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FDI as a Catalyst for Domestic Investment in Developing Economies: New Evidence from Industry-level Data

Alessia A. Amighini^{a*}, Margaret McMillan^b, Marco Sanfilippo^c

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Abstract. We contribute to the long debated issue of whether inward FDI can stimulate domestic investment in developing countries by introducing a novel measure of FDI, based on industry-level data. We assess the differential impact of FDI on domestic investment according to the activities performed by MNEs abroad as well as the source of FDI. Our results suggest a positive impact of FDI on domestic investment, if MNEs effectively engage in productive activities that can exert spillovers to the host economies, compared to trade-related activities that instead tend to remain enclaves without linkages to the domestic economy. Moreover, we find evidence of a more beneficial impact of foreign investors from advanced economies. Our results are robust to alternative model specifications.

Keywords: Foreign Direct Investment, domestic investment, gross fixed capital formation, crowding out, developing countries, MNEs

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*corresponding author

^aDepartment of Economics and Business, Università del Piemonte Orientale, Via Perrone 18 - 28100 Novara, Italy. Tel. 0039 0321 375 332. Fax 0039 0321 375 305. Email: alessia.amighini@eco.unipmn.it

^bTufts University and IFPRI

^cUniversity of Antwerp

1 Introduction

As economic growth is mostly driven by capital accumulation, at least up to the optimal level of capital per worker (Solow, 1956), increasing investment in developing countries is a key policy objective. Therefore, in countries with persistently insufficient domestic capital formation, foreign direct investment (FDI) is often welcome as a means to financing development. As a result, FDI attraction policies into the developing world have increased dramatically, so that FDI has actually become the leading source of external financing (Calderon et al, 2004; OECD, 2014). However, the overall effects of FDI on economic growth in developing economies are far from certain, and contrasting perspectives on the developmental impact of FDI vividly confront with one another both in scholarly and in policy circles.

The effects of inward FDI on domestic investment have been the focus of a sizeable theoretical and empirical literature since at least the end of the 1970s (Brecher & Diaz-Alejandro, 1977; Lall & Streeten, 1977; Matos, 1977). Theory suggests that FDI plays a crucial role in financing development, both directly, as an external source of capital, and indirectly through its impact on domestic capital formation. However, FDI can potentially be beneficial or detrimental to domestic investment, and theoretical prescriptions on which net effect a country hosting FDI should expect are still inconclusive. No less controversial are the results from the empirical literature, which suffer from severe data limitations on the real investment by foreign invested firms, due to the fact that they rely upon aggregate FDI data taken from the Balance of Payments (BoP) statistics.

Yet, empirically assessing the role of FDI in financing development - and possibly also the conditions under which FDI is likely to have beneficial or detrimental effects - has remarkable policy implications. Since economic policy can influence investment decisions, understanding whether and how FDI triggers more or less domestic investment would help tailoring investment policy measures aimed at attracting FDI. Those policies are now widespread in a growing number of developing countries, but largely unconditional on the actual activities performed by MNEs, and often combined with industrial development and fiscal policies towards domestic investment that are not necessarily consistent with the overall aim of increasing capital formation.

This paper contributes to the long debated issue of whether inward FDI can stimulate domestic investment in developing countries in two major ways. First and foremost, we introduce a novel measure of FDI, based on project-level data on the activities of multinational enterprises (MNEs) operating in developing countries, which allows to overcome the previous limitations of the literature concerning data availability on industry and firm-level foreign investments.

Relying on firm-level data with both industry and business activity breakdowns, instead of aggregate investment flows, allows including a further – and so far unexplored – dimension into the analysis, i.e. the industry level. Second, we account for the possible differential impact of FDI on domestic investment according to 1) the business activities performed by MNEs abroad, distinguishing between productive and trade-related activities (i.e. sales, marketing, client support, retail and wholesale) and 2) the source of FDI, distinguishing investing countries between advanced and developing economies. Our dependent variable varies by industry – as it is defined by the Gross Fixed Capital Formation (GFCF) for each 2-digit industry x in the manufacturing sector – besides also being country and time variant. Therefore, we are able to explore the issue of whether FDI foster capital accumulation in host economies in a much more refined way than in the extant literature (which focuses on the crowding in or out debate at the level of national economy), namely we try to assess whether – and which type of – FDI, measured as the number of MNEs entering a specific foreign industry, foster capital accumulation in that same industry. Another important feature of this study compared to the existing literature is that we specifically focus on greenfield FDI, which contribute directly to domestic capital formation, unlike mergers and acquisitions (M&A) – which instead simply imply a change in the ownership structure of existing firms (Calderon et al., 2004; Ashraf and Herzer, 2014).

Our overall results suggest a positive impact of FDI on domestic investment and are therefore consistent with more recent evidence from studies relying on macro data (Farla et al, 2014). Moreover, we are able to better qualify the link between FDI and domestic investment by identifying which types of FDI are indeed likely to be more beneficial to domestic capital formation. Our evidence provides support to the widespread view that foreign capital can be a source of development financing for developing countries, provided that MNEs effectively engage in productive activities that can exert spillovers to the host economies, and do not just engage in trade-related activities that instead tend to remain enclaves without linkages to the domestic economy. Moreover, we find evidence of a differential impact of the presence of foreign firms from advanced countries compared to those from developing economies. The latter, despite some encouraging evidence on the beneficial effects of South-South FDI, seem to have no significant effects on domestic capital formation, and this is probably due to the little experience of Southern MNEs as foreign investors.

The remainder of this paper is organized as follows. Section 2 outlines the related theoretical and empirical literature. Section 3 describes the data and the methodology. Section 4 presents the results. Policy implications and concluding remarks are presented in Section 5.

2 Literature background

Economic theory points to a number of distinct channels through which FDI may affect capital accumulation in recipient economies. FDI can exert both direct and indirect effects on capital formation. As regards direct effects, the most common perspective considers FDI as a financial flow contributing to capital stock accumulation, by adding up to domestic investment. As such, the impact of FDI largely depends on the entry mode of MNEs. Greenfield investments – i.e. brand new domestic subsidiaries of foreign firms – are more likely to have a direct impact on capital formation as they create new capital assets, whereas M&As mainly result in a partial or total transfer of existing capital assets through a change in the nationality of existing domestic firms, but do not add to the capital stock.

Nor is it certain that the acquisition of a domestic firm by a foreign firm would lead to more investment than the acquired firm would have made without the acquisition (Mencinger, 2003; Agosin & Machado, 2005; Herzer, 2012). There is indeed some evidence pointing to the dubious - and in some instances, potentially negative – effect of M&As on capital formation (Ashraf and Herzer, 2014).¹

Although the literature has regularly acknowledged a differential impact of FDI on capital formation depending on the entry mode of MNEs in the host economies, most empirical studies relying on macro data cannot disentangle between different entry modes. Only recently, Ashraf & Herzer (2014) have explored the different impact of greenfield investment and M&A on domestic investment, with aggregate data from UNCTAD FDI database; their results confirm that M&A do not have a significant impact on domestic investment, whereas (estimated) greenfield flows do seem to have a crowding-out effect.

The literature has also invariably overlooked the fact that FDI as an aggregate measure from the BoP statistics represents just a financing flow, and not necessarily investment (Calderon et al, 2004). FDI includes any financial transfers from a multinational's headquarters to its subsidiary, and back². As they are measured in net terms, aggregate FDI flows can be either positive or negative, but that does not relate at all to the amount of investment in the host economy. Moreover, aggregate FDI statistics do not allow for industry-level breakdown on

¹ As a matter of fact, the increased importance of M&A in total FDI flows starting in the 1990s, especially in developing countries embarking in massive privatisation policies, has been singled out as the likely cause of an observed weakening in the empirical FDI-investment link in that decade (World Bank 2001).

² UNCTAD (2013) claims that the amount of repatriated profits could be substantial, especially in certain sectors and countries. The same report estimates that, globally, in 2010 about 60% of total FDI income was repatriated.

a bilateral basis, nor include information about different entry modes of MNEs into foreign markets.

A complementary perspective acknowledged in the literature is to look at FDI as knowledge flows that accompany capital. As a matter of fact, FDI are often welcome in developing countries as they bring fresh capital together with a number of intangible assets that are usually scarce in those economies, namely technological capabilities, management skills, brand names, channels for marketing products internationally, product design (Romer, 1992; Moran, 2011). Besides the direct effects of FDI on capital accumulation in the host economy, indirect effects can take place through the impact of foreign capital on domestic capital formation, as the entry of foreign firms may alter the incentives to invest by domestic firms. Several channels are at work.

Theory has pointed out a number of mechanisms through which FDI can increase the profitability of domestic investment. First, FDI can act as a catalyst for domestic investment because multinationals usually have greater access to information and financial resources than most private investors do in developing countries. Hence, they are able to both identify and take advantage of profitable opportunities more quickly than domestic investors, so that the entry of foreign firms in a developing country signals the existence of unexploited profitable business opportunities that domestic investors might not be capable of identifying or willing to seize by themselves. Moreover, foreign firms entering a developing country often bring about the need for more efficient infrastructure facilities (roads, telecommunications, ports, railways, etc.), which they can contribute to finance (Cardoso & Dornbusch, 1988) if they are not - as it is often the case - directly involved in providing such infrastructure. As poor or insufficient infrastructure is often a binding constraint to business development in developing countries, improved infrastructures can open up new business opportunities that would not have been profitable otherwise, thus increasing the profitability of overall domestic investment. A further mechanism through which foreign firms can contribute to capital formation is through the supply of scarce inputs (Helleiner, 1988), which they can vehicle by importing human and physical capital, technology, and other intangible inputs. In particular, positive externalities are the increased availability of training services, managerial skills, technological capabilities, access to overseas markets, market information, all of which benefit all domestic firms (Moran, 2011). The entry of foreign firms may also create new demand for inputs that can be provided by local firms through backward linkages as complements to those imported from their home countries (Gorg and Greenaway, 2004). Finally, in developing countries with poor business opportunities, FDI can contribute with additional tax revenue invested in public goods (Cardoso and Dornbusch, 1988).

The literature has also emphasized the existence of potential negative effects on the profitability of domestic investment due to the presence of foreign firms. Different mechanisms may be at work. Foreign owned firms can acquire domestic market shares to the detriment of domestic firms (Aitken & Harrison, 1999). Foreign firms can crowd out domestic investment if they increase the host country's interest rate by borrowing on the domestic market (Harrison & McMillan, 2003). Foreign firms entering a developing country in sectors with relatively underdeveloped productive capacity may sensibly increase the cost of locally supplied inputs, especially wages (Lall & Streeten, 1977). Moreover, FDI have uncertain effects on the degree of competition in host economies, as foreign firms, usually more efficient and productive than domestic firms, can boost competition among the latter, but at the same time could acquire market power, with a potentially negative effect on domestic investment (Markusen and Venables, 1999). FDI can have negative effects on overall capital formation in developing countries, when the entry of foreign-owned firms pushes the less efficient domestic firms out of the market and therefore reduces domestic production capacity (Gorg and Greenaway, 2004). Finally, foreign firms could also have a negative impact on the demand for local inputs, if they rely less on domestic inputs than domestic firms (Rodriguez-Clare, 1996).

Empirical evidence on the relation between FDI and investment has largely been provided at the macroeconomic level³ (a summary of empirical evidence is reported in Table 1). The macroeconomic studies typically use aggregate measures of investment to study either one particular country or a panel of countries. Among the first to analyse panels of countries, Fry (1993) used macroeconomic data for a sample of 16 countries to show that FDI can have a positive or a negative impact on domestic investment depending on the level of trade barriers and financial regulations imposed by the host country. Later evidence is similarly inconclusive. Empirical studies by Morrissey and Udomkerdmongkol (2012), Mutenyo, Asmah, and Kalio (2010) and Titarenko (2005) all find that increases in FDI crowd out domestic investment. Conversely, other scholars find that FDI or crowds in private domestic investment, such as De Gregorio, & Lee (1998), Bosworth & Collins (1999), de Mello (1999), Borensztein, Ndikumana & Verick (2008), Tang, Selvanathan, & Selvanathan, 2008), Ramirez (2011), Al-Sadig (2013), Farla et al. (2014). Several scholars find mixed evidence when using several lags for FDI or when splitting the country sample according to

³ Microeconomic studies are much less frequent. They include case studies and studies on firm-level panel data for specific countries. Among those, Aitken and Harrison (1999), on a panel of more than 4,000 Venezuelan firms, show that the impact of FDI on domestic investment depends on the ownership structure. FDI that participates with domestic firms in a joint venture arrangement enhances the profitability of the domestic investment. By contrast, FDI negatively affects the productivity of firms with 100% domestic ownership. On balance, they find that FDI has a positive impact on domestic investment.

geographic region (Agosin & Mayer, 2000; Misun & Tomsik, 2002; Agosin & Machado, 2005; Apergis, Katrakilidis, & Tabakis, 2006; Adams, 2009), or find no effect of FDI on domestic investment (Lipsey, 2000).

While most of the studies reported in Table 1 have so far examined the direct relation between FDI and proxies for domestic investment, some recent works have provided further insights. Morrissey and Udomkerdmongkol (2012) show that the crowding out effect of FDI on private investment is stronger in countries with higher political stability. Farla et al (2014) contributed to that issue with a better implementation of system GMM, as well as to the adoption of a less artificial measure of domestic investment in order to investigate whether the results in the literature are robust to such changes. By so doing, they conclude that foreign investment has a positive effect on total investment, but find no moderating role of good governance in the relation. Starting from similar findings, Munemo (2014) adds that such positive impact of FDI is conditional on the existence of a good investment climate.

Overall, neither the theoretical work nor the empirical evidence provides a definitive answer as to the impact of FDI on domestic investment. On balance, however, the empirical work seems to suggest that FDI has a positive impact on domestic investment. Arguably, none of the existing studies have been able so far to move behind the aggregate picture, ignoring the potential heterogeneity that can arise from micro factors such as the sectorial distribution of the investors as well as the kind of business activity they perform. This papers aims at specifically filling this gap.

TABLE 1 HERE

3. Data and Methodology

3.1 Data

While some of the existing studies have constructed a measure of gross fixed capital formation (GFCF) net of FDI flows to try building a 'pure' measure of domestic investment (Morrissey and Udomkerdmongkol, 2012), some well-motivated criticisms have been moved to this definition based on two main arguments. First, GFCF and FDI are measured according to different accounting rules (National Accounting rules and Balance of Payments, respectively) and are therefore hardly comparable in practice (Agosin and Machado, 2005). Second, and more fundamental, FDI flows from the BoP do not correspond directly to any measure of real investment. Indeed, as reported by Leino and Ali-Yrkko (2014: 3): "... real investments of foreign-owned companies can be funded locally or by other foreign entities than direct investors. (...). Furthermore, recorded inward FDI may

consist of funds that are immediately invested abroad by the investment-receiving FDI enterprises".

In this paper we take the perspective of FDI as encompassing the amount of capital invested, and also considering the knowledge flows accompanying capital, which are likely to be an important source of spillovers onto the host economies. By so doing, we depart from the extant literature, and consider the number of MNEs entering a developing country, rather than the overall flow of capital. In most studies, the impact of FDI is analyzed by expressing FDI as a percentage of gross fixed capital formation in the domestic economy. This ratio is often considered as an indicator of the share of domestic capital formation undertaken by foreigners. However, as argued by Ramstetter (1996), a more meaningful indicator of the importance of FDI would be the share of foreign multinationals in total output, or, as here, the number of foreign firms entering a host country.

Therefore, we depart from a traditional investment function, such as in Farla et al. (2014), and use instead the total value of sector GFCF as our main indicator. Our dependent variable is a measure of industry level GFCF in percentage over total GDP. In this respect, one of the main strengths of our paper over existing macroeconomic studies is that we can move away from aggregate level statistics, and construct our main variables at the industry level. Our aim is to test whether MNEs entering a country in a given industry exert a positive or negative impact on overall capital formation in that industry. As foreign firms can stimulate spillovers both within and across sectors, our definition of FDI and empirical specification will possibly tend to underestimate the overall impact of FDI on capital accumulation in host economies. Moreover, our definition of FDI based on project-level data allows testing for additional factors that can influence the impact of FDI on capital accumulation, namely: the country of origin of the investing firm (distinguishing between high-income OECD economies (henceforth the "North") and non high-income OECD economies (henceforth the "South")); the business activities performed by foreign subsidiaries; as well as a series of control variables at industry level. To do this, we rely on the 2014 edition of the Industrial Statistical Database (INDSTAT) published by the United Nations Industrial Development Organization (UNIDO). INDSTAT provides information over the main aggregates, including GFCF, for all industries (defined at the 2-digit levels of the ISIC rev. 3) included in the manufacturing sector for a long time series (1964-2011) and with a large coverage of developing and emerging economies (for a list of the countries included in our database, see table A in the appendix).

As regards our main variables of interest, i.e. FDI, we define a variable building from project level data. To do so, we rely on an original source of information (Financial Markets' *FDIMarkets*) covering data on greenfield investments at the deal level, including information on source country, destination country, industry

(2-digit ISIC rev. 3) and year (2003-2011, the longest time series currently available). It is worth emphasising - as discussed in Section 2 - that precisely greenfield investment data are appropriate for our purpose, because they add up to domestic productive capacity, while M&A simply substitute foreign for domestic existing activities. Summary statistics on the actual number of FDI project by industry are shown in Table 2. The list of FDI included in our study is not as large as the entire FDI database, but it is largely influenced by data availability in INDSTAT. In fact, the number of observations is the number of investments in any given country, conditional upon that country being covered by INDSTAT with industry level data in one of the N manufacturing industries in any given year between 2003 and 2011⁴.

TABLE 2 HERE

This feature of the data allows us to move further from the traditional issue of whether FDI crowds in/out domestic investments, and to explore more in details an additional question, i.e. whether or not greenfield investors contribute to the stock of capital domestically. As our main interest is the impact of foreign firms on capital formation in the host economies, we exploit the richness of our industry-level data (compared to aggregate FDI flows) to build two alternative measures of the presence of foreign firms, namely the number of MNEs entering into a host economy in a given country/industry/year combination (henceforth called "flows") or as the total number of MNEs operating in a host economy since the beginning of the period considered (cumulated FDI or FDI "stock").

By so doing, we overcome a major limitation of the previous literature, i.e. the lack of data on real investment by MNEs and on the presence and weight of foreign firms in host economies. In developing countries local firms may lack access to foreign markets and technology, and therefore suffer from "binding constraints" (Rodrik, 2006) to growth that inhibit their investment behaviour. The entry of MNEs could serve as a vehicle for domestic firms to get access to new technology and possibly also to larger markets, to the extent that they can enter into arm's length relationships with more productive firms that can exploit larger international distribution networks, thereby increasing investment profitability. In this perspective, the same amount or size of total MNEs' investment would have a different impact on GFCF depending on the actual number of foreign firms in the host economy. In fact, the positive impact of foreign firms on domestic capital formation is likely to depend on the number of interactions between any domestic firm and any foreign firm, so that the number of foreign firms in an economy is

⁴ The case of Vietnam is quite indicative in this sense. Vietnam hosts a much higher number of foreign firms than what we can consider in the analysis, but the country is largely underreporting data on GFCF in INDSTAT.

potentially a more appropriate measure when assessing the spillover to the local economy.

Using industry level information on FDI provides an important addition over existing aggregate evidence. It might be argued, in fact, that the net impact of FDI on capital accumulation results from high sectorial heterogeneity. Agosin and Machado (2005), for instance, suggest that FDI is more likely to add up to GFCF in sectors with lower investments and replace it in more developed industries. Similarly, due to the richness of our FDI data, we are also able to distinguish the business activities undertaken by foreign firms (see Table 3). Drawing on the large literature on FDI and development, we can argue in fact that the potential spillovers to the domestic economy, including on investments, largely depend on the extent to which foreign investors are involved in activities more likely to foster local linkages, such as production, rather than “footloose” ones, such as export platform FDI (Farole and Winkler, 2013).

TABLE 3 HERE

Finally, we further innovate on the previous literature by including the origin of FDI as a variable of interest. There is nowadays a rising interest in understanding whether South-South FDI could result in larger positive spillovers compared to North-South flows, but still little evidence playing in favour of this hypothesis (Amighini and Sanfilippo, 2014; Pfeiffer et al., 2014). The underlying idea behind this is that FDI might have a different impact on domestic firms depending on the “distance” between home and host economies, being it technological, geographic or institutional. Southern economies are in fact more likely to share similar technologies due to closer factor endowments, and to their higher complementarities along the product space (Klinger, 2009; Hausmann et al., 2007). However, while these arguments have often been raised in favour of stronger spillovers from South-South FDI, they might similarly be used to affirm that southern MNEs are as well strong competitors of domestic firms, undermining their competitiveness (Sanfilippo and Seric, 2014). This notwithstanding, evidence is still scant and inconclusive about the potential effect of South-South FDI on the domestic capital formation.

As far as the additional explanatory variables are concerned, following the theoretical insights and existing empirical works, we include the following (see Table 4 for a full description): lagged GFCF to account for the fact that current investment decisions have a strong path dependence due to depreciation component and to the fact that it is a structural component of the economy; per capita GDP growth to account for the fact that current investment decisions depend on the expected flow of future profits which are increasing in income; political stability and inflation as measures of political and economic uncertainty

surrounding investors; fuel exports is included as a proxy for the abundance of natural resources in host countries, with the aim of testing whether capital formation in resource-rich economies is relatively lower due to the lack of profitable business opportunities in non-resource intensive sectors such as manufacturing; the price of investment, as a proxy of the cost of capital. We also include some industry specific variables, all taken from INDSTAT, such as the size and the value added produced, to test whether the impact of foreign firms on domestic GFCF varies according to the importance of the sector to the host economy (Agosin and Machado, 2005).

TABLE 4 HERE

We estimate an augmented investment function on a large group of low- and middle-income countries as recipients of FDI from any investor country (distinguishing between North and South) with annual bilateral data since 2003, as specified in Equation (1). Our study covers a decade characterized by a dramatic increase in FDI into the developing world, by investors from both developed and developing economies. Unlike the earlier waves of FDI into the developing world, the current one is somehow unprecedented, as developing economies have become attractive locations for overseas investment not only by traditional investors from advanced economies – still the major investors worldwide, both in terms of total number of MNEs with foreign investment activity and in terms of stock of outbound investment – but also increasingly by investors from a number of emerging economies. Moreover, while M&A are the preferred FDI type of firms investing in the North, the large majority of greenfield investments has instead gone to the South (Figure 1).

FIGURE 1 HERE

The final specification is therefore the following:

$$GFCF_{ixt} = b_1 GFCF_{ixt-1} + b_2 GDP_PC_G_t + b_3 INFL_t + b_4 FUEL_t + b_5 POL_STAB_t + b_6 IP_t + b_7 N_Firms_{ixt} + b_8 VA_GDP_{ixt} + b_9 FDI_{ixt} + g_{ix} + m_t + e_{ixt} \quad (1)$$

where i denotes the country, including all the low and middle income countries for which the data on GFCF are available from INDSTAT (see Table A for a list), x the industry, and t the year, covering the period 2003-2011. As remarked, in further specifications of (1) the variable FDI will be disaggregated according to the business activity performed and the origin of the investors, as follows:

$$GFCF_{ixt} = b_1 GFCF_{ixt-1} + b_2 GDP_PC_G_t + b_3 INFL_t + b_4 FUEL_t + b_5 POL_STAB_t + b_6 IP_t + b_7 N_Firms_{ixt} + b_8 VA_GDP_{ixt} + b_9 FDI_{ixt}^{prod} + b_{10} FDI_{ixt}^{trade} + g_{ix} + m_t + e_{ixt} \quad (2)$$

$$GFCF_{ixt} = b_1 GFCF_{ixt-1} + b_2 GDP_PC_G_{it} + b_3 INFL_{it} + b_4 FUEL_{it} + b_5 POL_STAB_{it} + b_6 IP_{it} + b_7 N_Firms_{ixt} + b_8 VA_GDP_{ixt} + b_9 FDI_{ixt}^{north} + b_{10} FDI_{ixt}^{south} + g_{ix} + m_t + e_{ixt}$$

(3)

Table 5 provides the summary statistics of all the variables included, while table A2 in the appending reports the correlation matrix.

TABLE 5 HERE

3.2 Methodology

The dynamic nature of equation (1) suggests taking autocorrelation duly into account to avoid the standard OLS estimator producing biased coefficients. In addition, theory suggests a potential reverse causality between GFCF and FDI, since higher domestic investments could represent good signal to foreign firms, in turn affecting their entry choice (Mody and Murshid, 2005).

In light of this, and coherently with the vast majority of the existing literature (see Table 1), we rely upon a dynamic panel based on a two-step system GMM estimator (Blundell and Bond, 1998; Roodman, 2009). GMM is normally well suited for dynamic models with samples including a short time period and a large cross-section. To do this, we adapt the structure of the data allowing panels to vary as a combination of countries and industries. While in the first step the first difference of equation (1) drops out the cross-sectional fixed effects γ_{ix} , the second step consists of constructing suitable instruments for the endogenous variables. More specifically, along the lines of the existing evidence (Morrisey and Udonmkerdmongkol, 2012; Farla et al., 2014; Munemo, 2014; Ashraf and Herzer, 2014), we treat lagged GFCF, GDP growth and all the FDI-related variables as endogenous, on the ground of a potential reverse causality, and we instrument them using their lagged levels and differences. Additional instruments are represented by the strictly exogenous variables, i.e. all the remaining from equation (1). From equation (1), we also include year fixed effects in order to control for time specific effects as well as to avoid contemporaneous correlation among individuals across time (Roodman, 2009).

Still, despite the cross-sectional dimension is not as small as in previous studies considering the addition of the industry level, we try to keep the number of instruments under control to preserve the stability of the over-identification test. We do this by using the second lag of the dependent variable and the second and the third lags of the other endogenous variables. Lastly, we make the standard errors of the two-step model robust by adopting the correction suggested by Windmeijer (2005). In order to control for the exclusion of second order

correlation and to check for over-identifying restrictions we run the Arellano-Bond and the Hansen tests at the end of each output.

4. Results

Table 6 reports the results of our main specification using the GMM method, while Table A3 in the Appendix reports the same results using a simple OLS model with fixed effects for comparison⁵. All over the different columns, the Arellano-Bond test supports the null of no autocorrelation, while the Sargan test demonstrates that over identification restrictions are valid, and not compromised by the presence of too many instruments.

TABLE 6 HERE

Most of the standard control variables behave according to the expectations and in line with the findings of the existing literature. Domestic investment has a strong structural component, as demonstrated by the large and statistically significant values of the lagged dependent variable.

Our results seem to confirm the view that good governance, proxied by the levels of political stability, contributes to generate a better investment climate domestically, as previously found – using the same indicator – by Morrissey and Udonmkerdmongkol (2012), and weakly confirmed by Farla et al. (2014).

We provide empirical support to the view that the cost of capital has a negative effect on domestic investment, an hypothesis that has clear economic foundations, but that so far has got only weak evidence in the empirical literature. Rather than using the real interest rate (as in Mody and Murshid, 2005 or in Jude, 2014), we follow Munemo (2014) and adopt the price level of capital, finding similar results.

Conversely, we do not find any significant effect for some variables, such as the growth of the GDP, inflation or the natural resource endowments, which have been previously found as significant determinants of FDI in aggregated studies⁶.

As far as the variables taken from INDSTAT are concerned, our results show consistently across different specifications that capital formation in the host economies is not independent from the characteristics of the industry. In particular, the amount of investment does not seem dependent on the overall size

⁵ Though the results remain consistent across the two different models, it should be noted that autocorrelation affects the fixed effects estimator, which reports downward bias, as well as the coefficients of the endogenous variables.

⁶ This could be due to the fact that while the dependent variable is measured at the industry level, these controls are at the country level.

of the industry⁷. Instead, a more beneficial impact on capital formation is found the higher the capacity of the host industry to generate value added in the production process.

Moving to our variables of interest, results confirm that FDI has an overall positive effect on domestic capital formation, as shown by more recent empirical literature (Farla et al., 2014; Munemo, 2014). This result is robust across different specifications. Interestingly, this positive relation is also robust to the adoption of both FDI number (n_FDI) and “stock” of foreign companies in the host country⁸ (columns I and IV of Table 6). Compared to the extant literature, however, our results better qualify this relation. First, by looking at greenfield investments only we reduce the potential bias represented by the inclusion of M&As simply changing the property of the owner, but not affecting the propensity to invest. Second, and more importantly, by looking only at the manufacturing sector we provide a more concrete picture of the potential effects of FDI on domestic investment. FDI in natural resource sectors have in fact a large share of their profits repatriated, rather than reinvested, as recently estimated by UNCTAD (2013). On the other hand, FDI in the services generally require lower fixed investments. Third, by looking at the number of investors, rather than at the flows, we are able to disentangle the effect of the investment itself, which in the case of greenfield FDI involves a direct contribution to GFCF due to purchase of fixed assets, from the overall contribution of foreign multinationals on the formation of domestic capital, which can materialize through alternative modalities as well. Evidence reported in Agosin and Machado (2005: 152) suggest for instance that the purchase of fixed assets (i.e. what enters in the balance of payment definition of FDI) represents only a small part of their total investment, lately involving the addition of assets for modernization and technology upgrading.

Additional findings (columns II and V, Table 6) show that the type of activity performed by foreign firms matters: foreign affiliates engaged in productive activities are more likely to increase the profitability of domestic investment, unlike those operating in trade-related activities. In our view, this is a relevant distinction, especially in a context where most FDI are strategically linked with the different stages of GVCs. In this regard, our results seem to show that foreign affiliates involved in local production are more likely to contribute to domestic

⁷ The size of the industry has been measured as the total number of domestic firms net of the number of foreign-owned firms. This, however, does not exclude the presence of foreign firms in the data, due to the inclusions of investors established before 2003 or through different modalities, i.e. M&As. In further specification, we have measured industry size by total employment, with not significant changes in the results.

⁸ Still, however, in such specific setting, our preferred measure of foreign presence is the “stock”, considering that new investments can be undertaken by foreign affiliates independently on the time of their entry. Also, a large stock of foreign firms (relative to domestic), may indicate that larger shares of GFCF are under foreign control (Farla et al., 2014).

capital formation. A likely explanation for this is that the propensity to invest further to expand efficiency-seeking FDI in countries involved in middle stages of the value chain is higher compared to investments in upstream or downstream activities, where the income is less likely to be reinvested (UNCTAD, 2013). In addition, production oriented FDI are more likely to generate domestic spillovers in the form of backward and forward linkages (Rodriguez-Clare, 1996). Conversely, foreign investments in trade-related activities do not seem to exert a positive impact on domestic investment, because their objective is to create platforms either for exports to third countries or for imports from the investing country. In both cases, trade-related FDI reinforce direct relations with the parent firms, while relying less on market-based transactions, which are more likely to give rise to spillovers to or linkages with local firms.

Finally, a further important dimension that we are able to explore with our data has to do with the different effect of FDI according to the origin of the investor. Despite a lot has been said so far on the potential advantages of South-South FDI, our results do not support the view that emerging and developing countries investors have so far contributed to raise GFCF. Conversely, we find that a positive and significant relation characterizes FDI from traditional sources. The explanations can be diverse. The first is possibly due to the scale effect. Southern FDI are in fact still quantitatively (in terms of number of projects at least, where they still represent less than 20% of the total) less relevant than northern ones. The second is that they are relatively more recent and investors less structured and experienced compared to their northern counterparts. These features are particularly relevant when looking at their impact on domestic investments. Investments are lumpy, and therefore risky, requiring knowledge of the host country and experience that southern MNEs are still building up starting from lower levels (Cuervo-Cazurra and Genc, 2008). Moreover, since their structure and levels of efficiency are still lower compared to well-established players from the North, this does not favor the establishment of linkages with domestic firms, as recently demonstrated by research on foreign MNEs in Sub-Saharan Africa (Amendolagine et al., 2013). Still, the negative sign of the coefficient (though not significant) can be viewed as the result of a competitive effect. Contrary to Northern MNEs, Southern MNEs, adopting technologies more adaptable to the local context, may find themselves in direct competition with domestic firms, crowding them out of the market, and depressing their propensity to undertake investments.

4.1 Further results and robustness checks

Results discussed in the previous section point to a number of relevant findings on the relation between GFCF and FDI. Still, however, some issues can be raised concerning this relation, and the data used for the analysis.

In this section, we report a number of robustness checks to compare with the main results described by Table 6. First of all, further estimations of (1)-(3) show that results remain stable to (a) the addition of further controls, such as the total size of the economy or the government consumption (which are nonetheless not significant); (b) the measurement of industry size by means of total employment; and (c) the addition of country and industry fixed effects; and (d) the reduction of the sample to the period 2003-2010, given that data for the year 2011 is incomplete⁹.

Secondly, we have also checked whether the level of technology of the industry could affect the general results in (1)-(3). Tables A4-A5 in the appendix provide evidence distinguishing according to the technological level of the industry. Interestingly, results show that in higher technology industries GFCF has stronger dependency on its past values, and is most likely to be positively affected by better governance. Conversely, we show some (weak) evidence that lower technology industries rely more on higher economic growth, and on the presence of a larger number of firms. Concerning our variables of interest, we can show that capital formation in low technology industries receive a positive impact by the presence of foreign firms, especially from the north, independently on the activities performed. On the other hand, interestingly, the rate of capital accumulation in higher tech industries seem to be enhanced by investments in productive activities, more likely to generate local linkages.

Lastly, despite with the adoption of the number of firms we look at the contribution of FDI to domestic investments in a broader way, still, we might want to understand whether the investment itself – i.e. the capital flow involved with the establishment of the new project – has a positive or negative impact on domestic capital. This is the question traditionally raised by the vast majority of the studies reported in Table 1, and resulting in the crowding-in/out argument. Information included in *FDIMarkets* report the capital expenditure for each project, based on the investment announced at the time of opening. This allows computing the investment flows and stocking at the host country and industry level. There are, however, some methodological concerns related to the adoption of this information. A large portion of these data is estimated based on a proprietary econometric model, introducing thus serious measurement errors in the estimates. Specific to our sample of developing countries' recipients, this affects about 64% of the projects included¹⁰.

⁹ All these results, not added for reasons of space, are available upon request.

¹⁰ This notwithstanding, it must be noted that such information is normally used by UNCTAD to compile the annual World Investment Report, and adopted in empirical research by other scholars (e.g. Desbordes and Wei, 2014). In addition, in our specific case, data on the constructed flows is highly correlated to the data on the number of firms.

Table 7 reports the results of model (1) using the aggregated flows instead of the number of firms. A few interesting findings emerge. First, the coefficients generally report a positive sign, except for trade-related projects and those coming from the South, confirming thus that there is indeed a contribution to domestic capital formation. Second, looking at the magnitude, being the coefficients generally lower than 1, this would suggest a crowding-out effect, despite it is questionable whether all the capital invested becomes then real investment (Agosin and Machado, 2005).

TABLE 7 HERE

5. Conclusions

In this paper, we have analysed the impact of greenfield FDI on capital accumulation in developing countries by exploiting firm- and industry-level data to build a measure of FDI that allows overcoming the limitations of investment flows, the main FDI measure in the extant literature. Such disaggregated data allows a more detailed analysis of FDI spillovers on the host economies, including the differential impact of foreign firms according to their country of origin (whether from the North or from the South), and according to the business activity performed by foreign affiliates (production or trade-related).

Our main results suggest that FDI exert positive spillover effects on domestic capital formation, in particular they spur investment within the specific industry in which the investments take place. Foreign affiliates engaged in productive activities are more likely to spur capital accumulation in the host economies than foreign affiliates performing different trade-related activities such as sales, marketing, client support. Finally, FDI from the North seem to be more beneficial in terms of their impact on GFCF than FDI from the South.

Overall, we contribute to the literature on the impact of FDI on capital accumulation in developing economies in two major ways. First, we explore whether different types of FDI have diverse impact on domestic investment; foreign affiliates with productive activities are more beneficial to host economies as they are more likely to increase the profitability of domestic investment. Instead, foreign affiliates performing trade-related activities are less likely to have a positive impact on domestic investment. This suggest that FDI attraction policies by developing economies should better consider linking incentives to the business activities of foreign affiliates. Second, the impact of FDI largely depends on the technological distance between investing and recipient countries; Northern FDI seem to have a positive impact on GFCF in developing economies, unlike Southern FDI. Although this result might be explained by the relatively low share of Southern investment in the South, compared to Northern investment, and to the

lower average Southern firms' age, our evidence suggests that the competition effects of Southern FDI might compensate for the knowledge spillovers accruing to domestic firms, so that the net effect is negative. Overall, the crowding in vs crowding out debate would greatly benefit from detailed analyses on micro data that allow considering FDI both as a source of capital and as a source of knowledge for domestic firms in developing economies.

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Tables and Figures

Table 1: Inward FDI and Domestic Capital Formation: Empirical Evidence (1975-present)

Date	Author(s)	Methodology	Countries	Results
2014	Munemo	OLS and GMM	139 countries	+ conditional on good business regulation
2014	Ashaf and Herzer	FE and GMM	100 countries	- greenfield only
2014	Farla et al	GMM	46 countries	+
2014	Iwasaki & Tokunaga			
2013	Al-Sadig	GMM	91 countries	+
2012	Morrissey & Udomkerdmongkol	GMM	46 countries	-
2011	Ramirez		Latin America	+
2010	Mutenyo et al			
2009	Adams	OLS, FE	SSA	-
2008	Ndikumana & Verick	FE	SSA	+
2008	Tang et al	ECM	China	+
2006	Apergis et al		30 countries	+/- depending on regions
2005	Agosin & Machado	GMM	36 countries	-
2005	Titarenko	LS	Latvia	-
2002	Misun & Tomsik		CZ, HU, PO	+/-
2000	Agosin & Mayer		developing countries	+/-
2000	Lipsey		OECD countries	none
1999	Bosworth & Collins	IV	58 countries	+
1999	de Mello	TS	33 countries	+
1998	Borensztein et al		69 developing countries	+
1997	Mbekeani	2SLS ECM	South Africa	+
1997	Aitken & Harrison	TS, panel, FE	Venezuela	+ for JV, - no local partner
1997	Fry	TS, SM, 3SLS	46 countries	+
1993	Wells	case studies	East Asia	+
1993	Wells & Warren	case studies	Indonesia	+
1993	Fry	TS, SM, 3SLS	16 countries	+/- depending on policies in place (2)
1992	Katikati	TS, Granger	Ghana	-
1992	Faroque & Bougrine	SM, TS	Morocco	-
1989	Rhee & Belot	case studies	11 countries	-
1986	Encarnation & Wells	case studies	Asia	+/- depending on policies in place (2)
1977	Matos	case study	Venezuela	-

Notes: (1) Prior to 1975, several studies were done on the impact of MNCs in Latin America. Most of these are case studies and it would be impossible to list all of them in this table. For a good summary of these see Grieco (1986). (2) For example, Encarnation & Wells find that where FDI substitutes for imports because it is "tariff-jumping", the overall impact on the host country is negative.

Table 2. No. of FDI by main activity

	N_FDI	N_FDI_PROD	N_FDI_TRADE
2003	1207	516	175
2004	1316	599	187
2005	1446	561	336
2006	1898	615	459
2007	1993	773	332
2008	2345	839	324
2009	2049	407	525
2010	2162	798	386
2011	1532	501	371

Source: Authors' elaboration on *FDIMarkets*

Note: **N_FDI_PROD** includes foreign firms doing manufacturing activities in host economies, while **N_FDI_TRADE** includes foreign firms that enter the host economy to perform non-manufacturing business activities such as sales, marketing, support and retail/wholesale.

Table 3. FDI by main manufacturing industry

year	Food& beverages (15)	Textiles (17)	Chemicals (24)	Rubber &plastics (25)	Basic Metals (27)	Machinery &equip. (29)	Electrical mach (31)	Radio, TV (32)	Motor vehicles (34)
2003	150	94	102	102	46	71	179	130	203
2004	149	117	122	122	58	102	184	134	180
2005	190	101	124	124	76	122	196	164	198
2006	237	171	148	148	121	151	278	185	265
2007	171	159	224	224	127	252	205	212	302
2008	241	188	239	239	184	297	207	182	366
2009	283	172	264	264	110	261	221	109	290
2010	227	239	260	260	137	258	246	159	275
2011	162	222	181	181	81	157	164	108	173

Source: Authors' elaboration on *FDIMarkets*

Table 4. Variables description

VARIABLES	DESCRIPTION & SOURCE
Dependent var	
gfc_gdp	Gross Fixed Capital Formation on GDP (UNIDO & WDI)
lgfcf	Gross Fixed Capital Formation deflated by IIP (UNIDO)
Main Controls	
gdp_pc_growth	Per capita GDP growth (WDI)
pol_stab	Political Stability (WGI)
fuel_exp	Share of fuels on export (WDI)
infl	Inflation, % change consumer prices (WDI)
pl_i	Price of investment (2005=100) (Penn World Tables)
establishments	Number of domestic firms in host country (net of foreign), industry and year (UNIDO)
lempl	Number of employees in host country, industry and year, in Log (UNIDO)
va_gdp	Value added on GDP in host country, industry and year (UNIDO)
Variables of interest	
n_fdi	Number of greenfield FDI in host country, industry and year
n_fdi_production	Number of greenfield FDI in Productive activities in host country, industry and year
n_fdi_trade	Number of greenfield FDI in trade-related activities in host country, industry and year
n_fdi_north	Number of greenfield FDI from high-income OECD countries in host country, industry and year
n_fdi_south	Number of greenfield FDI from non high-income OECD countries in host country, industry and year
stock	Stock number of greenfield FDI in host country, industry and year
stock_production	Stock number of greenfield FDI in Productive activities in host country, industry and year
stock_trade	Stock number of greenfield FDI in trade-related activities in host country, industry and year
stock_north	Stock number of greenfield FDI from high-income OECD countries in host country, industry and year
stock_south	Stock number of greenfield FDI from non high-income OECD countries in host country, industry and year

Table 5. Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
GFCF_GDP	6384	0.042989	0.1401813	0	1.397454
GDP_PC_GROW	5473	4.037702	5.452248	-16.58917	33.03049
POL_STAB	6384	-0.0516068	0.8772116	-2.39011	1.543135
FUEL_EXP	5006	17.65031	27.84597	0	97.08278
INFL	6013	5.468709	5.133587	-2.5	44.39128
ESTABLISH	6011	1805.069	6105.912	0	143708
N_FDI	6384	2.49812	9.152408	0	134
STOCK_FDI	6384	11.64427	56.39713	0	970

Table 6 – Main Results, GMM

	(I) “flows”	(II) “flows”	(III) “flows”	(IV) “stock”	(V) “stock”	(VI) “stock”
L.gfcf_gdp	0.7319*** [0.071]	0.6877*** [0.073]	0.7184*** [0.068]	0.7235*** [0.073]	0.6956*** [0.073]	0.7148*** [0.071]
gdp_pc_growth	-0.0000 [0.000]	0.0000 [0.000]	-0.0000 [0.000]	-0.0000 [0.000]	0.0000 [0.000]	0.0000 [0.000]
pol_stab	0.0017* [0.001]	0.0016** [0.001]	0.0014 [0.001]	0.0018** [0.001]	0.0018** [0.001]	0.0015* [0.001]
fuel_exp	-0.0000 [0.000]	-0.0000 [0.000]	-0.0000 [0.000]	-0.0000 [0.000]	-0.0000 [0.000]	-0.0000 [0.000]
infl	0.0000 [0.000]	0.0000 [0.000]	0.0000 [0.000]	0.0000 [0.000]	0.0000 [0.000]	-0.0000 [0.000]
establishments	0.0000 [0.000]	0.0000 [0.000]	0.0000 [0.000]	0.0000 [0.000]	0.0000 [0.000]	0.0000 [0.000]
pl_i	-0.0088** [0.004]	-0.0065* [0.004]	-0.0077 [0.007]	-0.0088** [0.004]	-0.0076* [0.004]	-0.0077* [0.004]
va_gdp	0.0227** [0.011]	0.0348*** [0.012]	0.0246** [0.010]	0.0249** [0.011]	0.0335*** [0.011]	0.0301*** [0.011]
n_fdi_production		0.0009 [0.001]				
n_fdi_trade		0.0005 [0.001]				
n_fdi	0.0004** [0.000]					
n_fdi_north			0.0007** [0.000]			
n_fdi_south			-0.0019* [0.001]			
stock				0.0001** [0.000]		
stock_production					0.0005** [0.000]	
stock_trade					0.0003 [0.000]	
stock_north						0.0002** [0.000]
stock_south						-0.0004 [0.000]
Constant	0.0065** [0.003]	0.0062* [0.004]	0.0074 [0.006]	0.0067** [0.003]	0.0043 [0.003]	0.0056* [0.003]
Observations	3,393	3,393	3,393	3,393	3,393	3,393
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
hansenp	0.651	0.768	0.774	0.528	0.625	0.603
ar2p	0.511	0.449	0.500	0.506	0.460	0.499
N. Instruments	66	86	86	66	86	86

Robust standard errors in brackets

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

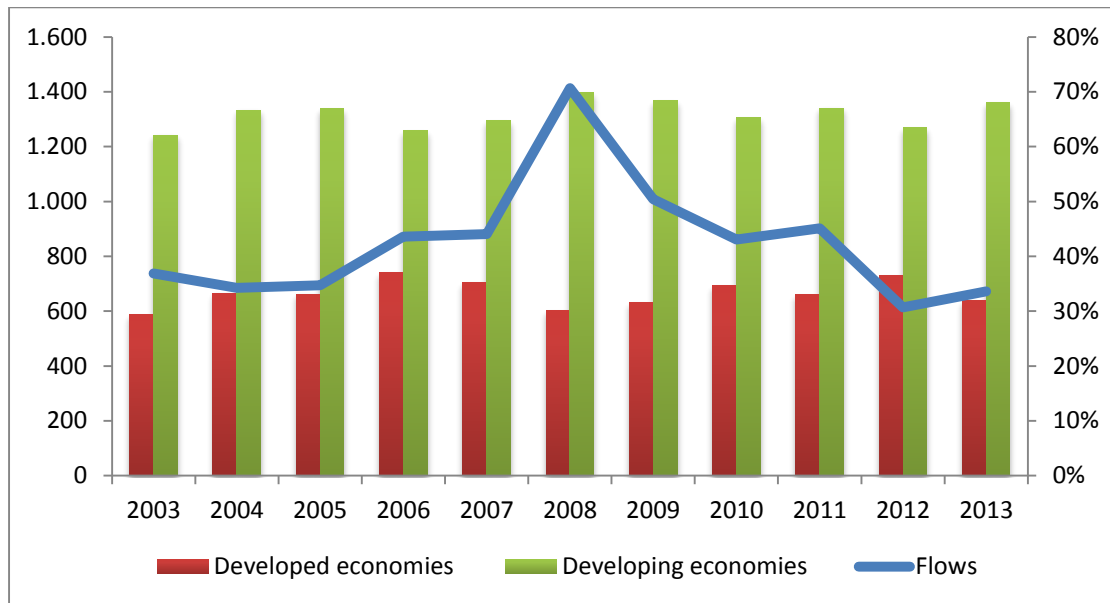
Table 7 – Main Results, using FDI flows rather than N.

VARIABLES	(1) fdi_flows	(2) fdi_flows	(3) fdi_flows	(4) fdi_stock	(5) fdi_stock	(6) fdi_stock
L.gfcf_gdp	0.7071*** [0.080]	0.7069*** [0.074]	0.6439*** [0.087]	0.7330*** [0.079]	0.7147*** [0.086]	0.6627*** [0.082]
gdp_pc_growth	0.0000 [0.000]	0.0000 [0.000]	-0.0001 [0.000]	0.0000 [0.000]	0.0000 [0.000]	-0.0000 [0.000]
pol_stab	0.0013 [0.001]	0.0010 [0.001]	0.0013 [0.001]	0.0016* [0.001]	0.0016* [0.001]	0.0009 [0.001]
fuel_exp	-0.0000 [0.000]	-0.0000 [0.000]	-0.0000 [0.000]	-0.0000 [0.000]	-0.0000 [0.000]	-0.0000 [0.000]
infl	0.0000 [0.000]	-0.0000 [0.000]	-0.0001 [0.000]	-0.0000 [0.000]	-0.0000 [0.000]	-0.0001 [0.000]
establishments	0.0000 [0.000]		0.0000 [0.000]	0.0000 [0.000]	0.0000 [0.000]	0.0000 [0.000]
pl_i	-0.0090** [0.004]	-0.0048 [0.004]	-0.0111** [0.005]	-0.0079* [0.005]	-0.0097** [0.004]	-0.0149** [0.006]
va_gdp	0.0271** [0.012]	0.0276** [0.012]	0.0377*** [0.013]	0.0242** [0.011]	0.0270** [0.012]	0.0323*** [0.011]
total_inv_gdp	0.5040 [0.561]					
total_inv_prod_gdp		0.5233 [0.503]				
total_inv_trade_gdp		-0.1435 [0.394]				
total_inv_north_gdp			1.9816 [1.794]			
total_inv_south_gdp			-0.2678 [0.558]			
stock_value_gdp				0.0880 [0.228]		
stock_value_prod_gdp					0.1000 [0.382]	
stock_value_trade_gdp					0.1051 [0.173]	
stock_value_north_gdp						0.5854** [0.285]
stock_value_south_gdp						-0.4864* [0.289]
Constant	0.0083** [0.004]	0.0049 [0.004]	0.0114** [0.005]	0.0071* [0.004]	0.0089** [0.004]	0.0146*** [0.005]
Observations	3,393	3,393	3,393	3,393	3,393	3,393
hansenp	0.431	0.526	0.554	0.652	0.874	0.115
ar2p	0.504	0.482	0.457	0.526	0.500	0.479
N. of instruments	66	86	86	66	86	86

Robust standard errors in brackets

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

Figure 1. Total value of greenfield investments (left scale, in billion \$) and share of main recipients (right scale)



Source: Authors' elaboration on UNCTAD data

APPENDIX

Table A1 – List of recipient economies

Country	Freq.	%
Eritrea	203	3.18
Azerbaijan	201	3.15
Jordan	201	3.15
Lithuania	196	3.07
Croatia	195	3.05
Hungary	185	2.90
Macedonia	184	2.88
Morocco	184	2.88
Singapore	184	2.88
Georgia	182	2.85
Cyprus	177	2.77
Slovenia	177	2.77
Latvia	176	2.76
India	175	2.74
Poland	175	2.74
Malaysia	174	2.73
Slovakia	171	2.68
Oman	168	2.63
Mexico	162	2.54
Ethiopia	161	2.52
Turkey	156	2.44
Malta	147	2.30
Malawi	135	2.11
Kuwait	132	2.07
Fiji	125	1.96
Ecuador	122	1.91
Uruguay	117	1.83
China	115	1.80
Israel	114	1.79
Sri Lanka	112	1.75
Bulgaria	109	1.71
Albania	108	1.69
Czech republic	107	1.68
Hong Kong	96	1.50
Estonia	91	1.43
Iran	85	1.33
Philippines	85	1.33
Moldova, republic of	77	1.21
Chile	76	1.19
Macau	75	1.17
Bermuda	70	1.10
Tanzania	62	0.97
Trinidad and Tobago	55	0.86
Romania	47	0.74
Egypt	45	0.70
Yemen	38	0.60
Nepal	37	0.58
Tunisia	32	0.50
Colombia	25	0.39
Bangladesh	23	0.36
Saudi Arabia	23	0.36
Lebanon	22	0.34
Pakistan	22	0.34
Madagascar	20	0.31
Ghana	18	0.28
Indonesia	16	0.25
Gambia	11	0.17
Viet Nam	3	0.05
Total	6,384	100

Table A2 – Correlation Matrix

	gfcf_gdp	l1.gfcf_gdp	gdp_pc_grow	pol_stab	fuel_exp	infl	establ	pl_i	va_gdp	n_fdi	stock
gfcf_gdp	1										
l1.gfcf_gdp	0.884	1									
gdp_pc_grow	-0.0597	-0.0544	1								
pol_stab	-0.0413	-0.0439	-0.1525	1							
fuel_exp	-0.0301	-0.0279	0.1278	-0.0157	1						
infl	0.0667	0.0704	0.2048	-0.4015	0.0752	1					
establ	0.0387	0.0374	-0.036	-0.1292	-0.0853	0.057	1				
pl_i	-0.0613	-0.0489	-0.1413	0.3317	-0.1607	-0.0933	-0.0032	1			
va_gdp	0.7105	0.6609	-0.0521	-0.1371	0.0507	0.0843	0.008	-0.0918	1		
n_fdi	0.1476	0.1424	0.0147	-0.0586	-0.0602	0.0064	0.2072	-0.086	0.0584	1	
stock	0.1773	0.1759	-0.0151	-0.0429	-0.0615	0.0174	0.195	-0.0391	0.0791	0.8995	1

Table 6 – Main Results, OLS Regression

VARIABLES	(1) n_fdi	(2) n_fdi	(3) n_fdi	(4) stock	(5) stock	(6) stock
L.gfcf_gdp	0.6081*** [0.049]	0.6071*** [0.049]	0.6081*** [0.049]	0.6071*** [0.049]	0.6021*** [0.049]	0.6065*** [0.049]
gdp_pc_growth	-0.0003 [0.000]	-0.0002 [0.000]	-0.0003 [0.000]	-0.0003* [0.000]	-0.0003 [0.000]	-0.0003* [0.000]
pol_stab	0.0031 [0.006]	0.0030 [0.006]	0.0031 [0.006]	0.0037 [0.006]	0.0038 [0.006]	0.0036 [0.006]
fuel_exp	0.0001 [0.000]	0.0001 [0.000]	0.0001 [0.000]	0.0001 [0.000]	0.0001 [0.000]	0.0001 [0.000]
infl	0.0002 [0.000]	0.0002 [0.000]	0.0002 [0.000]	0.0001 [0.000]	0.0002 [0.000]	0.0001 [0.000]
establishments	0.0000 [0.000]	0.0000 [0.000]	0.0000 [0.000]	0.0000 [0.000]	0.0000 [0.000]	0.0000 [0.000]
pl_i	-0.0036 [0.013]	-0.0037 [0.013]	-0.0036 [0.013]	-0.0028 [0.013]	-0.0025 [0.013]	-0.0026 [0.013]
va_gdp	0.0469*** [0.010]	0.0469*** [0.010]	0.0469*** [0.010]	0.0469*** [0.010]	0.0471*** [0.010]	0.0469*** [0.010]
n_fdi	0.0005*** [0.000]					
n_fdi_production		0.0014*** [0.000]				
n_fdi_trade		0.0006* [0.000]				
n_fdi_north			0.0004** [0.000]			
n_fdi_south			0.0010 [0.001]			
stock				0.0001** [0.000]		
stock_production					0.0006*** [0.000]	
stock_trade					0.0003** [0.000]	
stock_north						0.0002** [0.000]
stock_south						-0.0003 [0.000]
Constant	0.0083 [0.013]	0.0076 [0.013]	0.0080 [0.013]	0.0084 [0.013]	0.0069 [0.013]	0.0097 [0.014]
Observations	3,393	3,393	3,393	3,393	3,393	3,393
R-squared	0.827	0.827	0.827	0.827	0.828	0.827
Country effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in brackets

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

Table A3 – Results, Lower technology industries

VARIABLES	(1) n_fdi	(2) n_fdi	(3) n_fdi	(4) stock	(5) stock	(6) stock
L.gfcf_gdp	0.4632*** [0.145]	0.5643*** [0.127]	0.4804*** [0.134]	0.5330*** [0.138]	0.5404*** [0.124]	0.5293*** [0.134]
gdp_pc_growth	0.0000 [0.000]	0.0001 [0.000]	0.0000 [0.000]	-0.0000 [0.000]	0.0002 [0.000]	0.0001 [0.000]
pol_stab	0.0029 [0.002]	0.0049 [0.003]	0.0045* [0.003]	0.0027 [0.002]	0.0050* [0.003]	0.0049* [0.003]
fuel_exp	-0.0001* [0.000]	-0.0001 [0.000]	-0.0001 [0.000]	-0.0001* [0.000]	-0.0001 [0.000]	-0.0001* [0.000]
infl	0.0001 [0.000]	0.0001 [0.000]	-0.0000 [0.000]	0.0001 [0.000]	0.0002 [0.000]	0.0001 [0.000]
pl_i	-0.0046 [0.013]	0.0024 [0.019]	-0.0037 [0.013]	-0.0071 [0.011]	0.0033 [0.017]	-0.0018 [0.013]
establishments	0.0000 [0.000]	0.0000* [0.000]	0.0000 [0.000]	0.0000 [0.000]	0.0000 [0.000]	0.0000 [0.000]
va_gdp	0.0554** [0.025]	0.0391** [0.017]	0.0547** [0.023]	0.0426* [0.023]	0.0427** [0.017]	0.0458** [0.021]
n_fdi_production		0.0002 [0.002]				
n_fdi_trade		0.0011 [0.002]				
n_fdi	0.0007 [0.001]					
n_fdi_north			0.0003 [0.001]			
n_fdi_south			0.0036 [0.005]			
stock				0.0002** [0.000]		
stock_production					0.0000 [0.001]	
stock_trade					0.0001 [0.001]	
stock_north						0.0004* [0.000]
stock_south						-0.0019 [0.001]
Constant	0.0067 [0.008]	0.0041 [0.012]	0.0075 [0.009]	0.0100 [0.008]	0.0029 [0.010]	0.0086 [0.009]
Observations	1,131	1,131	1,131	1,131	1,131	1,131
Number of panel	236	236	236	236	236	236
Hansenp	0.0553	0.000160	0.0160	0.104	0.000512	0.00234
ar2p	0.438	0.493	0.439	0.501	0.477	0.483
N. of instruments	66	86	86	66	86	86

Robust standard errors in brackets

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

Note: Lower technology industries are those defined by OECD as low- and middle-low tech.

Table A4 – Results, higher technology industries

VARIABLES	(1) n_fdi	(2) n_fdi	(3) n_fdi	(4) stock	(5) stock	(6) stock
L.gfcf_gdp	0.6227*** [0.120]	0.6519*** [0.086]	0.6377*** [0.110]	0.6576*** [0.101]	0.6722*** [0.092]	0.6821*** [0.096]
gdp_pc_growth	-0.0002 [0.000]	-0.0001 [0.000]	-0.0002 [0.000]	-0.0001 [0.000]	-0.0000 [0.000]	-0.0002 [0.000]
pol_stab	0.0032* [0.002]	0.0033*** [0.001]	0.0036* [0.002]	0.0024* [0.001]	0.0039** [0.002]	0.0028 [0.002]
fuel_exp	-0.0001** [0.000]	-0.0001** [0.000]	-0.0001** [0.000]	-0.0001* [0.000]	-0.0001** [0.000]	-0.0001* [0.000]
infl	-0.0001 [0.000]	0.0000 [0.000]	-0.0000 [0.000]	-0.0000 [0.000]	0.0000 [0.000]	-0.0000 [0.000]
pl_i	-0.0074 [0.005]	-0.0058 [0.004]	-0.0037 [0.006]	-0.0055 [0.004]	-0.0086* [0.005]	-0.0049 [0.006]
establishments	0.0000 [0.000]	0.0000 [0.000]	0.0000 [0.000]	0.0000 [0.000]	0.0000 [0.000]	0.0000 [0.000]
va_gdp	0.0400** [0.020]	0.0398** [0.018]	0.0475** [0.020]	0.0380** [0.019]	0.0358* [0.020]	0.0390** [0.019]
n_fdi_production		0.0026 [0.002]				
n_fdi_trade		0.0006 [0.002]				
n_fdi	0.0007 [0.000]					
n_fdi_north			0.0006 [0.001]			
n_fdi_south			0.0027 [0.002]			
stock				0.0002 [0.000]		
stock_production					0.0009** [0.000]	
stock_trade					-0.0000 [0.001]	
stock_north						0.0002 [0.000]
stock_south						-0.0001 [0.001]
Constant	0.0064 [0.004]	0.0031 [0.004]	0.0038 [0.005]	0.0040 [0.004]	0.0086* [0.005]	0.0052 [0.004]
Observations	1,102	1,102	1,102	1,102	1,102	1,102
Number of panel	215	215	215	215	215	215
hansenp	0.575	0.733	0.196	0.615	0.499	0.298
ar2p	0.313	0.315	0.328	0.363	0.320	0.419
N. of instruments	66	86	86	66	86	86

Robust standard errors in brackets

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

Note: Higher technology industries are those defined by OECD as high- and middle-high tech.