FDI Promotion and Comparative Advantage*

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Abstract

This study argues that countries can use industrial policy to change their comparative advantage. It focuses on sector-specific FDI promotion efforts undertaken by 77 developing countries during 1984-2006. It finds that products belonging to sectors targeted by investment promotion efforts experience an increase in exports and revealed comparative advantage. This effect increases with the time targeting is in place and is larger for capital-intensive products and products requiring relationship-specific investments. The findings are robust to controlling for arbitrary country-sector-specific shocks that might have affected the choice of a particular priority sector by a given country in a given year. It is also robust to using the instrumental variable approach.

JEL-codes: F10, F14, F23, F68
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1 Introduction

Although over 200 years have passed since publication of David Ricardo's *On the Principles of Political Economy and Taxation*, in which he put forward what became to be known as the Principle of Comparative Advantage, understanding comparative advantage and its determinants is still an active area of research (see Nunn, 2007; Costinot et al., 2012; Bombardini et al., 2012; Levchenko and Zhang, 2016 and Alviarez, 2019, just to name some recent examples).

Even though comparative advantage is believed to be shaped by deep determinants, such as factor endowments and technology, governments are often tempted to search for tools to influence the future comparative advantage, upgrade the export structure and ultimately promote economic development. Export upgrading is not an easy task, particularly in developing countries, given the resources and time needed to build up the capital stock, the skill base and the reputation in foreign markets and considering the appropriability issues pointed out by Hausmann and Rodrik (2003).[1]

This paper investigates whether governments' efforts to attract foreign direct investment (FDI) can shape the evolution of export specialization. In line with recent contributions stressing the leading role of large firms in affecting the evolution of macro-aggregates (Gabaix, 2011; Canals et al., 2007; di Giovanni and Levchenko, 2012) and shaping export patterns (Freund and Pierola, 2015, 2016), it hypothesizes that entry of a few multinational firms, fostered by FDI promotion policies, may directly or indirectly change the trade specialisation of the host country.

Multinationals are creators of innovation, being responsible for the majority of global R&D spending (UNCTAD, 2003). Global value chains coordinated by multinational firms account for about 80% of global trade, while investment decisions of multinationals shape to a significant extent patterns of value added in global production networks (UNCTAD, 2013). There is also evidence suggesting that multinationals transfer knowledge to their foreign affiliates (Arnold and

[1] Hausmann and Rodrik (2003) highlight the importance of discovery costs. An entrepreneur who produces a good for the first time in a developing country faces uncertainty about the underlying cost structure of the economy. If the project is successful, other entrepreneurs learn about the profitability of the product in question and follow the incumbent's footsteps. In this way, the returns to the pioneer investor's cost discovery become socialized. If the incumbent fails, the losses remain private. This knowledge externality means that investment levels in cost discovery are suboptimal unless the industry or the government finds some way in which the externality can be internalized. In such a setting, the range of goods that an economy produces and exports is determined not just by the fundamentals but also by the number of entrepreneurs engaging in cost discovery. The larger their number, the closer the economy can get to its productivity frontier.

Javorcik, 2009; Javorcik and Poelhekke, 2017) and that foreign affiliates are more likely to introduce new products than their indigenous competitors (Brambilla, 2009; Guadalupe et al., 2012). Furthermore, multinationals may affect domestic firms' innovative efforts. By directly engaging in cost discovery in host countries, they may stimulate subsequent innovation by domestic rivals. By sharing product information and production-related know-how, multinationals may also lower the costs of innovation and product upgrading on the part of the local suppliers. Case studies of Malaysia, Costa Rica, and Morocco lead Freund and Moran (2017) to conclude that "*the objective of generating exports – in particular, exports in novel sectors – is more likely to come about by overcoming market failures and other obstacles that hinder multinational investment than by promoting domestic entrepreneurship.*"

Motivated by the above quote, this study examines whether FDI promotion practices affect the comparative advantage of developing and emerging economies. The analysis combines export data at the 4-digit SITC product level for 77 low and medium income countries with the information on sectors receiving priority in the efforts to attract FDI by national Investment Promotion Agencies (IPAs) and the timing of these efforts. It exploits the within-country variation in the FDI targeting practices across sectors and time in order to identify its impact on the country's export structure by accounting for heterogeneity specific to country-product, country-year and product-year. In a more demanding specification, we ask whether exports of products with particular characteristics are more strongly affected, which allows us to control for arbitrary country-sector-specific shocks that might have influenced the choice of a particular priority sector by a given country in a given year.

The investigation covers a wide time span, from 1984 to 2006, thus capturing a period of increasing efforts by developing country governments to foster integration with the global economy. The analysis focuses on developing and emerging countries for two reasons. First, FDI inflows are likely to have a more pronounced effect in economies which are further away from the technological frontier and thus stand to benefit more from knowledge and productivity spillovers. Second, empirical evidence suggests that investment promotion leads to higher FDI inflows in developing countries where it alleviates information asymmetries and burdensome bureaucratic procedures faced by foreign investors (Harding and Javorcik, 2011).[2]

[2] Harding and Javorcik (2011) used the same data to examine the effects of investment promotion on FDI inflows.

True to the title of the paper, our analysis first focuses on the revealed comparative advantage (RCA) index, introduced by Balassa (1965), and finds that products belonging to sectors prioritized by IPAs experience an increase in their RCA by about 14%. We then focus on the value of exports, which remains our outcome of interest throughout the rest of the paper, and show that products belonging to sectors targeted by IPAs see an 11% increase in their exports.

The credibility of our analysis hinges on the choice of priority sectors not being influenced by the pre-existing export structure or any factors that may influence future exports. Therefore, we consider this issue carefully. First, we show that our results are robust to excluding from the analysis countries that chose their priority sectors based on the past success or the lack thereof in attracting FDI inflows (given our belief that FDI inflows affect exports). Second, we conduct an event-study analysis and show that the effects of investment promotion are not felt until two years after targeting begins. There is also no indication of exports surging in sectors that will be chosen as priority sectors in the future. Third, we estimate a more demanding empirical specification that allows for *arbitrary sector-country-specific shocks* that might have made targeting of a particular sector by a given country in a given year more attractive than targeting another sector. We are able to do so by asking a more nuanced question: is investment promotion more effective at influencing exports of capital-intensive products or products relying on inputs that require relationship-specific investments? The answer is again affirmative. The results suggest that products with above-median capital-intensity see their exports increase by almost 13% more than other products as a result of investment promotion efforts. For products intensive in inputs that require relationship-specific investments, the corresponding magnitude is 18%. This finding is intuitive, as one would expect that the deeper pockets of multinational companies and their global sourcing networks make it easier for them to engage in production of such products. Finally, we use the instrumental variable approach by relying on the belief that countries will respond to actions of other countries when it comes to the choice of priority sectors. Therefore, we instrument for the priority status of a sector with the share of countries (excluding the country in question) that awarded priority status to this sector. Acemoglu et al. (2019) and Arezki

They tested whether sectors explicitly targeted by IPAs in their efforts to attract FDI received more investment in the post-targeting period, relative to the pre-targeting period and non-targeted sectors. Their difference-in-differences analysis controlled for unobservable heterogeneity at the country-sector level, country-year level and sector-year level. Their results were consistent with investment promotion leading to higher FDI flows in developing countries but not in industrialized economies.

et al. (2019) use similar strategies. Our instrument produces a strong first stage and second-stage estimates that are almost identical to the baseline findings.

In sum, our analysis suggests that investment promotion policies can affect the export structure of developing economies. This finding is consistent with trade theories emphasizing that comparative advantages and specialization patterns are inherently dynamic, with technological improvements (which in the context of this study materialize due to FDI inflows) playing a key role in their changes over time (Redding, 1999, 2002; Eaton and Kortum, 2002). It suggests that public policy can facilitate such a change through the removal of frictions, such as FDI promotion policies in the case of information asymmetries and red tape. However, the analysis does not suggest that governments have been successful at "picking winners" or should be encouraged to do so. The changes in the export structure appear to be rather more of a by-product of investment promotion policies.

Our paper is related to two strands of the existing literature. The first strand is the large empirical literature investigating the role of various sources of comparative advantage, including factor endowments (Bombardini et al., 2012; Harrigan, 1997; Romalis, 2004), institutions (Levchenko, 2007; Nunn, 2007), financial development (Beck, 2002; Manova, 2008; Ju and Wei, 2011; Manova, 2013) and geography (Harrigan, 2010). We contribute to this literature by showing how a concrete policy tool could affect the future export structure. This supply side policy may affect RCA through product quality improvements (Harding and Javorcik, 2012) or capital deepening (Harding and Javorcik, 2011). Our results are in line with the model of Sutton and Trefler (2016), which for low and intermediate levels of GDP per capita predicts a positive relationship between quality and global market shares within industries. The Heckscher-Ohlin model has a similar prediction for capital deepening (Leamer, 1984; Schott, 2003; Sutton and Trefler, 2016).

The second strand is the literature documenting knowledge transfer from multinational firms to their foreign affiliates (Arnold and Javorcik, 2009; Javorcik and Poelhekke, 2017), productivity spillovers from FDI (Javorcik, 2004; Gorg and Greenaway, 2004), FDI externalities related to knowledge about export markets (Aitken et al., 1997), and the relationship between FDI and export upgrading (Swenson, 2008; Harding and Javorcik, 2012; Javorcik et al., 2017). While these studies have examined mostly single countries, our study focuses on a large number of economies and shows that the impact of FDI inflows is visible at the macro level. Harding and Javorcik (2012)

use the same data set as this study to examine the relationship between FDI and unit values of exports.

The paper is structured as follows. Section 2 describes the data. The empirical strategy is presented in section 3. Section 4 presents graphical evidence comparing the RCA evolution of products between targeted and non-targeted sectors. The baseline results are reported in section 5 and the sensitivity checks in section 6. Section 7 presents the conclusions.

2 Data

2.1 Trade data

In this paper, we make use of COMTRADE export data recorded at the level of a country, year and 4-digit SITC Rev. 2 product for the period 1984-2006. In the econometric analysis, our dependent variable is defined as either the RCA index or the log of export volume. The RCA index, introduced by Balassa (1965), is defined as follows:

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

where X_{pct} and X_{pt}^{World} denote the value of product p exported at time t by country c and the world, respectively, while X_{ct} and X_{t}^{World} represent total exports from country c and the world at time t. We focus on all country-product-year observations with positive export flows, thus discarding zero flows. However, as we will show, our main results are robust to including zero flows.

2.2 Investment promotion data

The purpose of investment promotion activities is to attract FDI inflows to a particular country or location within a country. Such activities encompass: advertising, investment seminars and missions, participation in trade shows and exhibitions, distribution of literature, one-to-one direct marketing efforts, facilitating visits of prospective investors, matching prospective investors with local partners, help with obtaining permits and approvals, preparing project proposals, conducting feasibility studies and servicing investors whose projects have already become operational.

Investment promotion activities can be grouped into four areas: (i) national image building, (ii) investment generation, (iii) investor servicing, and (iv) policy advocacy. Image building activities aim to build a perception of the country as an attractive location for FDI. Investment generation involves identifying potential investors who may be interested in establishing a presence in the country, developing a strategy to contact them and starting a dialogue with the purpose of having them commit to an investment project. Investor servicing involves assisting committed investors in analyzing business opportunities, obtaining permits and approvals for establishing a business in the host country and maintaining business operations. Policy advocacy encompasses initiatives aiming to improve the quality of the investment climate and identifying the views of private sector in this area.

Investment promotion practitioners believe that the most effective way of attracting FDI is to focus on a few priority sectors (so called targeting) rather than attempt to attract all types of foreign investors (Loewendahl, 2001; Proksch, 2004). Thus, an agency not engaged in targeting will promote its country as a good place to do business, while an IPA targeting particular sectors will emphasize why its country is an ideal location for investors operating in these industries. Similarly, the former IPA will attend many different types of fairs and conferences, while the latter will present only at events specific to the industries it aims to attract. The idea behind targeting is that a more focused message tailored and delivered to a narrow audience will be more effective than general investment promotion activities.

Building on this view, in our analysis the explanatory variable of interest captures sector targeting practices undertaken by national IPAs. Information on which sectors the agencies have targeted as well as when the targeting started and stopped was collected in the 2005 World Bank Census of Investment Promotion Agencies.[3]

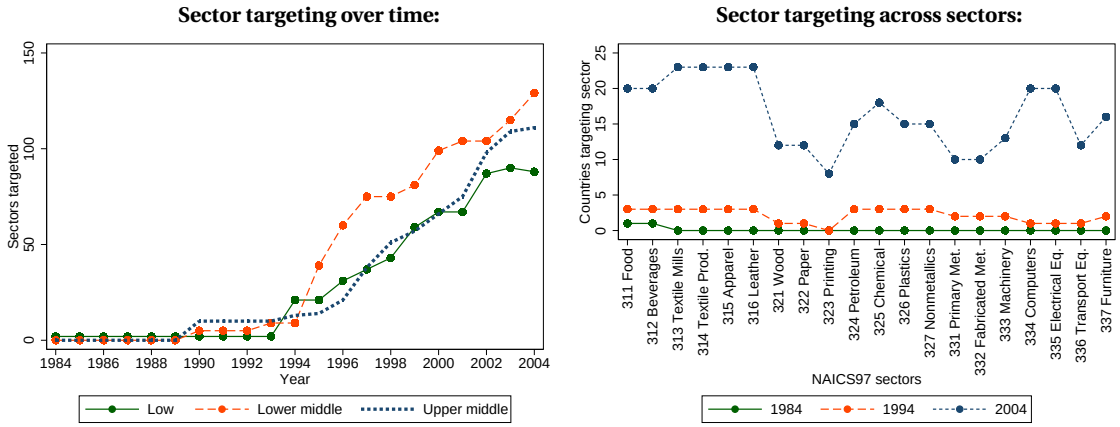
Investment promotion data are available at the country and 3-digit NAICS level over the period 1980-2004, which means that specifications with two-year lags of the targeting variable allow

[3]The Census was conducted by a team led by Harding and Javorcik, while both were employed by the World Bank. The effort took two years and covered all countries that had a national investment agency. The Census took a form of an email questionnaire that was followed up with multiple phone calls to obtain detailed information on the choice of targeted sectors and the timing of the targeting efforts. Each respondent country was presented with a list of sectors to standardize the responses, though respondents were able to refine the list by writing in descriptions of sectors that were relevant to their promotion efforts. The Census data have been used by Harding and Javorcik (2011) who tested the effectiveness of IPAs' targeting in increasing FDI inflows and by Harding and Javorcik (2012) who exploited the dataset to investigate the impact of targeting on export upgrading.

us to analyse trade data up to 2006. Figure 1 shows how sector targeting varies over time and sectors in our sample. The left panel shows that few sectors were targeted in the 1980s and early 1990s. From the mid-1990s, countries in all three income groups (low, lower middle and upper middle) were increasingly engaged in sector targeting. The right panel shows variation in sector targeting across the 20 NAICS manufacturing sectors. Production of textiles, clothing and leather as well as electrical equipment and computers are particularly popular as targeting choices.

The use of the data on FDI targeting instead of FDI inflows allows us to exploit the country-sector-time dimension. Such level of disaggregation is not available in FDI inflow statistics for global FDI flows. The use of targeting data also helps us mitigate the endogeneity concerns that arises in the analysis of the FDI-export nexus.[4] Finally, using these data allows us to assess the importance of FDI promotion as a policy tool available to governments interested in influencing the export performance of their countries.

Figure 1: Sector targeting



Notes: The left panel shows the number of sectors targeted per income group in our sample. We use World Bank's income group classification: low income, lower middle income and upper middle income. The right panel shows the number of countries in our sample targeting each of the 20 NAICS97 sectors at three different points in time.

2.3 Other data sources

To test whether the effect of promotion practices on comparative advantage differs across products we use two measures of product-level heterogeneity. The first captures product-level capital intensity, defined as ratio of the total real capital stock over output. The original data are avail-

[4] Of course, the choice of which sectors to target may also be endogenous. We will address this issue in our empirical strategy.

able from the NBER-CES Manufacturing Industry Database at the 6-digit 1997 NAICS level and are converted to the 4-digit SITC rev.2 level.[5] In the case of n:1 matches, we use the maximum value recorded over the period under study. For the purposes of our analysis, we define a dummy ($K\text{-}intensive_p$) taking on the value of one for products with capital intensity above the median value across all products, and zero otherwise.

The second measure reflects the proportion of intermediate inputs that require relationship-specific investments, i.e., inputs that are not sold on an organized exchange. This measure was compiled by Nunn (2007), who exploited the 1997 United States Input-Output Use Table and the product classification developed by Rauch (1999). It is available at the BEA's 1997 I-O industry classification and has been converted to the 4-digit SITC rev. 2 classification.[6] We define a dummy ($RS\text{-}intensive_p$) taking on the value of one for products with the indicator of input relationship-specificity above the median value across all products, and zero otherwise.

2.4 Final sample

Our sample consists of 77 low- and medium-income countries, identified on the basis of the 2011 World Bank country classification, for which the data are available. A complete list of the countries included in the analysis is reported in Table A.1 in the on-line Appendix. The matching between the trade data at the SITC 4-digit product level and the FDI targeting data at the sector level is done by exploiting the concordance table between the SITC Rev.2 and 1997 NAICS classifications.[7] Appendix Table A.2 reports the descriptive statistics for all variables used in the baseline regressions.

[5] The conversion is implemented by exploiting the correspondence table retrieved from the US import and export data that have been assembled by Robert Feenstra and are available at http://cid.econ.ucdavis.edu/usix.html

[6] The I-O codes have been converted to HS codes and then to SITC codes by exploiting the corresponding conversion tables made available by the BEA and the United Nations, respectively. When different I-O codes map into one SITC code we take the maximum value of the indicator. The conversion tables are available at https://www.bea.gov/industry/zip/NDN0317.zip and https://unstats.un.org/unsd/trade/classifications/correspondence-tables.asp

[7] The concordance is available at: http://www.nber.org/lipsey/sitc22.

3 Empirical Strategy

In our baseline analysis, we examine the relationship between FDI promotion activities and the RCA index or the export value. The value of exports is our preferred outcome variable, which will be used in all subsequent exercises, but in the baseline we find it useful to consider the RCA index as well, as it is a measure well understood by policy makers. We estimate the following model:

$$ExportOutcome_{pct} = \beta Targeted_{sct-k} + \alpha_{pc} + \alpha_{pt} + \alpha_{ct} + \mu_{pct} \quad (1)$$

where $ExportOutcome_{pct}$ denotes either the Balassa RCA index (RCA_{pct}) or logged exports $ln(X_{pct})$ of country *c* of 4-digit SITC product *p* in year *t*.[8] $Targeted_{sct}$ is a dummy variable taking the value of one if sector s, to which product p belongs, was a priority sector for the national IPA in country *c* at time *t-k* (where $k = 0, 1, 2$), and zero otherwise. In particular, we focus on the contemporaneous (*t*) or past (at time *t-1* and *t-2*) targeting activity, thus allowing for a delay in the policy impact. Product-time fixed effects, α_{pt}, are included to control for global demand and supply shocks, while product-country fixed effects, α_{pc}, are included to control for time-invariant country-determinants affecting the comparative advantage of a given product, such as, for instance, endowments or geography. The inclusion of country-year fixed effects, α_{ct}, controls for any economy-wide reforms or shocks influencing exports of all products.

Our empirical analysis relies on a difference-in-differences approach. The coefficient β captures the average difference in RCA (or exports) between targeted and non-targeted products in the post-targeting period relative to the pre-targeting years. Fixed effects capture any time-invariant difference in RCA (or exports) between products belonging to targeted versus non-targeted sectors (α_{pc}), as well as common global product-year-specific shocks potentially making the post-targeting period different from the pre-targeting period (α_{pt}).

As the dependent variable varies at the product level and the treatment $Targeted$ varies at the sector level, there may be a downward bias in the estimated standard errors due to potential existence of within-group correlation not being properly accounted for. In addition, the errors may be serial correlated. We therefore cluster standard errors at the country-sector level, as suggested by Bertrand et al. (2004).

[8] To exclude potential outliers, we trim the top and the bottom one percentile of the distribution of the RCA index.

As we will argue below, the choice of targeted sectors is unlikely to be endogenous to exports. Nevertheless, to deal with the possible endogeneity of sector targeting, our second empirical specification examines whether FDI promotion has a larger impact on exports of particular types of products within the targeted sectors. The two product dimensions we consider are capital intensity and reliance on inputs requiring relationship-specific investments. By focusing on the interaction term between a product characteristic and the indicator for targeted sectors, we are able to allow for *arbitrary country-sector-specific shocks* that might have made targeting of a particular sector by a given country in a given year more attractive than targeting of another sector. More precisely, in the case of capital intensity, our specification takes the following form:

$$ExportOutcome_{pct} = \delta Targeted_{sc\,t-k} * K\text{-}intensive_p + \eta_{sct} + \eta_{pt} + \epsilon_{pct} \tag{2}$$

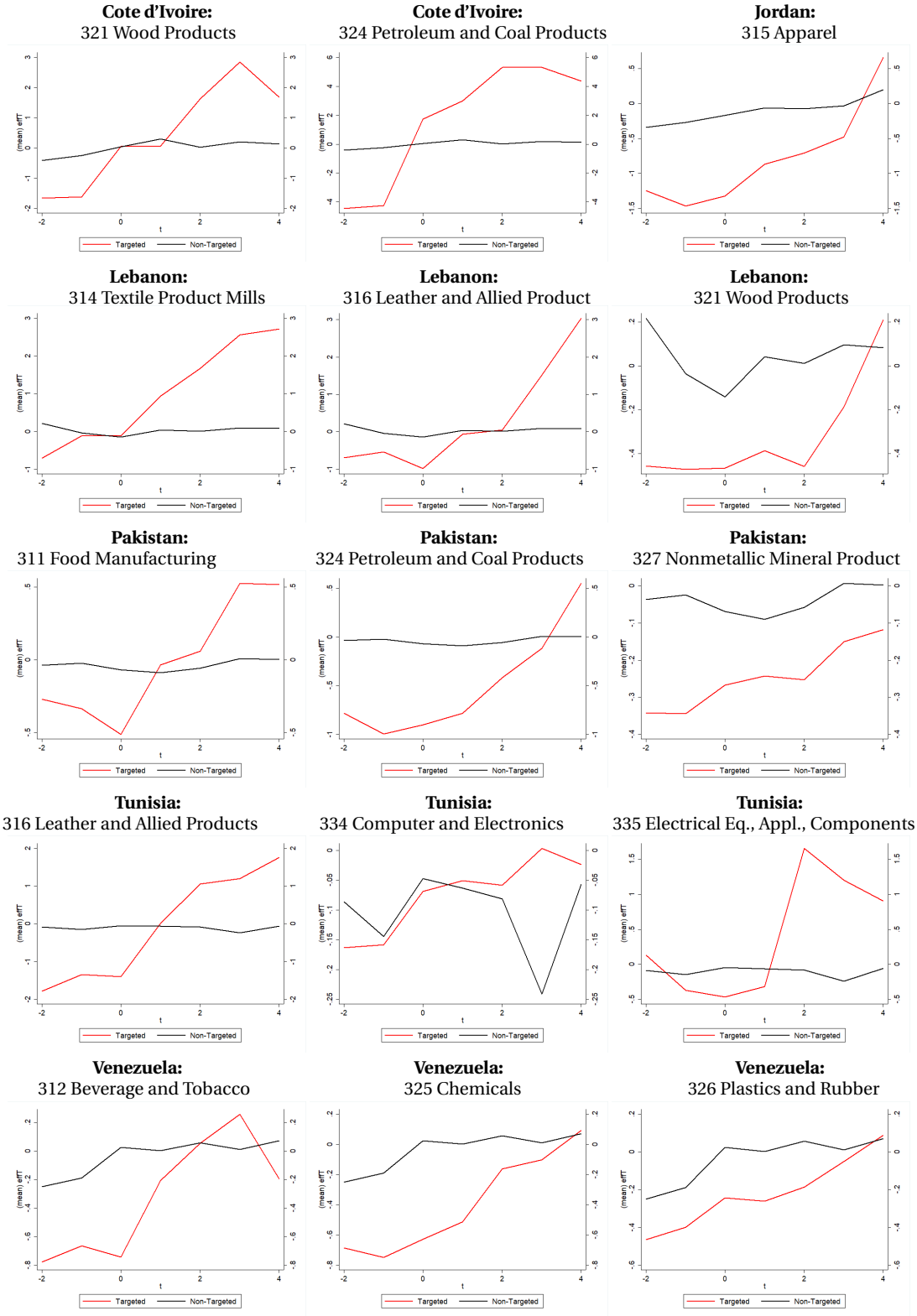
where η_{sct} is sector-country-year fixed effect, defined at the same level of aggregation as our $Targeted_{sct}$ variable. $K\text{-}intensive_p$ is an indicator variable taking on the value of one for products with capital intensity being above the median value across products, and zero otherwise. In the case of relationship-specific investments, the specification is analogous with the $RS\text{-}intensive_p$ indicator taking the value of one if the relationship specificity is higher than the median value across all products, and zero otherwise.

4 Graphical evidence

Figure 2 presents difference-in-differences graphs for a number of sectors in selected countries. We estimate the residuals from the regression presented in equation 1, where the $Targeted$ dummy, i.e., our treatment variable, is excluded. We then plot the mean residuals for products belonging to a particular targeted sector together with the mean residuals for products belonging to all non-targeted sectors in the same country. The year targeting starts is denoted by *t=0*. The graphs illustrate how the RCA of the targeted sectors take off around the implementation of targeting, although the lag structure varies across countries and sectors. Both targeted and non-targeted sectors appear to follow the trends in RCA before targeting starts, which is consistent

with the lack of correlation between past RCA and targeting presented in Table A.4 and discussed later in the paper.

Figure 2: Comparative advantage in targeted versus non-targeted sectors



Notes: Graphs show the coefficients estimated by regressing the RCA residuals on seven dummies denoting the timing of targeting. We consider 2 years before and 4 years after targeting starts. The year targeting starts (t=0) varies by country. For products belonging to non-targeted sectors, t takes the value of zero in the year the country starts targeting any sector. RCA residuals, which we use as dependent variable, are, in turn, obtained from a regression that is identical to equation 1, except for the targeted dummy being excluded.

5 Baseline estimates

Table 1 reports the results from estimation of equation (1).[9] Starting with the RCA index in columns 1-3, we find that sector-specific FDI promotion activities have a positive and statistically significant effect on revealed comparative advantage. This is true for both the current and the lagged values of the explanatory variable, with the coefficient very slightly increasing in the lag. In terms of magnitude of the effect, products belonging to sectors targeted by national investment promotion agencies see a 14% boost to their revealed comparative advantage. This finding reveals a sizeable influence of FDI promotion practices on trade patterns.

Table 1: Impact of investment promotion on comparative advantage

	RCA Index			**ln(X)**		
	(1)	(2)	(3)	(4)	(5)	(6)
Targeted t	**0.141***			**0.095***		
	[0.077]			[0.049]		
Targeted t-1		**0.146***			**0.098****	
		[0.075]			[0.049]	
Targeted t-2			**0.142***			**0.112****
			[0.075]			[0.048]
Observations	483 670	515 225	546 721	483 670	515 225	546 721
R-squared	0.635	0.63	0.625	0.826	0.825	0.825
Country-product FE	yes	yes	yes	yes	yes	yes
Product-year FE	yes	yes	yes	yes	yes	yes
Country-year FE	yes	yes	yes	yes	yes	yes

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

The coefficients on the targeting variables remain positive and statistically significant in columns 4-6, where the outcome variable is defined as logged exports. The magnitude of the estimates becomes larger as a longer lag is considered. It is also economically meaningful: products belonging to priority sectors see an 11% increase in their exports (based on column 6) relative to products in non-targeted sectors.

As a robustness check, we consider two alternatives to the standard RCA by following French (2017). More specifically, by estimating a model for bilateral trade flows we can compute the regression based index (RBI) and the gravity-based index (GBI) of comparative advantage. The former is obtained as the prediction of exporter-product-time fixed effects in a log-linear spec-

[9] Specifications with a lagged targeting variable allow us to include export data for additional years (2005 and 2006), hence the higher number of observations. Recall that the information on targeting practices is only available until 2004.

ification that also controls for importer-product-time fixed effects and exporter-importer-time fixed effects. The latter is obtained as the prediction of exporter-product-time fixed effects in a Poisson pseudo-maximum likelihood estimation that again controls for importer-product-time fixed effects and exporter-importer-time fixed effects. These alternative measures are computed both considering bilateral trade flows of all countries and just focusing on bilateral trade flows of low and middle income exporters.[10] The results, presented in Appendix Table A.3, confirm our baseline findings when we consider both RBI and GBI as dependent variables.

6 Addressing potential endogeneity

The three sets of fixed effects discussed above go a long way in controlling for potential omitted variable bias in our estimation. However, they do not necessarily control for a bias caused by potential simultaneity between targeting and comparative advantage. Therefore, 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 types of production not carried out before by the country. In particular, IPAs may focus on activities 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 their economy and where the absorptive capacity needed to take advantage of the inflows of foreign investments exists, thus strengthening an already established strong position.

In order to explore the possible existence of reverse causality in a rigorous way we follow several strategies. First, we check whether the pre-existing country trade specialization predicts the IPAs' targeting decisions. We do so by regressing the sector targeting indicator, $Targeted$, of country c and NAICS sector s in year t on the lagged exports and revealed comparative advantage at the sector level. The latter is defined as either (i) the RCA index computed directly at sector

[10] In all cases, zero flows are excluded as their inclusion would make the model estimation computationally demanding.

level; (ii) and the weighted average of RCA indices across all the SITC products p belonging to sector s in year t. We test for the first and second lag of the sector-level RCA and export measures. We control for country-sector, country-year and sector-year fixed effects. The results, which are displayed in Appendix Table A.4, 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. In other words, IPAs' targeting practices do not seem to be driven by the previous evolution of the RCA and exports of the sectors.

Second, we re-estimate equation (1) but exclude countries which reported in the IPA Census that their choice of priority sectors was based on (i) prior success in attracting FDI to the sector; (ii) past lack of success in attracting FDI to the sector; and both (i) and (ii). The estimation results, presented in Table 2 for the logged export value, confirm our earlier findings.[11] The variables of interest are positive and statistically significant in all specifications. The estimated magnitudes are similar to those found in the baseline specification.

Table 2: Sub-samples excluding potentially endogenous targeting decisions

	Excluding countries where the choice of targeting was driven by:								
	PAST SUCCESS in attracting FDI			**PAST FAILURE to attract FDI**			**either PAST SUCCESS or FAILURE to attract FDI**		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Targeted t	**0.139****			**0.086***			**0.119****		
	[0.063]			[0.047]			[0.057]		
Targeted t-1		**0.155****			**0.086***			**0.135****	
		[0.064]			[0.048]			[0.059]	
Targeted t-2			**0.160****			**0.102****			**0.141****
			[0.064]			[0.048]			[0.061]
Observations	388,636	414,009	439,250	446,591	475,382	504,158	364,449	387,676	410,807
R-squared	0.825	0.825	0.824	0.815	0.815	0.814	0.825	0.824	0.824
Country-product FE	yes	yes	yes	yes	yes	yes	yes	yes	yes
Product-year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes
Country-year FE	yes	yes	yes	yes	yes	yes	yes	yes	yes

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level.
The dependent variable is the logged export value.
Standard errors, reported in brackets, are clustered by country-sector.

Third, we conduct an event study where we trace the impact of investment promotion on exports relative to the *year before targeting starts.* Thus our sample includes products belonging to targeted sectors observed between three years prior to and four years after the policy intervention. All observations for non-targeted products are included. The specification includes

[11] Results for the RCA index mimic the ones presented in the paper.

indicator variables denoting each period with respect to the policy intervention, with the *year before targeting starts* being the omitted category. As visible from the left panel of Table 3, the impact of investment promotion efforts on exports becomes positive and statistically significant two years after the policy intervention begins and its magnitude grows with time. There is no indication that products belonging to sectors that will be targeted in the future register an increase in exports prior their sector being chosen as priority. In right panel of the same table, we repeat the exercise but require the non targeted country-sector pairs to be observed at least for a 7-year time span. The conclusions remain the same, and the magnitude and the significance level of the impact of investment promotion efforts on exports increase.

Table 3: Event-study analysis

	All Non Targeted Country-Sector Pairs	**Balanced sample of Non Targeted Country-Sector Pairs**
	(1)	(2)
t-3	-0.021	-0.019
	[0.043]	[0.056]
t-2	-0.019	-0.005
	[0.032]	[0.041]
t-1	*Omitted category*	*Omitted category*
t =0	0.038	0.051
	[0.029]	[0.039]
t+1	0.028	0.026
	[0.036]	[0.042]
t+2	**0.087***	**0.103***
	[0.048]	[0.053]
t+3	**0.106***	**0.125****
	[0.055]	[0.058]
Observations	405,348	393,162
R-squared	0.841	0.837

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level.
The dependent variable is the logged export value.
Standard errors, reported in brackets, are clustered by country-sector.
The data cover the period [t-3,t+3] for targeted sectors and all periods for non targeted ones.
The right hand side panel focuses on the balanced sample of non targeted country-sector pairs.

These three exercises give us confidence that endogeneity of sector targeting is not affecting our conclusions. Nevertheless, we take the possible endogeneity seriously and proceed to address it in two ways.

First, we estimate equation (2), which allows us to control for unobservables specific to sector-country-year cells that may be driving the choice of priority sectors in a given country in a given time period. The inclusion of sector-country-year fixed effects precludes us from examining the average impact of targeting across products (as the $Targeted$ variable varies at the sector-country-year level). Instead, we ask whether the impact of investment promotion policies was different for capital-intensive products or products relying on inputs requiring relationship specific investments, as compared to other products in the targeted sectors.

Table 4: The IPA's targeting practices and RCA of capital intensive and relationship-specificity intensive products

	Baseline sample						**Including 0s**					
	Capital Intensity			**Relationship Specificity**			**Capital Intensity**			**Relationship Specificity**		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Targeted$_t$*D^{High}	**0.120****			**0.166***			**0.121****			**0.212****		
	[0.059]			[0.088]			[0.058]			[0.092]		
Targeted$_{t-1}$*D^{High}		**0.115***			**0.175****			**0.124****			**0.226****	
		[0.059]			[0.087]			[0.058]			[0.091]	
Targeted$_{t-2}$*D^{High}			**0.130****			**0.181****			**0.141****			**0.230*****
			[0.059]			[0.085]			[0.059]			[0.088]
Observations	476,266	507,017	537,717	479,140	510,293	541,365	848,628	891,415	934,108	855,234	898,492	941,661
R-squared	0.678	0.681	0.684	0.676	0.679	0.682	0.727	0.730	0.733	0.728	0.731	0.734
Country-Sector-Time FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Product-Time FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level.
The dependent variable is the logged export value.
Standard errors, reported in brackets, are clustered by country-sector.

As visible from the left Panel of Table 4, this was indeed the case. Starting with capital-intensive products, we find that the interaction terms of interest are positive and statistically significant in all specifications. The estimated effects are also economically meaningful. As a result of investment promotion efforts, products with above-median capital-intensity experience a 13% larger increase in exports than the other products in the targeted sectors (column 3). Moving on to products relying on inputs that require relationship-specific investments, we again find that the interaction terms bear positive and statistically significant coefficients in all three regressions. The magnitudes are also plausible. They suggest that investment promotion efforts translate into an 18% higher effect on exports of products with high relationship specificity relative to other products in targeted sectors (column 6). Both these findings are in line with a large literature documenting that multinational companies and their global sourcing networks engage in production of sophisticated products and products that require technology transfers.

So far, we have focused on actual export flows. However, not all countries export all products and hence export statistics include a lot of zero export flows. In the right Panel of Table 4 we include cases of product p not being exported by country c in a given year.[12] We find positive and statistically significant coefficients in all 6 specifications. Both the magnitudes and the significance levels increase.

Table 5: Estimation with other countries' targeting choice as IV

	(1)	(2)	(3)
	Second stage		
Targeted t	**0.094***		
	[0.049]		
Targeted t-1		**0.099****	
		[0.049]	
Targeted t-2			**0.115****
			[0.048]
Observations	475,440	505,803	535,847
Country-product FE	yes	yes	yes
Product-year FE	yes	yes	yes
Country-year FE	yes	yes	yes
	First stage		
Share of countries targeting sector s at time t	-100.353***		
	[0.317]		
Share of countries targeting sector s at time t-1		-100.334***	
		[0.320]	
Share of countries targeting sector s at time t-2			-100.324***
			[0.324]
Observations	475,440	505,803	535,847
Shea	0.997	0.997	0.997
Ftest	99991	98024	95862
Country-product FE	yes	yes	yes
Product-year FE	yes	yes	yes
Country-year FE	yes	yes	yes

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level.
The dependent variable is the logged export value.
Standard errors, reported in brackets, are clustered by country-sector.

In our second and final exercise, we employ an instrumental variable (IV) approach. We believe that countries may choose their priority sectors based on actions of other countries. Some may follow what is considered "fashionable" within investment promotion circles, while other may target unpopular sectors in their belief that it will be easier to attract FDI in sectors where there is less competition from other agencies. We define our instrument as the share of countries

[12] We add one before taking the logs when we use the log of export values as the dependent variable.

targeting sector s at time t (excluding the country in question).[13]

The first stage results, presented in the bottom panel of Table 5, suggest that our instrument is indeed a good predictor of targeting choices. Specifically, it seems that, conditional on products' attractiveness captured by product-year fixed effects, countries will prefer to target sectors where there is less competition from other agencies. The estimated coefficients associated to the instrument are statistically significant and the F-statistics are very large. More importantly, the second stage estimates presented in the top panel of Table 5 are almost identical to those found in the baseline analysis.

In sum, all of the exercises presented in this section boost our confidence in the findings that investment promotion efforts have a positive impact on exports originating in targeted sectors.

7 Conclusions

This paper highlights the potential of FDI promotion as a policy tool governments of developing countries can exploit in order to foster comparative advantage in a given product category and thus influence the country's future trade pattern. We find a positive and statistically significant relationship between FDI promotion activities and exports of products belonging to the sectors targeted by national investment promotion agencies.

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

It is worth noting that we are not suggesting offering tax breaks or subsidies to foreign investors because we do not believe that such policies are effective at attracting foreign investors or worthwhile. Rather we are suggesting engaging in investment promotion efforts aimed at reducing the costs of FDI by providing information on business conditions and helping foreign investors deal with bureaucratic procedures. And because this type of investment promotion

[13] Our IV-strategy is similar to the strategies of Acemoglu et al. (2019), who use regional democratization waves as an IV for democracy, and Arezki et al. (2019), who instrument a country's market orientation with the market orientation of neighbouring countries. The instrument we exploit is also supported by Buera et al. (2011) who find that policy makers are influenced by the policy choices of neighbours regarding market-oriented policies.

does not involve large outlays and (unlike most industrial policies) does not introduce distortions, there is little downside to it. The worst thing that can happen is that no FDI will come.

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On-line Appendix

A Tables

Table A.1: List of countries

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

Table A.2: Descriptive Statistics

Variable	Obs	Mean	SD	Min	Max
RCA	483,670	1.234	3.733	0.000	40.425
ln(X_{cpt})	483,670	4.999	3.115	-6.908	17.659
Targeted	483,670	0.105	0.307	0	1
K−intensive	473,472	0.684	0.338	0.150	2.234
D^{High} K−intensive	473,472	1	0.500	0	1
RS−intensive	476,302	0.899	0.150	0.096	1.000
D^{High} RS−intensive	476,302	1	0.483	0	1

$K\text{-}intensive$ and $RS\text{-}intensive$ denote the product level measures of capital intensity and of the proportion of inputs requiring relationship-specific investments, respectively. D^{High} $K\text{-}intensive$ and D^{High} $RS\text{-}intensive$ are instead the corresponding dummies equal to 1 if the SITC product p's indicator of capital intensity and relationship specificity is higher than the median value across products.

Table A.3: GBI or RBI computed as in French (2017) as dependent variable

	GBI computed on bilateral trade flows of All Exporters			GBI computed on bilateral trade flows of Low and Middle Income Exporters		
Targeted t	**0.070***			0.061		
	[0.042]			[0.044]		
Targeted t-1		**0.091****			**0.078***	
		[0.041]			[0.044]	
Targeted t-2			**0.104*****			**0.094****
			[0.040]			[0.042]
Observations	358 265	385 315	412 233	343 043	369 744	396 373
R-squared	0.705	0.709	0.712	0.699	0.628	0.637
Country-product FE	yes	yes	yes	yes	yes	yes
Product-year FE	yes	yes	yes	yes	yes	yes
Country-year FE	yes	yes	yes	yes	yes	yes

	RBI computed on bilateral trade flows of All Exporters			RBI computed on bilateral trade flows of Low and Middle Income Exporters		
Targeted t	**0.056***			**0.053***		
	[0.029]			[0.029]		
Targeted t-1		**0.071****			**0.068****	
		[0.030]			[0.029]	
Targeted t-2			**0.101*****			**0.107*****
			[0.031]			[0.030]
Observations	358 265	385 315	412 233	343 043	369 744	396 373
R-squared	0.689	0.682	0.675	0.614	0.61	0.606
Country-product FE	yes	yes	yes	yes	yes	yes
Product-year FE	yes	yes	yes	yes	yes	yes
Country-year FE	yes	yes	yes	yes	yes	yes

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level. Standard errors, reported in brackets, are clustered by country-sector.
0s are excluded from all models.

Table A.4: Does comparative advantage predict IPAs' targeting practices?

	RCA Index at sector level		**Weighted average of RCA Index across products**		**ln(X) at sector level**	
	(1)	(2)	(3)	(4)	(5)	(6)
RCA t-1	0.002		0.000		0.002	
	[0.001]		[0.000]		[0.002]	
RCA t-2		0.002		0.000		0.001
		[0.002]		[0.000]		[0.002]
Observations	24 630	23 260	25 192	23 798	25 005	23 622
R-squared	0.804	0.811	0.803	0.810	0.805	0.812
Country-sector FE	yes	yes	yes	yes	yes	yes
Sector-year FE	yes	yes	yes	yes	yes	yes
Country-year FE	yes	yes	yes	yes	yes	yes

* Significant at 10% level; ** significant at 5% level; *** significant at 1% level. Standard errors, reported in brackets, are clustered by country-sector.
In columns 1-2, RCA Index is computed at 3-digit NAICS level.
In columns 3-4, the weighted average of product-specific RCA Indices within a 3-digit NAICS sector is used. Export shares of a given product in the total sectoral exports are used as weights.
In columns 5-6, a logged value of the measure from columns 3-4 is used.