Mind the Gap:

How Linkages Strengthen Understanding of Spillovers

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FDI spillovers have long been studied, as a means to assess the role of multinational enterprises (MNEs) in economic development of countries, especially developing economies. Spillovers refer to the externalities created by foreign firms, positive or negative, leading to changes in the competitive environment and in indigenous firms (Blomström and Kokko, 1998; Kugler, 2006). One of the main drawback of spillover studies is that they do not contribute to a deeper understanding of how, why, and when indigenous firms' development occur (Giroud and Scott-Kennel, 2009). For this reason, authors that have investigated the relationship between linkages and spillovers suggest both concepts should be treated separately (Javorcik 2004).

By and large, linkages act as mechanisms for spillovers, and their understanding help uncover some of the reasons behind contradicting results found in spillover studies. Spillovers' and linkages' studies differ primarily in terms of the focus of analysis. Whilst spillover studies investigate the net effect of FDI, linkages studies focus on distinct and separate effects of MNEs' activities, using foreign subsidiaries and/or local firms as the unit of analysis. As such, linkages studies, in contrast to aggregate-level research on spillovers, clarify firm-level relationships and help explaining how firms learn from each other. To fully understand process of inter-firm relations, authors suggest linkages measurements and evaluations must pay attention to various attributes, and cover for both quantitative and qualitative assessment (Giroud and Scott-Kennel, 2009). This is, in part, due to the fact that MNEs diffuse knowledge and technology to local indigenous firms through direct linkages formation; it has been suggested that it is through such knowledge diffusion that MNEs provide the greatest potential for development, and it is also those that lead to spillovers.

This paper argues that linkages studies fill research gaps that exist in spillovers studies for several reasons. First linkages studies enable to understand how spillovers occur – i.e. unravel the context/content of the *direct* relationships established between MNEs and local firms; secondly, they provide firm-level considerations, making it possible to understand how strategies and entry modes lead to varying degrees of MNE impact in host economies; thirdly, MNEs have superior assets, but contrary to assumptions made in spillover studies, there is a cost to technology transfer – linkages study enable to understand how these cost affect impact potential, and therefore by contrasting technological potential of individual firms, linkages studies can cater for variation in impact; finally, spillover studies find contradicting results – one explanation for conflicting results resides in the existence of significant negative spillovers due to crowding-out effects, by contrast, linkages studies can help better understand conditions that lead to enhanced positive effects and allow for more targeted policies by host governments.

The paper is organised as follows; key gaps in spillovers studies and the usefulness of the linkages approach is first explored, before a discussion on the need to disentangle

linkages from spillovers, and a focus on the way linkages studies enable to explore the role of firms' strategies and knowledge transfer.

Gaps in spillovers studies

One common restrictive assumption in spillover studies resides in firm homogeneity (Caves, 1974). For instance, strategic intent by the foreign subsidiaries in terms of technology transfer to local partners in the host economy is not tested nor elucidated (Smarzynska Javorcik and Spataneanu, 2011). Spillover studies are based upon the assumption that foreign firms are homogeneous in terms of their roles within the multinational network and in terms of their technological capabilities and competencies. The international business field has demonstrated, to the contrary, that subsidiaries possess varying degrees of competences, these in turn leading to different interactions with external business partners and spillovers (Hallin and Holmström, *Forth*).

Recent spillover studies refute the homogeneity assumption, and investigate the influence of subsidiary heterogeneity on spillovers in host countries, focusing on R&D intensity (Driffield and Love, 2007; Driffield et al., 2010) or various subsidiary mandates (Marin and Sasidharan, 2010). Similarly, firm homogeneity does not apply to local indigenous firms, as those may possess different levels of absorptive capacity (Liu and Buck, 2007; Criscuolo and Narula, 2008; Blalock and Simon, 2009). These firm characteristics matter, for instance, because the technology and performance gaps between foreign and local firms explain levels of spillovers (Kokko and Blomström, 1995). More recent studies, still, suggest a curvilinearity of FDI spillovers, as spillover impact evolves together with foreign subsidiaries' ownership advantages (Buckley et al., 2007; Smarzynska Javorcik and Spataneanu, 2008), and familiarity with the local environment (Merlevede, Schoors and Spatareanu, 2010).

The usefulness of linkages studies is illustrated in the search to better understand how individual firms' characteristics lead to differential impact on the host economy. One can infer from these recent spillover studies that not only spillovers themselves, but also their medium- to long-term direction, differ depending upon individual characteristics of the

foreign subsidiary, and not solely as a result of differences in the host country environment, such as the economic and institution development level (Meyer and Sinani, 2009) or the technological intensity of the industry in which the foreign firm operates (Keller and Yeaple, 2009). Linkages studies allow consideration of key drivers for spillover variations, that are MNE strategies, individual subsidiaries' and local firms' characteristics. Meyer and Sinani (2009) contrast spillover impact with level of economic development of host countries, and argue for a U-shaped curvilinear relationship between FDI spillovers and economic growth. Depending upon the level of economic development of the local host country, demonstration effects may not be dominant. Horizontal effects can be small to start with, in which case, vertical linkages can constitute a useful boost for development, raising the need to better understand the conditions under which these latter occur.

In sum, linkages studies provide firm-level considerations, making it possible to understand how strategies, technological competences, or entry modes lead to varying degrees of MNE impact in host economies. It is widely accepted that MNEs benefit from superior assets and resources, yet, the conditions under which technology and knowledge are transferred to local business partners is best understood when contrasting technological potential of individual firms is investigated. As a result, it can be argued that the source of conflicting results in spillover studies resides in the existence of both positive and negative effects on local firms; in this case, linkages studies can help better understand conditions behind differential impact. In the following section, we explore the advantages of linkages studies in filling some the gaps in spillover research mentioned above.

Disentangling Linkages from Spillovers: Concepts and Measurements

FDI spillovers are externalities of MNEs activities in host economies (Görg and Greenaway, 2003) which occur strictly through *indirect* mechanisms such as competition, demonstration effects and labour turnover/mobility (Castellani and Zanfei, 2006). Whilst they are indirect impacts of MNEs activities, spillovers arise as a direct consequence of linkages creation between a foreign subsidiary and its local business partners (Dunning and Lundan, 2008). Linkages can be defined as transactions between foreign affiliates

and local businesses (backward vertical supply chain linkages with suppliers, forward vertical supply chain linkages with customers/agents, or collaborative horizontal linkages with alliance partners or competitors) (Giroud and Scott-Kennel, 2009), as well as non-business and governmental entities (institutional linkages) such as universities, research and technology institutes or governmental agencies (Santangelo, 2009).

Studies that investigate linkages and spillovers suggest both concepts should be treated separately, especially in empirical studies (Blomström et al., 2000; Javorcik, 2004); this is because, in practice, most spillover studies are unable to disentangle direct and indirect effects at an aggregate level, and therefore capture both (Günther, 2005). Direct inter-firm relationships induce improvement in quality and efficiency of local firms, such as in the case of suppliers, by creating demands to attain economies of scale and providing access to advanced resources (Saliola and Zanfei, 2009: 371).

Barrios et al. (2011) argue that measures of backward linkages used in spillover studies are problematic because of restrictive assumptions, namely that (1) domestically produced inputs are used in the same proportion as imported inputs, (2) foreign multinationals have the same input sourcing behaviour as domestic firms, and multinationals from different nationalities have the same input sourcing behaviour, and (3) the share of total output by foreign multinationals in a sector is reflective of their demand for locally produced inputs.” (ibid, page 864). The authors further argue that measurements matters to draw possible conclusions from the existence of FDI spillovers. By focusing on firm level information, linkages studies allow to overcome such limitations.

Linkages studies, thus, support the understanding of spillovers by allowing a focus on relationships formed by a given firm, with details about interactions, flows of capital, knowledge and people in the context of subsidiary characteristics (see for instance studies by Ivarsson and Alvstam, 2005; Jindra et al., 2009). Industry or firm case studies can describe complex inter-firm relationships and establish causality. Surveys conducted amongst MNEs and or local firms provide less qualitative insights, but offer firm-level information, with the ability of combining both vertical and horizontal relationships and investigating levels of firms’ interactions (Scott-Kennel, 2004). A few studies even

combine datasets from both the MNE and local firms' perspectives, enabling for a more complete picture of the context behind inter-firm relationships (see for instance Halbach, 1989; Lorentzen et al., 2003; Gentile-Lüdecke and Giroud, *Forth*).

One of the main advantages of linkages studies, therefore, resides in the ability to explore, in depth, the relationships developed by individual subsidiaries, with details about interactions, flows of resources, knowledge and technology transfer, whilst capturing strategic intent and firms' characteristics.

Knowledge and Technology Transfer and Linkages Studies

The literature suggests that MNEs possess superior firm-specific assets and resources (Dunning and Lundan, 2008), and it is through linkage formation that MNEs play a role in the diffusion of knowledge and technology to local firms (Kugler, 2006). Most spillover studies are based upon the assumption that technology is transferrable at no cost, because of its public good nature. By contrast, linkages studies consider that the foreign subsidiary acts as a nodal point in the linkage, exerting power and influence over local partners. The primary purpose of linkage formation, from the MNE's point of view (beyond that of simple transactional exchange), is to overcome the deficiencies of pure market relationships (Lall, 1980), which arise following operational or strategic considerations. In such cases, technology transfer requires the commitment of real resources, leading to variations in transfer costs. Linkages studies allow to compare and contrast the costs associated with technology diffusion from the MNE to the subsidiary, in the first instance, and subsequently from the subsidiary to its local business partners. In their focus on individual firms' characteristics, linkages studies better reflect potential for knowledge transfer to local partners (Jindra et al., 2009). Finally, by taking various firm-level factors into considerations, linkages studies enable to distinguish the type of impact of knowledge transfer upon the local business partner (Gentile-Lüdecke and Giroud, *Forth*).

The underlying consequences for spillover and linkages studies are that, firstly, linkages studies can better assess individual costs related to inter-firm technology transfer; secondly, they can assess the conditions related to MNE strategies behind technology

intensity at the level of the subsidiary, and thirdly, they can assess how appropriate and useful the knowledge and technology shared with local business partners actually is. Although recent generation of technology transfer models challenges the passive role of foreign affiliates in technology transfer (Driffield and Love, 2007; Castellani and Zanfei, 2006; Marin and Sasidharan, 2010), without suitable firm-level data, the role of the affiliate or the MNE strategy can not easily be integrated within spillover studies. To summarize, technological characteristics of the foreign subsidiary is paramount to understanding the potential for spillovers: not all firms possesses the same knowledge transfer potential for foreign subsidiaries, nor the same level of absorptive capacity for local firms, and factors related to the technological strategy of the MNEs, knowledge development potential of the subsidiary or the propensity to establish technological cooperation with local firms are complex factors that explain why, ultimately, technological spillover potentials differ.

Final Remarks

Spillover studies are essential to better understand the impact of FDI on host countries' economic development. These studies, however, have limitations, many of which can be overcome by research focusing on linkages. In this paper, we argue that it is possible to better understand contradicting spillover results, by exploring in more depth differences in foreign and local firms' strategies and technological competences, within the context of complex relationships and interactions. To date, the significance of individual firm's characteristics for the development of local firms' competences remains under-studied. Whilst the spillover literature is extensive, we lack sufficient linkages studies to fully understand the mechanisms through which linkages impact upon the development and competence upgrading of local firms.

The linkages effects of MNEs on local firms are, by no means, automatic. Linkages can have a detrimental impact upon local firms. It is therefore all the more essential to better grasp the conditions leading to beneficial impacts.

Bibliography

- Barrios, S., Görg, H. and Strobl, E. (2011), "Spillovers through backward linkages from multinationals: Measurement matters!" *European Economic Review*, Vol. In Press, Corrected Proof.
- Blalock, G. and Simon, D.H. (2010), "Do all firm benefit equally from downstream FDI? The moderating effect of local supplier's capabilities on productivity gains". *Journal of International Business Studies*, Vol. 40, pp. 1095-112.
- Blomstrom, M. and Kokko, A. (1998), "Multinational Corporations and Spillovers". *Journal of Economic Surveys*, Vol. 12, No. 3, pp. 247-77.
- Blomström, M., Kokko, A. and Zejan, M. (2000), *Foreign Direct Investment: Firm and Host Country Strategies* (London: MacMillan Press).
- Buckley, P.J., Wang, C. and Clegg, J. (2007), "The impact of foreign ownership, local ownership and industry characteristics on spillover benefits from foreign direct investment in China". *International Business Review*, Vol. 16, No. 2, pp. 142-58.
- Castellani, D. and Zanfei, A. (2006), *Multinational Firms, Innovation and Productivity* (Cheltenham: Edward Elgar).
- Caves, R.E. (1974), "Multinational firms, competition and productivity in host country markets". *Economica*, Vol. 41, pp. 176-93.
- Criscuolo, P. and Narula, R. (2008), "A novel approach to national technological accumulation and absorptive capacity: Aggregating Cohen and Levinthal". *European Journal of Development Research*, Vol. 20, No. 1, pp. 56-73.
- Driffield, N. and Love, J.H. (2007), "Linking FDI motivation and host economy productivity effects: conceptual and empirical analysis". *Journal of International Business Studies*, Vol. 38, No. 3, pp. 460-73.
- Driffield, N., Love, J.H. and Menghinello, S. (2010), "The multinational enterprise as a source of international knowledge flows: Direct evidence from Italy". *Journal of International Business Studies*, Vol. 41, pp. 350-59.
- Dunning, J. and Lundan, S. (2008), *Multinational Enterprises and the Global Economy* (Cheltenham: Edward Elgar).
- Gentile-Lüdecke, S. and Giroud, A. (Forth.), "Knowledge transfer from TNCs and upgrading of domestic firms: The Polish automotive sector". *World Development*.
- Girma, S. and Gong, Y. (2008), "FDI, Linkages and the Efficiency of State-Owned Enterprises in China". *The Journal of Development Studies*, Vol. 44, No. 5, pp. 728.
- Giroud, A. (2003), *Transnational corporations, Technology, and Economic development: Backward Linkages and Knowledge Transfer in South East Asia* (Cheltenham and Northampton: Edward Elgar Publishing Limited).
- Giroud, A. and Scott-Kennel, J. (2009), "MNE linkages in international business: A framework for analysis". *International Business Review*, Vol. 18, No. 6, pp. 555-66.
- Görg, H. and Greenaway, D. (2003) 'Much Ado About Nothing? Do Domestic Firms Really Benefit from Foreign Direct Investment?' *Discussion Paper N. 944* (Bonn: IZA).
- Günther, J. (2005), "Technology spillovers from foreign investors in transition economies - are the effects still expected?" *Economic and Business Review for Central and South - Eastern Europe*, Vol. 7, No. 1, pp. 5-24.
- Halbach, A.J. (1989) *Multinational enterprises and subcontracting in the Third World: A study of inter-industrial linkages*.

- Hallin, C. and Holmström Lind, C. (Forth), "Revisiting the external impact of MNCs: An empirical study of the mechanisms behind knowledge spillovers from MNC subsidiaries". *International Business Review*, Vol. In Press, Corrected Proof.
- Ivarsson, I. and Alvstam, C.G. (2005), "Technology Transfer from TNCs to Local Suppliers in Developing Countries: A Study of AB Volvo's Truck and Bus Plants in Brazil, China, India, and Mexico". *World Development*, Vol. 33, No. 8, pp. 1325-44.
- Javorcik, B.S. (2004), "Does foreign direct investment increase the productivity of domestic firms? In search of spillovers through backward linkages". *American Economic Review*, Vol. 9, No. 3, pp. 605-27.
- Javorcik, B.S. and Spatareanu, M. (2011), "Does it matter where you come from? Vertical spillovers from foreign direct investment and the origin of investors". *Journal of Development Economics*, Vol. In Press, Corrected Proof.
- Jindra, B., Giroud, A. and Scott-Kennel, J. (2009), "Subsidiary Roles, Vertical Linkages and Economic Development". *Journal of World Business*, Vol. 44, No. 2, pp. 167-79.
- Keller, W. and Yeaple, S. (2009), "Multinational enterprises, international trade, and productivity growth: Firm-level evidence from the United States". *Review of Economics and Statistics*, Vol. 91, No. 4, pp. 821-31.
- Kokko, A. and Blomström, M. (1995), "Policies to encourage inflows of technology through foreign multinationals". *World Development*, Vol. 23, No. 3, pp. 459-68.
- Kugler, M. (2006), "Spillovers from foreign direct investment: Within or between industries?" *Journal of Development Economics*, Vol. 80, No. 2, pp. 444.
- Lall, S. (1980), "Vertical interfirm linkages in LDCs: An empirical study". *Oxford Bulletin of Economics and Statistics*, Vol. 42, pp. 203-26.
- Liu, X. and Buck, T. (2007), "Innovation performance and channels for international technology spillovers: Evidence from Chinese high-tech industries". *Research Policy*, Vol. 36, No. 3, pp. 355-66.
- Lorentzen, J., Møllgaard, P. and Rojec, M. (2003), "Host-country absorption of technology: Evidence from automotive supply networks in Eastern Europe". *Industry and Innovation*, Vol. 10, No. 4, pp. 415-32.
- Marin, A. and Sasidharan, S. (2010), "Heterogeneous MNC subsidiaries and technological spillovers: Explaining positive and negative effects in India". *Research Policy*, Vol. 39, No. 9, pp. 1227-41.
- Meyer, K.E. and Sinani, E. (2009), "When and where does foreign direct investment generate positive spillovers?: A meta-analysis". *Journal of International Business Studies*, Vol. 40, No. 7, pp. 1075-1094.
- Saggi, K. (2002), "Trade, foreign direct investment, and international technology transfer: A survey". *World Bank Research Observer*, Vol. 17, pp. 191-235.
- Saliola, F. and Zanfei, A. (2009), "Multinational firms, global value chains and the organization of knowledge transfer". *Research Policy*, Vol. 38, No. 3, pp. 369-381.
- Santangelo, G. (2009), "MNCs and linkages creation: Evidence from a peripheral area". *Journal of World Business*, Vol. 44, No. 2, pp. 192.
- Scott-Kennel, J. (2004), "Foreign Direct Investment: A Catalyst for Local Firm Development?" *European Journal of Development Research*, Vol. 16, No. 3, pp. 624-52.