FDI Promotion Policy and Comparative Advantage

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[Preliminary Draft]

Abstract

Can industrial policy affect the country's comparative advantage? This study argues that FDI promotion policy is an effective way of shaping the national export structure. We combine product-specific revealed comparative advantage (RCA) indicators with time-varying information on sectors receiving priority status in national FDI promotion efforts during the period 1984-2006. We find a positive and statistically significant relationship between investment promotion efforts and RCA in developing countries. The new Exporter Dynamics Database from the World Bank allows us to further analyse the effects of investment promotion polices across the distribution of firms. The results show that investment promotion efforts are associated with higher values of exports across the distribution of exporters. They also appear to be positively correlated with the firms' export values, regardless of their initial size in foreign markets, and with the number of export destinations.

JEL: F10, F14, F23, F68
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1 Introduction

Why should governments worry about the trade structure of their country's economic system? The perceived importance of understanding how countries specialise rests indeed on the belief that the economic development and growth are not just related to the amount of country's trade flows but also to the qualitative composition of trade (Hausmann et al., 2007). It follows then that from a policy standpoint it is important to identify the determinants of the country's trade specialisation and come up the strategies and tools that governments may exploit in order to orient and shape the future comparative advantage patterns.

In this paper, we investigate whether the governments' efforts to attract foreign direct investment (FDI) inflows can change the evolution of export specialisation. In line with recent contributions stressing the leading role of few firms in shaping the evolution of macro-aggregates and generating aggregate fluctuations (Gabaix, 2011; Canals et al., 2007; di Giovanni and Levchenko, 2012), we hypothesize that the entry of a few multinational firms, both directly and indirectly, may change the fate of a country and especially of its trade specialisation.

More specifically, we examine whether FDI promotion practices shape the comparative advantage (CA) patterns in developing and emerging countries and thus can be used as a policy tool to orient the future trade patterns. To this aim, we make use of the information about the activity of national Investment Promotion Agencies (IPAs) with a special focus on the sectors receiving priority in their efforts to attract FDI. This information was recently gathered in the World Bank Census of IPAs. We then exploit the within country-sector variation in the FDI targeting practices in order to identify its impact on the country's world position in the targeted products' exports.

Our analysis focuses on developing and emerging countries for three reasons. First, FDI inflows are likely to have a more pronounced effect in non-industrialised countries where there is more scope for knowledge and productivity spillovers due to the existence of a technology gap relative to the advanced economies. Second, empirical evidence suggests that investment promotion leads to higher FDI inflows in developing countries but does not appear to be effective in industrialised countries (Harding and Javorcik, 2011). Finally, due to data availability we are able to explore the changes in the micro export structure only in a sample of low and medium income countries.

We use information on trade flows for 73 low and medium income countries gathered from COMTRADE[1] at 4digit SITC level and we investigate the

[1] See: http://wits.worldbank.org/wits.

evolution of their RCA patterns in relation with the IPAs' FDI targeting practices which are recorded in the 2005 World Bank Census and available at 1997-NAICS sector level. Our investigation covers a wide time span, from 1984 to 2006, thus capturing the continuously increasing efforts made by developing countries' governments in order to open their borders and foster their integration in the global economy.

Our analysis suggests that FDI promotion policies play an important role in affecting the countries' trade specialisation. The results indicate that exports from sectors chosen as priority for investment promotion effects are more likely to see an increase in the revealed comparative advantage. Targeting a sector increases the RCA index of the corresponding products by about 17%. This finding is robust to a number of sensitivity checks: alternative definitions of the comparative advantage indicator, use of different estimators and regression specifications, controlling for additional country-time variables and other potential CA determinants.

By exploiting the Exporter Dynamic Database recently released by the World Bank, we then go deeper into the FDI-RCA nexus highlighted in our macro analysis and we dissect the role of FDI targeting in determining the countries' export micro-dynamics. Estimates reveal that the foreign multinationals' entry promoted by FDI targeting practices fosters the export performance and competitiveness of local firms. More specifically, exporters in targeted sectors expand their activity in foreign markets by enlarging the volume of traded goods and reaching a larger number of export destinations. They also increase the quality of their exports. This positive effect is not restricted to larger firms, but concerns all firms regardless of their size, thus confirming the importance of FDI promotion as engine of spillovers benefiting the local firms' population.

In sum, our analysis suggests that investment promotion may be an effective tool for policy makers wishing to re-orient the export structure of their countries. This finding is consistent with trade theories emphasizing that comparative advantages and specialization patterns are inherently dynamic and the key role technology may play in their changes over time (Redding, 1999; Proudman and Redding, 2000; Redding, 2002; Eaton and Kortum, 2002). While some of the literature focuses on the role of protection of infant industries in developing new comparative advantages (Melitz, 2005; Greenwald and Stiglitz, 2006) our work show that openness to international investment is (also) a viable route for changing comparative advantage.

The paper is structured as follows. The next section briefly reviews the related literature. Section 3 describes the data used in the empirical analysis. The empirical strategy is described in section 4 and the results together with

the sensitivity checks are reported in section 5. In section 6 we explore the micro-dynamics behind the FDI impact on CA. Section 7 presents the conclusions.

2 Review of the literature

[TO BE REVISED]

Our paper is related to different strands of the literature.

Factor endowments and productivity have been traditionally investigated as the main responsible of the country's trade patterns. In recent papers, Costinot and Komunjer (2007) and Romalis (2004), indeed, confirm the predictions of both Ricardian and Heckscher-Ohlin models by showing that cross-country technological disparities and the interaction between country's factor abundance and sectoral factor intensity significantly explain the country specialisation. A new body of literature complements these neoclassical theories by shedding light on the role of the country institutional quality (Levchenko, 2007; Nunn, 2007) and financial development (Beck, 2002; Ju and Wei, 2011; Manova, 2013). Given all these internal resources, the evolution of the comparative advantage seems to be predetermined. Recent works by Hidalgo and Hausmann (2009) and Hidalgo (2009) show indeed that there is a strong path-dependence in the evolution of countries' productive structures and export bundles. The pre-existing pattern of comparative advantage emerges as a good predictor of the future one. The former actually just reflects what that Hidalgo et al. (2007) and Hidalgo and Hausmann (2009) call non-tradable productive "capabilities" which are available in the country context, a concept that seems to be strictly related and enclose the internal factors the literature has traditionally explored as trade determinants. The evolution of the trade pattern then goes with new combination of the existing capabilities or with the development of new capabilities, which is however a more difficult task.

In this framework, policy makers may contribute to change the directions of the country's trade pattern by directly acting on the internal resources and factors which determine the trade flows. Investments in the education system and efforts undertaken to raise the education level across the population and increase the skill intensity of the workforce are important policy interventions at the basis of the evolution of both the industrial system and trade specialisation. The large Chinese education expenditures in recent years are a good example of such a policy being seen by some economists as an important source of the increased sophistication level of the Chinese exports and

its move up the value chain.[2] Also, the promotion of better regulation systems, a better property rights protection, and, more in general, the creation of a better business climate may have important consequences on the country specialisation, especially for those sectors that are more complex and more intensive in relationship-specific investments. However, interventions on internal factors are not the only possible policies governments can pursue in order to change the comparative advantage structure. An alternative strategy consists in turning to the external environment and try to attract those technologies and abilities needed to restructure the industrial system and create comparative advantage in new sectors. Foreign multinationals are then the natural candidates to be addressed by policy makers since they are actually able to transfer those resources, knowledge, abilities and skills missing in the local country context, especially from a developing country perspective. This is indeed the channel we investigate in this paper.

The impact of foreign firms on the host countries' economy has been investigated under different perspectives and special attention has been focused on the consequences for domestic efficiency and trade flows. From one side, foreign multinationals enjoy a superior productivity and export performance with respect to local domestic firms (Baldwin and Gu, 2003; Kneller and Pisu, 2004). It follows that their entry may have an immediate effect on the economy and they may importantly contribute to the country aggregate outcomes such as GDP and exports. This is in line with recent contributions supporting the leading role of few firms in shaping the evolution of macro-aggregates and generating aggregate fluctuations (Gabaix, 2011; Canals et al., 2007; di Giovanni and Levchenko, 2012). From the other side, the multinationals' activity in the country is not without consequences for the domestic operators, in developing countries especially. A wide literature deals with the knowledge and export spillovers stemming from the presence of foreign firms which may benefit both the local firms' productivity (Kokko, 1994; Blomstrom and Wolff, 1994; Buckley et al., 2002) and performance in foreign markets (Greenaway et al., 2004; Karpaty and Kneller, 2011). Different channels may be at the basis of such nexus. Foreign multinationals supply the local context, both through formal and informal linkages, with new and advanced technologies, managerial abilities, know-how and skills about new productions with a high qualitative and complexity level. They provide the access to large and global production networks. And they are important source of information flows about foreign markets and, more in general, about the export activity. All these potential benefits generated by the presence of multinationals are likely to be

[2] Wang and Wei (2010) have shown that the accumulation of human capital stock is positively related to the increase in the sophistication level of the Chinese cities' export structures.

more effective in a developing and emerging context. If it is true that the evolution of country's trade patterns is deeply rooted in its existing and current abilities (Hidalgo and Hausmann, 2009), FDI inflows promotion then represents a valid road to pursue in order to get new productive knowledge and technologies.

The experience of the East Asian economies represents a good example of the relevance of the FDI-CA nexus. US and Japanese multinationals investing in East Asia since '70s have brought about important transformations in the industrial composition of manufacturing production and exports, towards electronics and computers especially. Even if there exists some heterogeneity in the countries' experiences, Lipsey (2000) argues that the changes in their specialisation could not be predicted by resting on the initial comparative advantage existing before the large inflow of FDI. FDI have then represented in this context an important source to create CA in new sectors. In particular, the transmission of the comparative advantage from multinationals seems to have followed, according to Lipsey (2000), two phases. While in a first phase, the new comparative advantage pattern was driven by the direct export activity undertaken by multinationals, in a second step their relative role shrank due to a new momentum gained by the export performance of local firms which probably took advantage of the FDI knowledge and technology spillovers. Thus, from this case study, FDI inflows emerge to affect the country's export specialisation through both a direct and an indirect channel which deserve some exploration.

3 Data and Descriptive Analysis

3.1 Data sources

In this paper, we make use of trade data at country and 4 digit SITC product level for the period 1984-2006, which are gathered from COMTRADE database. Our analysis focuses on manufacturing export flows. We compute the revealed comparative advantage indicator (RCA) introduced by Balassa (1965) as follows:

$$RCA_{cpt} = \frac{X_{cpt}/X_{ct}}{X_{pt}^{World}/X_{t}^{World}}$$

where X_{cpt} and X_{pt}^{World} denote the value of product p exported at time t by the country c and the world respectively, while X_{pt}^{World} and X_{t}^{World} represent the country c's total exports and the world's total exports at time t.

In the econometric analysis we explore both the logged RCA as well as an indicator variable taking value of one for comparative advantage products. The latter are defined, following the standard in the literature, as products having an RCA index above one, and zero otherwise. We focus on all country-product-year observations with positive export flows, thus discarding the zero flows. However, in the robustness checks we deal with the potential bias generated by this empirical choice.

The explanatory variable of interest is the information on the FDI targeting practices performed by the national Investment Promotion Agencies (IPAs). This information was collected by the 2005 World Bank Census of Investment Promotion Agencies.[3] The Census contains a number of questions about the FDI promotion activities undertaken by IPAs, and our analysis rests on the information on the targeted (priority) sectors and the time evolution of such practices. It is a common view among investment promotion practitioners that focusing efforts on a handful of priority sectors is a more effective strategy than doing investment promotion across the board (Loewendahl, 2001; Proksch, 2004).

Investment promotion data are available at the country and 3-digit NAICS level over the period 1980-2004. The use of the data on FDI targeting instead of FDI inflows allows us to exploit the country-sector dimension, since FDI inflows are usually available either at the country or at the sector level. This choice also helps us to mitigate the endogeneity concerns that may arise in the analysis of the FDI-CA linkage.[4] Finally, using these data allows us to assess the importance of FDI promotion as a policy tool available to governments wishing to reorient their countries' future trade patterns.

In our analysis, we focus on the 73 low and medium income countries for which data are available in both datasets and for which we have information on control variables.[5] A complete list of the countries included in the analysis is reported in the upper panel of Table A.1 in the Appendix. The matching between trade data at product level and FDI targeting data at sector level is done by exploiting the concordance table between the SITC rev.2 and 1997 NAICS classifications.[6]

[3] For a more detailed description of the dataset see Harding and Javorcik (2011) who made use of that dataset in order to explore the role of the FDI targeting practice in fostering FDI inflows. Harding and Javorcik (2012), instead, exploiting the same data investigate the impact of IPAs targeting on the country export upgrading.

[4] We, however, test in the empirical analysis for the strict exogeneity of the right-hand-side variable.

[5] Low and medium income countries are identified on the basis of the 2011 World Bank country classification.

[6] Such concordance is available at the following website http://www.nber.org/lipsey/sitc22.

We control for a number of time-varying variables at the country level. These are: the GDP per capita, the country population and the inflation rate, all retrieved from the World Development Indicators (WDI) database of the World Bank. As robustness, we test for additional CA determinants suggested by the literature which reflect the countries' factor endowments, the sectoral factor intensity and the countries' institutional quality. A detailed description and definition of these controls is reported in the subsection 5.2. Table A.2 reports the descriptive statistics for all the variables used in the baseline regressions.

3.2 The RCA evolution before and after targeting

In order to obtain some insight into the way FDI promotion activities shape a country's comparative advantage pattern, we examine the evolution of the RCA index of targeted sectors before and after targeting, and we compare it with the pattern for non-targeted sectors. We use Venezuela and Bulgaria as our case studies.

The national IPA in Venezuela started to target sectors in 1990 and focused on the following ones: NAICS sectors 311 "*Food Manufacturing*", 312 "*Beverage and Tobacco Product Manufacturing*", 324 "*Petroleum and Coal Products Manufacturing*", 325 "*Chemical Manufacturing*", 326 "*Plastics and Rubber Products Manufacturing*" and 327 "*Non-Metallic Mineral Product Manufacturing*". The IPA in Bulgaria instead started its FDI promotion activity in 2002 by targeting: 331 "*Primary Metal Manufacturing*", 332 "*Fabricated Metal Product Manufacturing*", 333 "*Machinery Manufacturing*" and 337 "*Furniture and Related Product Manufacturing*".[7] We define t=0 as the year 1990 in Venezuela and the year 2002 in Bulgaria for both targeted and non targeted sectors. Then we present the median RCA index evolution on the pre- and post-targeting years for each group.

The pattern presented in the upper part of Figure 1, displaying the targeting experience of Venezuela, is quite striking. While in the pre-targeting period (ie before t=0), targeted and non targeted sectors followed the same evolution of RCA, after the targeting started, the pattern of RCA displayed by the two groups diverged substantially. Targeted sector saw an increase in their raw RCA index from 0.083 in t-1 to 0.257 in t+4,[8] thus gaining a more relevant

[7] In 2003 and 2004 the Bulgarian IPA focused its promotion activity on further sectors. However, in the graphical analysis we just plot the first targeted sectors that were probably considered the most relevant ones for the country's growth perspectives.

[8] It is worth mentioning that the graphs display the median of RCA across all exported products by the two investigated countries. This explains the low values of the plotted RCA indexes.

position in the foreign markets for these industries.

The Bulgarian experience (documented in the lower panel) is quite different. In 2002, Bulgaria started targeting sectors that were characterised by low values of the RCA relative to other industries. In this case, FDI targeting seems to represent a valid policy tool a government may exploit to affect the existing trade pattern, create comparative advantage in new sectors and/or strengthen the country's position in given industries in the world arena. The paths of the two sector groups indeed increasingly come closer over time, thus leading us to infer about a positive and significant role of FDI promotion.

In the following section, we use an econometric framework to examine whether this descriptive evidence is actually supported by a statistically significant causal nexus between FDI and RCA.

4 Empirical Strategy

We examine the relationship between FDI promotion activities performed by IPAs and the revealed comparative advantage pattern in developing countries. More specifically, we estimate the following model:

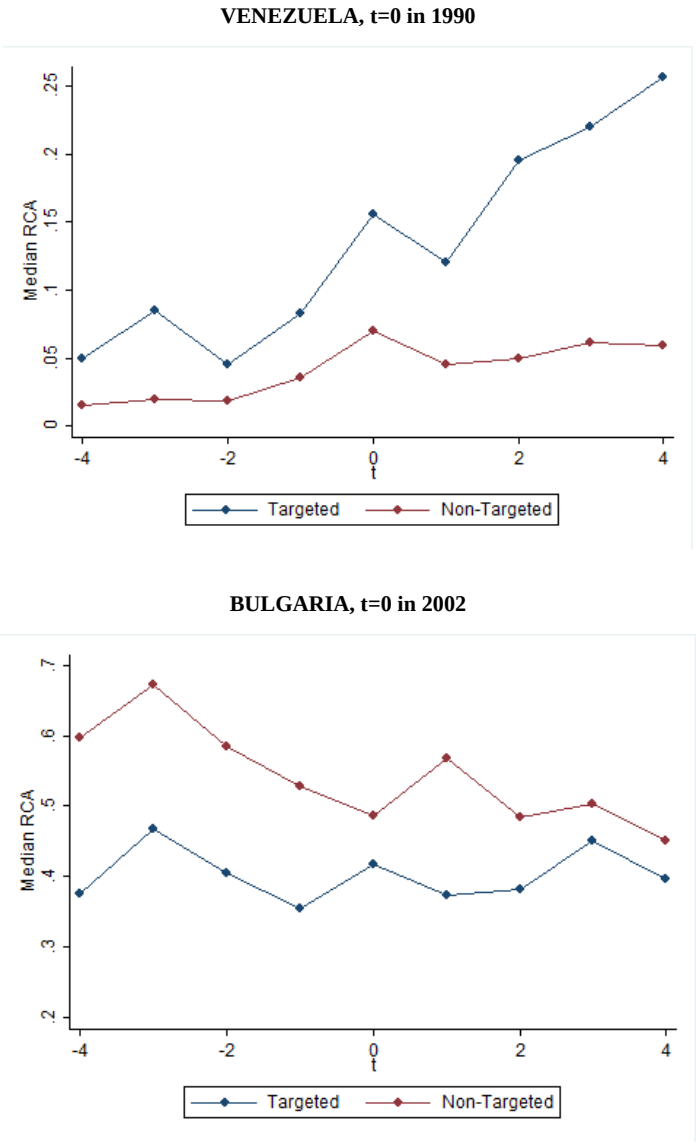
$$RCA_{cpt} = \alpha + \beta Targ_{cst} + \gamma X_{ct} + \delta_{pt} + \eta_{cp} + \epsilon_{cpt} \tag{1}$$

where RCA_{cp} denotes alternatively the logarithm of the Balassa RCA index of country *c* in 4-digit SITC product *p*, and a dummy variable taking value one for comparative advantage products - defined as those ones having a RCA value higher than one - and zero otherwise.[9]

$Targ_{cs}$ is a dummy variable taking the value of one if sector s was a priority sector for the national IPA in country *c* at time *t*, and zero otherwise. We focus on the contemporaneous or the previous targeting activity (at time *t-1* and *t-2*), thus allowing for the existence of some delay in the policy's impact on the country's trade patterns. X_{ct} is a vector of time-varying country variables, including the GDP per capita, the population level and the inflation rate. In the robustness checks, we control for additional time-varying country level covariates. Finally, δ_{pt} and η_{cp} are product-time fixed effects and country-product fixed effects respectively. The introduction of country-year fixed effects lets us identify the FDI-RCA nexus separately from the within country-product-time variation. Product-year effects allow to control for the evolution of common shocks to the product exports and production taking across

[9]To exclude potential outliers from our analysis of logged RCA, we trim the top and the bottom one percentile of the (unlogged) RCA index distribution.

Figure 1: RCA evolution before and after targeting for targeted and non targeted sectors



Notes: .
Source: Our elaborations from the sample.

countries over time.

In other words, our empirical approach is a difference-in-difference (DID) analysis where fixed effects capture any time-invariant difference in RCA between targeted and non-targeted sectors and any common time shock that characterise the post-targeting period relative to the pre-targeting period. The coefficient β captures the difference in the RCA evolution between targeted and non-targeted sectors in the post-targeting period relative to the pre-targeting years.

The investigation of the impact of a macro/meso aggregate on micro variables, as in our case, may lead to a downward bias in the estimated standard errors because of the potential existence of within-group correlation that is not properly accounted for. To deal with this issue, we cluster standard errors at country-sector level as suggested by Bertrand et al. (2004).

5 Results

5.1 Baseline specification

Table 1 reports the estimation results of equation 1.[10] We find that sector-specific FDI promotion activities have a positive and statistically significant effect on the value of RCA. This is true for both the current and the lagged values of the explanatory variable. The use of the RCA indicator variable instead of the logarithm of the RCA index delivers the same insights.

In terms of magnitude of the effect, products belonging to sectors targeted by national investment promotion activities have on average a 17% higher RCA or are 2% more likely to enjoy a comparative advantage. While it is not surprising that the impact is rather small on the RCA dummy whose change may indeed capture a radical transformation in the country trade specialisation, the finding on the RCA index reveals an impressive influence of FDI on trade patterns.

As far as the time-varying country controls are concerned, we find that country size measured in terms of population bears a negative and significant coefficient. This may reveal that among the low and medium income countries, which are the focus of our analysis, the ones characterised by smallest

[10]The higher number of observations when testing for the lagged values of $Targ$ is due to the inclusion in the estimation of further years - more specifically 2005 and 2006 when testing for the first and the second lag, respectively - for which we have information on export flows but no information on the current IPAs' targeting practices, just available till 2004. Also, the number of observations slightly differs between the two explored dependent variables - logged RCA and RCA dummy - because we discard some potential outliers for the logged RCA.

markets are the ones experiencing the largest volatility in their specialisation pattern. The GDP per capita instead does not play a significant role, the lack of any effect may be in part driven by the control for a large number of fixed effects.

Table 1: The impact of FDI targeting on RCA

	ln(RCA)			**RCA dummy**		
	(1)	(2)	(3)	(4)	(5)	(6)
$Targ_t$	0.171***			0.016**		
	[0.050]			[0.006]		
$Targ_{t-1}$		0.169***			0.016**	
		[0.050]			[0.006]	
$Targ_{t-2}$			0.176***			0.016**
			[0.050]			[0.007]
$GDPpc_{t-1}$	-0.001	-0.028	-0.029	-0.006	-0.007	-0.007
	[0.099]	[0.098]	[0.098]	[0.017]	[0.017]	[0.017]
Pop_t	-0.589***	-0.696***	-0.769***	-0.046	-0.056*	-0.060**
	[0.222]	[0.219]	[0.220]	[0.031]	[0.030]	[0.030]
$Infl_t$	0.000***	0.000***	0.000***	0.000**	0.000**	0.000***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Fixed Effects						
Country-Product	YES	YES	YES	YES	YES	YES
Product-Time	YES	YES	YES	YES	YES	YES
Obs.	457,145	487,474	517,709	468,266	499,897	531,481
R^2	0.682	0.676	0.67	0.618	0.613	0.608

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level. Standard errors are in brackets and are clustered by country-sector.

In order to interpret our results on the FDI-CA linkage as a causal relationship we need to rule out the existence of reverse causality. In other words, we need to consider the possibility that IPAs' targeting decisions are linked to the pre-existing comparative advantage patterns. The IPAs' strategies are indeed not random and might be led by motivations related to the country's performance and competitiveness across sectors. On the one hand, it could be the case that IPAs in developing countries aim to use FDI to foster economic activities that were scarcely developed in the local economy before. Foreign firms may indeed bring the needed technologies, knowledge and skills and give rise to new type of production not carried out before by the country. In particular, IPAs may focus on activities with a good growth prospects and in which the country does not enjoy a comparative advantage position yet. On the other hand, IPAs may decide to target FDI in sectors constituting the basis of the domestic economic system and where there exists the absorptive capacity needed to take advantage from the inflows of foreign investments, thus strengthening a well established existing position.

In order to explore the possible existence of reverse causality in a more rigorous way we follow two strategies. First, we conduct a strict exogeneity test of the FDI targeting variable by controlling for its lead value in our baseline specification (Wooldridge, 2002). Thus, we additionally include the targeting value at time $t+1$ in the baseline fixed-effect regressions for both the logarithm of RCA and the RCA dummy (see columns 1 and 3 of Table 2). Then we estimate expanded specifications where in addition to the lead and the contemporaneous value, we include the first and the second lag of the targeting variable (see columns 2 and 4). The lead value is never statistically significant, while the contemporaneous (and, in some cases the lagged) value bears a positive and statistically significant coefficient in all specifications. The lack of significance of the lead values of sector targeting in all the tested specifications leads us to conclude that sector targeting is exogenous in our empirical framework.

Our second strategy to test for the possible reverse causality relies on checking whether the pre-existing country trade specialisation predicts the IPAs' targeting decisions. We regress the sector targeting indicator, $Targ$, of country c and NAICS sector s on the lagged revealed comparative advantage at the sector level. The latter is defined as either (i) the RCA indicator computed directly at sector level, (ii) the continuous RCA variable computed directly at sector level; or (iii) the weighted average of the RCA value across all the SITC products p belonging to sector s. We test for the first, second or third lag of the logarithm of the sector RCA and the corresponding dummy variable. We control for country-sector and sector-year fixed effects.

The results, which are displayed in Table 3, show that the lagged trade pattern does not play a statistically significant role in explaining the future IPAs' decision about when and which sectors to target. Therefore, we conclude that IPAs' targeting practices are not systematically driven by considerations about the sectors' RCA evolution. Thus, reverse causality does not seem to be a concern in our econometric framework.

Sample of Developed Countries We have replicated the baseline exercise on the sample of high income countries. The results, shown in Table A.3 of the Appendix, indicate that FDI promotion practices are positively and significantly correlated with the trade specialisation of developed countries as well. The magnitude of the effect is also very similar to the one found in the baseline sample.

However, the tests presented in Table A.4 and A.5 in the Appendix raise doubts about the exogeneity of the IPAs targeting policies in developed countries. Even if the strict exogeneity tests do not fail in rejecting the null, Table

A.5 suggests that IPAs in developed countries spend their efforts in attracting FDI inflows to sectors where the country already enjoys a comparative advantage, thus casting some suspicion about the causality direction. This is the additional reason why we restrict our core analysis to low and medium income countries.

Table 2: Strict Exogeneity of $Targ$

	ln(RCA)		**RCA dummy**	
	(1)	(2)	(3)	(4)
Targ$_t$	0.161***	0.089**	0.017**	0.010*
	[0.052]	[0.036]	[0.007]	[0.005]
Targ$_{t-1}$		0.026		0.000
		[0.029]		[0.005]
Targ$_{t-2}$		0.091*		0.014*
		[0.052]		[0.007]
Targ$_{t+1}$	0.012	0.014	-0.001	-0.001
	[0.040]	[0.040]	[0.005]	[0.005]
GDPpc$_{t-1}$	0.033	0.031	-0.004	-0.004
	[0.100]	[0.100]	[0.017]	[0.017]
Pop$_t$	-0.483**	-0.502**	-0.038	-0.04
	[0.223]	[0.224]	[0.032]	[0.032]
Infl$_t$	0.000***	0.000***	0.000**	0.000**
	[0.000]	[0.000]	[0.000]	[0.000]
Fixed Effect				
Country-Product	YES	YES	YES	YES
Product-Time	YES	YES	YES	YES
Obs.	427,237	427,237	437,195	437,195
R^2	0.688	0.688	0.623	0.623

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level. Standard errors are in brackets and are clustered by country-sector.

5.2 Sensitivity Analysis

In this subsection, we implement a number of sensitivity checks to examine the robustness of the impact of FDI promotion on country's trade patterns. In the following, if not differently specified, we focus on the specification analysing the logarithm of RCA index and we display the results obtained by testing for the current value of the sector targeting practice, $Targ_t$. Similar results are obtained by including the lagged values of FDI targeting and are available from the authors upon request.

Table 3: Does RCA predict the IPA's targeting practices?

Dependent Variable	Targ_{sct}								
	RCA Dummy at sector level			ln(RCA) at sector level			Weighted average of ln(RCA) across products		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
RCA^{dummy}_{t-1}	0.006								
	[0.009]								
RCA^{dummy}_{t-2}		0.005							
		[0.009]							
RCA^{dummy}_{t-3}			0.006						
			[0.010]						
$\ln \text{RCA}_{t-1}$				0.003			0.001		
				[0.003]			[0.002]		
$\ln \text{RCA}_{t-2}$					0.004			0.001	
					[0.003]			[0.002]	
$\ln \text{RCA}_{t-3}$						0.005*			0.002
						[0.003]			[0.002]
GDPpc_{t-1}	0.065***	0.082***	0.095***	0.063**	0.079***	0.091***	0.065***	0.082***	0.095***
	[0.025]	[0.027]	[0.029]	[0.025]	[0.027]	[0.029]	[0.025]	[0.027]	[0.029]
Pop_t	0.284***	0.334***	0.388***	0.278***	0.333***	0.387***	0.286***	0.336***	0.391***
	[0.090]	[0.094]	[0.099]	[0.091]	[0.095]	[0.100]	[0.090]	[0.094]	[0.099]
Infl_t	0.001***	0.001***	0.001***	0.000***	0.000***	0.000***	0.000***	0.000***	0.000***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Fixed Effects									
Country-Sector	YES	YES	YES	YES	YES	YES	YES	YES	YES
Sector-Time	YES	YES	YES	YES	YES	YES	YES	YES	YES
Obs.	23,119	21,912	20,706	22,621	21,429	20,236	23,091	21,883	20,678
R^2	0.566	0.589	0.606	0.565	0.588	0.605	0.566	0.589	0.605

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level. Standard errors are in brackets and are clustered by country-sector.
In columns 1-3 the explanatory variable RCA^{dummy} is computed at 3-digit NAICS level.
In columns 4-6 we test for the logarithm of RCA index computed at 3-digit NAICS level, while in columns 7-9 we test for the weighted average of RCA index across all products belonging to the sector by using as weights the export share of the product over the total sectoral exports.

The definition of the dependent variable First of all, we test the robustness of our findings to alternative definitions of the dependent variable. In column 1 and 2 of Table 4 we include in our analysis all zero trade flows and test for both the log of the RCA index and the RCA dummy. When taking the logarithm of the index, in order to preserve the zero flows we add the constant 0.0001 to the RCA value.[11] In column 3 and 4 we use the raw index of RCA (i.e., without a logarithmic transformation), while in columns 5 and 6 we make use of the country-product export value as the dependent variable, instead of the RCA index, following part of the literature on the determinants of comparative advantage (Costinot and Komunjer, 2007; Chor, 2010; Manova, 2013). The RCA index, however, remains our preferred dependent variable since it takes into account of the evolution of the country's overall export performance over time. Finally, in columns 7 and 8 we test for the revealed symmetric comparative advantage (RSCA) index proposed by Dalum et al. (1998) which ranges between -1 (for non traded goods) and 1.[12] All the estimates confirm our baseline findings. In all regressions, we find a positive and statistically significant relationship between sector targeting and the RCA of products exported by the sector.

It is worth mentioning that when we include in the analysis the zero flows the magnitude of the FDI effect decreases (relative to the results displayed in Table 1). FDI promotion efforts in a sector increase the RCA value by around 2% for all potential goods, both exported, produced but non exported and non produced. As expected, the impact of FDI promotion is stronger for those goods which the country already produces and exports. If the production and trade structure of a country needs time to undergo a sizable restructuring process, it follows that it is more difficult to create and or enhance the country's comparative advantage position in formerly non-traded or non-produced goods. This explains the small coefficient found when we include the zero flows.

Testing for other RCA determinants Next we examine whether our results are affected by the omission of a number of country and country-sector determinants. In column 1 and 2 of Table 5 we control for the standard Heckscher-

[11] While in the analysis of export flows it is a common practice in literature to add the constant 1, in our empirical framework we are prevented from following this strategy due to the value range of our dependent variable where the value 1 represents the threshold dividing comparative advantage and comparative disadvantage products. Thus, adding the value 1 could bias our findings. We have then opted for the constant 0.0001 which represent a negligible value with respect to the value range of our indicator. Adding the constant 0.001 leads to similar results which are available upon request.

[12] The RSCA index is computed as: (RCA-1)/(RCA+1).

Table 4: Different definition of the dependent variable

	ln(RCA+0.0001) (1)	RCA^{dummy} (2)	RCA (3)	RCA>0 (4)	ln(Export_Value+1) (5)	ln(Export_Value) (6)	Symm-RCA (7)	Symm-RCA>-1 (8)
$Targ_t$	0.284***	0.010**	0.082**	0.120**	0.308***	0.202***	0.022***	0.029***
	[0.071]	[0.004]	[0.037]	[0.053]	[0.052]	[0.043]	[0.008]	[0.011]
$GDPpc_{t-1}$	-0.410***	-0.016	-0.203***	-0.213*	0.503***	0.789***	-0.030*	-0.005
	[0.117]	[0.010]	[0.078]	[0.129]	[0.084]	[0.103]	[0.017]	[0.026]
Pop_t	0.096	0	0.105	-0.184	-1.338***	-1.064***	-0.005	-0.094*
	[0.325]	[0.019]	[0.172]	[0.305]	[0.236]	[0.236]	[0.032]	[0.050]
$Infl_t$	-0.000***	0.000	-0.001	0.002	-0.006***	-0.003***	0.000	0.001***
	[0.000]	[0.000]	[0.001]	[0.002]	[0.001]	[0.001]	[0.000]	[0.000]
Fixed Effects								
Country-Product	YES	YES	YES	YES	YES	YES	YES	YES
Product-Time	YES	YES	YES	YES	YES	YES	YES	YES
Obs.	792,187	803,308	792,187	457,145	798,178	463,136	792,187	457,145
R^2	0.647	0.564	0.566	0.645	0.835	0.813	0.651	0.713

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level. Standard errors are in brackets and are clustered by country-sector.
In columns 1 and 2 the estimation includes country-product observations with zero export flows. Column 3 and 4 make use of the RCA index instead of its logarithmic transformation. In columns 5 and 6 the dependent variable is the logarithm of the export value recorded by each country c in product p. Columns 7 and 8 test for the revealed symmetric comparative advantage index suggested in Dalum et al. (1998)

Ohlin determinants of trade by focusing on the interaction between the sectoral factor intensity and the country's factor endowment. We include in our baseline specification a proxy for the human capital together with its interaction with the sectoral skill intensity, and the country's capital endowment together with its interaction with the sectoral capital intensity.[13]

Sectoral skill and capital intensity are retrieved from the NBER-CES Manufacturing Industry Database available at 6-digit 1997 NAICS level for the US manufacturing sectors. We collapse the data at the 3 digit NAICS level and compute the skill intensity as the ratio of non-production employees to total employees and the capital intensity as real capital stock per worker. Both variables are averaged over the period 1984-2004. We proxy the sectoral factor intensities in all countries using the US data.

The stock of human capital is defined as the enrollment ratio to the secondary school. The country's capital endowment is instead proxied by the gross fixed capital formation as percentage of GDP, due to the lack of capital stock data for a wide range of countries and years. Data on both factor endowments are from the World Bank's World Development Indicators.

A stream of literature has highlighted the key role of institutional quality as a source of comparative advantage, especially in those sectors producing complex goods which are more institutionally dependent. We take this prediction into account by adding in column 3 the institutional quality of countries and its interaction with the sectoral contract intensity. We thus investigate whether countries endowed with better institutions, regulations and legal systems experience a superior export performance in those goods more institutional intensive. We measure the product complexity with the indicator compiled by Nunn (2007), which reflects the weighted share of sectors' inputs requiring relationship-specific investments in their production. Institutional quality is proxied by the Fraser Institute's Economic Freedom of the World index which captures the level of economic freedom in five broad institutional areas: size of government, legal system and property rights, sound money, freedom to trade internationally, regulation. We use an indicator summarising the institutional development in all these areas that ranges from 1 to 7 and increases with the degree of economic freedom. The use of the index just capturing the development of the legal system and protection of the property rights does not lead to different results.

Furthermore, recent work has focused attention on the differences in the financial development across countries as a relevant driver shaping national patterns and distorting sectoral specialisation. Following Manova (2013) and

[13] Sectoral factor intensities do not enter the regressions since they are captured by the included fixed effects.

Ju and Wei (2011) we test the hypothesis that the presence of efficient financial institutions is a source of comparative advantage, particularly in financially vulnerable sectors. We do so in column 4 by controlling for the share of domestic credit to private sector, expressed as a percentage of GDP, to proxy for the country financial development, and its interaction with the sectoral index of external finance dependence. The former variable is obtained from the World Development Indicator. The latter measure comes from Rajan and Zingales (1998) who, exploiting the Compustat dataset, define the firm dependence on external finance as the ratio of the capital expenditures minus cash flow from operations to capital expenditures.

Finally, column 5 brings together the whole set of the additional RCA determinants. A description of all the variables entering the analysis is included in Table A.6 in the Appendix. The different number of observations across specifications is due to the availability of the additional regressors.

Our finding on the positive impact of FDI targeting on RCA proves to be robust to the inclusion of all the country and country-sector variables described above. The other potential determinants are in general not statistically significant. This may be due to our empirical strategy which relies on a large number of fixed effects - country-product fixed effects in particular - that may actually capture the impact of any CA determinant that does not display a large variation over time. Being our aim in the paper the investigation of the role of FDI promotion practices instead of a comprehensive analysis of the trade specialisation drivers, we are not concerned with this issue.

Alternative econometric strategy and methodological issues We also test for alternative empirical strategies and deal with some additional estimation issues.

First, we discard the panel dimension of our data and focus on comparing pre- and post-policy intervention outcomes. More specifically, we just focus on countries whose national IPAs target at least one sector over the sample period. We discard cases where targeting of different sectors starts in different years. It follows that all targeted sectors within a country - belonging to the selected sub-sample - share the same targeting year. Then we can easily compare them to developments in non targeted sectors over the same time frame. We define t=0 as the treatment year, and we focus on the difference between the RCA value one year before targeting starts(t=-1) and a year following targeting (t=1,..6). We control for product and country fixed effects. The latter take out for the different targeting year across countries. We then estimate the following specification:

Table 5: Testing for other RCA determinants

Dependent Variable: ln(RCA)	(1)	(2)	(3)	(4)	(5)
$Targ_t$	0.223***	0.163***	0.182***	0.165***	0.186***
	[0.061]	[0.050]	[0.052]	[0.049]	[0.062]
$Skill\_End_{t-1}$*$Skill\_Int_{t-1}$	3.105				2.105
	[1.972]				[2.027]
$Skill\_End_{t-1}$	-0.279				-1.045*
	[0.601]				[0.610]
Cap_End_{t-1}*Cap_Int_{t-1}		0.002			-0.002
		[0.003]			[0.003]
Cap_End_{t-1}		-0.014			-0.001
		[0.013]			[0.015]
$Inst\_Qual_{t-1}$*$Inst\_Dep_{t-1}$			-0.13		-0.166
			[0.184]		[0.210]
$Inst\_Qual_{t-1}$			0.011		0.055
			[0.162]		[0.184]
Fin_Dev_{t-1}*Fin_Dep_{t-1}				0.239	0.404
				[0.369]	[0.484]
Fin_Dev_{t-1}				-0.371***	-0.563***
				[0.143]	[0.187]
$GDPpc_{t-1}$	-0.089	0.042	0.034	0.056	0.360**
	[0.110]	[0.109]	[0.119]	[0.116]	[0.146]
Pop_t	-0.611***	-0.554**	-0.977***	-0.666**	-0.619*
	[0.219]	[0.221]	[0.268]	[0.287]	[0.348]
$Infl_t$	0.000***	0.000***	0.000	0.000***	0.000
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Fixed Effects					
Country-Product	YES	YES	YES	YES	YES
Product-Time	YES	YES	YES	YES	YES
Obs.	336,837	449,862	370,242	433,448	270,548
R^2	0.697	0.683	0.697	0.692	0.712

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level. Standard errors are in brackets and are clustered by country-sector.
In column 1 and 2 Heckscher-Ohlin predictions are tested by including the country human capital endowment and its interaction with the sectoral skill intensity, and the country physical capital endowment and its interaction with the sectoral capital intensity. Column 3 tests for the country institutional quality and its interaction with a sectoral indicator of institutional dependence, while column 4 focuses on a particular feature of the country institutional environment by exploring the role of financial development and its interaction with the financial external dependence of sectors.

$$\Delta_{t+\tau,t-1} ln(RCA_{cp}) = \alpha + \beta \Delta_{t+\tau,t-1} Targ_{cst} + \delta_p + \eta_c + \epsilon_{cp} \quad \textit{with} \quad \tau = 1,..,6 \quad (2)$$

where $\Delta_{t+\tau,t-1} ln(RCA_{cp})$ is the RCA change for product p in country c between each post-targeting period $(t+1,...t+6)$ and the pre-targeting year. $\Delta_{t+\tau,t-1} Targ$ is the change in the sector targeting practice indicator between

the period $t-1$ and $t+\tau$,[14] while δ_p and η_c denote product and country fixed effects respectively. The time t is the year when IPAs start targeting sectors and differs across countries.

The results of this analysis are displayed in Table 6. It emerges that even in this subsample of countries engaged in FDI promotion practices, targeted sectors experienced a superior performance in terms of RCA change relative to non targeted sectors, thus gaining competitiveness in the world markets. In sum, FDI targeting emerges as an effective policy able to affect the country specialisation pattern. In other words, our results suggest that countries may influence the comparative advantage pattern by engaging in efforts to attract FDI in that sector relative to others.

Table 6: Comparing Targeted and Non Targeted Sectors for Countries engaged in Targeting

	log(RCA)					
	$\Delta_{t+1/t-1}$	$\Delta_{t+2/t-1}$	$\Delta_{t+3/t-1}$	$\Delta_{t+4/t-1}$	$\Delta_{t+5/t-1}$	$\Delta_{t+6/t-1}$
$Targ$ in t	0.049	0.137**	0.274***	0.184**	0.204**	0.240***
	[0.052]	[0.066]	[0.073]	[0.076]	[0.091]	[0.087]
Obs.	8,064	8,139	7,450	6,731	5,694	5,222
R^2	0.125	0.135	0.171	0.198	0.22	0.253
Fixed Effects						
Country	YES	YES	YES	YES	YES	YES
Product	YES	YES	YES	YES	YES	YES

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level. Standard errors are in brackets and are clustered by country-sector.

We then examine the robustness of our findings to different levels of fixed effects. We do so by replacing country-product fixed effects with country-sector fixed effects. The resulting findings, displayed in column 1 of Table 7, confirm the robustness of our results. In column 2 we add instead the country-time fixed effects to check for any country-time shocks that may not be captured by the time-varying country variables previously included. The positive nexus between FDI and RCA proves to be robust to this tough control.

Next, we deal with the fact that no country exports all possible products and thus potentially our sample could include zero trade flows. This would be the case of a left-censored dependent variable where RCA takes value of zero for non exported products. In this case, we would be concerned about the OLS leading to inconsistent estimates. The implementation of a Tobit model for censored data could be a solution. However, the inclusion of fixed-effects

[14] Thus, it assumes value of 1 for targeted sectors and value of 0 for non-trageted sectors.

in maximum likelihood estimators raises the incidental parameters' problem in presence of a large number of cross-sectional units and a low time dimension. To overcome such inconsistency of fixed effect maximum likelihood estimators, Honore (1992) has developed a trimmed least absolute deviations (LAD) estimator for censored models in a panel framework. This is a semi-parametric estimator which does not introduce any assumption on the error term's distribution and assume the existence of a symmetry of the latent variable's distribution. Thus, it accommodates the presence of heteroskedasticity and non-normality of errors. Estimates obtained by making use of the Honoré trimmed LAD estimator are reported in columns 3 for the unlogged RCA indicator,[15] defined for all positive and zero trade flows. Because of computer power constraints, we are not able to control for product-time or sector-time fixed effects and we are compelled to just test for time fixed effects (in addition to country-product panel effects).

Another solution proposed in the literature to deal with the presence of zeros in the dependent variable and the presence of heteroskedasticity is to rely on the Poisson Pseudo Maximum Likelihood (PPML) estimator. Silva and Tenreyro (2006) have applied this estimator in the study of gravity models and have argued that it works well even with continuous variables that do not have a Poisson distribution. This estimator has gained popularity in the applied international trade literature. Since we are interested in controlling for country-product fixed effects, we estimate a fixed-effects poisson quasi maximum likelihood estimation. Results are reported in columns 4-6 for the RCA index computed on all trade flows, the RCA index computed on positive export flows and the logarithmic transformation of the RCA index, respectively.

Our results are robust to both the use of the Honoré fixed effects estimator and the fixed effects poisson estimator. In all specifications, we find a positive and statistically significant impact of FDI promotion policies on the RCA patterns.

6 In search for the underlying micro dynamics

The analysis above confirmed that FDI promotion practices represent an important tool for developing countries, which can be used to boost comparative advantage and strengthen their world position in a given product category. However, our analysis so far has not addressed the channels through which this effect works.

[15] According to Campbell and Honore (1991), if the dependent variable is generated by a tobit model it is not at all clear the LAD estimator also applies to its log. Hence, we focus on the unlogged RCA index.

Table 7: Testing for different estimators

	Country-Sector FE ln(RCA)	Country-time FE ln(RCA)	FE-Tobit RCA	FE-Poisson RCA	FE-Poisson RCA>0	FE-Poisson ln(RCA)
	(1)	(2)	(3)	(4)	(5)	(6)
$Targ_t$	0.145***	0.145*	0.387***	0.089**	0.105***	0.071***
	[0.046]	[0.079]	[0.108]	[0.041]	[0.038]	[0.024]
$GDPpc_{t-1}$	0.058		-1.256***	-0.374***	-0.181*	-0.072
	[0.091]		[0.167]	[0.095]	[0.096]	[0.063]
Pop_t	-0.454**		1.515***	0.407*	-0.026	-0.096
	[0.213]		[0.484]	[0.230]	[0.226]	[0.132]
$Infl_t$	0.000***		0.000	-0.001	0.002*	0.002***
	[0.000]		[0.000]	[0.002]	[0.001]	[0.001]
Fixed Effect						
Country-Sector	YES	YES				
Product-Time	YES	YES				
Country-Time		YES				
Country-Product			YES	YES	YES	YES
Time			YES	YES	YES	YES
Obs.	457,145	457,145	792,187	728,086	454,240	454,240
R^2	0.377	0.632				
Log-Likelihood				-548,569	-415,404	-205,894

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level. Standard errors are in brackets and are clustered by country-sector.

One answer that immediately comes to mind points to the direct role of foreign firms' exports as the main driver responsible for the change and evolution of the country's export specialisation. It is well known in the literature that multinationals are larger and more efficient than national firms and that they are characterised by a superior export performance. Their entry, promoted by the IPAs' targeting practices, may thus directly affect the country export performance due to their massive export flows. As a matter of fact, a recent strand of literature highlights the role of few and very large firms in determining the aggregate country performance - mainly, GDP and exports - and causing aggregate fluctuations (Gabaix, 2011; Canals et al., 2007; di Giovanni and Levchenko, 2012). This phenomenon may be especially prominent in developing and emerging countries where entry of large foreign multinationals constitutes a large shock relative to the size of the economy.

At the same time, other contributions in literature suggest that there is a positive effect of FDI inflows on improving and enhancing the efficiency of the domestic productive structure (Javorcik, 2004) and, as a consequence, its export performance (Brian et al., 1997). In other words, FDI inflows may also affect the comparative advantage pattern of countries via an indirect channel, that is, by fostering the development of the local productive structure and its position in foreign markets.

In order to shed light on the mechanisms at work, we analyse the impact of FDI promotion practices on the micro export structure. To do so we exploit the Exporter Dynamics Database (EDD), a database recently compiled by the World Bank, which includes information on the exporter characteristics and dynamics across a number of countries. The EDD data are available for 45 countries (both developed and developing countries) at the 6 digit HS product level[16] over the period 1995-2010.[17] We focus on the period 1995-2006 and rely on a group of 18 low and medium income countries for which data from the IPAs' Census are available.[18] The list of the countries included in the EDD analysis is reported in the lower panel of Table A.1 in the Appendix. The positive link between FDI promotion and the RCA is confirmed when we restrict the analysis based on equation 1 to this sub-sample of countries.[19]

[16]This classification is a very disaggregated one. The total number of products for which there exist positive export flows in at least one country of the sample we focus on is 5,185.

[17]The time span covered by EDD widely differs among countries with most of observations concerning the most recent years.

[18]We have at our disposal data on 18 countries when we test for the current value of sector targeting since in such case we are able to exploit exporter dynamics data just till 2004, that is the last year the sector targeting information is available. When testing for the first and second lag of sector targeting we have 21 and 25 countries respectively, since we can exploit EDD data in 2005 and 2006.

[19]The relative results are not shown for sake of brevity but are available from the authors

We focus on the following characteristics of exporters by country-product: their size in terms of export value, their market diversification, their unit prices and the export share of largest exporters. We implement the same empirical strategy applied for the aggregate analysis and we estimate the following specification:

$$ExpDyn_{c\widetilde{p}t} = \alpha + \beta Targ_{cst} + \gamma X_{ct} + \delta_{\widetilde{p}t} + \eta_{c\widetilde{p}} + \epsilon_{c\widetilde{p}t} \quad (3)$$

where $ExpDyn_{c\widetilde{p}t}$ are the exporters' characteristics and micro export margins mentioned above. Differently from the previous aggregate analysis the product, $\widetilde{p}$, denotes now a 6-digit HS code[20]. The other variables, $Targ$ and X_{ct}, are defined as before. We control for both country-product and product-year fixed effects.

Results of the micro dynamics analysis are displayed in Tables 8-10. The difference in the number of observations across specifications is due to the availability of both sector targeting and EDD data. When testing for the lagged targeting variable the number of observations increases since we can exploit data for 2005 and for 2006.[21]

Table 8 reports the estimates from the investigation of the distribution of the export value per exporter. We explore the mean, median, first and third quartile of the export value and we find a positive impact of FDI promotion along all of the distribution of the export value. The effect seems to materialize with a one-year lag. In particular, we find a higher elasticity for the first (bottom) quartile, thus revealing that FDI may actually benefit small exporters and cause a significant expansion in their export value, which may not be surprising given that they are starting from a low base.

A similar evidence is gathered when we investigate the exporters' market diversification in Table 9. FDI inflows appear to foster the exporters' involvement in a larger number of destination markets per product and, as in the case of the export value, the effect emerges with a one-year delay. This finding is confirmed for both the mean and the median value of the number of export markets per exporter. This result is consistent with the reduction of the destination-specific sunk costs taking place thanks to knowledge and in-

upon request.

[20]The World Bank researchers have created a time-consistent HS classification which harmonise the different updates HS codes undergo over the sample period. We make use of both SITC-HS concordance and SITC-NAICS concordance in order to match HS product codes with the 3digit NAICS codes used for the $Targ$ variable.

[21]Results stay unchanged when we restrict the analysis to a uniform sample regardless of the recording time (current or lagged values) of the sector targeting variable.

formation flows transferred by foreign multinationals to local firms.

Table 9 also shows, in the last three columns, the evolution of the export share recorded by the top 25% exporters in response to the IPAs' sector targeting. We expect that the entry of foreign multinationals leads, at least in a first phase, to an increased concentration of exports. Foreign multinational are often large exporters and it is likely they enter the right tail of the export value distribution and immediately capture a relevant share of exports. However, in contrast to our expectations, the FDI targeting does not increase the role of the largest exporters, and it decreases instead their weight in the overall exports one and two years later. It could be the case that foreign firms' exports crowd out other large domestic exporters which belong to the group of the top 25% exporters. Or the direct boost of the foreign firms' entry toward a higher concentration may also be in part counterbalanced by the increased export performance of marginal and small exporters which benefit from FDI spillovers.[22]

Moving to the analysis of export unit prices, Table 10 examines the impact of FDI promotion on the quality content of exports. We focus on both the mean and median of exporters' unit values. Exporters' unit values are obtained by diving the total exports of product p coming from exporter i in country c at time t by the corresponding volume. Then, then the mean and the median of the latter are taken for each product-country-year combination. It is worth mentioning that data on export unit values are just available for a sub-sample of country-product pairs as is evident by comparing the number of observations in Tables 8 and 10.[23] As far as unit prices are a good proxy for product quality, our findings suggest that FDI promotion helps both the average and median firm in increasing the sophistication level of a given exported product. Thus, the quality upgrading fostered by FDI would emerge as a within-product change instead of a repositioning towards more quality intensive goods, which cannot be investigated with the data at our disposal and is not however ruled out by our analysis. This evidence confirms the positive impact of FDI on export upgrading documented by Harding and Javorcik (2012) for developing countries and helps in shedding light on one mechanism behind such relationship. While Wang and Wei (2010) show that foreign owned firms in China have contributed to the country export sophistication

[22] Unfortunately, probably due to confidentiality issues, EDD contains very few observations on the export share of the top 1 percent of exporters for the relevant period and the country sample. The availability of such data could help shed further light on the changes of the export structure directly induced by the foreign firms' exports, since they are likely to represent the biggest exporters in the economy, especially in developing countries.

[23] Unit values analysis just concerns data available for 12, 15 and 19 countries when testing for the current value, first lag and second lag of sector targeting, respectively.

level by directly exporting goods with higher unit values, from our study it emerges that the export upgrading process promoted by FDI inflows involves a relevant part of the firms' population and is not just driven by the risen quality level of a small number of large - foreign owned - exporters.

Because of data limitations, we are prevented from quantifying the impact of the export activity of the largest foreign firms on comparative advantage patterns. Foreign owned firms usually represent a small fraction of the firms' population and exporters' population and they could directly shift, through their export activity, the right tail of the distribution - of export value, number of export destinations, export price but not its left tail and the measures of central tendency. However, the picture emerging from the EDD analysis above suggests that the role of FDI promotion in determining the country export specialisation is not just the result of the flows of foreign firms' exports. Even if we cannot separately observe the evolution of domestic and foreign exporters, we consider the finding of a significant effect on the average and, more important, on the median and first quartile of the investigated variables as reflecting the existence of important consequences for the domestic productive structure.

Because of the high disaggregation of the product classification - which include more than 5,000 products - exploited in the EDD database, some country-product cells include a small number of exporters. We test the robustness of our results by restricting the previous analysis to the subsample of country-product pairs for which there are at least 10, 20 and 30 exporters, respectively. Results are reported in Tables A.7-A.9 of the Appendix and confirm - with the exception of the effect on the median number of export destinations - the previous findings on the whole sample.

In sum, FDI promotion emerges as a policy significantly enhancing the host country's export performance, in favour of both large and small operators. It fosters their export volume, facilitates entry into new markets and promotes quality upgrading.

7 Conclusion

This paper has highlighted the importance of FDI promotion as a policy tool governments of developing countries may exploit in order to foster comparative advantage in a given product category and influence the future country's trade pattern.

Even if investments in internal resources such as human capital accumulation, improvement of regulation systems and development of financial institutions, play a significant role in the countries' growth perspectives, the

Table 8: The impact of FDI targeting on the Distribution of the Export Value per Exporter

	Mean			**Median**			**First Quartile**			**Third Quartile**		
$Targ_t$	0.008			-0.025			-0.016			-0.023		
	[0.060]			[0.134]			[0.205]			[0.102]		
$Targ_{t-1}$		0.130***			0.293***			0.427***			0.216***	
		[0.044]			[0.104]			[0.148]			[0.079]	
$Targ_{t-2}$			0.105***			0.279***			0.444***			0.196***
			[0.037]			[0.083]			[0.116]			[0.066]
$GDPpc_{t-1}$	2.126***	2.527***	2.586***	3.965**	4.986***	4.562***	6.305***	7.367***	6.934***	3.234**	4.032***	3.756***
	[0.752]	[0.639]	[0.530]	[1.639]	[1.461]	[1.208]	[2.354]	[2.124]	[1.764]	[1.271]	[1.112]	[0.932]
Pop_t	-1.923	-0.075	0.64	-2.787	0.764	1.161	-0.118	3.394	3.799	-2.281	0.599	1.182
	[1.307]	[1.105]	[0.929]	[2.374]	[2.173]	[1.866]	[3.168]	[3.021]	[2.618]	[1.916]	[1.712]	[1.464]
$Infl_t$	0.005	0.015***	0.016***	0.023***	0.049***	0.048***	0.028**	0.064***	0.064***	0.017***	0.037***	0.037***
	[0.003]	[0.004]	[0.003]	[0.008]	[0.008]	[0.007]	[0.011]	[0.011]	[0.010]	[0.006]	[0.007]	[0.006]
Obs.	102,068	129,820	162,883	102,068	129,820	162,883	102,068	129,820	162,883	102,068	129,820	162,883
R^2	0.921	0.905	0.893	0.862	0.837	0.824	0.813	0.779	0.762	0.874	0.85	0.837

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level. Standard errors are in brackets and are clustered by country-sector.

Table 9: The impact of FDI targeting on Market Diversification and Export Concentration

	# of Destinations per Exporter						Share of Top 25% Exporters		
	Mean			Median					
$Targ_t$	-0.012			-0.007			0.004		
	[0.016]			[0.011]			[0.006]		
$Targ_{t-1}$		0.042***			0.014**			-0.016***	
		[0.015]			[0.006]			[0.005]	
$Targ_{t-2}$			0.056***			0.018***			-0.021***
			[0.013]			[0.005]			[0.005]
$GDPpc_{t-1}$	0.863***	0.915***	0.817***	0.082	0.109	0.064	-0.154*	-0.172**	-0.119**
	[0.203]	[0.198]	[0.166]	[0.102]	[0.081]	[0.065]	[0.087]	[0.068]	[0.059]
Pop_t	0.137	0.568**	0.566**	-0.365**	-0.169	-0.175	0.017	-0.017	0.069
	[0.301]	[0.283]	[0.258]	[0.186]	[0.141]	[0.121]	[0.167]	[0.141]	[0.131]
$Infl_t$	0.004***	0.008***	0.008***	0.002***	0.003***	0.002***	-0.001**	-0.002***	-0.002***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.000]	[0.000]
Obs.	102,068	129,820	162,883	102,068	129,820	162,883	70,048	89,409	112,498
R^2	0.891	0.865	0.851	0.762	0.726	0.703	0.809	0.773	0.757

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level. Standard errors are in brackets and are clustered by country-sector.

Table 10: The impact of FDI targeting on Export Unit Value per Exporter

	Mean			Median		
$Targ_t$	0.136***			0.193***		
	[0.035]			[0.035]		
$Targ_{t-1}$		0.175***			0.232***	
		[0.026]			[0.035]	
$Targ_{t-2}$			0.108***			0.120***
			[0.028]			[0.030]
$GDPpc_{t-1}$	1.451***	1.294**	1.555***	0.687	0.72	1.031**
	[0.561]	[0.568]	[0.490]	[0.497]	[0.515]	[0.410]
Pop_t	2.576**	0.632	0.611	1.17	-0.766	-0.785
	[1.114]	[1.097]	[0.957]	[0.994]	[1.033]	[0.877]
$Infl_t$	-0.036***	-0.013***	-0.014***	-0.041***	-0.014***	-0.018***
	[0.005]	[0.004]	[0.004]	[0.005]	[0.004]	[0.004]
Obs.	63,385	78,897	99,564	63,385	78,897	99,564
R^2	0.934	0.926	0.923	0.939	0.931	0.927

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level. Standard errors are in brackets and are clustered by country-sector.

attraction of external resources - know-how, technology, skills - through the promotion of FDI inflows may represent a quicker and a less costly strategy to affect the export specialisation.

We show that FDI promotion practices performed by IPAs significantly

contribute to increasing the country's comparative advantage position. This FDI-CA nexus seems to be in part driven by a positive impact of FDI on the domestic firms' performance in foreign markets, in terms of the size of export flows, the number of export destinations and quality of exported goods.

In sum, facilitating entry of foreign multinationals appears to be an effective policy that can be used to enhance the international competitiveness of the local productive structure.

Acknowledgments

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Appendix

A Tables

Table A.1: List of countries

Countries in the FDI-RCA analysis			
Albania	Egypt	Libya	Togo
Argentina	Ethiopia	Lithuania	Thailand
Armenia	Fiji	Moldova	Tajikistan
Benin	Gabon	Madagascar	Turkmenistan
Burkina Faso	Georgia	Mexico	Tunisia
Bangladesh	Ghana	Macedonia	Turkey
Bulgaria	Guinea	Mali	Uganda
Belize	Gambia	Mongolia	Uruguay
Brazil	Guinea-Bissau	Mozambique	Uzbekistan
Central African Republic	Guatemala	Mauritania	Venezuela
Chile	Guyana	Mauritius	Samoa
China	Haiti	Nicaragua	South Africa
Cote d'Ivoire	Iran	Pakistan	Zambia
Cameroon	Iraq	Panama	
Congo	Jordan	Peru	
Colombia	Kazakhstan	Sudan	
Costa Rica	Kenya	Senegal	
Djibouti	Kyrgyz Republic	El Salvador	
Algeria	Cambodia	Suriname	
Ecuador	Lebanon	Chad	

Countries in the EDD analysis			
Albania	Costa Rica	Mauritius	Senegal
Bulgaria	El Salvador	Mexico	South Africa
Cambodia	Guatemala	Nicaragua	Uganda
Cameroon	Jordan	Pakistan	
Chile	Macedonia	Peru	

Table A.2: Descriptive Statistics

Variable	Obs	Mean	SD	Min	Max
RCA^{dummy}	803,308	0.121	0.327	0.000	1.000
RCA	792,187	0.720	2.911	0.000	40.425
ln(RCA)	457,145	-2.073	2.356	-8.070	3.699
Targ	803,308	0.092	0.288	0.000	1.000
GDPpc	803,308	7.911	0.901	5.704	9.767
Pop	803,308	8.960	1.622	5.053	14.075
Infl	803,308	1.042	7.257	-0.292	154.423

Table A.3: The impact of FDI targeting on RCA in High Income Countries

	log(RCA)			RCA dummy		
	(1)	(2)	(3)	(4)	(5)	(6)
$Targ_t$	0.129**			0.016*		
	[0.056]			[0.009]		
$Targ_{t-1}$		0.144**			0.020**	
		[0.058]			[0.009]	
$Targ_{t-2}$			0.160***			0.026***
			[0.059]			[0.009]
$GDPpc_{t-1}$	-0.883***	-0.897***	-0.882***	-0.102***	-0.099***	-0.096***
	[0.161]	[0.157]	[0.154]	[0.025]	[0.023]	[0.023]
Pop_t	1.338***	1.302***	1.200***	0.196***	0.192***	0.177***
	[0.297]	[0.289]	[0.284]	[0.044]	[0.044]	[0.043]
$Infl_t$	0.015	0.014	0.01	0.004	0.005	0.004
	[0.022]	[0.023]	[0.023]	[0.004]	[0.004]	[0.004]
Fixed Effects						
Country-Product	YES	YES	YES	YES	YES	YES
Product-Time	YES	YES	YES	YES	YES	YES
Obs.	325,780	342,881	359,982	327,826	345,124	362,397
R^2	0.785	0.78	0.776	0.7	0.694	0.689

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level. Standard errors are in brackets and are clustered by country-sector.

Table A.4: Strict Exogeneity of $Targ$, High Income Countries

	ln(RCA)		RCA dummy	
	(1)	(2)	(3)	(4)
$Targ_t$	0.092**	-0.032	0.011	-0.014***
	[0.041]	[0.022]	[0.007]	[0.005]
$Targ_{t-1}$		0.022		0.006
		[0.020]		[0.005]
$Targ_{t-2}$		0.191***		0.009
		[0.052]		[0.007]
$Targ_{t+1}$	0.05	0.061	0.007	0.037***
	[0.037]	[0.038]	[0.007]	[0.009]
$GDPpc_{t-1}$	-0.902***	-0.902***	-0.105***	-0.105***
	[0.167]	[0.167]	[0.026]	[0.026]
Pop_t	1.404***	1.408***	0.199***	0.200***
	[0.304]	[0.304]	[0.043]	[0.043]
$Infl_t$	0.015	0.016	0.004	0.004
	[0.021]	[0.021]	[0.004]	[0.004]
Fixed Effect				
Country-Product	YES	YES	YES	YES
Product-Time	YES	YES	YES	YES
Obs.	308,673	308,673	310,543	310,543
R^2	0.789	0.789	0.706	0.706

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level. Standard errors are in brackets and are clustered by country-sector.

Table A.5: Does RCA predict the IPA's targeting practices? Evidence from High Income Countries

	RCA Dummy at sector level			ln(RCA) at sector level			Weighted average of ln(RCA) across products		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
RCA^{dummy}_{t-1}	0.028*								
	[0.014]								
RCA^{dummy}_{t-2}		0.032**							
		[0.015]							
RCA^{dummy}_{t-3}			0.034**						
			[0.015]						
ln RCA_{t-1}				0.01			0.009*		
				[0.007]			[0.005]		
ln RCA_{t-2}					0.012*			0.011**	
					[0.007]			[0.005]	
ln RCA_{t-3}						0.015**			0.013**
						[0.007]			[0.005]
$GDPpc_{t-1}$	-0.091***	-0.091***	-0.088***	-0.093***	-0.093***	-0.087***	-0.086***	-0.088***	-0.085***
	[0.019]	[0.019]	[0.019]	[0.021]	[0.020]	[0.020]	[0.019]	[0.019]	[0.019]
Pop_t	-0.02	-0.009	-0.022	-0.023	-0.009	-0.018	-0.016	-0.003	-0.014
	[0.069]	[0.068]	[0.072]	[0.070]	[0.069]	[0.073]	[0.069]	[0.069]	[0.073]
$Infl_t$	-0.02	-0.083**	-0.079*	-0.021	-0.090**	-0.084*	-0.021	-0.087**	-0.080*
	[0.016]	[0.038]	[0.041]	[0.016]	[0.040]	[0.044]	[0.016]	[0.040]	[0.042]
Fixed Effects									
Country-Sector	YES	YES	YES	YES	YES	YES	YES	YES	YES
Sector-Time	YES	YES	YES	YES	YES	YES	YES	YES	YES
Obs.	10,847	10,280	9,698	10,774	10,209	9,632	10,834	10,267	9,685
R^2	0.541	0.559	0.573	0.541	0.559	0.574	0.541	0.559	0.573

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level. Standard errors are in brackets and are clustered by country-sector.
In columns 1-3 the explanatory variable RCA^{dummy} is computed at 3-digit NAICS level.
In columns 4-6 we test for the logarithm of RCA index computed at 3-digit NAICS level, while in columns 7-9 we test for the weighted average of RCA index across all products belonging to the sector by using as weights the export share of the product over the total sectoral exports.

Table A.6: List of variables

Variable	Definition	Sources
RCA_{cp}	revealed comparative advantage, Balassa (1965)	COMTRADE database
$Targ_{cs}$	dummy for sector targeting undertaken by the IPA of country c in NAICS sector s	2005 World Bank Census of IPAs
$GDPpc_c$	log of PPP-converted real GDP per capita	WDI, World Bank
Pop_c	log of population	WDI, World Bank
$Infl_c$	inflation rate	WDI, World Bank
$Skill\_End_c$	percentage of secondary school enrollment	WDI, World Bank
Cap_End_c	gross fixed capital formation (% of GDP)	WDI, World Bank
$Inst\_Qual_c$	Economic Freedom of the World index, ranging from 1 to 7	Fraser Institute
Fin_Dev_c	domestic credit to private sector (% of GDP)	WDI, World Bank
$Skill\_Int_s$	ratio of non-production employees to total employees for US sectors, average on 1984-2004	NBER-CES Manufacturing Industry Database
Cap_Int_s	capital intensity as real capital stock per worker for US sectors, average on 1984-2004	NBER-CES Manufacturing Industry Database
$Inst\_Dep_s$	weighted share of sectors' inputs requiring relationship-specific investments	Nunn (2007)
Fin_Dep_s	Sectoral dependence on external finance	Rajan and Zingales (1998)

Table A.7: The impact of FDI targeting on the Distribution of the Export Value per Exporter: restricted country-product level samples according to the number of exporters

	Mean			**Median**			**First Quartile**			**Third Quartile**		
	t	*(t-1)*	*(t-2)*	*t*	*(t-1)*	*(t-2)*	*t*	*(t-1)*	*(t-2)*	*t*	*(t-1)*	*(t-2)*
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**
Just keeping Country-Product pairs with wt least 10 exporters												
Targ	0.005	0.208***	0.162***	0.025	0.570***	0.568***	0.054	0.844***	0.858***	0.013	0.460***	0.437***
	[0.049]	[0.051]	[0.047]	[0.122]	[0.137]	[0.116]	[0.209]	[0.184]	[0.150]	[0.094]	[0.114]	[0.100]
Obs.	38,633	49,499	62,501	38,633	49,499	62,501	38,633	49,499	62,501	38,633	49499	62501
R^2	0.969	0.961	0.956	0.945	0.931	0.925	0.923	0.907	0.899	0.95	0.937	0.93
Just keeping Country-Product pairs with wt least 20 exporters												
Targ	-0.004	0.234***	0.199***	-0.004	0.632***	0.670***	0.029	0.935***	0.984***	-0.019	0.518***	0.534***
	[0.057]	[0.059]	[0.058]	[0.141]	[0.150]	[0.127]	[0.227]	[0.203]	[0.163]	[0.105]	[0.130]	[0.112]
Obs.	23,064	29,698	37,621	23,064	29,698	37,621	23,064	29,698	37,621	23,064	29698	37621
R^2	0.979	0.975	0.97	0.963	0.953	0.949	0.947	0.937	0.932	0.968	0.96	0.954
Just keeping Country-Product pairs with wt least 30 exporters												
Targ	-0.004	0.268***	0.244***	0.014	0.683***	0.744***	-0.002	0.987***	1.063***	-0.014	0.571***	0.614***
	[0.078]	[0.078]	[0.071]	[0.169]	[0.166]	[0.131]	[0.264]	[0.225]	[0.172]	[0.125]	[0.150]	[0.119]
Obs.	16,448	21,296	26,967	16,448	21,296	26,967	16,448	21,296	26,967	16,448	21296	26967
R^2	0.984	0.98	0.977	0.971	0.963	0.959	0.957	0.949	0.945	0.976	0.968	0.964

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level. Standard errors are in brackets and are clustered by country-sector.
$GDPpc$, $Infl$ and Pop are included in the estimation but not reported for sake of brevity.
The esimates reported in the difference columns test for different lags of the $Targ$ variable.

Table A.8: The impact of FDI targeting on Market Diversification and Export Concentration: restricted country-product level samples according to the number of exporters

	# of Destinations per Exporter						Share of Top 25% Exporters		
	Mean			Median					
	t	*(t-1)*	*(t-2)*	*t*	*(t-1)*	*(t-2)*	*t*	*(t-1)*	*(t-2)*
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Just keeping Country-Product pairs with wt least 10 exporters									
Targ	-0.006	0.068***	0.088***	-0.007	0.000	0.002	0.001	-0.018***	-0.025***
	[0.013]	[0.020]	[0.016]	[0.006]	[0.004]	[0.003]	[0.004]	[0.005]	[0.005]
Obs.	38,633	49,499	62,501	38,633	49,499	62,501	38,633	49,499	62,501
R^2	0.948	0.928	0.922	0.829	0.806	0.796	0.86	0.833	0.822
Just keeping Country-Product pairs with wt least 20 exporters									
Targ	-0.008	0.067***	0.089***	-0.007	-0.001	-0.001	0.001	-0.015***	-0.019***
	[0.013]	[0.019]	[0.015]	[0.006]	[0.003]	[0.003]	[0.004]	[0.004]	[0.004]
Obs.	23,064	29,698	37,621	23,064	29,698	37,621	23,064	29,698	37,621
R^2	0.961	0.946	0.942	0.863	0.844	0.836	0.899	0.88	0.875
Just keeping Country-Product pairs with wt least 30 exporters									
Targ	-0.007	0.059***	0.085***	-0.006	-0.002	-0.004	0.002	-0.013***	-0.017***
	[0.012]	[0.020]	[0.014]	[0.006]	[0.004]	[0.003]	[0.004]	[0.004]	[0.004]
Obs.	16,448	21,296	26,967	16,448	21,296	26,967	16,448	21,296	26,967
R^2	0.97	0.957	0.954	0.864	0.846	0.843	0.928	0.912	0.91

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level. Standard errors are in brackets and are clustered by country-sector.
$GDPpc$, $Infl$ and Pop are included in the estimation but not reported for sake of brevity.
The esimates reported in the difference columns test for different lags of the $Targ$ variable.

Table A.9: The impact of FDI targeting on Export Unit Value per Exporter: restricted country-product level samples according to the number of exporters

	Mean			**Median**		
	t	*(t-1)*	*(t-2)*	*t*	*(t-1)*	*(t-2)*
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Just keeping Country-Product pairs with wt least 10 exporters						
Targ	0.143***	0.192***	0.102***	0.184***	0.244***	0.108***
	[0.045]	[0.037]	[0.039]	[0.031]	[0.034]	[0.041]
Obs.	23,697	29,771	37,909	23,697	29,771	37,909
R^2	0.978	0.975	0.975	0.989	0.988	0.987
Just keeping Country-Product pairs with wt least 20 exporters						
Targ	0.159**	0.239***	0.126**	0.168***	0.273***	0.099*
	[0.062]	[0.044]	[0.056]	[0.035]	[0.034]	[0.053]
Obs.	14,598	18,408	23,449	14,598	18,408	23,449
R^2	0.986	0.985	0.984	0.994	0.994	0.993
Just keeping Country-Product pairs with wt least 30 exporters						
Targ	0.170**	0.238***	0.123**	0.176***	0.273***	0.094
	[0.083]	[0.042]	[0.055]	[0.046]	[0.042]	[0.060]
Obs.	10,636	13,464	17,099	10,636	13,464	17,099
R^2	0.989	0.988	0.987	0.996	0.996	0.995

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level. Standard errors are in brackets and are clustered by country-sector. $GDPpc$, $Infl$ and Pop are included in the estimation but not reported for sake of brevity.
The esimates reported in the difference columns test for different lags of the $Targ$ variable.