WORKING PAPER / 2015.09

What makes linkages "good" linkages?

Firms, the investment climate and business support services in Vietnam

Chiara **Franco**
Marco **Sanfilippo**
Adnan **Seric**

IOB
Institute of Development Policy and Management
University of Antwerp

Working Papers are published under the responsibility of
the IOB Research Lines, without external review process.
This paper has been vetted by **Danny Cassimon**, coordinator of the
Research Line **Conditional Finance for Development**.

Comments on this Working Paper are invited.
Please contact the author at marco.sanfilippo@uantwerpen.be.

Instituut voor Ontwikkelingsbeleid en -Beheer
Institute of Development Policy and Management
Institut de Politique et de Gestion du Développement
Instituto de Política y Gestión del Desarrollo

Postal address:
Prinsstraat 13
B-2000 Antwerpen
Belgium

Visiting address:
Lange Sint-Annastraat 7
B-2000 Antwerpen
Belgium

Tel: +32 (0)3 265 57 70
Fax: +32 (0)3 265 57 71
e-mail: iob@uantwerp.be
http://www.uantwerp.be/iob

WORKING PAPER / 2015.09

ISSN 2294-8643

What makes linkages "good" linkages?

Firms, the investment climate and business support services in Vietnam

Chiara **Franco***

Marco **Sanfilippo****

Adnan **Seric*****

December 2015

* Catholic University, Milan

** Institute of Development Policy and Management, University of Antwerp

*** UNIDO

IOB
Institute of Development Policy and Management
University of Antwerp

Table of Contents

Abstract

The role of backward linkages between foreign and local firms is considered as a crucial factor to favour the economic development of a country. This work tries to unveil its different dimensions with respect to the Vietnamese case. We develop our research questions in two steps. We first analyse what are the determinants of linkages, looking at both their extent and the capacity to set up a local supply chain. Then, we provide empirical evidence for the probability of linkages to be vehicles to enhance local firm's capacity to benefit from FDI. Our main findings reveal that firm specific factors affect mainly the size of linkages, while it is the provision of key business support services to investors to determine the probability for linkages to become "good" linkages.

Keywords: FDI; Linkages; Business Climate

JEL Classification: F45; O19

Acknowledgements

We thank participants to seminars at IOB, University of Antwerp, and at the Centre Emile Bernheim, Université Libre de Bruxelles, for useful comments on previous drafts of the paper.

1. Introduction

Since the early contribution by Hirschman (1958), linkages have been considered as key factors able to explain the economic development of laggard economies. More recently, due to the increasing availability of firms' surveys, input/output tables, and the proliferation of value chain analyses, linkages have turned back at the core of the economic development discourse. A recent example is the cross-country analysis by Bartelme and Gorodnichenko (2015), who robustly prove that the there is a nexus between the strength of linkages and aggregate productivity, including in developing countries.

This line of research has gained progressively more space in the debate on the presence of spillover effect coming from Foreign Direct Investment (FDI). In this respect, the theoretical model by Rodriguez-Clare (1996) is the starting point. In that model, domestic firms are spurred by the presence of MNEs to supply new intermediate services and inputs, thereby contributing to influence their productivity. The overall welfare effect generated depends on the number of linkages that MNEs contribute to create with respect to the number of firms they force to exit from the market.

Analysing the factors that contribute to the establishment of linkages is therefore an issue of high policy relevance, especially in low-income countries eager to find out new strategies to foster the development of a vibrant private sector. Recent evidence increasingly reveals that specific characteristics of the investing firms and the host country can favour the proliferation of linkages (Liu, 2011; Amendolagine et al., 2013). However, only a few studies investigate the potential implications for the host country, i.e. those linkages resulting in enduring support and cooperation between the foreign affiliate and the local firms, including the transfer of skills and technologies (Giroud et al., 2012; Joordan, 2011; Perez-Villar and Seric, 2015).

This paper brings new empirical evidence on some features of linkages that have been disregarded in the literature. More specifically, our main contributions are threefold: first, making a step forward in the existing literature on linkage determinants, we try to enlarge the scope of the analysis by comparing the performance of foreign affiliates with that of domestic firms (as in Jordaan, 2011, for the case of Mexico, or Winkler, 2013, on a number of low income countries). By analysing common patterns, as well as main differences, between domestic and foreign investors we can provide policymakers with a piece of advice to implement more efficient policies to promote the development of local networks. This results of high relevance especially when we look at the quality of the local linkages being created.

Second, while departing from existing evidence focussing on the shares of local inputs as a standard measure of linkages, we provide a short discussion on the potential flaws of such approach (see the work by Liu, 2011 and, broadly, Barrios et al., 2011) and propose the *scope* of linkages (i.e. the number of domestic suppliers) being created as a more reliable measure of domestic embeddedness of multinationals (Chen et al., 2004). As discussed by some papers analyzing the supply chain effect (e.g. Blalock and Gertler, 2009; Lin and Saggi, 2007; Farole and Winkler, 2014) we claim that the more linkages are created, the larger the potential benefits accruing to the local economy.

Third, we provide new evidence on the probability that linkages can be a significant means through which some forms of knowledge transfer could occur. We estimate whether linkages may be the source of "good" linkages by using a specific question of the survey in which foreign investors are asked whether and which kind of support they furnish to local suppliers provided that a linkage is in place. In this way, we are able to separate good linkages from

more generic ones, which might include those resulting in captive market based transactions (UNCTAD, 2013).

In all these steps, our further contribution is the attention we pay at the role of policies, especially those related to the establishment of a good investment climate and the provision of different types of business support services. While there is already a large literature linking the overall business environment to investors' performance (see Xu, 2010, for a review), in our paper we go somewhat further by focussing on which kind of specialized business-services can improve the quality of the linkages established. In this way, we provide new evidence supporting the implementation of the light-form of industrial policies to harness FDI as recently discussed by Moran (2014).

To carry out the empirical exercise we make use of an original survey, conducted in 2011, on roughly 1,500 investors (domestic and foreign) based in Vietnam. The Survey provides an ideal setting for our work, considering that a strong emphasis is on the local integration of foreign firms through backward and forward linkages as well as on the role of business climate and business services over the investment life-cycle.

Our results provide a number of new and policy relevant insights on the factors leading to the successful establishment and implementation of linkages. We show in particular that measuring the extent of linkages as the total share of local supply might hinder important information on the overall number of relations being actually created by foreign firms, leading to opportunities to link up to their supply chain. In addition, we show that the provision of a good investment climate and, especially, of ad-hoc services to investors significantly affect the capacity to attract foreign investments that transfer key resources and knowledge to domestic suppliers. The latter findings are especially relevant as they show which kind of specific policy interventions matter for attracting more quality investors in the country.

The remaining of the paper is structured as follows. Section 2 discusses the role of linkages for development and reviews the existing literature on their determinants. Section 3 introduces the original survey data and Section 4 describes the models adopted. Results are presented in section 5, while Section 6 concludes, drawing some policy implications.

2. Linkages, good linkages and the role of FDI

2.1. Linkages and FDI

Foreign direct investments (FDI) have been increasingly considered among the main sources of both finance and capital for many developing countries (UNCTAD, 2015), through which foster domestic growth and development. In this respect we have to distinguish two types of literature: a macro-level literature whose aim is that of highlighting long run relationships among country level variables such as GDP (or GDP growth) and FDI and a micro-level literature that tries to uncover the mechanisms through which a likely spillover effect, possibly benefitting local firms, can materialize.

From an empirical point of view, micro level analyses tend to confirm that the existence of linkages, generally proxied by the presence of foreign firms in upstream or downstream sectors, have positive implications on several dimensions of domestic firms' performance (e.g. Hrvanek and Irsova, 2011). The research questions typically analyzed by this literature refers to the measurement of the spillovers for local firms due to the presence of foreign firms in upstream or downstream industries, respectively creating backward and

forward linkages. The effect, which is usually measured using labour productivity or TFP as dependent variable, is most of the times positive, even though some non-significant results have been found as well (Gorg and Greenaway, 2004). However, one of the drawbacks in these types of studies is that the use of country/sectoral level data creates FDI homogeneity without identifying what is the "true" effect of linkages that MNEs contribute to create. This type of literature has the drawback of focusing mainly on the measurement of externalities rather than on the direct effect of linkages (Giroud et al., 2012; Morrisey, 2012; Zanfei, 2012). So, what are the mechanisms through which MNEs may affect the performance of domestic firms through the creation of backward linkages? Usually, MNEs could positively affect the productivity of domestic upstream firms (suppliers) by providing new knowledge through different typologies of assistance such as helping in complying with technological standards required by MNEs. In this way, they also set up a learning process and provide incentives to upgrade the production process and the quality of products and services. Positive effects of such kind are recognized especially in those firms' level studies accounting for the existence of direct linkages between domestic and foreign firms. Recent evidence exploring new information on the establishment of direct linkages seems in fact to be quite conclusive on their positive implications to domestic suppliers, including on their productivity and innovation (Newman et al., 2015; Gorg and Seric, 2015; Gorodnichenko et al., 2015).

In light of this, even though there is an increasing interest on which factors can actually affect the propensity of foreign investors to set up linkages with domestic firms, only a few empirical studies have been carried out. Most of these studies are grounded in the theoretical predictions of Rodriguez-Clare's (1996) seminal work showing that the technological capacities of the host and home country matter to the establishment of linkages, together with the distance and the dependence of the affiliate from the parent. The papers by Belderbos et al. (2001) on Japanese affiliates; Chen et al. (2004) and Liu (2011) on Taiwanese affiliates as well as the more comprehensive analysis by Amendolagine et al. (2013) on a large number of foreign affiliates from different countries based in Sub-Saharan Africa, are good examples of this approach. These studies all find that linkages are more likely to be established by affiliates characterized by higher autonomy from the headquarters, as well as longer experience in the host country, or those establishing JV.

2.2. The "extent" (the "scope") and the "intensity" of backward linkages

A limitation of the above-mentioned literature is that the mere existence of a linkage and its level (from now on, the *extent* of local linkages) is considered itself as a source of positive spillovers. As a matter of fact, this perspective risks to take into account only the advantages arising from the entry of foreign buyers that may affect input prices and market competition, and result in pecuniary externalities on firms' profit, rather than production functions (Zanfei, 2012). It is then the *intensity*, defined as the "direct and intentional knowledge flow", of the linkages – as correctly emphasized by Giroud et al. (2012) – that determine the effective transfer of resources between the affiliate and the local firms, and their likely improvements in productive capacities. In this paper we suggest that the factors affecting the decision to transfer resources might be different (and more crucial to policymakers) than those normally considered when deciding whether to establish a new linkage[1] (Chen et al., 2004), as this comes at some costs

[1] Indeed, the same study by Giroud et al. (2012) shows also that a larger recourse to local content does not necessarily result in greater transfer of knowledge. They show that the relation between the extent and intensity of linkages is subject to decreasing returns, concluding that is the mix of local and international sourcing (or the embeddedness of affiliates in global production networks) to result in larger

and implies a stronger commitment by the affiliate.

An additional issue arising from the literature has to do with the definition of linkages adopted. The largest part of the studies use the share of inputs sourced to local firms to measure the extent of backward linkages. Though this is a suitable measure of how much foreign affiliates rely on the domestic economy, it has the drawback of looking only at the overall amount of inputs supplied locally therefore hindering some further multiplier effects. Moreover, this measure does not provide information about the *scope* of linkages, i.e. the size of the local network being established and, thus, the number of local actors that could potentially take advantage from FDI.

The process of widening the local network on the side of foreign firms, rather than concentrating it among a few suppliers, can result in substantive implications on the overall welfare impact as the mechanisms in place contribute to reduce the overall costs and increasing the quality of inputs due to the competition effect among local firms (Blalock and Gertler, 2009). In the same way, foreign affiliates may have an incentive to transfer technology to a larger number of suppliers (Lin and Saggi, 2007). Indeed, a larger competition upstream in the local supply chain reduces the costs of inputs while the quality rises as a result of the transfer of resources from the foreign firm. This, in turn, might increase competition in the downstream sector as well, benefitting buyers in third sectors. Empirical results support such mechanisms on a sample of Indonesian establishments (Blalock and Gertler, 2009).

Still, expanding the local supply chain can have its drawbacks. First, transaction costs (e.g. search and contractual frictions) of managing a large number of interactions with local suppliers may reduce the economic incentives of the affiliate to transfer resources locally. Second, as firms settling up their local network might want to diversify the different tasks rather than merely raise the number of firms supplying similar products/services, there could be intrinsic limitation to expand the number of local suppliers (Chen et al., 2004).

3. Data

To analyze our research questions we exploit newly released information from the Vietnam Investor Survey (UNIDO, 2012). The case of Vietnam is quite interesting for the aim of this paper. The country experienced the shift from a totally planned economy followed by economic reforms aimed at introducing variety, creating a multi-sector economy, and encouraging in this way the development of a market economy (Ahn et al., 2006). Moreover, Vietnam is embedded in one of the largest and rapidly growing regional supply chains which represents an appealing reason for investors to set up production facilities.

Indeed, FDI have played an important role in the economic transformation of the country. A turning point is represented by the approval of the Law of Foreign Investment, which has been amended several times over the years, with the aim to provide progressively a suitable industrial structure to attract FDI. For example, the share of the manufacturing over the agricultural sector started to rise, as well as the amount of domestic investment. Moreover, since the '90s the higher openness to export and import flows (in particular of capital intensive products) helped to upgrade the local production capacity (Anwar and Nguyen, 2011). Since the start of the reforms in 1986, and increasingly so with the most recent access to WTO, the country has received massive amounts of FDI mainly driven by efficiency considerations and

knowledge flows, rather than – for instance – the need to comply with local contents requirements by the host country.

the exploitation of market opportunities, even though geographically concentrated due to the existence of different economic structures and institutions across provinces (Dang, 2013).

Such a massive presence of foreign investors provides huge opportunities to the domestic economy[2], as foreign invested enterprises (FIEs) represent now a large share of output and employment (accounting for more than half of the country's total exports, and 20% of GDP). But it poses a number of challenges, too. Turning to more "quality" FDI, i.e. those with larger potential to create local linkages, spurring domestic productive capacities, is nowadays one of the main concerns in Vietnam, calling for improvements in the design of investment attraction policies and in the provision of business services (Moran, 2014).

The survey we use provides very detailed information on the operations of 1,493 (domestic and foreign) investors in the country[3]. As FDI is the focus of the survey, the questionnaire includes ad-hoc questions on backward and forward linkages between foreign and domestic firms, from both points of view. The final sample, purposively collected among selected provinces (i.e. those hosting the largest share of FIEs in the country), is biased towards FIEs, representing 57.2% of the total, while the remaining are private (32.9%) and SOEs (9.9%)[4]. Consistently with the theory of heterogeneous firms, on average foreign firms invest, employ and exports more than domestic enterprises. They also pay more taxes, operate at higher capacity and are more profitable (UNIDO, 2012).

Foreign firms in the sample are mainly (about 70%) affiliates of MNEs based abroad, while the remaining are stand-alone investors. Though the sample of foreign firms is heterogeneous enough, the typical firm can be described as one established through a greenfield investment and affirm market- and efficiency-seeking being the main motivations to establish in Vietnam. FIEs are generally spread across industries (but mainly focussed on low-tech activities, see figure A1 in the appendix), but very concentrated in terms of geographic origin with three regional partners (Taiwan, Japan and South Korea) making the lion's share (see Figure A2 in the Appendix).

Interestingly enough, data show that foreign firms based in industrial zones are mostly export oriented and based on labour intensive labour force, including a larger share (relative to firms outside the zones) of female employment (UNIDO, 2012). Still, given to their global orientation, these firms tend to be less integrated with the domestic economy.

As far as the extent of local linkages is concerned, the survey shows that foreign firms generally source a low level of inputs (about 26%, plus an additional 12% sourced locally, but from foreign firms) from local producers, with higher shares recorded by stand-alone investors. This is much lower compared to their domestic counterparts (who source 64.6% of their inputs domestically), but it looks reasonably along the lines of existing evidence from other developing countries (UNIDO, 2011; Javorcik and Spatareanu, 2009). As discussed in the previous section, the share of inputs sourced locally is not necessarily a good proxy of domestic embeddedness.

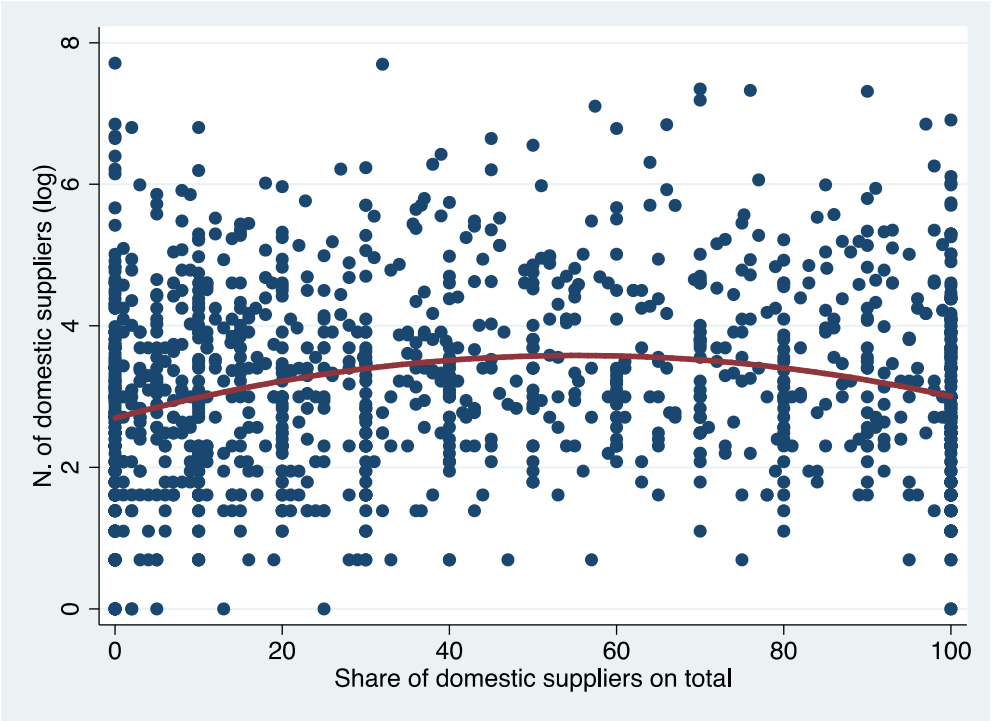
[2] Gueorguiev and Malesky (2012) underline that Vietnamese economy has gained a large amount of benefits from FDI: the empirical studies that demonstrated how inward FDI in Vietnam contribute to growth are not lacking (Nguyen et al., 2008).

[3] Even though this dataset provides us with very detailed information on both local and foreign firms it has the disadvantage of being cross section. Hence, while we can use the data to unearth and describe some hitherto unknown relationships, we are careful to avoid interpreting these as causal effects. However, we think that the relationships uncovered are sufficiently interesting and with important policy implications to justify our analysis.

[4] The sample surveyed is a stratified one based on a frame covering industries including manufacturing, construction and utilities; size; a capital threshold of 5 billion VND and 9 provinces (Ho Chi Min City, Hanoi, Vinh Phuc, Bac Ninh, Hai Phong, Da Nang, Binh Duong, Dong Nai, Ba Ria Vung Tau).

Looking at the data, there is no apparent relation between the share of local inputs and the number of local suppliers (Figure 1), our indicator of the *scope* of local linkages.

Figure 1. *Relation between the extent and the scope of linkages*



Source: Authors' elaboration on Vietnam Investor Survey

Among the main reasons to source from local firms the most relevant is by far the level of prices, followed by logistics and access to local raw materials (Table 1). A similar rank of motivations is brought forward by local firms, as well as FIEs based in industrial zones. Interestingly, very few firms report local content being an explicit requirement. This is due to existing obligations to FIEs (especially in selected industries such as motorbike) being phased out as a consequence of the country's accession to WTO (UNIDO, 2012).

Table 1. *Main reason for procuring inputs locally*

	Freq.	% on Tot.
Price	318	78.91
Easier logistics	40	9.93
Direct access to Vietnamese raw material	25	6.2
Local content is encouraged and demand	10	2.48
Lower tariffs and other tax incentives	7	1.74
CSR strategies	3	0.74

Source: Authors' elaboration on Vietnam Investor Survey

On the other hand, issues related to the quality of local products and services, together with uncompetitive price levels and the unreliability of domestic providers are among the main reasons for which FIEs prefer to rely on other channels, especially imports, to acquire

their intermediate inputs.

As remarked in the previous section, the establishment of a linkage itself does not necessarily imply a transfer of resources to domestic partners. Only 54.2% of the FIEs affirm that as a result of backward linkages they do interact with local suppliers with the aim of supporting their operation in one way or another, while the corresponding share of domestic firms is 10 percentage points higher. More specifically, such support is most of the time targeted to upgrade local producers' capacities to produce better quality inputs in a more efficient way (Table 2). Perhaps surprisingly, only a marginal share of FIEs report technological transfer to be implemented, possibly due to the prevalence of efficiency-seeking investments demanding lower value added inputs to foreign firms to be further processed in other stages of the value chain. Still, we are able to double-check such self-declaration by foreign firms. The survey asks to domestic firms to report whether foreign buyers based in Vietnam interact with them with the aim of improving their operations under the same dimensions[5]. The information reported by domestic suppliers seem to confirm the order of relevance of the different channels of resource transfer from FIEs, supporting the previous findings (Table 2).

Table 2. *Support to domestic suppliers*

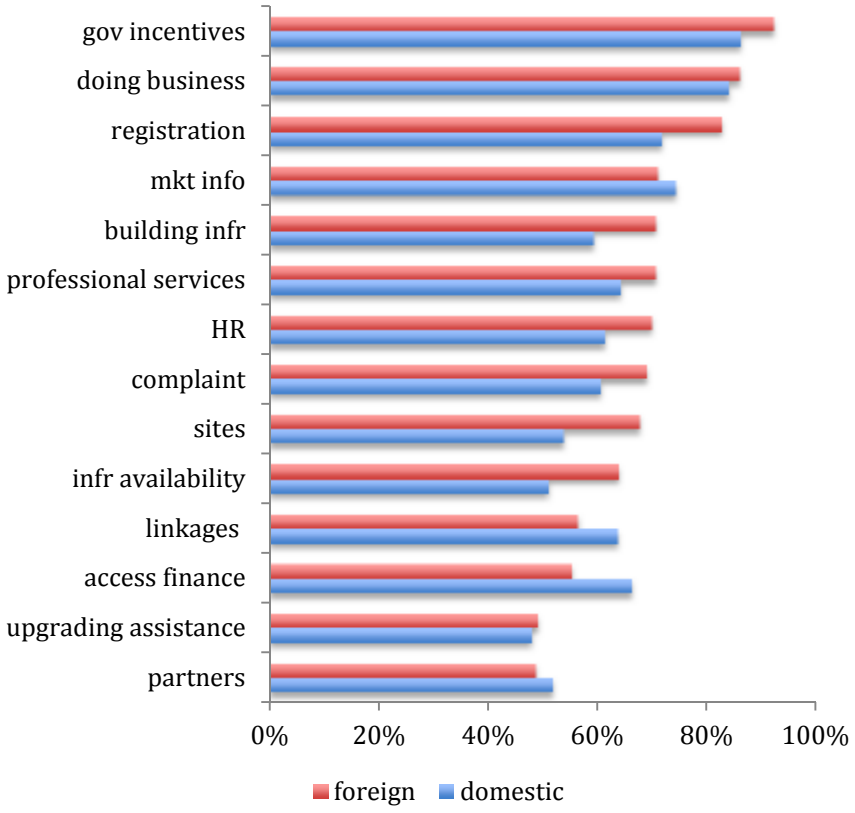
	Foreign (% on total)	Domestic* (#)
Upgrade quality of products	40.33	330
Upgrade production efficiency	25.09	217
Joint product design	23.33	236
Training	13.3	145
Improve access to WK/finance/equity	11.02	128
Tech transfer	6.8	126

Source: Authors' elaboration on Vietnam Investor Survey
** Absolute numbers only can be provided since many domestic firms did not respond to this specific question.*

Finally, looking at the domestic business environment and other location factors, foreign firms are mostly influenced by political and economic stability, the cost of labour and the institutional level of the country, proxied by the effectiveness of its legal environment. Importantly, most firms (both domestic and foreign) generally receive business support services, from Government agencies or other local institutions, during the different phases of the investment cycle. Most of these services are more frequently provided to foreign investors, including information on incentives, infrastructures or professional services (Figure 2).

[5] It is important to remark that we cannot ensure that the domestic suppliers reporting this have direct relations with the foreign buyers reporting on their backward linkages, since this information is not matched.

Figure 2. *Business services received by investors (%)*



Source: Authors' elaboration on Vietnam Investor Survey

4. Empirical model and methodology

4.1. Empirical specification and variables

Having the framework described above in mind, our empirical analysis has been built around three main objectives: the first is to analyse the determinants of the extent of linkages traditionally measured as the share of local inputs on total; the second is to compare the previous findings with an alternative measure which is suitable to catch the local supply chain effect of FDI, therefore looking at the scope of linkages; and the third is to look at the factors affecting the formation of "good" linkages, i.e. the relations leading to some form of knowledge transfer or support from the foreign firm to the local supplier.

In doing this, in all the models tested we use a similar set of control variables, and compare the outcomes of our regression in terms of differences between domestic and foreign firms. Specifically, we account for two main sets of factors that can affect the propensity to source from domestic suppliers, namely the firm level factors (X_i) and the domestic business climate factors (Z_i) characteristics. All models include also industry (δ_j) and province (λ_k) fixed effects to control for common factors not included in the regressions that could influence the respective outcomes. Here is the model general form:

$$Y_i = X_i + Z_i + \delta_{j+} \lambda_k + \varepsilon_i \qquad (1)$$

As far as the firms' characteristics are concerned, we control for age (*lage*), which is a proxy of the experience of the firms in the local context. It is measured as the log of the number of years since the firm first establishment in the country. The ratio of white collars to total employment (*skill*) is included as a proxy for the skill level of the firms, the size (*size_class*) and the levels of productivity (*l_lab_prod*) are added to control for potential differences in capabilities with the local suppliers. They are measured respectively as size groups in terms of number of full-time employees (Small-Medium-Large) and as total sales per full-time employee (in USD). Another important control variable we use in our benchmark model is the market orientation of the firm (*market_or_a*), with the assumption that firms mostly oriented towards the local markets will turn to local suppliers to a greater extent.[6]

When we run regressions on both domestic and foreign investors, we further control whether the different types of ownership may have any influence on the local sourcing strategies, by including two dummy variables: one identifying whether the firm is state owned (*soe*) and the other if the firm is foreign owned (*foreign*).

This benchmark model is then run only on the sample of foreign firms, which are the main focus of our analysis. When using this sub-sample, we include several other variables related to the investment along the lines of the existing research on this area (Liu, 2011; Amendolagine et al., 2013; Giroud et al., 2012). More specifically, we control for the motivation, including a dummy equal to 1 in case of efficiency-seeking investments (*eff_seeking*); for the mode of entry, with a dummy indicating whether it is a greenfield or not (*greenfield*); and on the type of investor, distinguishing between foreign affiliates and individual investors (*individual_inv*). We also control whether the share of foreign ownership (*share_foreign*) affects local sourcing strategies, as well as for the degree of autonomy (using two different variables, *autonomy_cat_hq*[7] and *role_parent*[8]) of the affiliate from the parent, which has been found one of the key factors promoting local sourcing (Liu, 2011).

Tables 3 and 4 provide descriptive statistics of the variables used in the benchmark models distinguishing between foreign and domestic firms.

Table 3. *Descriptive statistics of domestic firms*

Variable	Obs	Mean	Std. Dev.	Min	Max
percentage_inputs_domestic	632	64.65	36.80	0	100
n_domestic_suppliers	612	64.02	150.30	0	1550
spillover_bis	638	1.47	1.56	0	6
L_lab_prod	638	9.95	1.17	6.98	14.12
size_class	639	2.00	0.89	1	3

[6] The classification is based on export data and firms are divided in three categories: local market-seeking (exports <10%), regional market-seeking (exports >10%, SSA exports>50%), or global market-seeking (exports >10%, exports RoW>50%).

[7] This is a dummy variable equal to 1 if all decisions are taken at Parent HQs. The type of decisions that are taken by the Headquarters can be referred to : (1) Introduction/modification of products, (2) Introduction of new production and processing systems, (3) Generating new business in Vietnam,(4) Capital expenditure (including acquisitions), (5) Pricing strategy, (6) Enter new export markets, (7) Selection of suppliers, (8) Defining marketing strategies, (9) Recruitment/Selection of personnel

[8] This is a dummy variable equal to 1 if the firm replied "Very important" to the following question: " How important is the role of the foreign parent enterprise in the following areas?" Type of assistance considered: (1) Use of patents/trademarks/brand names (2) Technology and know-how transfer (3) Development of human resources (4) Access to finance (5) Access to foreign supplier network (6) Global market access.

lage	639	2.61	0.77	1.10	4.73
skill_ratio	639	23.66	15.65	1.56	100
sez	639	0.04	0.20	0	1
soe	639	0.23	0.42	0	1
market_or_a	638	1.55	0.88	1	3

Source: Authors' elaboration on Vietnam Investor Survey

Table 4. *Descriptive statistics of foreign firms*

Variable	Obs	Mean	Std. Dev.	Min	Max
percentage_inputs_domestic	850	26.16	29.78	0	100
n_domestic_suppliers	772	61.88	164.06	0	2233
spillover_bis	853	1.20	1.46	0	6
l_lab_prod	840	9.91	1.63	-4.82	17.90
size_class	854	2.24	0.86	1	3
lage	854	2.21	0.50	0.69	4.08
skill_ratio	854	19.49	15.58	1.10	100
sez	854	0.53	0.50	0	1
market_or_a	853	2.43	0.86	1	3
share_foreign	854	95.27	15.06	10	100
eff_seeking	854	0.42	0.49	0	1
greenfield	852	0.85	0.35	0	1
individual_inv	854	0.21	0.41	0	1
role_parent	560	0.11	0.32	0	1
autonomy_cat_hq	559	0.04	0.19	0	1

Source: Authors' elaboration on Vietnam Investor Survey

The final set of variables includes a large range of information on the characteristics of the investment climate[9]. They can be grouped around two main headings. The first group of variables measures whether the firm has benefitted from the overall competitiveness of the host location, and includes variables traditionally used to measure the quality of local institutions and of the domestic economic conditions. The second group measures whether the investors have actually received business-support services during the different phases of the investment cycle. A complete list of this kind of business climate variables and a brief description can be found in Table A1 in the Appendix.

Though difficult to define, the investment climate can be understood as the institutional, policy and regulatory environment in which firms operate (Stern, 2002). While this is clearly linked to the existence and the provision of quality institutions (Acemoglu et al., 2001), it involves factors and policies likely to reduce the risks and raise the returns of the investments. Since a good institutional and business climate generally contributes to attract FDI reducing the degree of uncertainty of the local environment as well as affecting the rate of return of local investment, we can expect it to be even more crucial in determining the quantity and, especially,

[9] To avoid the risk of collinearity among the different dimensions of the investment climate, in all the regression outputs we have tested the main specification adding them one by one in different specifications.

the quality of direct relations with local firms[10]. Measuring the business climate is difficult, however. Country level indicators usually adopted by the literature have two main drawbacks. The first is that they are hardly available at the subnational level. The second is that they are based on a top-down approach, capturing with some difficulties the real implications of different dimensions of the investment climate for firms. As in Dollar et al. (2005), we try to overcome such limitations by measuring the importance of business environment directly at the firm level, on the basis of specific questions asking firms about the importance of a number of dimensions of the domestic business climate. Furthermore, we try to make the concept of business climate adopted in the paper as much operational as possible by including as well information on the provision of some specialized services, along the lines of the "light-form of industrial policies" to maximize the developmental potential of FDI through backward linkages recently described by Moran (2014). In doing this we use responses to a specific question on whether and which kind of business-support services have been received by the firms before, during or after their investment took place (see Figure 2).

4.2. Methodologies

Owing to the different nature of the dependent variable our three empirical models are estimated using different econometric techniques.

The first model aims at uncovering the determinants of the amount of sourcing of local inputs (i.e. the extent of linkages). The dependent variable used in this case (*percent_inputs_domestic*) measures the share of local inputs sourced from Vietnamese firms based in the country. As it is bounded between 0 and 100 we carry out a two-limit Tobit analysis because the OLS estimates can produce biased results with censored data.

In addition, there is a methodological issue that must be taken into account. Local sourcing is not independent on alternative sourcing strategies, including importing or intra-firm transfers (Barrios et al., 2011). A change in the latter sources has an implication on the former, making the decision necessarily interdependent, but none of the existing studies, with the exception of Liu (2011), has actually accounted for this potential simultaneity bias. In order to do so, we also run our model using a system of regression using a Seemingly Unrelated Regressions (SUR) approach, through which we impose the error terms of the main equations to be correlated one each other[11]. From the result of the Breusch-Pagan test, which is highly significant, we infer that the residuals of our main equations are correlated.

This same pattern of regressions is used also when fulfilling the second objective of the paper: that is to measure the scope of linkages by using as a dependent variable the number of domestic suppliers (*n_domestic_suppliers*). In this case, since the variable is measured as a non-negative integer, we apply a negative binomial model that is mainly used for variables that are over dispersed. To check for this we rely on likelihood ratio test that α equals zero. Since the test returns a significant result, we prefer the negative binomial model with respect to a Poisson model as it seems more appropriate for our data.

The last step of the empirical analysis is that of estimating whether linkages are

[10] Indeed, institutional quality measured at the host country level has been found as a significant determinant of both the establishment of linkages (Amendolagine et al., 2013) and the probability that this results in knowledge transfer (Perez-Villar and Seric, 2015) on a large sample of foreign investors in Sub-Saharan Africa.

[11] As in Liu (2011), we sum up all imported inputs (from the parent company, imported directly by company and imported by a local importer) and we include two further equations: the first employs as a dependent variable the share of local inputs sourced from domestic firms, while the second the share of local inputs sourced from foreign firms based in Vietnam.

also "good" linkages, that is whether they are channels of knowledge transfer among foreign and domestic firms. The dependent variable used in this case is measured by building an index obtained by summing the value of six dummy variables that all refers to activities that firms may carry out in favor of local suppliers, as reported in Table 2[12]. This index therefore ranges from 0 to 6 with higher values representing cases in which different forms of support were implemented at the same time. Given the ordinal nature of the data, we therefore estimate this last relation using a simple ordered probit model.

5. Results

5.1. The determinants of the extent of linkages

The first set of results (Table 5) refers to the standard determinants of linkages, measured as the share of local inputs from Vietnamese owned firms in total firms' supply function. Results on the whole sample including as well domestic investors (Column 1), are quite striking in showing that smaller, less productive and less skill intensive as well as local market oriented firms have higher shares of local supply. Not significant results are obtained with respect to the coefficient of age, leading us to conclude that older firms are not necessarily those that source more inputs locally. In this benchmark model we also find out that being located inside a SEZ implies for firms to be less involved in the local context through backward linkages (this being true as well for domestic firms in SEZs). This finding is not surprising, considering the mandate of such zones that is to provide economic incentives to investors mainly with the aim of favoring their international sourcing strategies via import and export. While we do not find any significant difference for state ownership, our results point – unsurprisingly – to a foreign bias in local supply.

Table 5. *Determinants of the extent of linkages (Tobit estimator)*

	(1)	(2)	(3)	(4)
l_lab_prod	-2.818***	-1.270	-1.413	-1.728*
	(1.046)	(0.921)	(0.912)	(0.917)
size_class	-8.390***	-4.285***	-3.487*	-3.419*
	(1.454)	(1.610)	(2.021)	(2.027)
lage	2.172	0.254	0.339	0.987
	(2.222)	(2.917)	(3.526)	(3.539)
skill_ratio	-0.267***	-0.386***	-0.414***	-0.411***
	(0.0930)	(0.104)	(0.127)	(0.128)
sez	-10.55***	-8.725***	-9.725***	-9.499***
	(2.821)	(2.740)	(3.337)	(3.354)
market_or_a	-8.977***	-4.902***	-4.785**	-5.381**
	(1.548)	(1.696)	(2.202)	(2.204)
soe	2.227			
	(4.861)			
foreign	-34.16***			
	(3.287)			

[12] The forms of support provided by the investors to local suppliers include: (1) upgrading the efficiency of production processes: (2) upgrading the quality of products; (3) upgrading the quality of the workforce; (4) transfer of technology or know-how; (5) conducting joint product development; and (6) improving access to finance.

eff_seeking		-2.365	-6.033*	-5.341*
		(2.568)	(3.135)	(3.115)
share_foreign		-0.466***	-1.440	-2.291*
		(0.113)	(0.881)	(1.224)
greenfield		1.612	5.907	6.560
		(4.398)	(6.192)	(6.071)
individual_inv		4.338		
		(2.936)		
role_parent			-12.94**	
			(5.041)	
autonomy_cat_hq				-5.026
				(8.973)
Industry effects	Y	Y	Y	Y
Province effects	Y	Y	Y	Y
Constant	143.7***	120.9***	214.9**	300.2**
	(13.93)	(17.11)	(88.77)	(123.3)
Observations	1,466	833	550	549

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

We then run the model on the sub-sample of foreign firms by adding some variables that may affect their local sourcing strategies (Columns 2-4). Specifically, we can confirm extant literature that greenfield FDI leads to more linkages as well as that lower shares of foreign ownership favor more local sourcing. Not particularly relevant appears to be the variable measuring the motivation of the FDI (efficiency seeking), while the variable indicating whether the firm is owned by an individual provides a positive coefficient, even if not significant, which in line with what expected considering the limited scale of individual firms and their lack of international network. We also find that a larger involvement of the parent companies on strategic decisions of affiliates is negatively correlated with the level of local sourcing, somewhat in line with the existing evidence (Liu, 2011).

As discussed in the previous section, one way to better sort out these findings is to account for the simultaneity of the supply decision by estimating a system of equations, whose main results are reported in Table A2 in the Appendix. By looking at this, it becomes clear that local sourcing does not come first in the strategies of the more productive and well established firms, which on the other hand tend to import most of their inputs through the market.

In Table 8 (reported in Section 5.3) we present the results of the model by adding one by one our set of proxies for the domestic investment climate. In general, we find very little or no evidence on their capacity to foster firms to enhance their degree of sourcing. Firms with higher shares of local sourcing are those located in those provinces scoring higher in their overall competitiveness index. Other variables, including those related to the receipt of business support services, seem not relevant.

5.2. The determinants of the scope of linkages

Table 6 displays the results obtained using a negative binomial model. When we examine the size of linkages using the number of local suppliers, rather than their overall share, we find some different results compared to those reported in Table 5, irrespective of whether we consider domestic and foreign firms jointly. It is now evident that bigger firms, as well as the more productive and skill intensive ones are those able to manage a larger network of local suppliers, independently on the quantity of inputs being sourced. More resources, and greater

efficiency, are clearly needed to be able to manage a large number of transactions in a foreign environment. Indeed, differently from the previous results, we do not find evidence of a foreign bias, meaning that foreign investors are not necessarily less integrated in local supply chains than domestic ones. In addition, we do not find any evidence that the market orientation play a role in affecting the amount of linkages. Clearly, not all the foreign investors are equally capable to create such large networks of domestic suppliers. Results show that this is the case of individual investors, or firms with lower shares of foreign ownership, which can find difficult to coordinate a more extensive set of local relations. Moreover, we can show that the level of autonomy matters in shaping sourcing relations towards a larger number of domestic suppliers: it means that the higher the autonomy of the firms from the parent company the higher the freedom to increasing the number of local suppliers. Similarly, a stronger role of the parent company negatively influence the scope of linkages, this time in line with the results found in the previous section.

Table 6. *Determinants the scope of linkages (Negative binomial estimator)*

	(1)	(2)	(3)	(4)
L_lab_prod	0.188***	0.142***	0.188***	0.174***
	(0.0501)	(0.0377)	(0.0471)	(0.0592)
size_class	0.497***	0.455***	0.469***	0.455***
	(0.0509)	(0.0643)	(0.0804)	(0.0836)
lage	0.103	0.371***	0.523***	0.489***
	(0.0683)	(0.122)	(0.152)	(0.174)
skill_ratio	0.0164***	0.0234***	0.0144***	0.0165***
	(0.00335)	(0.00443)	(0.00547)	(0.00542)
sez	-0.254**	-0.232**	-0.264*	-0.237
	(0.109)	(0.117)	(0.149)	(0.194)
market_or_a	0.0569	0.0686	0.105	0.0979
	(0.0549)	(0.0682)	(0.0988)	(0.0981)
soe	0.0372			
	(0.152)			
foreign	-0.0148			
	(0.114)			
eff_seeking		0.0653	-0.0672	-0.00187
		(0.109)	(0.135)	(0.154)
share_foreign		-0.00209	0.139***	0.208***
		(0.00399)	(0.0444)	(0.0527)
greenfield		-0.0548	-0.278	-0.197
		(0.175)	(0.292)	(0.338)
individual_inv		-0.271**		
		(0.113)		
role_parent			-0.556***	
			(0.187)	
autonomy_cat_hq				0.778*
				(0.436)
pol_stab				
Industry effects	Y	Y	Y	Y
Province effects	Y	Y	Y	Y
Constant	0.708	0.518	-13.85***	-20.80***
	(0.558)	(0.636)	(4.561)	(5.614)
Observations	1,369	756	489	489

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

The coefficient of age remains non-significant, though positive, in the first column. It is always highly significant when running regressions on the subsample of foreign firms: this confirms that firms take time to develop their own network, after they have spent some time and resources to understand with which suppliers could establish longer term relations an equilibrium will be reached.

But some difference with the previous results is found when testing the different dimensions of business climate and service provision on the capacity of investors to generate local linkages (Table 8). We show that firms receiving ad-hoc services related to the provision of information on finding adequate human resources and the matchmaking with suppliers and service providers during the implementation and the operational stage of the investment have higher probabilities to create a larger local network. This seems extremely relevant, as these are services that can reduce the costs of searching and matching local resources, which could be otherwise high for firms interested to widen their own local networks.

5.3. The determinants of "good" linkages

Finally, we discuss whether the same factors examined so far have an influence on the quality of linkages being established. Compared to previous specifications, in this last model we add the scope of linkages and its square as an additional control to check if – as suggested by Giroud et al. (2012) – the relation between quality and quantity is non-linear. Our results, reported in Table 7, support the view that there are decreasing returns once a certain number of linkages has been established[13]. This is not surprising, considering the high transaction costs and the likely disincentives to transfer resources to a large number of firms. In a way, this looks consistent with existing literature in that investors seem to transfer resources up the extent that their cost advantage is larger than the increase in transaction costs and redundancy of contracts within the network (Blalock and Gertler, 2009; Lin and Saggi, 2007).

Table 7. *Determinants the intensity of linkages (Ordered Probit estimator)*

	(1)	(2)	(3)	(4)
n_domestic_suppliers	0.00151***	0.00215***	0.00386***	0.00378***
	(0.000410)	(0.000757)	(0.00121)	(0.00121)
n_domestic_suppliers_2	-1.08e-06***	-1.59e-06*	-3.83e-06**	-3.67e-06**
	(3.26e-07)	(8.51e-07)	(1.62e-06)	(1.62e-06)
l_lab_prod	0.0255	0.0138	-0.0187	-0.0252
	(0.0249)	(0.0267)	(0.0337)	(0.0343)
size_class	0.0489	0.0159	-0.00420	-0.00364
	(0.0382)	(0.0528)	(0.0706)	(0.0710)
lage	-0.0623	0.0350	0.0471	0.0522
	(0.0499)	(0.0957)	(0.119)	(0.120)
skill_ratio	-0.00671***	-0.00409	-0.000687	-0.00143
	(0.00239)	(0.00325)	(0.00459)	(0.00449)
sez	-0.107	-0.0479	-0.0272	-0.0288
	(0.0798)	(0.0917)	(0.116)	(0.116)
market_or_a	0.00335	0.0183	0.0145	0.00776

[13] We find that this turning point is nonetheless set at very high levels, around 350 suppliers. For a matter of completeness, we tested this hypothesis also using the share of total inputs sourced locally, as in the original model by Giroud et al. (2012) finding a higher threshold level, around 43%.

	(0.0380)	(0.0536)	(0.0744)	(0.0738)
eff_seeking		-0.304***	-0.217*	-0.193*
		(0.0900)	(0.111)	(0.111)
share_foreign		-0.00116	0.0225***	0.0216***
		(0.00254)	(0.00775)	(0.00775)
greenfield		0.138	0.0155	0.0301
		(0.129)	(0.181)	(0.176)
individual_inv		0.175*		
		(0.103)		
foreign	-0.146*			
	(0.0819)			
soe	-0.0326			
	(0.107)			
role_parent			-0.231	
			(0.176)	
autonomy_cat_hq				0.0209
				(0.308)
Province effects	Y	Y	Y	Y
Industry effects	Y	Y	Y	Y
Constant cut1	-0.428	-0.146	1.419	1.301
	(0.333)	(0.502)	(0.975)	(0.976)
Constant cut2	0.177	0.442	1.981**	1.862*
	(0.333)	(0.501)	(0.976)	(0.977)
Constant cut3	0.714**	0.954*	2.481**	2.360**
	(0.334)	(0.501)	(0.977)	(0.978)
Constant cut4	1.219***	1.457***	3.036***	2.922***
	(0.336)	(0.507)	(0.977)	(0.976)
Constant cut5	1.691***	1.987***	3.609***	3.492***
	(0.336)	(0.504)	(0.972)	(0.970)
Constant cut6	1.851***	2.120***	3.644***	3.528***
	(0.339)	(0.505)	(0.975)	(0.973)
Observations	1,369	756	490	490

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

Moving to the other results, it is striking to observe that the role of firms' specific factors does not seem to have a crucial influence on the quality of linkages, except for the negative effect of skill intensity, which looks plausible if this is considered as a potential source of technological gap, in turn hindering the transfer of resources between investors and suppliers (Rodriguez-Clare, 1996). A rather important result is the presence of a foreign-bias, or, better, that domestic investors are more likely to support their local providers by transferring resources and supporting their production activities. It can be argued that local suppliers have a more strategic role for domestic investors, whose performance is crucially related to the quality of inputs sourced locally, differently from foreign investors who have a more diversified network, including international suppliers. Still, in the case of foreign investors the motivation matters. Results show that efficiency-seeking investments are less likely to result in the provision of

support to local suppliers, as one could have expected given that they generally involve low-value added, cost-saving, activities at the bottom of the value chain. However, differently from other models, the influence of parent company in decision-making, as well as the degree of an affiliate's autonomy, do not report significant results.

Further, our results show quite consistently that policies matter to create an environment conducive to transfer knowledge through linkages (Table 8). First, foreign investors are more likely to transfer resources to local suppliers if they feel to operate in a good institutional environment, i.e. one where the implementation of contracts is protected by an effective rule of law. Second, the probability of good linkages to be established raises in presence of strategic location factors, including the availability of an existent suppliers' base; of skilled workers; and the implementation of effective trade policies. Third, the provision of ad-hoc business services over the investment life cycle can be viewed as a crucial strategy to raise the probability of hosting more quality investors. Firms that have received support on matchmaking with local providers, partners and human resources; as well as information about the local markets have a larger probability of providing support to their local partners, through a number of different channels. Fourth, we find that incentives to investors matter. Foreign firms that have received some forms of incentive, mostly fiscal (but not directly related to their location in SEZs), have a larger probability to provide assistance to their local suppliers.

Table 8. *Business climate variables in the three main models*

	Extent of Linkages (Tobit)	Scope of Linkages (Negative binomial)	Intensity of Linkages (Ordered Probit)
Investment Climate			
pol_stab	1.700	-0.0966	-0.0288
	(2.269)	(0.0984)	(0.0776)
qual_infr	-1.512	-0.0969	0.0790
	(2.276)	(0.0898)	(0.0796)
econ_stab	-1.498	0.0518	-0.0252
	(2.304)	(0.0918)	(0.0777)
rule_law	-1.977	-0.0284	0.163**
	(2.389)	(0.0958)	(0.0794)
suppliers	3.201	0.149	0.182**
	(2.174)	(0.0936)	(0.0737)
afta	-1.375	-0.0287	0.193***
	(2.003)	(0.0807)	(0.0638)
skill_labour	0.308	0.0730	0.192***
	(2.121)	(0.0937)	(0.0739)
info_linkage	-2.933	0.214**	0.244***
	(2.696)	(0.105)	(0.0888)
info_market	-2.784	0.0337	0.156*
	(4.304)	(0.121)	(0.0935)
info_gov	-1.345	0.0245	0.192
	(2.607)	(0.191)	(0.150)
info_partner	-0.415	0.149	0.161*

	(3.642)	(0.112)	(0.0864)
info_doing_business	2.097	0.134	0.0903
	(2.827)	(0.163)	(0.123)
info_serv_HR	0.975	0.384***	0.261***
	(2.549)	(0.106)	(0.0952)
incentives	1.399	-0.0494	0.150*
	(2.692)	(0.113)	(0.0894)
competitiveness	4.761***	-0.0289	-0.0685
	(1.455)	(0.0662)	(0.0499)

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

5.4. Robustness checks

So far, we have considered the variables representing the business climate and the provision of services as exogenous. However, such assumption has been questioned by the existing literature for at least two main reasons (Dollar et al., 2005; Hallward-Driemeier and Aterido, 2009). The first is the risk of not considering variables at the firm level that can affect some of the dimensions of the business climate[14]: this could result in an omitted variable bias and the correlation of the error term to the covariates. The second is reverse causality, which implies the self-selection of "better firms" into better investment climate. Finding a proper strategy to deal with such potential endogeneity, on the other hand, has proven challenging so far, considering the cross-sectional nature of most existing studies (Xu, 2010).

A study by Dollar et al. (2005) adopts two different strategies to deal with such potential biases. First, it re-aggregates some of the investment climate variables at the geographic and industry level, to allow it to be independent on firms' characteristics. This, however, does not solve the potential simultaneity bias due to self-selection. Second, also to tackle this latter issue, they re-run their regressions on a group of "less mobile" firms, i.e. smaller companies which – due to a number of different reasons (e.g. the origin of the founder) – are more likely to select their location independently on location incentives or the business climate and be less likely to change their location as a consequence of changes in these variables.

Focusing on the specification looking at the intensity of linkages only, as a robustness check, we have re-run our full model considering (a) small firms only (both domestic and foreign) and (b) small and medium domestic firms[15]. Results, summarized in Table A3 in the Appendix, are consistent with those discussed in the previous section. A similar set of investment climate factors is found to positively affect the probability to transfer resources through linkages, supporting our original results. In the case of domestic SMEs, in addition, we find that other factors, including for instance also the quality of infrastructures, play an important role in shaping the quality of linkages established.

[14] A recent work by Dang (2013) shows indeed that FDI across Vietnamese provinces have a causal effect on local institutions.

[15] Small size companies are those with less than 200 employees, while medium sized are those with more than 200 but less than 300 employees.

6. Conclusions

This paper has analysed the determinants and mechanics through which linkages may affect domestic firms in developing countries. This analysis has been conducted through the Vietnam Investor Survey (UNIDO, 2012), which releases cross-section data for the year 2011. Our empirical strategy has been that of uncovering different features of the multifold dimensions of the linkage formations. On the one side, we analysed what are the determinants of linkages, looking at both their extent and scope. On the other side, we provide empirical evidence for the possibility that linkages are vehicles to enhance local firm's capacity to benefit from FDI. We put particular attention to the role played by policy variables in shaping the determinants and the potential developmental effects of linkages.

Our results provide a number of new and policy relevant insights on the factors leading to the successful establishment and implementation of linkages. Not surprisingly, we consistently show that domestic investors are more integrated into the local economy compared to foreign firms, but also that they are more likely to provide support, in the form of assistance and the transfer of knowledge and technology, to their local suppliers. Considering that, as shown by our results, domestic investors (as foreign ones) are sensitive to respond to improvements in the local business climate and to the provision of business services, these findings call for policies broadly supporting the creation of good linkages, not necessarily being targeted to foreign investors.

As far as the determinants of linkages are concerned, we show some substantial differences according to the variable used to measure them. While using the share of local linkages may understate the role of more productive and better performing firms as a source of domestic demand in their total supply function, the picture changes dramatically when we consider the number of linkages actually generated. More established players, including higher productive ones, are those likely to set up a larger number of linkages with domestic firms, being them also the more able to set up and coordinate a more complex local supply chain. This has immediate implications for investment attraction policies. Whether the interest of policy makers is on maximizing the local content requirement of foreign firms, i.e. the overall size of their share of inputs, this could nevertheless lead to targeting the wrong type of investors, that is those endowed with less valuable resources. Conversely, if the objective is that of enhancing the multiplier effect of investments and the development of local supply chains, maximizing the number of interaction of foreign with local firms may contribute to bring in the country more efficient firms as well as raise the probability of key resources being transferred.

Finally, when we look at the factors affecting the establishment of quality ("good") linkages, we show that it is no longer firm's (or investment) specific factors influencing the transfer of resources or the support to local suppliers. Rather, local suppliers are more likely to be supported conditional to the existence of a good business climate and, especially, the provision of key business services. More specifically, we show that the probability for linkages to be accompanied by larger assistance and the transfer of key resources is positively correlated to the existence of strong institutions (measured by the rule of law), trade policies and the availability of skilled workers and quality suppliers. In addition, we provide new evidence on the role and effectiveness of business services. We show that investors are more likely to improve the relations with their suppliers when they receive ad-hoc business services, such as the provision of information on local markets and potential partners, as well as the matchmaking with workers and suppliers. Importantly, we also show that incentives, mostly in the form of tax

exemptions, can represent a good tool to enable the transfer of resources from foreign investors provided that they are not related to their location into special economic zones.

Taken together, these findings call for a reconsideration of policies supporting local linkages, as well as emphasize once more the need for central and local governments to provide firms, both domestic and foreign, with the most favourable conditions for their investment. Our results show that not only a good business climate opens the way to more profitable investments by the firms as suggested by earlier literature (Xu, 2010), but also that it decisively contributes to spread the benefits of it to the domestic firms upstream.

Importantly, our results make clear also that – to maximize the developmental potential of linkages – policies supporting the creation of local capabilities for both local workers and producers work more efficiently when accompanied by the provision of information on local market opportunities and on domestic resources to new investors. In times of high competition to attract investments from abroad, as recently discussed by Moran (2014), this perfectly reflect recent view supporting the successful experiences of some developing countries in implementing light forms of industrial policies to maximize the developmental effect of FDI through linkages.

References

Acemoglu, D., Johnson, S. and J. Robinson (2001), The Colonial Origins of Comparative Development: An Empirical Investigation, *American Economic Review*, 91: 1369-401.

Anh, Phan Thi Thuc, et al. (2006), Knowledge acquisition from foreign parents in international joint ventures: An empirical study in Vietnam. *International Business Review* 15(5): 463-487.

Anwar, S., and L.P. Nguyen (2011), Foreign direct investment and trade: The case of Vietnam. *Research in International Business and Finance* 25(1): 39-52.

Amendolagine, V., et al. (2013), FDI and local linkages in developing countries: Evidence from Sub-Saharan Africa. *World Development* 50: 41-56.

Bartelme, D. and Y. Gorodnichenko (2015), Linkages and Economic Development, NBER Working Paper n. 2151

Barrios, S., Görg, H. and E. Strobl (2011), Spillovers through backward linkages from multinationals: Measurement matters! *European Economic Review* 55 (6): 862-875.

Belderbos, R., Capannelli, G. and K. Fukao (2001). Backward Vertical Linkages of Foreign Manufacturing Affiliates: Evidence from Japanese Multinationals, *World Development*, 29(1): 189-208.

Blalock, G. and P. J. Gertler (2009), Welfare Gains from Foreign Direct Investment through Technology Transfer to Local Suppliers, *Journal of International Economics*, 74: 2402-21.

Chen, T., Chen, H. and Ying-Hua Ku (2004), Foreign direct investment and local linkages." *Journal of International Business Studies* 35(4): 320-333.

Dang, D.A. (2013) How foreign direct investment promote institutional quality: Evidence from Vietnam, *Journal of Comparative Economics*, 41: 1054-72

Dollar, D., Hallward-Driemeier, M. and T. Mengistae (2005) Investment Climate and Firm Performance in Developing Economies, *Economic Development and Cultural Change*, 54(1): 1-31.

Giroud, A., Jindra, B. and P. Marek (2012) Heterogeneous FDI in Transition Economies – A Novel Approach to Assess the Developmental Impact of Backward Linkages, *World Development*, 40(11): 2206-20.

Farole, T., and D. Winkler, eds. (2014) *Making Foreign Direct Investment Work for Sub-Saharan Africa: Local Spillovers and Competitiveness in Global Value Chains*. Washington: World Bank

Görg, H. and D. Greenaway (2004), Much Ado About Nothing? Do Domestic Firms Really Benefit from Foreign Direct Investment? *World Bank Research Observer* 19, 171-97.

Görg, H., and Seric, A. (2015) "Linkages with Multinationals and Domestic Firm Performance: The Role of Assistance for Local Firms." *European Journal of Development Research*, in press, DOI: 10.1057/ejdr.2015.33

Gorodnichenko Y., Svejnar, J. and K. Terrel (2015) Does Foreign Entry Spur Innovation? NBER Working Papers N. 21514.

Gueorguiev, D., and E. Malesky (2012) Foreign investment and bribery: A firm-level analysis of corruption in Vietnam, *Journal of Asian Economics* 23(2): 111-129.

Hallward-Driemeier, M. and Aterido, R. (2009) Comparing Apples with…Apples – How to make (more) sense of subjective rankings of constraints to business, World Bank Policy Research Working Paper n. 5054

Hirschman, A. O. (1958) *The strategy of economic development*. New Haven: Yale University Press

Hrvranek, T. and Z. Iršova (2011), 'Estimating Vertical Spillovers From FDI: Why Results Vary and What the True Effect is', *Journal of International Economics*, 85, 2, 234–44

Javorcik, B.S. and M. Spatareanu (2009) Tough Love: Do Czech Suppliers Learn from

their Relationships with Multinationals? *The Scandinavian Journal of Economics*, 111(4): 811-23.

Jordaan, J. A. (2011) FDI, local sourcing, and supportive linkages with domestic suppliers: The case of Monterey, Mexico, *World Development*, 39(4): 620–32.

Lin, P., and Saggi, K. (2007).Multinational firms, exclusivity, and backward linkages, *Journal of International Economics*, 71, 206–20.

Liu, B. J. (2011) MNEs and local linkages: Evidence from Taiwanese affiliates. *World Development*, 39(4), 633–47.

Moran, T. (2014) Foreign Investment and Supply Chains in Emerging Markets: Recurring Problems and Demonstrated Solutions, Peterson Institute Working Paper Series N. 12-14.

Morrissey, O. (2012), FDI in Sub-Saharan Africa: Few linkages, fewer spillovers. *European Journal of Development Research* 24 (1): 26-31.

Newman, C., Rand, J. Talbot, T. and F. Tarp (2015) Technology transfers, foreign investment and productivity spillovers, *European Economic Review*, 76: 168-187.

Nguyen N.A., et al. (2008). Foreign Direct Investment in Vietnam: Is there Evidence of Technological Spillover Effects. DEPOCEN working paper series no. 2008/18

Perez-Villar, L. and A. Seric (2015), Knowledge transfer in global supply chains: Multinationals in Sub-Saharan Africa, Kiel Working Paper n.1994

Rodrıguez-Clare, A. (1996) Multinationals, linkages and economic development. *American Economic Review*, 86(4), 852–73.

Stern, N. (2002) *A Strategy for Development*, the World Bank: Washington, DC.

UNIDO (2011) *African Investor Survey*, United Nations Industrial Development Organization, Vienna

UNIDO (2012) *Vietnam Industrial Investment Report 2011*, United Nations Industrial Development Organization, Vienna

UNCTAD (various years) *World Investment Report*, UNCTAD: Geneve

Winkler, D. (2013) Potential and Actual FDI Spillovers in Global Value Chains The Role of Foreign Investor Characteristics, Absorptive Capacity and Transmission Channels, World Bank Policy Research Working Paper n. 6424

Xu, L.C. (2010) The Effects of Business Environments on Development: Surveying New Firm-level Evidence, *The World Bank Research Observer*, 26 (2): 310-40

Zanfei, A. (2012). Effects, not externalities, *European Journal of Development Research*, 24(1), 8–14.

Appendix

Table A1. *Descriptive statistics of the business climate variables*

Variable	Description	Obs	Mean	Std. Dev.	Min	Max
pol_stab	Political stability as location factor (1-3)	1493	2.54	0.53	1	3
qual_infr	Importance of quality of infrastructure as location factor (1-3)	1492	2.37	0.54	1	3
econ_stab	Importance of economic stability as location factor (1-3)	1493	2.58	0.52	1	3
rule_law	Importance of rule of law as location factor (1-3)	1493	2.30	0.55	1	3
Suppliers	Importance of Vietnamese suppliers as location factor (1-3)	1493	2.16	0.57	1	3
afta	Importance of profit of AFTA as location factor (1-3)	1493	2.07	0.64	1	3
skill_labour	Importance of skilled labour as location factor (1-3)	1493	2.40	0.56	1	3
info_linkage	Service for linking with providers received	1479	0.59	0.49	0	1
info_mkt	Service for market information received	1485	0.72	0.45	0	1
info_gov	Service for info on gov incentives received	1481	0.90	0.31	0	1
info_partner	Service for information on potential partner received	1479	0.50	0.50	0	1
info_doing	Service for information on procedures for doing business in Vietnam received	1484	0.85	0.36	0	1
info_servHR	Service to find HR received	1480	0.66	0.47	0	1
incentives	Investment Incentives Received	1493	0.44	0.50	0	1
competitiveness	Provincial competitivenness (Vietnam Gov. & USAID, 2011)	1493	62.31	2.76	57.07	67.27

Table A2. *Results, Seemingly Unrelated Regressions*

	imported_inputs	percent_inputs_domestic	inputs_for_manuf
L_lab_prod	1.768**	-1.589**	-0.178
	(0.735)	(0.637)	(0.474)
size_class	4.546***	-3.419***	-1.122
	(1.283)	(1.112)	(0.827)
lage	-0.144	0.0195	0.120
	(2.372)	(2.056)	(1.530)
skill_ratio	0.349***	-0.295***	-0.0540
	(0.0817)	(0.0708)	(0.0527)
sez	3.899*	-5.682***	1.776
	(2.286)	(1.982)	(1.475)
market_or_a	7.112***	-3.747***	-3.370***
	(1.395)	(1.210)	(0.900)
eff_seeking	0.608	-2.154	1.550
	(2.240)	(1.942)	(1.445)
share_foreign	0.394***	-0.373***	-0.0213
	(0.0783)	(0.0679)	(0.0505)
greenfield	-2.823	0.787	2.056
	(3.263)	(2.829)	(2.105)
individual_inv	-6.034**	3.199	2.838*
	(2.607)	(2.260)	(1.682)
Constant	-31.24**	115.2***	15.98*
	(13.44)	(11.65)	(8.668)
Industry effects	Y	Y	Y
Province effects	Y	Y	Y
Observations	820	820	820
R-squared	0.291	0.306	0.141

Breusch-Pagan test of independence: chi2(3) = 722.309, Pr = 0.0000

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

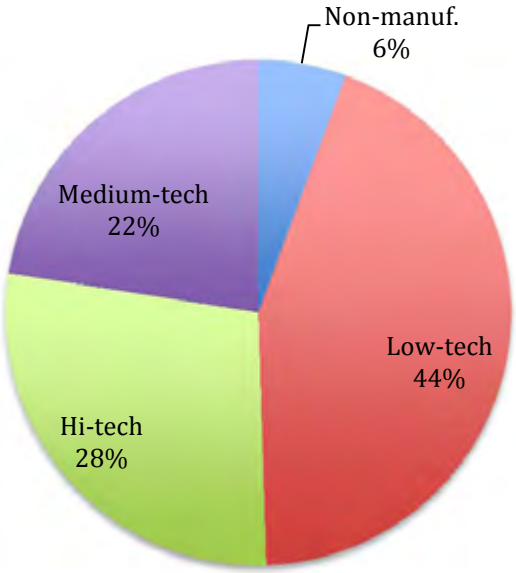
Table A3. *Business climate variables, robustness check*

	Main (for comparison)	Small firms	Domestic SMEs
pol_stab	-0.0288	0.0635	0.255**
	(0.0776)	(0.102)	(0.111)
qual_infr	0.0790	0.148	0.255**
	(0.0796)	(0.107)	(0.116)
econ_stab	-0.0252	0.176	0.168
	(0.0777)	(0.117)	(0.122)
rule_law	0.163**	0.288***	0.305**
	(0.0794)	(0.107)	(0.120)
suppliers	0.182**	0.0673	0.0729
	(0.0737)	(0.0965)	(0.0962)
afta	0.193***	0.0851	0.247**
	(0.0638)	(0.0875)	(0.0986)
skill_labour	0.192***	0.0389	-0.0736
	(0.0739)	(0.0941)	(0.120)
info_linkage	0.244***	0.180	0.142
	(0.0888)	(0.113)	(0.123)
info_market	0.156*	0.211*	0.303**
	(0.0935)	-0.118	(0.135)
info_gov	0.192	0.332**	0.438**
	(0.150)	(0.167)	(0.180)
info_partner	0.161*	0.280**	0.367***
	(0.0864)	(0.111)	(0.121)
info_doing_business	0.0903	0.184	0.225
	(0.123)	(0.150)	(0.168)
info_serv_HR	0.261***	0.246**	0.291**
	(0.0952)	(0.119)	(0.126)
incentives	0.150*	-0.0530	0.164
	(0.0894)	(0.118)	(0.137)
competitiveness	-0.0685	-0.0262	0.0363
	(0.0499)	(0.0499)	(0.0507)

Robust standard errors in parentheses

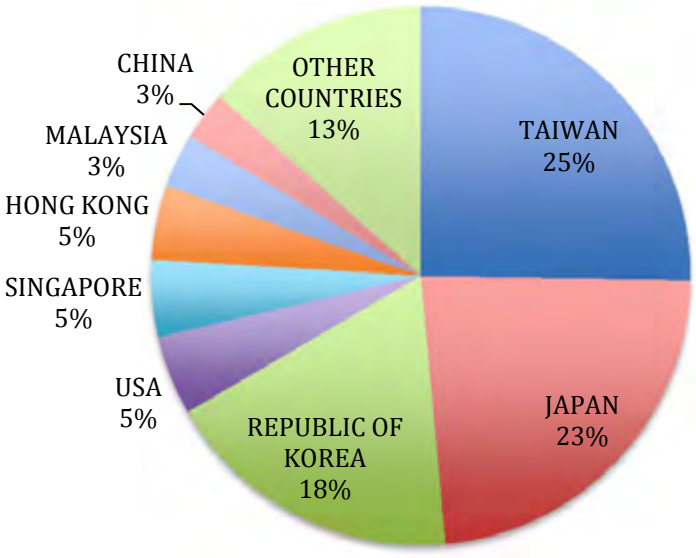
*** p<0.01, ** p<0.05, * p<0.1

Figure A1. ***Distribution of FIEs in Vietnam, by technological intensity of industry***



Source: Authors' elaboration on Vietnam Investor Survey

Figure A2. ***Distribution of FIEs in Vietnam, by country of origin***



Source: Authors' elaboration on Vietnam Investor Survey

IOB
Institute of Development Policy and Management
University of Antwerp