal, 1986; Gupta and Govindarajan, 1994; Birkinshaw and Morrison, 1995; Venaik et al., 2005). Instead of regarding MNC subsidiaries as a uniform, homogeneous, isomorphic system, it emphasizes differentiation among subsidiaries in the MNC network, dictated by the environmental context of each subsidiary. Based on their differentiated roles, subsidiaries are classified variously as autonomous, implementers, receptors, contributors, or strategic leaders with world mandates (Taggart, 1997).

Although the new literature on MNCs addresses issues at a finer level of the subsidiaries, the focus of attention continues to be the performance of the MNC network as a whole, rather than that of the individual subsidiaries within the MNC system. In particular, it falls short of examining how subsidiary activities may impact on the stakeholders<sup>1</sup> of the host country where it is located. Given that welfare impact may be an important question for policymakers in developing countries who have been welcoming FDI led globalisation, such an aggregated approach gives an imprecise notion about the effectiveness of the subsidiary in a specific environment.

In the emerging knowledge based economy, it is widely acknowledged that the creative output of MNC subsidiaries is a result of interactions between the ownership (O) advantages of the MNC parent and the location (L) advantages situated in the host country. The focus has therefore shifted from exploiting static advantages to creating dynamic advantages. As a result, recent research in MNCs is directed towards understanding the process of local linkages and knowledge creation in MNC subsidiaries (Hakanson and Nobel, 1992; Nobel and Birkinshaw, 1998; Taggart, 1991; Birkinshaw, Hood and Johnson, 1998; Nohria and Ghoshal, 1997). Yet the question that has received little attention is whether the country units of MNCs are conducting sufficient value added in and creating valuable knowledge in the host country which can dynamize its comparative advantages. Although there is extensive research on externality related benefits of FDI (e.g., Aitken and Harrison, 1999; Moran et al., 2005), there is relatively little research on the direct cost-benefits of FDI in the form of value added, R&D, exports and royalties paid their contribution to the MNC network. The perspective is largely through the lens of the MNC parent and the MNC network, and rarely through the lens of the MNC subsidiary.

When MNCs tap into location specific advantages such as ideas, skills, aptitudes, dynamism and knowledge resources of host nations, it is as much the expectation of the host governments to benefit from the innovation as it is the goal of the MNC-parent (Hu, 1992). However the extent to which the host country actually manages *ex-post* to claim a share of the benefits arising from the innovation effort by the MNC can be a different matter altogether. Innovation generated through R&D is significant for a country in terms of direct returns from intellectual property, indirect returns via spin-offs, and tax revenues. Subsidiaries of MNCs are often allowed tax offsets for R&D expenses and

therefore such investments are subsidised by host governments. The current aggregated view wherein the financing, creation, ownership and utilization of innovation is considered to be carried out by actors with co-aligned interests is an oversimplified representation of a complex process (Aghion and Tirole, 1994). Often, the actors have diverse interests, and the critical question of sharing of rewards among the multitude of actors involved in the innovation process is not considered. Moreover, a government's expectations from a subsidiary located in a developed country like Ireland may be quite different from a government's expectation in a developing country such as India.<sup>2</sup> On the one hand, the MNC parent may like to appropriate all the gains arising from the activities carried out by its subsidiaries. On the other, the subsidiary country managers and governments aim to maximize the benefits that accrue to the subsidiary/country where the activities are carried out (Bartlett and Ghoshal, 1989). If research is performed by MNCs in the host country and patent rights also reside in it, the welfare function is similar to the case by a local inventor. In the light of this potential contest between the MNC parent and its subsidiaries to appropriate the gains from subsidiary activities, Ozawa and Castello (2004) suggested the need to look at the issue of internalisation from the perspective of both the MNC parent and the host country where the MNC subsidiary is located. Similarly, Grosse and Behrman (1992) developed a "bargaining theory" approach to explain how the subsidiary "spoils" is shared between the MNC and the host government. Although there is extensive research on externality related benefits of FDI (e.g., Aitken and Harrison, 1999; Moran et al., 2005), there is relatively little research on the direct cost-benefits of FDI in the form of R&D, exports and royalties paid by MNC subsidiaries.

Our research aims to fill this gap. The point of departure of this study is its unit of analysis which helps us to more precisely examine how foreign ownership influences linkages and knowledge creation in a developing host country. Understanding the issues from a welfare perspective will help in designing strategies by policymakers and MNCs that enhance convergence and reduce conflicts among the diverse stakeholders worldwide. We would therefore like to move forward the analysis of MNC activities from an MNC-centric lens to a subsidiary-centric lens from the perspective of the MNC subsidiary company's impact on the country, where it is located. This is important because in developing countries, large amount of resources are spent by governments in the form various tax

incentives and R&D subsidies to attract inward FDI – which have huge opportunity costs. Consequently, developing countries have certain performance expectations from MNC activity in the form of exports and royalty earnings. Secondly, the local stakeholders of the MNC subsidiary are more interested in the impact that the MNC subsidiary has on the immediate locale than on the world as a whole. For example, prices, dividends and taxes influence how customers and suppliers, shareholders and governments respectively view the benefits of MNCs in the country. Third, as yet there is no formal study showing who actually manages to internalize the externalities—is it the MNC-parent or the subsidiaries? Because of the public good qualities of ‘spillovers’, it might lead subsidiary managers to under-invest in it (Arrow, 1962). Even if the subsidiary incurs all of the expenses associated with the effort of innovation, it is by no means clear that the subsidiary will be able to appropriate the resulting intra-firm rents (Argyres and Silverman, 2004) – which can lead to this situation.

The objective of our paper therefore is to understand who in fact internalises the gains from the interaction between mobile assets of MNCs and the immobile assets of a host country? The exchanges between the multinational firm and the foreign country should result in the creation of new advantages that could potentially benefit both the multinational firm and the host country; whether this transpires in practice is what we are exploring in this paper. The paper is organized as follows. The next section presents the theoretical model and the hypotheses tested in our study. This is followed by a discussion of the methodology used for data collection and analysis. Finally, the paper presents the results of our research, the conclusions and limitations of our findings, and issues for future research.

### **THEORETICAL MODEL AND HYPOTHESES**

Governments in developing countries expect MNC subsidiaries to contribute directly to national development priorities in the form of greater R&D intensity, higher exports, value added and local integration, and lower foreign exchange outflows on account of royalties and license fee payments (Ray, 2004; Ray and Venaik, 2004; von Dijk and Rao, 1994). Indeed, multinational firms are often treated more favourably than domestic enterprises in the hope that their high R&D, export and patenting intensity will dynamize the local economy and promote faster economic growth (Javorcik and Spatareanu, 2005, p.45; UNCTAD, 2005, p.103). Whereas higher R&D intensity potentially

creates faster new innovations, strong export orientation disciplines local industries, and prevents technological sloth (Lall, 1996). However, attracting FDI entails significant costs. These include In addition to the resource transfer costs in the form of returns on FDI, such as profits, royalties, dividends etc. back to the MNC-parent;, and there are a number of indirect costs, such as tax, incentives and subsidies, which countries offer to attract inward FDI (Sisodia, 1992). Thus, whereas host countries hope to internalise the benefits from MNC operations, MNCs hope to benefit from the positive externalities of the location (Bartlett and Ghoshal, 1989). Moreover, in the new knowledge economy, whoever owns the rights to intellectual property (patents) embodying a technology, potentially controls the ‘nerve centre’ of competitive advantage in global competition.

We propose a theoretical model shown in Figure 1 to illustrate the objectives of host countries. As shown in the Figure, host country stakeholders expect foreign ownership to have a favourable impact on local and external linkages and innovation, while at the same time reduce outflows of capital in the form of royalty payments by the local subsidiary. The model is elaborated further in the hypotheses section, discussed next. Since our objective is to test the impact of foreign ownership, we develop hypotheses for the paths from foreign ownership to the outcomes of subsidiary R&D, exports and royalty payments. The two dotted paths – from R&D to exports and to royalty payments – are used as controls.

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FIGURE 1 ABOUT HERE

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### **Hypotheses**

#### Foreign ownership → Subsidiary R&D

Earlier, multinational firms conducted R&D largely in the corporate headquarters (Caves, 1996). However, with the increasing difficulty of headquarter-based R&D teams to understand consumer preferences in subsidiary markets, MNC-parents located some of the adaptive R&D activities in the subsidiaries (Jarillo and Martinez, 1990). Subsidiary-level R&D thus focussed largely on product adaptations to suit local customer needs and preferences (UNCTAD, 2005, p.119). Of late however, MNCs are increasingly conducting critical R&D in the subsidiaries to absorb and assimilate

knowledge from universities and research labs in host countries – in order to augment their existing firm-specific ‘O’ advantages (Birkinshaw et al., 2006; Cantwell and Narula, 2003, p.4).

Thus, the internationalisation of R&D is being motivated by one or more of the three demand and supply factors, namely, i) the need for local adaptation of foreign products and production processes, ii) location-specific cost advantages in the supply of human capital assets and labour, and iii) the localised knowledge spillovers in countries that are more advanced than the home country of the MNC in specific fields (Kumar, 2001). The traditional centralized R&D structure is progressively being replaced by the emergence of overseas R&D networks which tap into new knowledge and research produced by universities and competitors across the globe (Teigland et al., 2000). The increasing scale of national technological effort in many newly industrialising countries (NICs) is also favouring the relocation of R&D efforts of foreign MNCs to these NICs (Kumar, 2001, Pearce and Singh, 1992). In the area of high calibre human-capital intensive information and communication technologies, MNCs are conducting R&D in countries such as India, China and East European nations that have a large, low-cost pool of high quality scientists and engineers (UNCTAD, 2005, p.119). As a result, MNCs’ R&D activities in developing countries are evolving from simple adaptation for local markets to the creation of new products and processes for world markets (UNCTAD, 2005, p.119). For example, over 100 foreign MNCs across a wide range of industries have established R&D centres in India – these include large, well-known firms such as Astra-Zeneca, Daimler-Benz, Intel, Microsoft, Motorola, etc. (UNCTAD, 2005, p.167). Empirical studies (Erdilek 2005, p.120) on countries such as Turkey found that MNC subsidiaries have higher R&D intensity than domestic firms. Overall, an increase in foreign ownership stimulate local technological effort both for adaptation and absorption of foreign knowledge, and for creation of new knowledge locally (Aggarwal, 2000; Siddhartan and Safarian, 1997). Hence, we propose the following hypothesis:

*H2: MNE presence is expected to foster new knowledge spillovers*

Foreign ownership → Subsidiary exports

Typically, host governments encourage inward FDI in the expectation of improving the competitiveness of their domestic economies – through transfers of technology from MNCs. FDI is

also acknowledged to boost exports,<sup>3</sup> since MNCs possess greater ability to export vis-à-vis domestic firms, due to their vastly superior ownership-specific advantages and worldwide product-market networks. Moss et al. (2005, p.356) found that due to their superior connection to global markets, the export to output ratio for foreign firms was three times as high as that for domestic firms. The subsidiary may engage in intra-firm trade with the network of MNC subsidiaries worldwide, or it may take the form of inter-firm trade with foreign firms that have linkages with one or more subsidiaries of the MNC. Exporting is also likely to be high if the subsidiary is granted a global export mandate by the multinational firm (Birkinshaw et al., 1998). During the pre-WTO era, developing countries directed MNC subsidiaries to enhance the level of exports from the host country (Long, 2005, p.321). In the post-WTO global economy, government mandates have been replaced with generous tax and tariff concessions, export incentives and R&D subsidies – in order to entice MNC subsidiaries to voluntarily achieve government’s local R&D and export objectives (Lawrence, 2005, p.370). This leads us to the following hypothesis:

*H2: Foreign ownership has a positive effect on subsidiary exports.*

#### Foreign ownership → Subsidiary royalty earnings

MNCs increasingly use their subsidiaries to create new knowledge that can be exploited by the MNC network worldwide (Bartlett and Ghoshal, 1986; Birkinshaw et al., 1998). Previous research by Roth and Morrison (1990) and Holm and Pedersen (2000) on ‘World-mandated Subsidiaries’ and ‘Centres of Excellence’ indicates that the former class has responsibility to develop entirely new product lines, whereas the latter class conducts both basic and applied research for product development. If the subsidiary that creates new knowledge is assigned the patent for invention, the subsidiary can license the technology to the parent company or other subsidiaries and earn royalties for the technology.

Foreign R&D also generates reverse technology transfer and positive spillover effects on the *home* economy of the MNC (UNCTAD, 2005, p.179). If some of these benefits are shared with the subsidiary, which is the source of the new technology, it will result in a positive inflow of royalty payments from the MNC-parent to the subsidiary or a negative outflow of royalty payments from the

subsidiary. Thus, the greater the foreign ownership in the subsidiary, the lower the likelihood of foreign royalty payments by the subsidiary, leading to the following hypothesis:

*H3: Foreign ownership has a negative effect on subsidiary royalty payments.*

The next section discusses the methodology used for testing the proposed model.

## **METHODOLOGY**

We tested the proposed model with secondary data from the “Prowess” database of the Centre for Monitoring the Indian Economy, by far the most comprehensive and reliable sources of data on the Indian economy. India is well-known for its ability to provide high technology skills at lower cost relative to developed countries (UNCTAD, 2005, p.160). Economic liberalization from 1991 onwards created enormous opportunities for foreign MNCs to enter India via FDI and set up their R&D centres to tap into the low-cost, high technologically skilled manpower base. More than 100 TNCs have since established R&D facilities in India (UNCTAD, 2005, p.140). India got rated second after China as the most attractive FDI destination (ATKearney, 2005), and third after China and the USA as the most attractive prospect for R&D location (UNCTAD, 2005, p.153). This backdrop provides a good justification to use a sample of firms in India to test our proposed model.

The “Prowess” database contains cross-sectional information at the level of firms, both domestic and foreign affiliates, and classified by industry. For the purpose of this study, we sampled 187 firms operating in three industry groups – automotive (54), chemicals (80) and electronics (53) with annual sales greater than Indian Rupees 400m per annum (approx US\$9m). Industries selected belong to the medium-high technology categories (UNCTAD, 2005, p.108); show high level of MNC involvement; and are characterised by high R&D intensity globally. Indeed, according to the World Investment Report (UNCTAD, 2005, p.v) firms in automobiles, electronics, biotechnology and pharmaceuticals are establishing R&D facilities in selected developing countries – to access expanding pool of scientists and engineers, and to meet the demand of increasingly sophisticated markets. We included local firms in our sample specifically to compare their R&D intensity, exports and royalty payments vis-à-vis foreign affiliates.

### **Measures of Constructs and Data Analysis Methodology**

All constructs are measured with actual firm-level data. Foreign ownership is measured by the percent of equity owned by foreign entities. Enterprises holding more than 10 per cent foreign equity were classified as MNCs – in accordance with the IMF definition (see also Hymer, 1976).<sup>4</sup> R&D is measured as percent of sales to control for firm size (Tsai, 2001). Exports and royalty payments by the firm to foreign entities are expressed as percent of sales to control for firm size.

The proposed model was tested empirically using the structural equation modelling (SEM) based partial least squares (PLS) methodology. PLS is considered to be appropriate in the initial exploratory stages of theory development, when the conceptual model and the measures are being developed (Chin, 1998). PLS also offers several advantages over other SEM approaches such as flexibility to estimate complex models with small sample sizes, no distributional assumptions about the data used for model estimation, and the ability to generate bootstrap statistics for significance testing (Chin, 1998).

## **RESULTS AND DISCUSSION**

Table 1 contains sample descriptive statistics and correlations of variables in our model. The results of testing our theoretical model are summarized in Table 2 and Figure 2. We have hypotheses for three paths: from foreign ownership to R&D, exports and royalty payments. The remaining two paths from R&D to exports and royalty payments are used as controls while estimating the hypothesised relationships.

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TABLES 1 to 3 AND FIGURE 2 ABOUT HERE  
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The first hypothesised relationship between foreign ownership and R&D is not statistically significant, which suggests that foreign ownership does not result in higher R&D intensity. This is contrary to earlier findings, which suggest that foreign affiliates exhibit higher R&D intensity to both adapt their products and processes for the local market and to create new knowledge for the benefit of the MNC network (e.g., Caves, 1974). A number of plausible explanations for our contrary findings come to the fore. Globalisation of markets may ordain MNCs not to make significant adaptations for local markets; the adaptations may need little R&D; or adaptive R&D may be conducted outside the

host country. Another plausible explanation is perhaps the absence of R&D mandate for the subsidiary, which would result in lower R&D in comparison with that in the transnational corporation (e.g., Birkinshaw et al., 1998). There may also be downsizing of local R&D if FDI involves acquisition of domestic firms and transfer of R&D mandate to other parts of the MNC network (UNCTAD, 2005, p.xxix), since “innovative corporate activity as measured by patents is still predominantly located close to the firm’s headquarters” (OECD, 1999, in Erdilek, 2005, p.109). It is also possible that progressively stronger IPR protection in developing countries is encouraging MNCs to transfer advanced technology directly to the local subsidiary from the MNC’s global network, obviating the need for significant level of local R&D (Maskus, 2000). Finally, the recent increase in R&D by MNCs in developing countries may have started from a very low base, only just reaching the R&D intensity of domestic enterprises. Even though anecdotal evidence points towards increasing R&D in MNC subsidiaries in developing countries (UNCTAD, 2005, p.119), our results show that it is unlikely to match MNC’s global levels anytime soon. The insignificant impact of foreign ownership on R&D intensity contradicts our predictions that MNC subsidiaries confer greater positive externalities for the local economy, than their ‘less illustrious’ domestic counterparts.

The second hypothesis about the effect of foreign ownership on exports is *rejected* at  $p < 0.001$  level. That is, *contrary* to our hypothesis, we find that foreign ownership has a significant *negative effect* on export intensity. The experience of Africa in this regard is similar, i.e., FDI becoming a drain on foreign exchange due to increasing material imports and profit remittances (Chudnovsky and Lopez, 2002). There are several plausible explanations for the contrary findings. One is the simple one discussed above, that is, since foreign ownership does not have a significant positive effect on R&D, MNC subsidiaries are unlikely to be more competitive in exporting intermediate and final products to foreign markets. Under this assumption however, it should result in a non-significant effect rather than a negative effect of foreign ownership on exports – which makes this explanation rather fragile. The second plausible explanation is the motivation for FDI. Although foreign-owned firms have greater export capability in general, the level of exports actually realised by MNC subsidiaries in a foreign market depends on a complex interaction between the firm’s objectives in the market and the country’s institutional environment. Foreign owned firms may be less export oriented if the MNC

pursues a 'multidomestic' strategy; if the host country lacks the knowledge and skills to add value to imported intermediate goods; or if it restricts imports of intermediate inputs for processing in the country (Melitz, 2005, p.275).

The third hypothesis about the effect of foreign ownership on royalty payments is also *rejected* at  $p < 0.001$  level. Again, *contrary* to our hypothesis, foreign ownership has a *significant positive effect* on royalty payments. There are a number of other plausible explanations for our result.<sup>5</sup> Since foreign ownership did not have a significant effect on R&D intensity, MNC subsidiaries may not have the opportunity to create new technologies to replace those licensed from their MNC parent. Increase in royalty payments may also be due to the high level of technology transfer from the MNC's global network to the subsidiary for a fee (Erdilek, 2005, p.120; Long, 2005, p.329). In addition, royalties and licence fees may be used by MNCs to transfer profits abroad, especially from countries that strictly monitor and/or regulate profit repatriation by subsidiaries to their foreign parent.

Do these outcomes have any adverse consequences for local stakeholders? Prima facie, transferring profits via royalties and licence fees reduces the taxes payable by the subsidiary in the country where it is domiciled, thus affecting the welfare of the local economy (Lall, 1973). If the technology supplied by the MNC parent is more costly than that available from the market, it would adversely affect the performance of the subsidiary and reduce the direct, as well as indirect (spill-over) gains accruing to local stakeholders. If the subsidiary is constrained by the MNC-parent from exploring more efficient alternative sources for its technology needs locally or globally,<sup>6</sup> increasing tensions may develop in the relationship between the parent firm and subsidiary – one that could mar future interactions between, and innovation conducted at, the local and global level. Lower profitability may reduce the dividends earned by local subsidiary shareholders. If executive compensation is based on local subsidiary performance, it will reduce the rewards for subsidiary executives. In addition, low profits may also inhibit the emergence of domestic competitors, and reduce choice for local consumers (Hymer, 1970; Lall, 1973). Ironically in this instance, lower profitability of MNC subsidiaries does not imply more competitive and efficient industries, but reflects the subsidiary's debility from high outflows of royalties and license fees.

Furthermore, the MNC's global network may restrain a subsidiary from exporting and/or earning royalties in competition with other members of the MNC network. According to UNCTAD (2005, p.135), "a large share of all patents granted to inventors in developing economies is assigned abroad, notably TNCs". For example, from 2001-2003, the United States Patent and Trademark Office granted 1022 patents to residents in India. Of these, 611 patents were granted to domestic-owned entities and 411 to foreign-owned entities. Of the latter, 409 patents were assigned to foreign institutions and only 2 patents were assigned to foreign affiliates in India (data from UNCTAD, 2005, pp.135-136). Since the "assignee becomes the legal owner of the patent" (UNCTAD, 2005, p.134), the transfer of patent rights from the MNC subsidiary to the parent may deprive the opportunity for MNC subsidiaries to earn royalties from its inventions. In sum, positive externalities from new technologies notwithstanding, transfer of profits via royalties and license fees to the MNC parent, have an adverse impact on the performance of the subsidiary, and on the benefits available to the local stakeholders of the subsidiary. Thus, any assessment regarding the extent of spillover benefits of MNCs needs to be conducted *ex-post*, and in line with the actual empirical evidence, not on some *ex-ante* cost-benefit analysis.

### **A NEW FRAMEWORK**

As stated in the introduction, our objective was to look at MNC subsidiary activities from the alternative perspective of local subsidiary stakeholders, to complement existing research on MNC subsidiaries that is undertaken largely from MNC-parent and MNC-network perspectives. Consistent with this view, we propose a new framework (Figure 3) which examines the contribution of MNC subsidiaries to the local network of host country stakeholders as well as to the global network of the MNC-parent and other subsidiaries.

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FIGURE 3 ABOUT HERE  
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As shown in the Figure, MNC subsidiaries can have low or high level of contribution to its local or global networks. Subsidiaries that contribute to neither the global, nor the local network of the MNC are positioned in cell 1. An example of such a subsidiary would be one whose performance is

mediocre, or inadequate, across a range of value creation activities, and does not hold significant prospects for benefiting either the MNC parent or itself. Subsidiaries that make a significant contribution to the MNCs' global, but not local network, are in cell 3. An example would be a subsidiary that uses transfer price mechanism to shore up MNC's global profits to the detriment of local subsidiary performance. In cell 3, the parent is appropriating most of the location-specific externalities by internalising *in the headquarters* any new firm-specific asset (e.g., patents/copyrights) created by the subsidiary. The MNC-subsidiary in cell 2 is the opposite of the subsidiary in cell 3, in that it aims to maximize benefits for the local subsidiary, rather than for the MNC's global network. In this configuration, it is the *subsidiary* that internalises the externalities of the location, and manages to appropriate new patents for itself. Finally, like a transnational (Bartlett and Ghoshal, 1989), the subsidiary in cell 4 makes significant contribution to both local, as well as global networks of the MNC. In this cell, the subsidiary, as well as the parent, gets to internalise a significant share of the positive externalities of FDI, *both in the host and the home country of the MNC in question*. Such an outcome maximises the two-way spillovers of knowledge and linkages that the MNC spawns in the host environment, delivering a virtuous cycle of interaction between the MNC's 'O' advantages and the host nation's 'L' advantages.

Our results however suggest that the MNC subsidiaries in India are positioned either in cell 1 or cell 3 since they make relatively weak contribution to their local network. The usefulness of this framework is its specification of the contributory role of the MNC subsidiary from the alternative perspective of local stakeholders, in addition to their global counterparts.

## CONCLUSION

Our study proposed and tested a model linking foreign ownership with the outcomes of R&D, exports and royalty payments by the foreign subsidiary. We found no significant effect of foreign ownership on local R&D intensity. The results indicate that MNC subsidiaries do not seem to achieve the level of knowledge creation and intellectual property generation sought by local subsidiary stakeholders. If MNC subsidiaries conduct lower local R&D, both the direct benefits from the innovations that could be created locally and the indirect benefits from spillovers and externalities – that could have been generated, would not be forthcoming.

In addition, two of the three hypothesized effects were significant, but in a direction opposite to our predictions. Foreign ownership has a significant *negative* effect on exports and a significant *positive* effect on royalty payments. Thus, whereas earlier findings on externality related benefits of FDI are inconclusive (Javorcik and Spatareanu, 2005, p.70), our research shows that the direct benefits of FDI in the form of R&D and exports by MNC subsidiaries are illusory. This carries significant managerial and public policy implications. MNCs may be regarded as institutions that retard opportunities for the country to “internalize” (Ozawa and Castello, 2004) the gains from R&D carried out within the country’s borders with the support of nation’s private and public resources. Governments could therefore be in dilemma whether or not to continue incentives to MNCs. They could also enforce mandatory levels of local R&D and exports, and to impose limits on foreign royalty payments.

Overall, there may be increasing support for the view that “the escalation of incentives and subsidies offered to international corporations by both developed and developing countries needs to be capped, and brought under multilateral discipline to maximize the benefits that flow from investor operations” (Birdsall and Bergsten, 2005, p.xiii). Such negative perceptions may hinder the expansion of MNC activities within the host country. Increasing regulations will enhance governance costs for the MNC resulting in scaling down or withdrawal of MNC from the country, and a loss of potential opportunity for both the MNC and the host country to benefit from each others’ unique assets and capabilities. Low level of subsidiary R&D will provide fewer opportunities for talented subsidiary managers to engage in innovative activities locally, and to gain professional recognition within the firm by virtue of their new discoveries. It will also weaken their ability to compete with their global peers for high level local subsidiary roles and resources. We do not claim that these possibilities are inevitable, but they do seem plausible given the empirical evidence.

### **Limitations and future research**

Our research has a few limitations that need to be addressed in future research. First is the issue of sample context. We conducted our research with data from India for three industries – automotive, chemical and electronics. To enhance the generalizability of our findings, the model need to be retested with data from subsidiaries operating in other industries and located in other developed and

developing countries. Second is the issue of research methodology and construct measures. We collected data from secondary sources and used objective measures to measure each construct. In future, secondary data analysis could be supplemented with primary survey data using multiple perceptual measures to capture the broad domain of each construct in the model. Finally, cases studies are needed to get more in-depth understanding of the complex relationship between MNC and its subsidiaries in terms of interunit flows of products, knowledge and information, and sharing of benefits among the members of the MNC network.

### **Key contribution**

To conclude, we believe our paper makes three contributions to the IB literature. First, like the current literature, it focuses on the phenomena of knowledge creation and R&D activities in MNC subsidiaries. However, it extends the literature by examining these issues from a new perspective of the subsidiary company stakeholders. Looking at subsidiary activities from the dual lens of both the global MNC network and the local subsidiary network will enable MNCs to develop strategies that optimally balance the often conflicting objectives of these two stakeholder groups. Second, our study finds that foreign-owned firms have insignificant impact on R&D intensity, and significant negative impact on exports and on royalty payments relative to their domestic counterparts. The lesson for any host country is that the governments should reduce their expectations on how much MNCs can contribute to the local economy. That is not to deny that there are many positive externalities of MNC operations in host countries. In the ultimate analysis, what matters is whether the positive externalities are balanced with the negative ones.

Finally, from a subsidiary management standpoint, inadequate sharing of high-level roles and rewards among the MNC subsidiaries will diminish the ability of subsidiaries to attract, motivate and retain talented employees, ultimately undermining MNC's sustainable competitive advantage locally and globally. It is therefore critical that local and global imperatives are considered simultaneously both in the management of MNC subsidiaries and in the sharing of benefits among the country units. Whereas the former is a recurring theme in the international business literature, our paper brings to the fore the issue of sharing benefits equitably between the headquarters and subsidiaries and among the diverse country units of multinational firms.

## NOTES

1. It is often assumed that the nation-state is the ultimate *repository of social welfare*, often equated to the national interest (Lall, 1976); it represents a large multiplicity of stakeholders between whom it is neutral; it pursues the goals of maximising benefits and of minimising costs for the large majority of stakeholder consisting of buyers, suppliers, employees and third-parties.
2. In a developed country, the spillover benefits from MNC subsidiaries are usually sufficient to justify incentives for inward FDI, whereas in the case of developing countries, there is often an additional expectation, and sometimes a requirement for MNC subsidiaries to also provide more direct benefits in the form of R&D, exports and royalty earnings (Kumar, 1996; von Dijck and Rao, 1994).
3. Source: [http://finmin.nic.in/the\\_ministry/dept\\_eco\\_affairs/investment\\_div/fip.htm](http://finmin.nic.in/the_ministry/dept_eco_affairs/investment_div/fip.htm)
4. The IMF's Balance of Payment Manual defines **the owner of 10% or more** of a company's capital as *a direct investor* (IMF - International Monetary Fund, 1993: Balance of Payments Manual 5th Edition, Washington DC). However, a lower threshold may also entail a controlling interest in the company (and, conversely, that a share of more than 10% may not signify control) – the manual acknowledges.
5. Following discussions with John Cantwell and participants at the Academy of International Business 2006 meeting.
6. Based on discussions with managers in Telcon, India on 18 July 2005.

## REFERENCES

- Aggarwal, A. (2000). "Deregulation, technology imports and in-house R&D efforts: an analysis of the Indian experience". *Research Policy*. 29(9), 1081-1093.
- Aitken, B.J. and Harrison, A.E. (1999). "Do domestic firms benefit from foreign direct investment? Evidence from Venezuela". *American Economic Review*. 89(3), 605-618.
- Asakawa, K. (2001). "Organizational tension in international R&D management: the case of Japanese firms". *Research Policy*. 30, 735-757.
- AT&Kearney. (2005). *A CII-AT&Kearney Survey*. <http://economictimes.indiatimes.com/articleshow/1325008.cms>, accessed 9<sup>th</sup> December 2005.
- Bartlett, C.A. and Ghoshal, S. (1986). Tap your Subsidiaries for Global Reach. *Harvard Business Review*. November–December, 87–94.
- Bartlett, C.A. and Ghoshal, S. (1989). *Managing Across Borders: The Transnational Solution*. Boston: Harvard Business School Press.
- Birdsall, N. and Bergsten, C.F. (2005). "Preface". In Moran, T.H. Graham, E.M. and Blomstrom, M. (Eds.) *Does Foreign Direct Investment Promote Development?* Washington, DC: Institute for International Economics. xi-xiv.
- Birkinshaw, J. and Morrison, A. (1995). 'Configurations of strategy and structure in subsidiaries of multinational corporations', *Journal of International Business Studies*. 26(4), 729-753.
- Birkinshaw, J. Hood, N. and Jonsson, S. (1998). "Building Firm-Specific Advantages in Multinational Corporations: The Role of Subsidiary Initiative". *Strategic Management Journal*. 19(3), 221-241.
- Birkinshaw, J. Bouquet, C. and Ambos, T. (2006). "Attention HQ". *Business Strategy Review*. Autumn, 4-9.
- Buckley, P.J. and Casson, M. (1991). *The Future of Multinational Enterprise*. London. Macmillan (2<sup>nd</sup> Edition).
- Caves, R. E. (1996). *Multinational enterprise and economic analysis*. 2nd Ed. Cambridge, Cambridge University Press.
- Caves, R.E. (1974). "Industrial Organization". In Dunning, J.H. (Ed.). *Economic Analysis and the Multinational Enterprise*. Allen and Unwin: Surrey. 89-114.
- Chin, W.W. (1998). "The Partial Least Squares Approach for Structural Equation Modeling". In Marcoulides, G.A. (Ed.). *Modern Methods for Business Research*. Mahwah, NJ: Erlbaum.
- Chudnovsky, D. and Lopez, A. (2002). *Globalization and Developing Countries: Foreign Direct Investment, Growth and Sustainable Human Development*. UNCTAD Occasional Paper. Geneva: United Nations.
- Dunning, J. (1988). "The Eclectic Paradigm of International Production: A Restatement and Some Possible Extensions". *Journal of International Business Studies*. 19(1), 1-31.
- Erdilek, A. (2005). "R&D Activities of Foreign and National Establishments in Turkish Manufacturing." In Moran, T.H. Graham, E.M. and Blomstrom, M. (Eds.) *Does Foreign Direct Investment Promote Development?* Washington, DC: Institute for International Economics. 107-136.
- Fisch, J.H. (2003). "Optimal dispersion of R&D activities in multinational corporations with a genetic algorithm". *Research Policy*. 32, 1381-1396.
- Gupta, A.K. and V. Govindarajan (1994). "Organizing for knowledge within MNCs". *International Business Review*. 3(4), 443-457.
- Holm, U. and Pedersen, T. (2000), *Centres of Excellence*. London: Macmillan
- [Http://devdata.worldbank.org/dataonline](http://devdata.worldbank.org/dataonline), accessed 10<sup>th</sup> November 2005
- [Http://finmin.nic.in/the\\_ministry/dept\\_eco\\_affairs/investment\\_div/fip.htm](http://finmin.nic.in/the_ministry/dept_eco_affairs/investment_div/fip.htm), accessed 15th November 2005.

- Hymer, S. (1976). *The International Operations of National Firms*. Doctoral Dissertation. Cambridge, Mass.: MIT Press.
- Hymer, S. (1970). "The efficiency (contradictions) of multinational corporations." *American Economic Review*. LX(2), 441-448.
- Jarillo, H.C. & Martinez, J.L. (1990). "Different roles for subsidiaries: the case of multinational corporations in Spain." *Strategic Management Journal*, 11: 501-12.
- Javorcik, B.S. and Spatareanu, M. (2005). "Disentangling FDI spillover effects: what do firm perceptions tell us?" In Moran, T.H. Graham, E.M. and Blomstrom, M. (Eds.) *Does Foreign Direct Investment Promote Development?* Washington, DC: Institute for International Economics. 107-136.
- Kumar, N. (1996). "Intellectual Property Protection, Market Orientation and Location of Overseas R&D Activities by Multinational Enterprises". *World Development*. 24(4), 673-688.
- Kumar, N. (2001). "Determinants of Location of Overseas R&D Activity of Multinational Enterprises: The Case of US and Japanese Corporations." *Research Policy*. 30, 159-174.
- Lall, S. (1973). "Transfer pricing by multinational manufacturing firms". *Oxford Bulletin of Economics and Statistics*. 35(3), 173-195.
- Lall, Sanjaya (1976), 'Conflicts of concepts: welfare economics and developing countries', *World Development*, 4(3), pp. 181-195.
- Lall, S. (1996), 'Transnational corporations and economic development' in T. Moran, (ed.), *Transnational corporations and world development*, London: International Thomson Publishing Company.
- Lawrence, R.Z. (2005). "Comment." In Moran, T.H. Graham, E.M. and Blomstrom, M. (Eds.) *Does Foreign Direct Investment Promote Development?* Washington, DC: Institute for International Economics. 367-371.
- Long, G. (2005). "China's policies on FDI: review and evaluation." In Moran, T.H. Graham, E.M. and Blomstrom, M. (Eds.) *Does Foreign Direct Investment Promote Development?* Washington, DC: Institute for International Economics. 315-336.
- Maskus, K.E. (2000). *Intellectual property rights in the global economy*. Washington: Institute for International Economics.
- Melitz, M.J. (2005). "Comment." In Moran, T.H. Graham, E.M. and Blomstrom, M. (Eds.) *Does Foreign Direct Investment Promote Development?* Washington, DC: Institute for International Economics. 273-277.
- Moran, T.H. Graham, E.M. and Blomstrom, M. (Eds.) (2005). *Does Foreign Direct Investment Promote Development?* Washington, DC: Institute for International Economics.
- Moss, T.J. Ramachandran, V. and Shah, M.K. (2005). "Is Africa's skepticism of foreign capital justified? Evidence from East African firm survey data." In Moran, T.H. Graham, E.M. and Blomstrom, M. (Eds.) *Does Foreign Direct Investment Promote Development?* Washington, DC: Institute for International Economics. 337-366.
- OECD (Organisation for Economic Cooperation and Development). (1999). *OECD Science, Technology and Industry Scoreboard* (Paris: OECD).
- Ozawa, T. and Castello, S. (2004). "FDI and Endogenous Growth: IB Perspectives". In Cantwell, J. and Narula, R. (Eds.). *International Business and the Eclectic Paradigm*. London: Routledge. 74-95.
- Pearce, R. and Singh, S. (1992). *Globalizing Research and Development*. New York: St. Martin's.
- Ray, A.S. (2004). "The changing structure of R&D incentives in India". *Science, Technology & Society*. 9(2), 295-317.
- Ray, P. and Venaik, S. (2004). "Overseas Research and Development and Appropriation of Intellectual Property Rights in Transnational Corporations." In Bhattacharya, M. Smyth, R. & Vicziany, M. (Eds.). *South Asia in the Era of Globalisation: Trade, Industrialization and Welfare*. New York: Nova Science. 45-57.

- Roth, K. and Morrison, A.J. (1990). "An empirical analysis of the integration-responsiveness framework in global industries". *Journal of International Business Studies*. 21(4), 541-564.
- Siddhartan, N.S. and Safarian, A.E. (1997). "Transnational corporations, technology transfer and import of capital goods: the recent Indian experience". *Transnational Corporations*. 6(1), 31-49.
- Taggart, J.H. (1997). "Autonomy and procedural justice: a framework for evaluating subsidiary strategy". *Journal of International Business Studies*. 28(1): 51-75.
- Teigland, R., Fey, C.F. and Birkinshaw, J. (2000). "Knowledge Dissemination in Global R&D Operations: An Empirical Study of Multinationals in the High Technology Electronics Industry". *Management International Review*, 40(1): 49-65.
- Tolentino, P.E. (2002). "Hierarchical pyramids and heterarchical networks: organizational strategies and structures of multinational corporations and its impact on world development". *Contributions to Political Economy*. 21, 69-89.
- Tsai, W. (2001). "Knowledge transfer in intraorganizational networks: effects of network position and absorptive capacity on business unit innovation and performance". *Academy of Management Journal*. 44(5), 996-1004.
- UNCTAD (United Nations Conference on Trade and Development). (2005). *World Investment Report 2005: Transnational Corporations and the Internationalization of R&D*. Geneva and New York: United Nations.
- Venaik, S. Midgley, D.F. and Devinney, T.M. (2005). "Dual paths to performance: the impact of global pressures on MNC subsidiary conduct and performance". *Journal of International Business Studies*. 36(6), 655-675.
- Vernon, R. (1966). "International investment and international trade in the product cycle". *Quarterly Journal of Economics*. 80(May), 190-207.
- Von Dijk, P. and Rao, K.S.C. (1994). *India's Export Policy and Export Performance of Industry*. Sage: New Delhi.

**Table 1 Descriptive statistics and bivariate correlations**

	Mean	SD	R&D/sales (%)	Exports/sales (%)	Royalty payments/sales (%)
Foreign ownership (%)	23.72	22.06	0.02	-0.21	0.36
R&D/sales (%)	0.50	0.84	-	-0.06	0.07
Exports/sales (%)	14.07	19.99	-	-	-0.01
Royalty payments/sales (%)	0.26	0.48	-	-	-

**Table 2 Structural model results**

Dependent variables →	R&D/sales (%)			Exports/sales (%)			Royalty payments/sales (%)		
R-square →	0.00			0.05			0.14		
Independent variables ↓	Beta	t-value	Sig.	Beta	t-value	Sig.	Beta	t-value	Sig.
Foreign ownership (%)	0.02	0.32	ns	-0.21	3.79	***	0.36	5.76	***
R&D/sales (%)	-	-	-	-0.05	1.49	ns	0.06	1.33	ns

\*\*\* $p < .001$ , \*\* $p < .01$ , \* $p < .05$ , ns – not significant. All tests are 1-tail.

Figure 1 Theoretical model

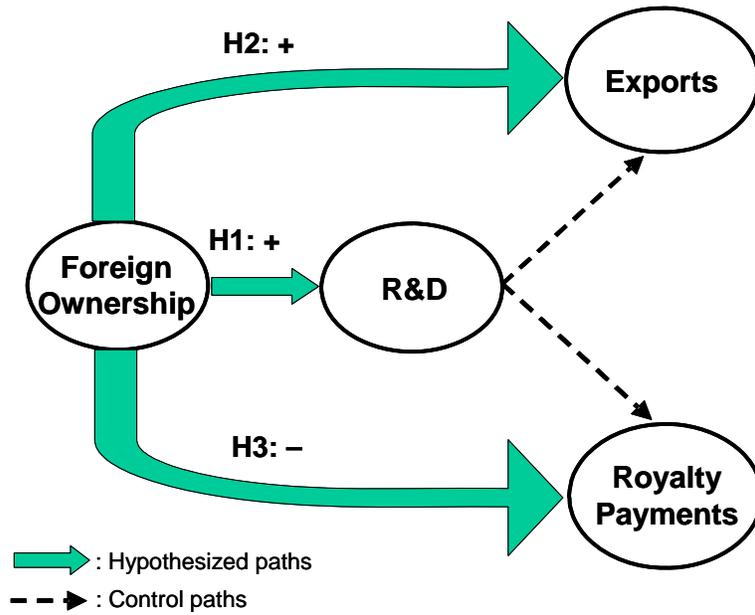
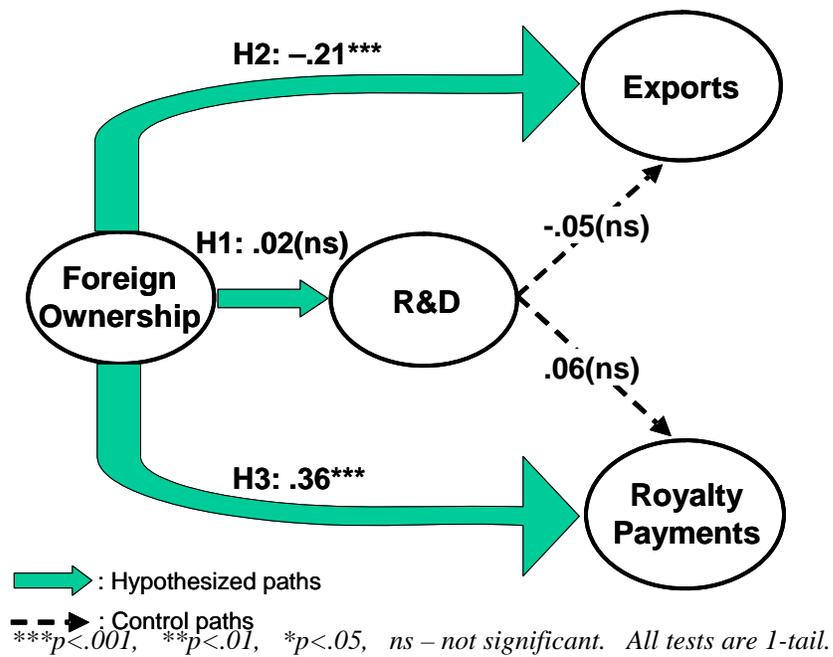


Figure 2 Structural model results



**Figure 3 A new framework of MNC subsidiaries**

Contribution of MNC Subsidiary to <b>Global</b> Network	High	3	4
	Low	1	2
		Low	High

Contribution of MNC Subsidiary  
to **Local** Network