Outward FDI Spillovers from Inward FDI:

Evidence from Italian firms

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Abstract

Using data from Italian firms during the period of 2008-2012, this paper empirically explores how the presence of foreign-owned firms can affect the domestic firm's probability to invest abroad (i.e. *Outward FDI spillovers from Inward FDI*). We find positive spillovers via horizontal linkages, and negative spillovers through forward and backward linkages. However, an important role is played by both the origin of Inward FDI and the destination of Outward FDI. We document that the presence of foreign competitors leads domestic firms to invest more in extra-EU markets and less in the EU markets. Similar effects are found following the presence of EU-owned suppliers, whereas suppliers from extra-EU economies seem to push domestic firms to decline the probability to invest in extra-EU countries. Finally, EU-owned customers lead Italian firms to establish more affiliates in EU economies at the expenses of affiliates in extra-EU areas.

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1. Introduction

Foreign direct investment (FDI) is considered an important driver of economic growth and development. Indeed, many policy-makers compete to attract FDI in their own countries. It is argued that the presence of foreign-owned firms might positively affect the productivity of domestic firms within the same industry (*horizontal spillover*), via learning or competition effects: i.e. the latter can learn more advanced technologies from the former through imitation process or workers' mobility between them, or can be simply pushed to decrease their X-inefficiency to prevent the exit from the market. Furthermore, the presence of multinationals (MNEs) can also generate positive effects on productivity of local firms operating in different sectors, through vertical linkages. For example, MNEs can indirectly increase the efficiency of domestic firms in both downstream sectors, by supplying a higher number or quality of intermediate inputs (*forward vertical spillover*), and in upstream sectors, through directly providing their know-how to local suppliers in order to have better inputs, or indirectly pushing them to upgrade their technology (*backward vertical spillover*). While there are very few theoretical models that focus on productivity spillover from FDI (such as Ethier and Markusen, 1996; Rodriguez-Clare, 1996; and Markusen and Venables, 1999), there is a large amount of empirical evidences which leads to mixed results with different explanations.[5]

In addition to productivity spillovers from FDI, few other studies focus their attention on how the presence of foreign-owned firms can affect the ability to domestic firms to serve the international market. All these studies focus on the export channel (*export spillover from FDI*). For example, using firm-level data from UK, Kneller and Pisu (2007) find that while the export decision is positively affected by the presence of foreign firms within the same sector

[5] See the survey in Görg and Greenaway (2004).

(horizontal spillovers), the firm's export intensity is positively related to the presence of foreign firms in downstream sectors (backward spillovers).

However, a firm can find more profitable to serve the foreign market, by selling through a foreign affiliate rather than by exporting (Brainard, 1993). By considering that the FDI channel is associated with a larger fixed cost respect to the export channel, which in turn is also connected to a variable transport cost, Helpman, Melitz and Yeaple (2004) theoretically show that the most productive firms serve the international market by FDI, the least productive ones supply only the domestic market, and some firms in the middle range of productivity serve the foreign market through exporting. From this theoretical framework, it can be shown that following FDI liberalisation, while the probability of becoming multinational increases, the probabilities of exporting and surviving decrease. Therefore, a larger presence of inward-FDI firms within the industry is associated with a greater presence of outward-FDI firms. However, because of symmetry across countries, the causality link between inward FDI and outward FDI within the industry cannot be established, and anyhow, the role of vertical linkages is neglected.

More recently, Imbruno, Pittiglio and Reganati (2015) show theoretically how using intermediates from foreign-owned suppliers located within country can positively affect the productivity within firms, as well as their decision to establish foreign affiliates to serve the international market. In other words, they theoretically highlight the vertical relationship between inward FDI (within intermediate good sector) and outward FDI (in the final good sector) – similarly to the vertical linkage between imports of intermediate goods and exports of final goods, already documented in the literature (Bas and Strauss-Kahn, 2014; Feng, et al. 2016) – providing new interesting insights.

To the best of our knowledge, there is no empirical evidence on how inward FDI can influence the probability of establishing an affiliate abroad to serve the international market (outward

FDI).[6] The main purpose of our work is to empirically explore how the presence of foreign-owned firms can affect the domestic firm's probability to invest abroad (*Outward FDI spillovers from Inward FDI*), by considering both horizontal and vertical linkages. In addition to *FDI spillovers via forward linkages* highlighted by Imbruno, et al. (2015), the presence of foreign firms can also increase the firm's probability to establish affiliates abroad within the same industry, as domestic firms can learn multinational strategies from their foreign competitors (*FDI spillovers via horizontal linkages*). Moreover, domestic producers of intermediate inputs are more likely to establish foreign affiliates to serve the final good producers abroad, after benefitting from the know-how transfer by foreign-owned customers (*FDI spillovers via backward linkages*).

However, it is worth noting that such spillover effects might also be negative when domestic firms are unable to absorb the superior knowledge arising from foreign firms. Indeed, considering that high productivity is positively associated with the ability to establish foreign affiliates (Helpman, et al. 2004), negative productivity spillovers from inward FDI may lead domestic firms to decline their propensity to invest abroad. For instance, if domestic firms cannot exploit foreign competitors' more sophisticated technology, they could only suffer market shares losses that lead to a decline in performance (Aitken and Harrison, 1999), implying a reduction in the probability of survival (Kosová, 2010), and therefore in the likelihood to establish affiliates abroad. At the same time, the exit of domestic firms due to the FDI competition within an industry implies the loss of domestic-owned suppliers for downstream sectors and the loss of domestic-owned customers for upstream sectors. Therefore, if domestic firms are unable to use more sophisticated inputs produced by foreign-owned

[6] Yao et al. (2016) studies the relationship between inward and outward FDI in China, by using panel data at the country level during the period of 2003–2009. They find a strong and positive relationship between lagged inward FDI (IFDI) and contemporaneous OFDI, implying that capital outflow from China has been partially induced by the countries which have invested in China.

suppliers, they can just suffer negative productivity effects due to the exit of domestic-owned suppliers, implying negative effects on domestic firms' likelihood to invest abroad. Likewise, if domestic firms are unable to adjust to the superior technology required by foreign-owned customers, they could only suffer economic performance losses due to the exit of domestic-owned customers, entailing a reduction in domestic firms' probability to have foreign affiliates.

Our baseline results highlight the presence of positive horizontal spillovers and negative vertical spillovers via both forward and backward linkages. These findings suggest that while domestic firms are able to absorb knowledge from foreign competitors so that the probability to invest abroad increases, they seem to be unable to adjust their technology to foreign suppliers and foreign customers so that the likelihood to establish affiliates abroad declines. It is however noting that the negative Outward FDI spillovers via vertical linkages may due to the fact that domestic firms prefer using inputs produced by foreign suppliers located at home – rather than establishing foreign affiliates to use foreign inputs abroad – or supplying foreign customers located at home – instead of having foreign affiliates to supply intermediate inputs to foreign customers abroad.

Next, we explore whether FDI origin and FDI destination matter to further explain these findings. We indeed expect that Italian firms find relatively easier to absorb knowledge from EU-owned firms (positive spillovers) and more difficult to absorb the knowledge from non-EU-owned firms (negative spillovers), since the Italian market is closer and more integrated to the EU markets, than the non-EU markets. Indeed, Ayyagari and Kosova (2010) found that positive horizontal spillovers from inward FDI in the Czech Republic occured through EU-owned affiliates, but not through non-EU affiliates. Similar effects are found by Monastiriotis and Alegria (2011) in Bulgaria, especially if FDI are from Greek-owned firms. Conversely, Ni, et al. (2017) found negative horizontal spillovers in Vietnam if FDI are from Asia, and insignificant effects if FDI are from Europe and North-America. They also found positive

backward spillovers from Asian affiliates and insignificant effects from other foreign affiliates. They argue that these significant effects of FDI from Asian firms are perhaps due their technological proximity to the domestic firms, i.e. on the one hand, Asian firms are more likely to compete with domestic firms, and on the other hand, they are also more likely to source inputs from domestic suppliers. However, it is worth noting that when exploring backward vertical spillovers in Romania, Javorcik and Spatareanu (2011) found evidence of positive effects if foreign investors are American, and no effects if foreign investors are from Europe. They argue that the American affiliates have more incentive than the European affiliates to source from local suppliers, since the origin-markets are relatively more distant and less integrated with the Romanian market. As regards forward spillovers, they are expected to be positive if foreign suppliers are from closer and more integrated markets, given they share similar technological EU standards, and negative or insignificant if they are from other foreign economies.

At the same time, the positive spillover effects are expected to be more evident for tougher foreign destinations to reach (i.e. non-EU markets), whereas insignificant or negative spillover effects can occur for the other markets. Indeed, previous studies have already highlighted the importance of both firm productivity and destination characteristics to explain the outward FDI structure within an economy. For example, Yeaple (2009) found that both firm productivity and destination characteristics affect both the scale and the scope of outward FDI in US. In particular, he showed that high-productivity firms are more likely to reach less attractive countries than low-productivity firms. Using cross-section data from French multinationals, Chen and Moore (2010) found that more productive firms are more likely to invest in tougher foreign markets than less efficient competitors. Therefore, we can deduce that any productivity spillover from inward FDI is more likely to affect firms' decision to invest in tougher markets.

We find that the presence of foreign competitors lead domestic firms to invest more in non-EU markets and less in the EU markets. Similar effects are found following the presence of EU suppliers, whereas non-EU suppliers seem to push domestic firms to decline the propensity to invest in non-EU markets. Finally, EU customers lead Italian firms to invest more in EU markets and less in non-EU markets.

The rest of paper is organised as follows. Section 2 introduces the data. Section 3 reports the empirical strategy. Section 4 discusses the results. Finally, Section 5 provides conclusion remarks.

2. Data

To investigate whether and how the presence of foreign-owned firms can affect the domestic firm's probability to invest abroad, we use firm-level data from Italy in the period 2008-2012, collected from Bureau Van Dijk's AIDA (Analisi Informatizzata Delle Aziende) database. AIDA database contains detailed financial, operation, and ownership information for a very large number of Italian firms. For each active company for which an unconsolidated account is available, we have drawn information on sales, costs, number of employees, value added, start-up year, sector of activity, as well as legal and ownership status (including shareholders, subsidiaries, ultimate owner).

The ownership section of the database allows us to identify three categories of firms, namely Outward-FDI firms (OFDIs), Inward-FDI firms (IFDIs), and Non-FDI firms (NFDIs). Specifically, a firm is classified as IMNE if its ultimate owner is not Italian. To define the ultimate owner, we consider a share of ownership greater/equal to 50 percent. Likewise, when a non-foreign-owned firm is the ultimate owner of firms located abroad, it is defined as OFDI firm. The remaining firms are therefore considered NFDI firms. It is worth noting that although

AIDA database provides firm ownership status for the last year rather than annually, this information was yearly collected. Therefore, the ownership status is time-varying. After dropping all companies with missing and/or negative values for any variable of interest during the sample period, we obtain a balanced panel of 64,386 companies over the period of 2008-2012. **Table 1** displays the distribution of FDI firms in the sample. In 2008, the share of IFDI firms is around 1.54 percent, while the fraction of OFDI firms is around 1.06 percent. By comparing these values with those related to the last year of the sample (2012), we can observe that the number of FDI firms increased over time, and the share of OFDI firms (2.41 percent) became larger than the share of IFDI firms (1.75 percent).

Moreover, the information on both the country-origin of inward FDI and the country-destination of outward FDI is also available. **Table 2** reports the distribution of IFDI firms across EU (26 members, excluding Italy) and non-EU areas, showing that the majority of foreign-owned firms are from EU economies. Indeed, the share of EU-owned firms was around 60.1 percent in 2008, and even increased to about 67 percent in 2012.

To measure the industry-level presence of foreign-owned firms, we follow the standard practice in the literature (Javorcik, 2004), by computing the following spillover variables. The Horizontal Spillover capturing the presence of foreign competitors is defined as

$$HOR_{jt} = \frac{FORsales_{jt}}{DOMsales_{jt} + FORsales_{jt}}$$

where $FORsales_{jt}$ ($DOMsales_{jt}$) is the total sales of all foreign (domestic) firms in industry *j* in year *t*, while the Forward and Backward Spillovers capturing respectively the presence of foreign suppliers and the presence of foreign customers are calculated as follows

$$FORW_{jt} = \sum_{u} w_{uj} HOR_{ut}$$

$$BACK_{jt} = \sum_{k} v_{jk} HOR_{kt}$$

where w_{uj} is the share of intermediate inputs sourced by sector *j* from upstream sector *u*, while v_{jk} is the share of intermediate inputs sold by the industry *j* to the downstream industry *k* . The weights w_{uj} and v_{jk} are obtained from the Italian Input-Output table (ISTAT, 2005). **Figure 1** displays the time evolution of the three spillover measures. On average the Horizontal Spillover variable increased from 10.6% in 2008 to about 13.0% in 2010 and then followed a decreasing trend in the last two years of the sample period reaching its lowest value in 2012 (4.7 %). Both forward and backward spillovers changed over time along a similar trend from the initial values of about 10-11% to the final values of about 4%.

When considering the OFDI firms in **Table 3**, we observe that the drastic increase in the number of firms involved in Outward FDI between 2008 and 2012 is associated to a decline in the average number of destinations across firms from 1.78 to 1.35. This is not surprising since the new OFDI firms have foreign affiliates in a smaller number of countries than the old OFDI firms. Interestingly, we can notice that the firm-level number of extra-EU destinations on average increased from 0.41 in 2008 to 0.94 in 2012, at the expenses of the firm-level number of EU destinations, which on average declined from 1.06 in 2008 to 0.72 in 2012. Thus, the Italian-owned firms seem to have shifted their interest from closer and more integrated foreign markets to tougher global markets to reach in their decisions to invest abroad. These patterns seem to be coherent with recent studies on FDI in Italy (Borin and Cristadoro, 2014).

3. Empirical strategy

To study the role of inward FDI on the probability of Italian firms to invest abroad, we firstly restrict our attention to the sample of firms that are involved in Outward FDI at least for one year during the sample period. Secondly, the dataset has been extended to all possible

destinations for each firm, by reaching a balanced panel of about 241,713 firm/destination pairs over five years. **Table 4** shows the summary statistics of the main variables of interest. It is worth noting that about 0.6 percent of observations are associated with Outward FDI, and while the industry-level presence of foreign competitors and foreign customers is around 10 percent, the industry-level presence of foreign suppliers is relatively higher, i.e. around 14 percent.

Next, we estimate the following linear probability model

$$OUT_{ict} = \beta_1 HOR_{jt-1} + \beta_2 FORW_{jt-1} + \beta_3 BACK_{jt-1} + \beta_X X_{it-1} + \alpha_{ic} + \alpha_t + \varepsilon_{ict} \qquad (1)$$

where OUT_{it} is dummy variable that takes the value one if the Italian firm *i* invested in a given foreign country *c* in the year *t*, or zero otherwise; HOR_{jt}, $FORW_{jt}$ and $BACK_{jt}$ are respectively the Horizontal, Forward, and Backward Spillovers for each industry *j* and year *t*, as computed in the previous section; X_{it} is a set of time-varying firm-level control variables, such as those capturing the past outward FDI experience, the productivity, the age, the size and the capital-labour ratio.[7] We indeed expect that firms already engaged with Outward FDI in the past are more likely to be involved currently with Outward FDI since firm's decision to invest abroad is associated with large sunk fixed costs (Helpman, et al. 2004). Moreover, larger, older, more productive and/or more capital-intensive firms are also expected to be associated with a higher propensity to invest abroad. We also include firm/destination fixed effects (α_{ic}) to control for time-invariant characteristics at the firm/destination level, and year fixed effects (α_t) to control for common macroeconomic shocks across firm/destination pairs, while ε_{ict} stands for the classical error term. Notice that all explanatory variables have been lagged by one year to reduce potential problems of reverse causality, and standard errors have been corrected for clustering at the firm-destination level.

[7] Firm productivity (*LP*) is computed as firm's value added per employee; firm age (*AGE*) is defined as the difference between year of observation *t* and the official year of incorporation of the firm; firm size (*SIZE*) is measured as the number of employees, and firm-level capital-labour ratio (*KL*) is given by the fixed assets over total employment. All these variables are expressed in logarithms.

Returning to our main explanatory variables, we expect that firm's decision to invest in a given foreign country is positively affected by horizontal, forward and backward spillovers ($\beta_1, \beta_2, \beta_3 > 0$), as owing to the knowledge acquired from foreign competitors, foreign suppliers and foreign buyers located within country, domestic firms can actively learn how to establish their own multinational network. However, it is worth nothing that this is true when domestic firms are on average able to absorb the better knowledge arising from foreign firms, otherwise, we can also have negative effects ($\beta_1, \beta_2, \beta_3 < 0$). Indeed, if domestic firms are not able to absorb the knowledge from their foreign competitors, they could potentially suffer only negative competition effects on economic performance arising from market shares losses due to the presence of foreign firms (Helpman, et al. 2012). Likewise, if domestic firms are unable to absorb intermediate inputs produced by foreign suppliers, they could potentially suffer productivity losses arising from the exit of domestic input suppliers, caused by the arrival of foreign suppliers (Imbruno, et al. 2015). Moreover, if domestic firms are unable to adjust to the higher technological standards required by the foreign customers, they can just suffer negative effects on the economic performance, due to the exit of some domestic customers from the market arising from tougher foreign competition (Carluccio and Fally, 2013).

For this reason, we also explore whether there is any heterogeneity in terms of FDI origin, through the following specification:

$$OUT_{ict} = \gamma_1 HOR_{jt-1}^{EU} + \gamma_2 HOR_{jt-1}^{noEU} + \gamma_3 FORW_{jt-1}^{EU} + \gamma_4 FORW_{jt-1}^{noEU} + \gamma_5 BACK_{jt-1}^{EU} + \gamma_6 BACK_{jt-1}^{noEU} + \gamma_X X_{it-1} + \alpha_{ic} + \alpha_t + \varepsilon_{ict} \quad (2)$$

where the EU-specific spillovers and non-EU-specific spillovers are computed as follows:

$$HOR_{jt}^{EU} = \frac{EUsales_{jt}}{DOMsales_{jt} + EUsales_{jt}} \qquad HOR_{jt}^{noEU} = \frac{noEUsales_{jt}}{DOMsales_{jt} + noEUsales_{jt}}$$

$$FORW_{jt}^{EU} = \sum_{u} w_{uj} HOR_{ut}^{EU} \qquad FORW_{jt}^{noEU} = \sum_{k} v_{jk} HOR_{kt}^{noEU}$$

$$BACK_{jt}^{EU} = \sum_{u} w_{uj} HOR_{ut}^{EU} \qquad BACK_{jt}^{noEU} = \sum_{k} v_{jk} HOR_{kt}^{noEU}$$

Notice that $EUsales_{jt}$ ($noEUsales_{jt}$) represents the total sales of EU-owned (non-EU-owned) firms in industry *j* in year *t*, while $DOMsales$ stands for the total sales of domestic-owned firms in industry *j* in year *t*. Again, the weights w_{uj} and v_{jk} are from the Italian Input-Output table in 2005.

We expect that the spillover effects are more likely to be positive if foreign firms are from the EU, given that they share common EU production standards with Italian firms, and therefore domestic firms' technological adjustment to EU-owned firms is relatively easier and faster. Conversely, the spillover effects can be potentially negative if foreign firms are from extra-European countries.

Finally, we also interact these spillover variables with two dummy variables capturing the EU destination and the non-EU destination respectively to investigate whether there is any heterogeneity in terms of FDI destination. We expect that thanks to the presence of foreign multinationals, domestic firms are able to invest in tougher markets to reach, i.e. the extra-European markets that are relatively more distant and less internationally integrated with the Italian market. Indeed, Italian firms could find exporting to EU countries more profitable than establishing affiliates abroad.

4. Results

Baseline results

In **Table 5** (column 1), we report the results related to the baseline specification, which document the presence of positive horizontal spillovers and negative vertical spillovers through both forward and backward linkages. These results suggest that domestic firms' probability to invest abroad is positively affected by the presence of foreign competitors, and negatively influenced by the presence of foreign suppliers and foreign customers. Thus, Italian firms seem to learn how and what to produce from foreign competitors to serve their countries of origin, and/or more generally the multinational strategies to supply the global market.

At the same time, Italian firms seem to be unable to absorb intermediate inputs produced by foreign suppliers, implying losses in performance and market shares so that they are forced to shut down their foreign affiliates. An alternative reason may be that following an increasing presence of foreign suppliers at home, some domestic firms prefer producing their goods domestically by using the new inputs produced by these foreign suppliers, rather than producing abroad by outsourcing from suppliers located abroad.

Moreover, Italian firms seem to be unable to supply intermediate inputs to foreign-owned firms, which require relatively higher production standards, implying some losses in performance and market shares, due to the potential exit of domestic-owned customers. An alternative reason may be that following an increasing presence of foreign customers at home, some domestic firms prefer focusing on them, rather than supplying foreign customers abroad.

These results are strongly confirmed in column 2 when implementing the Conditional Logit Model rather than the Linear Probability Model. In column 3, we report the related odds ratios by firstly rescaling the spillovers variables from the range of [0,1] to the range of [0,100]%, to quantify the effects more easily. We estimate for one-percentage-point increase in the presence

of foreign competitors that the odds of investing abroad increases by 1.76%. Conversely the odds of having affiliates abroad declines by 1.93% following one-percentage-point increase in the presence of foreign suppliers and by 7.27% following one-percentage-point increase in the presence of foreign customers. From here onwards, we keep adopting the linear probability model for our estimations since the coefficients of interaction terms are more straightforward to interpret.

When exploring the FDI origin in Italy in **Table 6**, it appears that the positive horizontal spillovers are due to the presence of EU-owned firms, whereas the negative forward spillovers are due to the presence of firms from extra-EU countries. These results confirm the hypothesis that Italian firms can easily learn the FDI strategies from the EU-owned competitors, whereas they cannot easily absorb intermediate inputs produced by foreign input suppliers coming from extra-European countries.

These patterns become even more evident when considering simultaneously the EU status of both the origin and the destination of FDI in **Table 7**. First, the presence of foreign competitors leads domestic firms to invest more in extra-EU countries and less in EU countries, regardless of the EU status of FDI origin. This means thanks to the presence of both EU and non-EU competitors, Italian firms learn more about multinational strategies to supply tougher markets to reach at the expenses of the Italian presence in closer and more integrated markets.

While similar effects are found due to the presence of EU-owned suppliers, it seems that input suppliers from extra-EU countries leads domestic firms to decline the probability to invest in the extra-EU economies. These results corroborate the hypotheses that Italian firms find relatively easier to absorb inputs produced by EU-suppliers, implying an increase in performance and therefore in their propensity to invest in more distant and less integrated markets, at the expenses of investments in EU markets. Conversely, the inability to absorb

inputs from extra-EU suppliers pushes Italian firms to decline their probability to invest in extra-EU areas.

Finally, the presence of EU-owned customers leads domestic firms to invest more in EU territories and less in the rest of the World. These results confirm the hypothesis that Italian firms are able to supply EU-owned customers, as the adjustment to the EU production standards is relatively easier than the adaptation to non-EU ones. Once the adaptation to EU standards occurs, Italian firms seem to find profitable to intensively supply the whole EU markets, by establishing affiliates directly in the EU territories.

Endogeneity issues

Reverse-causality problems are almost negligible in our specification because of several reasons. First, a single Italian firm's decision to establish a foreign affiliate in a given destination is unlikely to influence the presence of foreign multinationals within the whole Italian 2-digit sector. Second, this potential concern is further reduced by lagging all explanatory variables, including our spillover measures. Third, we control for a large set of time-invariant characteristics at the firm(sector)/destination, by including firm/destination fixed effects in addition to year fixed effects.

Nevertheless, as a robustness check, we also implement an Instrumental Variable (IV) approach. As instruments, we use the industry-level spillover lagged by six periods, and the industry-level OECD's FDI Regulatory Restrictiveness Index[8] in 1997, both computed in horizontal, forward and backward fashions.

[8] The FDI Regulatory Restrictiveness Index measures statutory restrictions on foreign direct investments, by considering four main type of FDI restrictions: Foreign equity limitations; Screening or approval mechanism; Restrictions on the employment of foreigners as key personnel; and Operational restrictions, e.g. restrictions on branching and on capital repatriation or on land ownership.

Notice that we use the FDI Regulatory Restrictiveness index for the first year available, rather than using the related values for the current years, because this index is not available for all years and is quite time-invariant for the Italian case. For this reason, we initially first-difference the baseline equation to remove the firm/destination fixed effects, and then we implement the IV strategy. **Table 8** displays the results related to the first-difference specification by OLS (column 1) and IV (column 2), respectively. First, the signs of OLS coefficients are in line with those related to the baseline specification in column 1 of Table 5, although only the coefficient of the Forward spillover turns out to be statistically significant. When looking at the IV results, all the signs are confirmed again, while the statistical significance is strongly confirmed for both vertical spillovers. Thus, while the presence of foreign competitors has a positive (although not statistically significant) effect on domestic firms' probability to invest abroad, the presence of foreign suppliers and customers generate statistically significant negative effects.

5. Conclusion

The determinants and the effects of FDI are two important research areas that have received a great attention from both academic researchers and policy-makers. We contribute to these strands of literature, by studying how the presence of foreign-owned firms affects the domestic firms' decision to establish affiliates abroad (i.e. *Outward FDI spillovers from Inward FDI*).

We find firstly that while the presence of foreign competitors generates positive effects on the domestic firm's decision to invest abroad, the presence of both foreign suppliers and customers has negative effects. An important role is played by both the origin of inward FDI and the destination of outward FDI. We indeed find that the presence of foreign competitors leads domestic firms to invest more in tougher markets (extra-EU markets) and less in the other

foreign markets (EU markets). Similar effects are found due to the presence of EU-owned suppliers, whereas the remaining foreign suppliers seem to push domestic firms to decline the propensity to invest in extra-EU markets. Finally, EU-owned customers lead Italian firms to invest more in closer and more integrated markets (i.e. EU markets) and less in the remaining foreign markets.

Our findings may have relevant implications for policy-makers as they suggest that attracting FDI can make domestic firms, not only more productive as documented in the previous evidences, but also more active in the internationalization process. In particular, by drawing firms from closer and more integrated economies would allow domestic firms to expand their business in markets that are relatively more difficult to penetrate.

Tables

Table 1: Initial sample of firms

Year	Number of firms	Inward-FDI firms	Outward-FDI firms
2008	64,386	1.54%	1.06%
2012	64,386	1.75%	2.41%

Table 2: Inward-FDI firms

Year	Number of firms	From EU countries	From Non-EU countries
2008	992	60.08%	39.92%
2012	1126	67.05%	32.95%

Table 3: Outward-FDI firms

Year	Number of firms	Average Number of countries	Average Number of EU countries	Average Number of Non-EU countries
2008	680	1.78	1.06	0.72
2012	1,554	1.35	0.41	0.94

Table 4: Summary statistics (Final sample)

Variable	Obs	Mean	Std.Dev.
OUT_{ict}	1,208,565	0.0061	0.0781
HOR_{jt}	1,208,565	0.1048	0.0894
$FORW_{jt}$	1,208,565	0.1457	0.1188
$BACK_{jt}$	1,208,565	0.1018	0.0488

Note: Balanced panel of firm/destination pairs over the period of 2008-2012.

Table 5: Outward FDI Spillovers from Inward FDI

Dependent Variable: OUT_{ict}	Linear Probability Model (1)	Conditional Logit Model (*Coefficient*) (2)	Conditional Logit Model (*Odds Ratio*) (3)
HOR_{jt-1}	0.0060*	1.7456*	1.1973***
	(0.0036)	(0.9560)	(0.0671)
$FORW_{jt-1}$	-0.0080**	-1.9531**	1.0176*
	(0.0039)	(0.9684)	(0.0097)
$BACK_{jt-1}$	-0.0231**	-7.5457**	0.9807**
	(0.0115)	(2.9540)	(0.0095)
OUT_{ict-1}	0.0704***	0.1801***	0.9273**
	(0.0106)	(0.0560)	(0.0274)
LP_{ict-1}	0.0001	0.0102	1.0103
	(0.0003)	(0.0926)	(0.0935)
KL_{ict-1}	0.0010***	0.3470***	1.4148***
	(0.0002)	(0.0865)	(0.1223)
AGE_{ict-1}	0.0111***	3.6979***	40.3616***
	(0.0021)	(0.6670)	(26.9224)
$SIZE_{ict-1}$	0.0015***	0.5631***	1.7561***
	(0.0003)	(0.1226)	(0.2154)
Firm-destination FE	YES	YES	YES
Year FE	YES	YES	YES
Observations	871,836	11,312	11,312
R-squared	0.5983		

Note: Balanced panel of firm-destinations pairs over the period 2008-2012. Spillover variables are rescaled from the range of [0,1] to the range of [0,100]% in column 3. Standard errors are clustered by firm-destination pair and are reported in parentheses. *** Significance at 1% level; ** Significance at 5%; * Significance at 10%.

Table 6: Outward FDI Spillovers from Inward FDI: Exploring the FDI origin

Dependent Variable: OUT_{ict}	(1)
HOR_{jt-1}^{EU}	0.0069*
	(0.0036)
HOR_{jt-1}^{noEU}	0.0001
	(0.0072)
$FORW_{jt-1}^{EU}$	-0.0002
	(0.0058)
$FORW_{jt-1}^{noEU}$	-0.0338*
	(0.0194)
$BACK_{jt-1}^{EU}$	-0.0099
	(0.0144)
$BACK_{jt-1}^{noEU}$	-0.0212
	(0.0271)
Firm-level Controls	YES
Firm-destination FE	YES
Year FE	YES
Observations	871,836
R-squared	0.5983

Note: Balanced panel of firm-destinations pairs over the period 2008-2012. Standard errors are clustered by firm-destination pair and are reported in parentheses. *** Significance at 1% level; ** Significance at 5%; * Significance at 10%.

Table 7: Outward FDI Spillovers from Inward FDI: Exploring the FDI destination

Dependent Variable: OUT_{ict}	(1)
$EUd * HOR_{jt-1}^{EU}$	-0.0185**
	(0.0090)
$EUd * HOR_{jt-1}^{noEU}$	-0.0572***
	(0.0190)
$EUd * FORW_{jt-1}^{EU}$	-0.0333**
	(0.0149)
$EUd * FORW_{jt-1}^{noEU}$	0.0617
	(0.0524)
$EUd * BACK_{jt-1}^{EU}$	0.2051***
	(0.0284)
$EUd * BACK_{jt-1}^{noEU}$	-0.0614
	(0.0659)
$noEUd * HOR_{jt-1}^{EU}$	0.0150***
	(0.0036)
$noEUd * HOR_{jt-1}^{noEU}$	0.0186***
	(0.0068)
$noEUd * FORW_{jt-1}^{EU}$	0.0104*
	(0.0055)
$noEUd * FORW_{jt-1}^{noEU}$	-0.0643***
	(0.0177)
$noEUd * BACK_{jt-1}^{EU}$	-0.0790***
	(0.0145)
$noEUd * BACK_{jt-1}^{noEU}$	-0.0083
	(0.0259)
Firm-level Controls	YES
Firm-destination FE	YES
Year FE	YES
Observations	871,836
R-squared	0.5988

Note: Balanced panel of firm-destinations pairs over the period 2008-2012. Standard errors are clustered by firm-destination pair and are reported in parentheses. *** Significance at 1% level; ** Significance at 5%; * Significance at 10%.

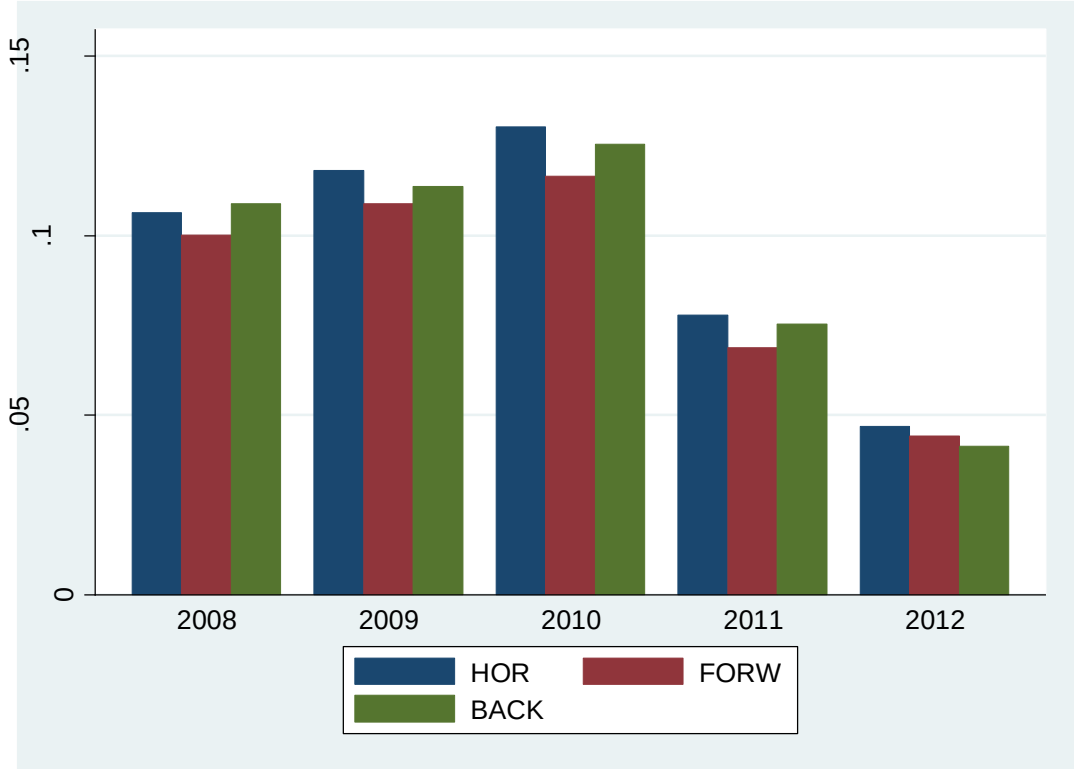
Table 8: Outward FDI Spillovers from Inward FDI: IV Approach

	(1)	(2)
Dependent Variable: ΔOUT_{ict}	OLS	IV
ΔHOR_{jt-1}	0.0033	0.0087
	(0.0034)	(0.0217)
$\Delta FORW_{jt-1}$	-0.0076**	-0.0123**
	(0.0037)	(0.0057)
$\Delta BACK_{jt-1}$	-0.0082	-0.1010**
	(0.0103)	(0.0444)
Firm-level Controls	YES	YES
Year FE	YES	YES
Observations	630,230	630,230
R-squared	0.0214	0.0207

Note: Balanced panel of firm-destinations pairs over the period 2008-2012. Instrumental variables are the industry-level spillover lagged by six periods, and the industry-level OECD's FDI restrictiveness index in 1997, both computed in horizontal, forward and backward fashions. Standard errors are clustered by firm-destination pair and are reported in parentheses. *** Significance at 1% level; ** Significance at 5%; * Significance at 10%.

Figures

Figure 1: The presence of foreign firms over time



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