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Working Paper

Information Frictions, Investment Promotion, and Multinational Production: Firm-Level Evidence

CESifo Working Paper, No. 9043

Provided in Cooperation with:

Ifo Institute – Leibniz Institute for Economic Research at the University of Munich

Suggested Citation: Carballo, Jerónimo; Marra de Artiñano, Ignacio; Volpe Martincus, Christian (2021) : Information Frictions, Investment Promotion, and Multinational Production: Firm-Level Evidence, CESifo Working Paper, No. 9043, Center for Economic Studies and Ifo Institute (CESifo), Munich

This Version is available at:

<https://hdl.handle.net/10419/235413>

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Impressum:

CESifo Working Papers

ISSN 2364-1428 (electronic version)

Publisher and distributor: Munich Society for the Promotion of Economic Research - CESifo GmbH

The international platform of Ludwigs-Maximilians University's Center for Economic Studies and the ifo Institute

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Editor: Clemens Fuest

<https://www.cesifo.org/en/wp>

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Information Frictions, Investment Promotion, and Multinational Production: Firm-Level Evidence

Abstract

While countries make use of a wide range of policies to attract multinational firms, identifying the effect of such policies is difficult. Combining firm-level data on both the location of these firms' foreign affiliates and detailed service-specific information from Costa Rica's investment promotion agency (IPA) over time, we find that IPA support significantly increases the probability that a multinational firm establishes its first affiliate in the country, but has generally no impact on the expansion of its presence thereafter. We then show that this effect is primarily driven by the resolution of information asymmetries. It is stronger for IPA information services and on multinational firms from countries and in sectors facing more severe information frictions.

JEL-Codes: F230, F130, F140, L230, L250, L520, O250.

Keywords: information frictions, investment promotion, multinational production.

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This version: April 2021

This paper was originally circulated under the title “Multinational Production and ‘Soft’ Industrial Policies” (IDB Working Paper 1106). We would like to thank Carlos Salamanca Malagon and Matthew Hurt for their excellent research assistance and Sandro Zolezzi and Lourdes Arana Flores for generously helping us build the dataset used in this paper. We are also grateful to Roberto Álvarez, Lorenzo Caliendo, Peter Egger, Beata Javorcik, Magnus Lodefalk, Rick Mansfield, Thierry Mayer, Alejandro Micco, Ariell Reshef, Peter Schott, Rodrigo Wagner, Andrés Zahler, and participants at a seminar at Universidad Diego Portales, a seminar at Universidad de Chile, the European Trade Study Group Conference, the RIDGE Workshop on Trade and Firm Dynamics, the Economics Seminar at the University of Maastricht, the Ljubljana Empirical Trade Conference, the ELSNIT Conference on Trade and Investment Promotion, the CEPR-EBRD Conference on Industrial Policy, and the CESifo Global Economy Conference. The views and interpretations in this paper are strictly those of the authors and should not be attributed to the Inter-American Development Bank, its executive directors, its member countries, or CINDE. Other usual disclaimers also apply.

1. Introduction

Multinational production —i.e., the production that is carried out by firms outside of their home country — accounts for a large share of global economic activity.¹ The extensive margin accounts for a large share of the variation of this production across countries and is responsible for most of given multinational firms’ expansion over time (see Ramondo et al., 2015; and Garetto et al., 2019). Governments around the world have resorted to different policies to attract these multinational firms. One of these policies is *investment promotion* —a public intervention designed to reduce information frictions that does neither distort prices nor involve direct financial support—. ² Despite being ubiquitous, rigorous microeconomic evaluations of the causal impacts of this policy are virtually nonexistent. In this paper, we precisely examine whether and how investment promotion affects multinational firms’ location decisions and the spatial patterns of multinational production’s extensive margin. In so doing, we use a unique firm-level dataset over a long period of time that combines firm-level data on *both* location decisions and policy assistance status.

Gravity factors, in general, and trade costs, in particular, influence the level of multinational production and especially its extensive margin (see, e.g., Head and Mayer, 2004; Ramondo, 2014). Despite progress in information and communication technologies, information barriers are still an important component of these costs and, as such, a major determinant of the geography of this production (see, e.g., Oldenski, 2012; Keller and Yeaple, 2013; Allen, 2014; Ramondo et al., 2015; Alfaro and Chen, 2018). This is particularly true in the current economic environment characterized by trade disputes and the pandemic, which are reshaping of global value chains due to increased uncertainty (see, e.g., Baldwin and Evenett, 2020; and Fajgelbaum et al., 2020).

More specifically, firms seeking to invest abroad must learn about the regulations that need to be complied with and the costs and specific conditions implied when establishing and operating in the destination country. Information in these regards can be highly incomplete and gathering it can be very costly, especially in less popular or far away destinations. For instance, in Costa Rica, the country we focus on in this paper, each topic-specific study for a given possible location or establishment costs between US\$ 5,000 and US\$ 10,000.³ As a result, multinational firms may end up considering a

¹ Thus, sales from foreign affiliates amount to approximately 40% of global GDP (see UNCTAD, 2018).

² Other policies include incentives to foreign firms in the form of income tax holidays, tariff exemptions, and subsidies for infrastructure, not infrequently combined under free zone regimes. Unlike investment promotion, these kinds of interventions imply deviations from policy neutrality and that create price distortions (see Harrison and Rodriguez-Clare, 2010).

³ These figures come from a market study conducted by Costa Rica’s national investment promotion agency. Examples of these studies are reports on tax incentives, tailored simulations of profits and losses, and surveys to relevant firms established in the country based on interviews to senior managers, etc.

small range of locations and disregard several potentially convenient alternatives (see Loewendahl, 2018).⁴

Nearly all countries have established dedicated organizations, the so-called Investment Promotion Agencies (IPAs), whose activities aim at attracting multinational firms by precisely lowering information barriers. IPAs primarily provide these firms with a series of information and other support services (see, e.g., Alfaro and Charlton, 2007; and Harding and Javorcik, 2011; and Volpe Martincus and Sztajerowska, 2019).

In this paper, we address two main questions: (i) What is the impact of investment promotion on the likelihood that multinational firms establish an affiliate in a country? (ii) What are the mechanisms behind the observed effects? More specifically, are these effects consistent with an information reduction mechanism —i.e., larger for IPAs' information services and firms from home countries or active in sectors facing more severe information frictions—?

In answering these questions, we use a rich dataset that combines data on the worldwide distribution of multinational firms' foreign affiliates including information on the country, the main sector, and the year of establishment for both each parent firm and each of its affiliates; and data on Costa Rica's IPA assistance to multinational firms that specify the activity through which the support actually took place and the associated costs over the period 2000–2016.

These data allow us to observe, for the first time to our knowledge, all four possible combinations of policy treatments and outcomes: assisted multinational firms that locate in the host country in a given year, assisted multinational firms that never locate in the host country, non-assisted multinational firms that locate in the host country in a given year, and non-assisted multinational firms that never locate in the host country.

In order to identify the effects of investment promotion on these firms' location decisions, we first apply a difference-in-differences (DID) strategy. In particular, our baseline specification relates a firm-level binary indicator of affiliate establishment with a firm-level binary indicator of IPA assistance, along with multiple firm-level covariates that capture size and geography of network of affiliates, and firm fixed effects and home country-sector-year fixed effects. Estimates of this specification indicate that investment promotion has been effective in attracting new multinational firms to Costa Rica. In contrast, the IPA's assistance does not seem to have generally affected firms' reinvestment decisions —as measured through the opening of subsequent affiliates—. It only makes a difference when several years have elapsed from the previous establishment and thus

⁴ Given its virtual non-excludability and its non-rivalry use, gathered information can spillover to other firms, thus generating free riding. These externalities are typically not included in the multinational firms' private assessment of the costs and benefits associated with doing business overseas and investing abroad and could provide a rationale for public intervention (see Blyde et al., 2014).

installation-specific information originally provided is likely to have depreciated due to changes in the business environment. Taken together, these results suggest that investment promotion would operate by reducing information-related, location-specific fixed costs associated with starting new firms and especially with opening a first affiliate in a country.

Admittedly, such an estimation approach does not allow to entirely rule out self-selection. To deal with this issue, we implement an instrumental variable strategy that exploits IPA's prioritization approach. More specifically, CINDE (Costa Rica's national investment promotion agency) targets large multinational firms, mainly from the United States (see Volpe Martincus and Sztajerowska, 2019). This firm-level targeting strategy relies on the use of external lists of companies. This is primarily the case with Fortune 1000 (F1000) list, which includes the 1,000 largest US firms by revenue in a specific year. We therefore instrument firms' investment promotion assistance status with a series of binary indicators that capture firms' contemporaneous and lagged membership to the F1000 list. The instrumental variables estimates confirm our baseline. In this regard, it is worth stressing that, while absolutely larger, the instrumental variables estimates are not significantly different from their OLS counterparts when the sample is restricted to include only multinational firms that are similar in size and received a similar level of assistance. Now, while the aforementioned instruments are strong predictors of IPA support, the validity of this identification strategy could be threatened by a potential violation of the exclusion restriction. Since variation comes primarily from changes in firms' membership into the F1000 list and these changes are driven by relative increases in firms' revenues, it might be argued that expanding firms that become part of the F1000 list will more probably open affiliates abroad, in general, and in Costa Rica, in particular, anyways, regardless of the IPA assistance.

However, the exclusion restriction is likely to be fulfilled. The reason is twofold. First, the baseline specification controls for the relevant determinants of multinational firms' geographical expansion identified in the literature (see, e.g., Antràs and Yeaple, 2013; Egger et al., 2014). This is particularly the case when we also account for firms' annual revenue—which is the sole variable used by Fortune to produce the list—as we do in the subsample for which we have data thereon. Using worldwide data on the location of multinational firms' affiliates over time, we consistently show that, conditional on the covariates and the benchmark fixed effects, the F1000 indicator does not directly affect the probability to establish an affiliate in more than 95% of the smaller economies (i.e., with GDP below US\$ 100 billion). In the specific case of Costa Rica, the F1000 indicator has a significant effect in the full sample (which corresponds to the reduced-form estimate) but a insignificant effect on such a probability when we exclude

the firms assisted by the national investment promotion agency.

Second, we exploit two sources of exogenous variation: the location of multinational firms' headquarters and firms' nature and accounting practices. Thus, non-US-based multinational firms whose performance in general and their revenue in particular are comparable to those of their US peers do not belong to the F1000 as this list only includes firms that are incorporated and operate in the United States and file financial statements with US government agencies. In this regard, it should be noted that our baseline specification includes time-varying firm-level controls and firm and home country-sector-year fixed effects that account for differences in the propensity to locate in Costa Rica across similar parent firms based in different countries and operating in different sectors over time.

The nature of the firms (i.e., public firms which are required to submit financial statements vs. private firms which are not required to do so), reporting practices and rules (e.g., filing dates), and measurement errors can also play a significant role (see, e.g., Minnis and Shroff, 2017; Lisowsky and Minnis, 2020). Results from estimations suggest that multinational firms that have larger revenues *and* are public and submit their financial statements in the second semester of the year are more likely to be part of the F1000 list, even after controlling for the firm-level covariates and fixed effects in our baseline specification. This might be related to the facts that such statements, which are used as a key source for firms' revenues, are more readily available for public firms and that the list is compiled during the first semester of the subsequent year. Importantly, such differences in reporting practices are unlikely to be directly correlated with firms' decisions to locate in Costa Rica. From an economic point of view, besides being a proxy for size, membership in the Fortune lists is perceived as a mark of prestige (see, e.g., Meneghetti and Williams, 2017). Hence, the F1000 can be seen as a signalling mechanism that helps reduce the multidimensional information problem confronted by the IPAs when selecting the firms to prioritize. Conditional on the control variables, the effect of F1000 on firms' investment promotion assistance status can only come precisely from its signalling function.

In addition to the baseline DID and the instrumental variables estimations, we conduct two main exercises that aim at providing further support to a causal interpretation of our results. First, we take advantage of the detailed data stored in CINDE's information systems and distinguish assisted firms between those that initiated the contact (*reactive assistance*) and those that were approached by the agency (*proactive assistance*). The latter are typically selected based on variables that are either observable to us and accounted for by the covariates included in the baseline specification (e.g., firm's size) or controlled for by the array of fixed effects (e.g., sector of activity). Thus, given our

baseline specification, self-selection into investment promotion support can be considered to be a less severe issue for the latter firms (see Munch and Schaur, 2018). We find that *proactive assistance* has a positive and significant impact on attracting multinational firms whose magnitude is similar to that obtained in our benchmark estimation.

Second, we perform a more thorough assessment of the information cost mechanism using novel firm-level, program-specific data. If these information costs are the source of observed impacts, then we would expect the size of these impacts to vary with the type of assistance and the level of these costs. We accordingly examine whether effects are heterogeneous across different IPA services and different firms' home countries and sectors in a manner that is consistent with the severity of information incompleteness along these dimensions. Evidence indicates that the impacts are larger when firms are assisted in gathering relevant and accurate information on business conditions, in general, and installation-related matters, in particular, and these firms are from home countries or active in sectors that can be considered to face more severe information frictions.

Our study contributes to two main strands of the literature. First, a large number of papers examine the patterns, determinants, and implications of multinational production (see, e.g., Alfaro and Chen, 2014; Egger et al., 2014; Ramondo et al., 2015; Conconi et al., 2016; Alviarez, 2019; Garetto et al., 2019; Head and Mayer, 2019).⁵

We add to these papers by incorporating a public policy angle into the analysis. More specifically, we assess the role of investment promotion, a widely used firm-level policy aiming at lowering an important source of trade costs —information barriers— in shaping the geography of multinational production. Our findings highlight that this policy is a relevant determinant of multinational firms' spread over space and time. Thus, they suggest that quantitative frameworks for multinational production would benefit from incorporating more explicitly information frictions and policies aimed at reducing them.

Second, we complement a series of papers that evaluate the impact of investment promotion on foreign direct investment (FDI).⁶ Broadly speaking, these papers proxy such a policy through aggregate binary variables indicating either (i) the existence of an IPA or an IPA's office in the host or home country/city (see, e.g., Head et al., 1999;

⁵ Earlier contributions include Markusen (2002), Markusen and Maskus (2002), Yeaple (2003), Nunn and Trefler (2008), Antràs et al. (2009), Alfaro and Charlton (2009), Chen and Moore (2010), Antràs en Yeaple (2013), and Irarrazabal et al. (2013), among others.

⁶ Most of the papers in this literature use FDI as the outcome of interest. FDI is primarily a financial variable whose spatial distribution does not necessarily correspond to that of multinational production, especially across industries (see, e.g., Lipsey, 2007). Thus, while it actually implies a change in the extensive margin of such a production, the establishment of an affiliate in a country would not show up in the FDI statistics if it was financed with resources from local sources (see Ramondo et al., 2015).

Bobonis and Shatz, 2007; Hayakawa et al., 2014; and Ni et al., 2017) or (ii) whether specific sectors are targeted by the IPA (see, e.g., Alfaro and Charlton, 2007; Harding and Javorcik, 2011; and Crescenzi et al., 2019).⁷ For instance, in a pioneer paper which can be considered the reference in this literature, Harding and Javorcik (2011) use changing IPAs' sector targeting to identify the impact of investment promotion on FDI inflows. In so doing, they apply a difference-in-differences strategy on host country-sector-year data, while controlling for host country-sector, host country-year, and sector-year fixed effects. Their results indicate that sector prioritization has translated into an additional annual inflow of US\$ 17 million from the US for the median country-sector combination in 1990-2004.

We contribute to this literature in three main ways. First, we assess the effectiveness of public interventions specifically designed to attract multinational firms using firm-level data on *both* location decisions and assistance statuses.⁸ Using data at the level that the policy operates enables us to have a tighter identification strategy. Unlike studies based on aggregate data, we can include appropriate sets of fixed effects to account for unobserved time-varying country-sector and, in addition, unobserved time-invariant and observed time-varying firm-level factors that are relevant for the spatial distribution of multinational production and potentially correlated with investment promotion.

Second and related, taking advantage of our policy micro data, we examine whether investment promotion actually influences the firms' extensive margin of multinational production, which plays a major role in the expansion of this production. Importantly in this regard, we can distinguish between margins and estimate the specific impacts of investment promotion on the establishment of the first affiliate and on subsequent establishments (reinvestment) in a country. The severity of information barriers faced by multinational firms is likely to differ between these instances. Hence, the margin-specific estimations help inform the channels through which the policy intervention works, in general, and whether the effects are aligned with reduction of information frictions, in particular, thereby also contributing to their identification.

Third and further along these lines, we characterize the extensive margin of investment promotion policies (i.e., the number of supported firms) and explore potential heterogeneous effects of the different specific IPAs services and across groups of firms depending on the severity of information problems associated with their home coun-

⁷ Harding and Javorcik (2012) and Harding et al. (2019) exploit sectoral targeting to identify the effects of FDI on recipient countries' export quality and comparative advantage.

⁸ The virtual absence of evidence based on investment promotion data at the firm-level sharply contrasts with that on the effects of export promotion, a policy that also aims at reducing information-related trade costs but to make it easier for domestic firms to start selling and to expand their sales abroad instead of to facilitating the arrival of foreign firms (see, e.g., Volpe Martincus and Carballo, 2008, 2010; Cadot et al., 2015; van Biesebroeck et al., 2016; and Munch and Schaur, 2018).

tries or sectors. In so doing, we provide entirely new evidence on the underlying mechanisms of the effects, which also supports causal identification.

The remainder of this paper consists of four sections. Section 2 introduces the databases used in the empirical analysis and presents descriptive evidence. Section 3 explains the empirical strategy. Section 4 reports and discusses the estimation results, and Section 5 concludes.

2. Data and Descriptive Evidence

2.1. Data

To characterize the patterns and evolution of multinational production in Costa Rica we rely on three main databases: Dun and Bradstreet (DB)'s WorldBase and three databases which were kindly shared with us by CINDE.⁹

Our sample consists of all (global ultimate) parent firms that, at some point of the sample period, have at least one affiliate in a different country (i.e., roughly 200,000 firms as of 2016). For these multinational firms, the WorldBase furnishes us with data on home country, year of establishment, and sector of activity of the parent firm as well as data on location —i.e., host country—, year of establishment, and sector of activity for each of its affiliates.

Given that the coverage of WorldBase is not perfect in developing countries such as Costa Rica, we complement it using two database kindly shared by CINDE.¹⁰ The first database also provides us with data on parent firm, home country, sector of activity, and starting year for the foreign affiliates established in the country. The second database includes information on firms' revenues, nature (public vs private), financial statement filling date (quarter) from S&P Capital IQ. In addition, a third database provided by CINDE informs all firms in free trade zones. This allows us to identify foreign affiliates operating under such a regime.

In Costa Rica, the sole responsibility for national investment promotion has been assigned to CINDE. This IPA, whose unique mandate is precisely to promote inward FDI, has a sectoral focus in its promotional efforts and actively targets multinational firms from the United States —where the agency has its single overseas office—. ¹¹ Importantly, CINDE prioritizes investment projects of large foreign firms.

⁹ For details on how the WorldBase is constructed and its coverage and accuracy, see Alfaro and Chen (2012, 2014); DB (2019); and Carballo et al. (2020).

¹⁰ Our baseline estimation results are robust to considering only those multinational firms present in the WorldBase data. These results are available from the authors upon request.

¹¹ Priority sectors include various manufacturing activities; recycling; computer programming and related activities; research and experimental development in natural sciences and engineering; architectural, engineering and other technical activities; advertising; business activities; and higher education.

CINDE has a highly developed CRM (Customer Relationship Management) system that accurately tracks all these support activities (and their modalities) to individual firms since 2000 and the associated costs for the organization. This is precisely the information we use in our empirical analysis. In particular, CINDE has also kindly granted us access to the list of all multinational firms assisted by the agency each year over the period 2000–2016, the nature of the service (either reactive—initiated by the firm or proactive—initiated by the agency), the specific type of service, and the labor costs of each service.

As mentioned above, CINDE targets large firms. Exploiting the IPA’s institutional arrangements and following its own operational practices, we will proxy such firm prioritization with the Fortune 1000 list over the period—which are available on the web—.

The databases on multinational production, investment promotion assistance, and F1000 list have been merged using firms’ names. While these names generally differ in the databases, all assisted firms could be identified in the base of multinational firms after harmonizing their names and applying a fuzzy matching algorithm complemented with a clerical review of the resulting matches.¹²

2.2. *Descriptive Evidence*

Using these merged data, Columns 1-4 of Table 1 report the total number of multinational firms and that of their affiliates established in Costa Rica along with the total number of home countries and sectors of activity. The number of multinational firms located in Costa Rica more than doubled from 2000 to 2016 reaching 465.¹³ These firms from approximately 50 countries have more than 600 affiliates that are active in 141 4-digit ISIC sectors. Most multinational firms are headquartered in the United States, Panama, and the United Kingdom, and operate in the financial services (ISIC 64), wholesale trade (ISIC 46), and office administration, office support, and other business support activities (ISIC 82) sectors.

Column 5 of Table 1 presents the total annual number of multinational firms assisted by CINDE—i.e., regardless of whether they located or did not locate in the country—. Firms supported by CINDE grew significantly in these years. Their number increased

¹²For additional details on the matching procedure, see Carballo et al. (2020). It is worth stressing that our estimation results remain the same when the sample is restricted so that only perfect initial matches are considered. These estimation results are available from the authors upon request.

¹³This figure is comparable to that reported in Alfaro-Ureña et al. (2021) who use data from Costa Rica’s Central Bank.

from less than 10 at the beginning of the 2000s to more than 150 in most recent years.¹⁴ Out of these assistances, 20% correspond to F1000 firms (see Figure 1).

Figure 2 shows the number of multinational firms that opened their first affiliate in Costa Rica with CINDE's assistance relative to the total number of multinational firms present in the country in each year of the sample period. This figure seems to suggest that CINDE could have played an important role in sustaining and even strengthening the growth of the extensive margin of multinational production in Costa Rica. Overall, the contemporaneous conversion rate—as measured by the number of support instances that are associated with the establishment of a multinational firm in the same year—is 6.5%. This percentage drops to an average of 2.1% for the subsequent three years. Noteworthy, 20.1% of all establishments are linked to an assistance.

In promoting investment into Costa Rica, CINDE provides multinational firms with different services. These services can be grouped in two main categories: (i) *information services* through which CINDE supports firms in gathering specific information on local business conditions, in general, and the installation process, in particular;¹⁵ and (ii) *other services*, which include *procedural services* through which CINDE assists firm in completing relevant procedures and *human capital services* through which CINDE helps firms find and hire personnel.¹⁶ Importantly, these services to multinational firms are provided free of charge.

Columns 3 and 4 in the lower panel of Table 1 present the distribution of the firms' assistances between those for first establishment (i.e., multinational firms that were not previously established in Costa Rica) and for reinvestment (i.e., multinational firms that were already located in Costa Rica), whereas Columns 5-7 report the number of firms supported through information services both overall and for each specific location decision, respectively. On average, assistances for first establishment account for roughly 50% of the total number of firms working with CINDE every year and approximately 70% of these assistances for first establishment correspond to provision of relevant business data. The contemporary conversion rate is 10.5% for information services and lies below 4% for the other services.¹⁷

¹⁴As a percentage of the total number of multinational firms established in Costa Rica, it raised from approximately 4% in 2000–2003 to 30% in 2013–2016.

¹⁵Specific examples include participation and establishment of contacts with investors in sectoral fairs and exhibitions; reply to specific inquiries including analysis of raw data and production of market studies, tailored Gantt charts along with a detailed explanation of the installation process in a specific sector, simulations of expected profits and losses for concrete business models, and organization of meetings with potential clients, suppliers, and government officials to learn about specific prices and conditions.

¹⁶Specific examples include assistance for registration, acquisition of licenses and construction, health, and environmental permits -including scheduling of meetings with government officials-; and assistance to hire and programs to train their local personnel, respectively

¹⁷The results of CINDE's customer satisfaction survey in recent years provide further anecdotal support to the presumption that firms find information provision services especially useful.

In the next section, we explain our empirical approach to formally establish whether and, if so, how strong is the link between opening of affiliates and support from CINDE.

3. Empirical Methodology

We aim at estimating the effects of investment promotion assistance on multinational firms' decisions to establish an affiliate in the country. This requires to properly account for other relevant observed and unobserved factors that may affect both location decisions and use of investment promotion services such as multinational firms' size, changing countries' comparative advantages, time-varying, country pair- and sector-specific trade policies. In so doing, we use the following baseline general linear probability model:¹⁸

$$\mathbb{I}(E)_{\text{fhst}} = \sum_{k=0}^K \alpha_k \mathbb{I}(\text{IPA})_{\text{fhst}-k} + \sum_{j=1}^J \sum_{k=1}^K \beta_k^j X_{\text{fhst}-k}^j + \lambda_{\text{fhs}} + \rho_{\text{hst}} + \varepsilon_{\text{fhst}} \quad (1)$$

where $\mathbb{I}(E)_{\text{fhst}}$ is a binary indicator of either first establishment or expansion of a multinational firm in the country. More precisely, in the former case, the binary indicator takes the value of one if the (ultimate) parent firm f operating in sector s from home country h establishes its first affiliated firm in Costa Rica in year t and zero otherwise, whereas in the latter case it takes the value of one if the parent firm f operating in sector s from home country h opens an additional affiliated firm in the country in year t and zero otherwise.¹⁹ These dependent variables correspond to the extensive margin of multinational production. This is precisely the margin that accounts for the largest share of the variation in bilateral flows of multinational production and for most of multinational firms' growth (see Ramondo et al., 2015; and Garetto et al., 2019).²⁰

$\mathbb{I}(\text{IPA})_{\text{fhst}(-k)}$ is a binary indicator that takes the value of one if the parent firm f operating in sector s from home country h was assisted by the national investment promotion agency CINDE in year $t(-k)$ and zero otherwise, where $k \neq 0$ allows for non-contemporaneous supports to affect the outcome variable. The coefficient on $\mathbb{I}(\text{IPA})$, α , is accordingly our parameter of interest. If $\alpha > 0$ ($\alpha = 0$), then investment pro-

¹⁸While certainly not free from issues, we resort to the linear probability model to be able to include high dimensional fixed effects to account for relevant sources of unobserved heterogeneity across firms and across countries and sectors over time while avoiding the incidental parameter problem non-linear estimators would be subject to.

¹⁹Unfortunately, we cannot examine the impact of investment promotion assistance on the intensive margin of multinational production because we do not have data on firms' FDI, sales, or employment.

²⁰Using data across 59 countries for the late 1990s, Ramondo et al. (2015) find that two-thirds of the increase in bilateral multinational production flows can be traced back to increase in the number of affiliates and only one third can be attributed to larger sales per affiliate. This is different from international trade where the intensive margin appears to be dominant.

motion support has a positive (no) impact on the probability that a multinational firm establishes or increases its number of affiliates in Costa Rica.

The remaining terms of Equation (1) correspond to control variables. Thus, $X_{fst-k} = \{X_{fst-1}^1, \dots, X_{fst-K}^J\}$ is set of lags of time-varying firm-level characteristics that capture (i) firm's size such as the parent firm's total number of affiliates, the total number of countries in which the parent firm is present (which can also be considered a proxy for productivity —see, e.g., Helpman et al., 2004; Yeaple, 2009; and Chen and Moore, 2010—), and the number of sectors in which the parent firm operates (across affiliates); and (ii) firm's geographical network such as binary indicators for the presence of affiliates in neighboring countries, other non-neighboring Central American countries, other Latin American countries, countries in the same income group (according to the World Bank's classification), and countries with which Costa Rica has a preferential trade agreement (PTA), a bilateral investment treaty (BIT), or double taxation treaty (DTT) in force in the year in question (see, e.g., Head and Mayer, 2004; Baltagi et al., 2007; Blonigen et al., 2007; Chen, 2011; Antràs and Yeaple, 2013; Egger et al., 2014; and Conconi et al., 2016).

λ_{fhs} and ρ_{hst} are sets of firm-home country-sector fixed effects and home country-sector-year fixed effects, respectively. The former control for both time-invariant firm-specific factors and standard bilateral gravity variables such as distance, common language, and common border between the home country and Costa Rica and hence for the firm's systematic propensity to establish an affiliate therein. The latter account for a myriad of time-varying (host country-)home country-sector factors including market size; Costa Rica's productivity growth and changing comparative advantages in given sectors (e.g., relative skilled labor endowments; sector-specific policies; differences in business cycles; the number of affiliates from the home country operating in Costa Rica; share of those firms that were assisted by the IPA; sectoral and actual country IPA's prioritization; potential information spillovers across parent firms in given sectors and home countries; exchange rates; trade-related procedures (i.e., port handling and customs processing times); transport costs and tariffs (see, e.g., Alfaro and Chen, 2018); PTAs, BITs, DTTs, and tax rates differentials between Costa Rica and the home countries. ε is the error term.

The sets of fixed effects (along with the time-varying firm-level variables) therefore account for a wide range of potential confounding factors and ameliorate the risk of omitted variable biases. In particular, these sets of fixed effects are stricter than those previous studies using more aggregated data could rely on to deal with unobserved heterogeneity.²¹ The issue remains, though, that actual support can be endogenous

²¹For instance, Harding and Javorcik (2011) work with host country-sector-year level data and their main specification includes host country-sector, host country-year, and sector-year fixed effects.

to multinational firms' location decisions for several reasons. Thus, for instance, one could conceivably think that firms that are strongly interested or have already decided to establish an affiliate in Costa Rica self-select into CINDE assistance, in which case the agency would behave in a reactive manner.

In order to isolate a source of variation in CINDE's support that is exogenous with respect to firms' location decisions, we exploit the agency's firm-level prioritization approach described in Section 2. As explained there, CINDE targets large multinational firms, particularly those headquartered in the United States. This firm size-based prioritization strategy has been operationalized through the use of reference external multinational firms' lists. More specifically, according to our interviews with CINDE's management, the IPA uses the F1000 list to target firms and began to actively do so in 2006. Consistently, the average F1000 share raised from 0.293 in 2003–2005 to 0.402 in 2006–2008 (see Figure 1). This is the maximum increase in such a share from 2000 to 2016. We accordingly estimate Equation (1) by instrumental variables using the F1000 list for every year as instruments for investment promotion assistance status starting in 2006.²² Formally, the first-stage equation is as follows:

$$\mathbb{I}(\text{IPA})_{\text{fhst}} = \sum_{k=0}^K \psi_k \mathbb{I}(\text{L})_{\text{fhst}-k} + \sum_{j=1}^J \sum_{k=1}^K \gamma_k^j X_{\text{fhst}-k}^j + \sigma_{\text{fhs}} + \theta_{\text{hst}} + \nu_{\text{fhst}} \quad (2)$$

where $\mathbb{I}(\text{L})_{\text{fhst}}$ is a binary indicator that takes the value of one if the multinational firm belongs to the F1000 list in the year in question and zero otherwise. In particular, we consider the contemporaneous and three lags of this binary indicator to allow for targeting of firms that have joined the list and therefore become more visible in recent years and not just the current one.

To be valid instruments, the F1000 list should predict investment promotion assistance, but it should be otherwise uncorrelated with multinational firms' location decisions. This involves two conditions. First, being part of the aforementioned list must be correlated with investment promotion support once other relevant variables have been netted out. This can be expected to be the case, as CINDE targets large multinational firms, primarily from the United States. More specifically, firms entering the F1000 list are more likely to be targeted for attraction and assisted by CINDE.

Second, being in the F1000 list must be uncorrelated with the error term after conditioning on all other relevant explanatory variables. In other words, it must be exogenous. True, it may be argued that foreign firms joining the F1000 list are growing and specifically expanding and are therefore more likely to open affiliates in other countries,

²²It is worth stressing that instrumental variable estimates are virtually identical if we alternatively use as starting years 2005 or 2007. These estimation results are available from the authors upon request.

in general, and in Costa Rica, in particular. Note, however, the firm and home country-sector-year fixed effects and the time-varying firm-level variables precisely control for the main determinants of such as a geographical (and sectoral) spread. Importantly in this regard, while data on annual revenues are not available for all firms in our main estimation sample, we were able to gather these data for a relatively large number of these firms and hence explicitly control for this variable in the respective subsample.²³ Hence, the exclusion restriction is likely to be fulfilled since our comprehensive sets of fixed effects along with the firm-level covariates can be expected to account for other channels through which becoming part of the F1000 list could directly affect the likelihood to establish a first or subsequent affiliate in Costa Rica.

In order to substantiate this statement, we first examine whether our instruments have a direct effect on the location decisions of (non-assisted) multinational firms. We estimate a reduced-form equation which corresponds to a modified version of Equation (1) where the IPA assistance indicator is replaced with a binary indicator of membership to the F1000 list:

$$\mathbb{I}(E)_{\text{fhst}} = \sum_{k=0}^K \kappa_k \mathbb{I}(L)_{\text{fhst}-k} + \sum_{j=1}^J \sum_{k=1}^K \omega_k^j \chi_{\text{fhst}-k}^j + \pi_{\text{fhs}} + \iota_{\text{hst}} + \xi_{\text{fhst}} \quad (3)$$

Equation (3) is estimated for both all countries around the world and the subset of countries with annual GDP below US\$ 100 billion to which Costa Rica belongs. Furthermore, we estimate this equation both with the standard set of firm-level controls and with those controls plus firms' annual revenue. Estimates are reported in Figure 3.²⁴ These estimates reveal that the F1000 indicator is positive and significant in 16.5% of the countries worldwide and in only 4.5% of the 112 small economies. After conditioning by relevant factors driving multinational firms' location decisions, no mechanical relationship seems therefore to generally exist between membership to the F1000 list and first (or subsequent) establishments, especially for smaller countries.

Noteworthy, Costa Rica is among the few small economies for which F1000 has a positive and significant effect on this outcome. This is in line with what should be expected from an instrument meeting the first condition referred to above. Importantly, such an indicator ceases to be significant when the reduced form equation is estimated on the sample excluding assisted multinational firms (see Figure 3). While the validity of the exclusion restriction cannot be tested, this evidence would informally suggest that

²³As shown below, OLS and IV estimates are identical regardless of firms' revenues are or not included in the estimating equation (see Table 4). This suggests that control variables included in our baseline specification can account to a large extent for the influence of firms' annual revenues—the single variable based on which the F1000 list are constructed—.

²⁴The figure only shows estimates for first establishment. Those for reinvestment are similar and can be obtained from the authors upon request.

being in the F1000 list does not have a direct effect on the probability that multinational firms establish an affiliate in Costa Rica, but through the IPA assistance.

It must be admitted, though, that such evidence naturally leads to the question of what exogenous variation that makes firms which are similar in size, geographical spread, and performance, to be part or not of the F1000 list is being used to identify the impact of interest. Such an exogenous variation has two main sources.

To start with, the F1000 list only include firms incorporated in the United States that submit financial statements to the US government agencies. In this sense, it is worth recalling that our baseline specification encompasses firm fixed effects along with the home country-sector-year fixed effects, which control for potential systematic differences in firms' propensity to establish an affiliate in Costa Rica across home countries-sector combinations over time.

In addition, among firms based and with presence in the United States, a number of accounting rules and practices can play an important role. More precisely, the reason why some similarly large and strong performing firms do not show up in the F1000 list could be fourfold. First, firms can be publicly traded or privately held. Despite that both groups include large firms, these different types of firms face different reporting regulations. Thus, the latter are not required to produce or disclose financial reports nor have them audited (see Minnis and Schroff, 2017; Lisowsky and Minnis, 2020). As a consequence, while revenues for public firms are readily available, those for private firms need to be searched for in alternative —generally unofficial— sources and could be not systematically accessible.²⁵ This can influence membership to the F1000 list as it excludes firms that fail to report full financial statements for at least three quarters of the relevant fiscal year.²⁶

Second, even among those firms that report, they typically do so at different times since they can determine when their fiscal years start and end to accommodate different seasonal trends. In this regard, it should be mentioned that the F1000 list is produced in the first semester of calendar year using data from the end of the previous year. Hence, growing firms that submit their statements in the second semester might potentially register larger (conditional) revenues in the margin.

Third, there may be significant measurement errors. In particular, firms' financial statements depend on estimates and judgement calls that can be inaccurate (see,

²⁵These sources are usually idiosyncratic and are accordingly less comparable across them and even for each of them over time.

²⁶Further and related, firms that become publicly traded typically report their revenues backwards, thus making them available after the lists were completed. Moreover, F1000 revenues are based on originally reported data. Changes are made only for significant restatements due to errors that required firms to fill in an amended financial form.

e.g., Sherman and Young, 2016). Fourth and related, according to prevailing financial reporting rules, firms are not allowed to record any revenues from sales whose costs cannot be established beforehand. To assess whether these factors make a difference, we estimate the equation: $\mathbb{I}(L)_{\text{fhst}} = \phi_1 \text{Revenues}_{\text{fhst-1}} + \phi_2 \text{Revenues}_{\text{fhst-1}} \mathbb{I}(\text{PF})_{\text{fhs}} + \phi_3 \text{Revenues}_{\text{fhst-1}} \mathbb{I}(\text{SS})_{\text{fhs}} + \sum_{j=1}^J \mu^j X_{\text{fhst-1}}^j + \zeta_{\text{fhs}} + \tau_{\text{hst}} + \chi_{\text{fhst}}$, where $\mathbb{I}(\text{PF})_{\text{fhs}}$ is a binary indicator that takes the value of one if the firm is publicly traded and zero otherwise and $\mathbb{I}(\text{SS})_{\text{fhs}}$ is a binary indicator that takes the value of one if the firm reports during the second semester and zero otherwise. The estimating sample consists of either all of US-based multinational firms whose annual revenues are as large as those of those of the firms in the F1000 list or all multinational firms based on the United States.

OLS estimates of this equation indicate that multinational firms that have larger revenues and are public and present their financial statements in the second semester are indeed more likely to be part of the F1000 list.²⁷ Importantly, these conditioning factors that influence the inclusion into the F1000 list can be considered uncorrelated with the probability firms open an affiliate in Costa Rica. Economically, in addition to proxying for size in general and revenue in particular, the F1000 is an independent mark of prestige (see, e.g., Meneghetti and Williams, 2017). As such it serves as a signalling mechanism that helps reduce the information problem encountered by IPA's officials when selecting which large firms to approach. This is precisely what we exploit for identification purposes after conditioning by all control variables and fixed effects.

In addition to the baseline DID and instrumental variable estimations, we carry out two main robustness check exercises that aim at providing additional evidence to support a causal identification of the effects of interest. First, we exploit the highly detailed data in CINDE's CRM to distinguish assisted multinational firms between those that approached the IPA and their counterparts that were approached by the agency when estimating the impact of investment promotion on the location decision. While self-selection is clearly a concern for estimates specific to firms that decided to contact the IPA in the first place and accordingly received a *reactive assistance*, this is less likely to the case for those corresponding to their peers that were contacted by the IPA and hence received a *proactive assistance*. More specifically, under the assumption that IPA's proactive selection of firms is exogenous conditional on the observable time-varying firm-level covariates and the fixed effects, the estimated effect of proactive assistance would more accurately identify the true impact of the investment promotion. In this regard, it worth noting that such an identifying assumption could be expected to hold as these control variables account for virtually all relevant information observed and considered by IPA's officials when deciding which firms to approach. This strategy is

²⁷ These estimates are available from the authors upon request.

similar to that used by Munch and Schaur (2018) to identify the effects of trade promotion on firms' exports.

Second, as explained in Section 1, investment promotion primarily operates by reducing information barriers for multinational firms. We therefore explicitly investigate whether observed specific effects are consistent with such a mechanism. In so doing, we estimate the impact of IPA's information services and other services, both overall and for groups of firms from home countries and in sectors subject to different levels of information frictions.

We accordingly generalize the baseline equation to allow for heterogeneous effects along these dimensions as follows:

$$\mathbb{I}(E)_{\text{fhst}} = \sum_{m=1}^M \sum_{l=1}^L \sum_{k=0}^K \alpha_{m,l,k} \Phi_1 \mathbb{I}(\text{IPA}_m)_{\text{fhst-k}} + \sum_{j=1}^J \sum_{k=1}^K \beta_k^j \chi_{\text{fhst-k}}^j + \lambda_{\text{fhs}} + \rho_{\text{hst}} + \varepsilon_{\text{fhst}} \quad (4)$$

where m and l index IPA's specific services (i.e., information services and other services) and groups of firms defined according to the nature of the assistance they received (i.e., proactive or reactive), their specific home countries (i.e., with and without common language with Costa Rica, where language is both a communication vehicle and a contextual cultural factor), or their specific sectors (i.e., differentiated and non-differentiated); and Φ_1 is the corresponding group indicator.

In all cases, standard errors will be clustered by firm for inference purposes, thus allowing for an unrestricted covariance structure over time within firms, which may differ across them.

4. Estimation Results

4.1. Baseline Estimates

Table 2 reports OLS estimates of alternative specifications of Equation (1) that focus on contemporaneous support. Moving from Column 1 to Column 6, these specifications incorporate additional controls in a cumulative way. More precisely, starting in Column 1 with no fixed effects; Column 2 introduces sets of fixed effects that are standard in cross-country-sector analyses, i.e., home country-sector, home country-year and sector-year fixed effects; Column 3 incorporates firm fixed effects; Columns 4 and 5 add time-varying firm-level covariates capturing size and geographical distribution of affiliates, lagged one year, respectively; and Column 6 replaces the home country-year and sector-year fixed effects with a set of home country-sector-year fixed effects and thus is our baseline specification. The different panels distinguish between the first and

subsequent affiliates. Thus, the top panel (*First Establishment*) shows the estimated effect of investment promotion assistance on the probability that a multinational firm that is not yet presented in Costa Rica establishes its first affiliate in the country, whereas the bottom panel (*Reinvestment*) that on the probability that a multinational firm that already has an affiliate in Costa Rica opens another one.²⁸

Estimates indicate that assistance from the investment promotion agency has had a positive and significant effect on the first establishments of multinational firms in Costa Rica. Thus, investment promotion support has been associated with an increase of 11 percentage points in the probability that a multinational firm opens its first affiliate in the country.²⁹ The estimated impact on reinvestment is weaker and substantially less robust.

These results can be seen as consistent with the existence of an information-related, location-specific fixed cost of establishing a first affiliate in a host country, which the IPA appears to effectively reduce through their assistance activities. Once the multinational firm is present in the country, the respective fixed costs of opening a new affiliate are lower, so that general investment promotion assistance, on average, makes less of a difference.³⁰ We will come back to this issue in Subsection 4.2.3.³¹

OLS estimates assume that, conditional on our high dimensional fixed effects and various time-varying firm-level covariates, there is no self-selection into investment promotion assistance.³² While these fixed effects and covariates go a long way — and are specifically a step forward in controlling for variables that may result in such self-selection relative to the existing literature—, they might arguably not be enough to entirely preclude it. To tackle this concern, we use an instrumental variables ap-

²⁸The estimation samples are accordingly different. The *First Establishment* sample consists of all firm-year observations since the creation of the firms and either up to the year in which the firms establish their first affiliate in Costa Rica, if they do so, or until the end of the period of study if they do not do so. The *Reinvestment* sample only includes multinational firms that are already present in Costa Rica.

²⁹We have also estimated specifications that include three lags of the investment promotion support indicator for first establishment. Estimates, which are available from the authors upon request, coincide with those shown in Table 2. In particular, lagged support does not seem to have a significant effect. This likely reflect the fact that firms can be and are assisted in several occasions over time, in general, and through the establishment, in particular. Hence, we will continue with specification with the contemporaneous IPA assistance indicator hereafter.

³⁰This could be seen as an extreme (within country instead of cross country) version of the extended gravity observed in international trade (see Morales et al., 2019). Note, however, that recent studies could not corroborate the existence of such an extended gravity for affiliate entry (see Garetto et al, 2019).

³¹Given that multinational firms frequently divest (see, e.g., Javorcik and Poelhekke, 2017; and Borga et al., 2020), assistance could play an important role in retaining firms. Regrettably, our data do not allow us to rigorously examine whether support from CINDE impacts divestment.

³²We have also estimated the full specification additionally incorporating three lags of the time-varying firm-level size and geographical network variables. Estimates, which are available from the authors upon request, are also entirely consistent with the baseline. We will therefore retain the basic specification hereafter.

proach. As discussed above, we take advantage of the fact that CINDE targets large non-established multinational firms and use annual F1000 list as instruments for the IPA assistance. More precisely, these instruments consist of a set of binary indicators capturing contemporaneous and up to three lags of firms' membership to the F1000 list.

Table 3 presents these instrumental variable estimates of Equation (1) and variants thereof along with the respective specification test statistics. These estimates confirm that CINDE's support has a positive and significant impact on the probability that a multinational firm establishes a first affiliate in the country. In contrast, but in line with the OLS estimates, results suggest that investment promotion does not seem to have an impact on the extensive margin of multinational firms' reinvestment.³³ The Kleibergen-Paap robust F test statistics of weak identification are above 10, thus indicating that there is a strong conditional correlation between the instruments and the annual lists of firms assisted by CINDE.³⁴ As for the exclusion restriction, the evidence presented in Section 3 indicates that the F1000 indicators do not appear to directly affect multinational firms' decision to open an affiliate in Costa Rica. The Hansen J test statistic is consistently non-significant. This indicates that our overidentifying restrictions cannot be rejected.³⁵

The instrumental variables estimated impact is larger than the OLS counterpart in the case of first establishment. Such a discrepancy can be traced back to two main factors: differences in the intensity of assistance and differences in firms' size and consequently responsiveness to investment promotion assistance across prioritization statuses. Thus, it is worth mentioning that our instrumental variables estimations exploit the IPA's targeting approach. The implied prioritization is typically associated with higher levels of support intensity (see Blyde et al., 2014). Hence, the discrepancy between OLS and instrumental variable estimates might be partially driven by differences in the associated implicit assistance intensity —average in the case of OLS estimates and high in the case of the instrumental variables estimates. Such a difference in intensity appears to play a role. Whereas about 10% of the F1000 firms are assisted only once a year, this is the case for approximately 40% of the non-F1000 firms. When the treatment group is restricted to multinational firms with similar levels of support (i.e., more than once per year), OLS estimates become closer to their instrumental variables counterpart (see Figure 4).

³³Consistent with a priori expectations, first stage estimates reveal that becoming a F1000 firm significantly increases the likelihood of being assisted by CINDE. These estimates are available from the authors upon request

³⁴The F1000 instruments are weak in the case of reinvestment so that the respective estimates are not as reliable. This suggests that, while CINDE uses F1000 list to target large multinational firms without presence in Costa Rica, it does not resort to them to prioritize specific groups of firms among those that are already established in the country.

³⁵It is worth stressing that this is a test of joint-exogeneity and, as such, does not strictly provide information on the validity of the instruments but on their coherence, i.e., whether they identify the same vector of parameters (see Parente and Santos Silva, 2012).

Thus, estimations of the impact of investment promotion that use IPA's prioritization strategies could be considered to produce upper bound estimates linked to stronger promotional efforts.

In addition, prioritized multinational firms tend to be larger and accordingly have a larger potential for geographical diversification than the median assisted firm. As such, the former could be more responsive to investment promotion assistance than the latter. Given that the identification in the instrumental variables strategy primarily comes from the behavior of these larger multinational firms, this could translate into larger relative estimated effects. To assess whether this is the case, we replicate the baseline OLS and instrumental variables estimations on a restricted sample that encompasses the F1000 firms and the 50 most similar non-F1000 peers in terms of size within the respective home country-sector combinations.³⁶ Consistent with firms' size being a relevant factor behind the relative size of OLS and instrumental variables estimates, the gap between them becomes smaller in this sample (see Figure 4).

Finally, when imposing similarity in terms of both assistance intensity within the treatment group and firms' size across treatment and control groups, OLS and instrument variable estimates move further closer to each other (see Figure 4). More specifically, the latter is only 50% larger than the former and their confidence intervals largely overlap, such that the upper end of the OLS estimate's confidence interval virtually coincides with the point instrumental variables estimate. More formally, the Hausman test statistics indicate that OLS and instrumental variables estimates are not significantly different from each other.

Importantly, this also holds when we additionally account for firms' revenues — the single variable based on which the F1000 list are constructed— in the sample for which the respective data are available (see Table 4). As discussed in Section 3, in this case, the remaining exogenous variation used for identification is associated with the interplay between these revenues and firms' nature (publicly traded vs. privately held) and accounting practices (presenting financial reports in the second semester vs. in the first semester), which significantly affect firms' likelihood to be in the F1000 list but in no obvious systematic ways that to locate in Costa Rica.³⁷

³⁶The most similar firms are identified using a Mahalanobis measure of multidimensional distance. The dimensions of firms' size considered for this purpose are the total number of foreign affiliates worldwide, the total number of host countries, and the total number of active sectors. Estimation results are comparable when restricting the sample to the F1000 firms and the 10 or 100 most similar non-F1000 firms.

³⁷The results are very similar when the sample is further restricted to US-based multinational firms. These estimation results are available from the authors upon request.

4.2. Robustness

In this subsection, we present the results of several robustness checks that provide further supporting evidence for our empirical approach. These exercises primarily consist of alternative strategies to address potential firms' self-selection into investment promotion assistance and include: (i) estimations that exploit information on who initiated the contact—either the IPA or the multinational firm—and hence on the nature of the assistance—either *proactive* or *reactive*—, respectively; (ii) placebo tests and estimations of modified versions of the baseline equation, estimations of that equation on alternative samples; and (iii) exploration of the mechanisms—how estimated impacts vary across the IPA's specific services and with firms' characteristics and whether these estimated potentially heterogeneous impacts are consistent with a reduction in information costs—. ³⁸

4.2.1. Proactive vs. Reactive Assistance

Self-selection into investment promotion assistance implies that multinational firms that were already interested in investing in the country for some reason approached the respective national IPA and ended up receiving its support. As an alternative way to address this issue, we use detailed information from CINDE's CRM system on the direction of the initial contact between the IPA and the firms.

More specifically, this information allows us to distinguish assisted multinational firms between those that contacted the agency (*services initiated by the firm*) and those that were contacted by the agency (*services initiated by the agency*). Conditional on the home country-sector-year fixed effects—which account for the IPA's sector and actual country prioritization practices—and on firm fixed effects and time-varying multinational firms' characteristics—which control for relevant dimensions of IPA's prioritization of specific types of investors—it can be argued that, when services are initiated by the IPA, there is no systematic bias in the IPA's approaching of firms and thus the treatment could be considered essentially exogenous (see Munch and Schaur, 2018). The first column of Table 5 reports estimates of a variant of Equation (4) whereby we allow for different effects of investment promotion precisely depending on whether the firm approached the agency or the agency approached the firm. These estimates reveal that agency-initiated investment promotion, which can be considered less subject to self-selection

³⁸Our baseline specification could not be estimated with non-linear estimators. The main reason is their large set of fixed effects. However, we have estimated a *less demanding specification* with bias-corrected fixed effect probit and logit and conditional logit to explicitly take into account the binary nature of the dependent variable. These marginal effects confirm our main findings. These estimates are available from the author upon request

concerns, has a positive and significant effect on first establishment. This estimated effect is similar to our baseline and thus corroborates our initial findings.

4.2.2. *Alternative Specifications, Alternative Samples, and Placebos*

As alternative strategies to reduce the scope for unobserved firm heterogeneity to generate self-selection, we re-estimate Equation (1) on the sample of firms that were supported at some point over the period 2000–2016—in which case we primarily exploit the timing of assistance—and estimate modified versions of this equation that include a firm linear trend or adopt a first-differences form augmented with firm fixed effects.³⁹ The results from these estimations are also in line with the baseline (see Columns 2 to 4 in Table 5).

Moreover, our baseline difference-in-differences identification approach relies on the parallel trend assumption, i.e., investment promotion should not be associated with any difference in investing behavior between assisted multinational firms and non-assisted multinational firms before such assistance takes place. In order to assess the plausibility of this identifying assumption, we conduct two falsification exercises that imply regressing current location decisions in future IPA support. Thus, we estimate Equation (1) on data over the period 2000–2007 excluding those multinational firms that were assisted in these years and assuming that firms assisted in 2009–2016 were instead assisted in 2000–2007. These placebo estimates are shown in Column 5 of Table 5. Reassuringly, the estimated coefficients are not significantly different from zero. Note that, in contrast, estimates for the actual 2000–2007 and 2009–2016 samples are positive and significant (see Columns 6 and 7 in Table 5).

Alternatively, we artificially allocate the first assistance to different previous periods (i.e., $t-1, \dots, t-5$) and re-estimate Equation (1) on the sample of firms that were not assisted until the years in question. Figure 5 presents the results of this set of placebo tests for assisted firms. Consistent with the first exercise and in accordance with a causal interpretation, no significant effects are observed before the first assistance.

Admittedly, multinational firms can be assisted by other countries' IPAs or supported through other policies in Costa Rica itself. Such assistance is an unobserved time-varying firm-level variable that might affect the likelihood that these firms establish an affiliate in Costa Rica. Data on lost cases from CINDE's CRM system suggest that Mexico is the main competing location. To control for the incidence of Mexico's investment promotion activities, we gather and use annual support data from the country's

³⁹The last two specifications control for secular changes in unobserved firm(-host country-sector)-level factors that might affect the probability to establish an affiliate in Costa Rica such as increases in firms' exports to this country (see, e.g., Conconi et al., 2016).

former national IPA PROMEXICO over our sample period and estimate a modified version of Equation (1) augmented to include a binary indicator capturing such support. The estimation results, which are presented in Column 1 of Table 6, do not differ from our reference ones.

Similarly, investment promotion is one among various policy instruments governments resort to to attract multinational firms to their territories. The possibility to locate in free trade zones and accordingly receive fiscal and even financial incentives is a prominent widely used tool. In fact, as mentioned in Section 1, Costa Rica has free trade zones where several multinational firms are established. The question then arises of whether it is the assistance from the agency or the more favorable tax and customs regime that is inducing multinational firms to open an affiliate and be present in this host country. In order to assess whether this potential confounding factor is contaminating our results, we exploit information on free trade zone status and estimate Equations (1) on a sample that excludes multinational firms operating in these zones. Estimates are reported in the second column of Table 6. These estimates indicate that, while relatively smaller, investment promotion assistance has a positive impact on the probability of first establishment even when multinational firms locate outside of the free trade zones and therefore do not enjoy advantages in the form of tax deductions.

Finally, it is well known that multinational firms can experience ownership changes over time; can be located in tax heavens; and can behave differently depending on their main sector of activity, particularly those operating in the financial sector. Estimates presented in columns 3-5 of Table 6 reveal that the baseline results are robust to excluding these firms.⁴⁰

4.2.3. Mechanisms: IPA's Services and Firms' Characteristics

IPAs support multinational firms through a wide variety of services. As mentioned in Section 2, in the case of Costa Rica, the main services can be broadly classified in two main categories: assistance to gather relevant information on local business conditions and installation process (*information services*) and assistance to complete relevant administrative procedures and to find and recruit properly trained employees (*other services*). Given their different nature and purpose, these services predictably have different effects depending on the location outcomes in question. We explore these potential heterogeneous effects by estimating a variant of Equation (4) that includes individual binary indicators for specific investment promotion supports. Evidence presented in

⁴⁰Firms with ownership changes and headquartered in countries considered tax heavens have been identified using annual information on ownership structure from Dun and Bradstreet over our sample period and the classification proposed by Hines (2010), respectively.

Table 7 suggests that information services have the strongest effect on establishing the first affiliate (see Column 1). Note that, unlike when services are bundled together, assistance with information also has a positive and significant effect on the probability that already established firms open a new affiliate (reinvestment), albeit smaller in magnitude (see Column 2). Interestingly, this is exclusively the case when a significant amount of time (i.e., five years) has elapsed since the previous opening (see Columns 3 and 4).

Taken together, these results indicate that provision of relevant information helps multinational firms expand along the extensive margin mainly by establishing an affiliate for the first time in Costa Rica. It also promotes the opening of additional affiliates in the country but only when a period has passed since the last establishment and the information originally provided has lost its value. This would be consistent with a reduction in information-related fixed costs associated with each of these location decisions. More specifically, information provided by IPAs through their support services appears to remain pertinent to address firms' knowledge needs for some years and can be reused by these multinational firms as inputs for their location decisions. However, such an information is subject to depreciation and obsolescence as contextual conditions and businesses change over time. Hence, after a period, multinational firms considering establishing a new affiliate in the country are confronted with renewed information gaps, which IPAs' services impactfully help to fill in. Importantly, this alignment between services and outcomes provides further informal support to our identification of the effects of interest and the channels thereof.

Investment promotion services can be anticipated to have heterogeneous effects depending on the prevailing information barriers associated with firms' home countries and sectors. For instance, we could expect the impact to be larger on location decisions by multinational firms from home countries that are less familiar with the host country and hence there is less information available. Similarly, support from the agency can affect differently decisions of multinational firms operating in sectors producing goods and services with varying degrees of differentiation. We examine whether this is the case in Table 8. More specifically, this table shows estimates of variants of Equation (4) whereby the effects of investment promotion support are allowed to differ across home countries and sectors: (i) home countries that have/do not have a common language with Costa Rica, where a common language can be seen as a summary measure of more broadly cross-country similarities in terms of cultural, historical, social, political, economic, and consequently business contexts (see, e.g., Guiso et al., 2009; Egger and Lassmann, 2015); and (ii) differentiated and non-differentiated sectors (see Rauch, 1999). These estimates indicate that promotion efforts are more effective in attracting

multinational firms from countries whose populations speak a different language, and that operate in differentiated sectors. Noteworthy, this is particularly the case when the assistance takes the form of information provision. These estimation results consistently point to stronger effects of investment promotion, in general, and information services, in particular, on the extensive margin of multinational production when information obstacles are large.

To sum up, IPA's information services have stronger effects on the cross-country firms' extensive margin of multinational production (first establishment) than on the within-country firms' extensive margin of such production (reinvestment—expansion of subsequent affiliates) and hence when information problems are more severe. Furthermore, along the cross-country firms' extensive margin, the impacts are specifically larger when multinational firms come from countries where a different language is spoken and where the business environment is not similar and operate in differentiated sectors and thus face more information barriers. This is precisely what can be expected if investment promotion acts as an information cost reduction mechanism.

4.3. Is Investment Promotion Cost-Effective?

Taking into account the increased probability that multinational firms establish an affiliate for the first time in the country, the average total cost of the associated assistance, and alternative initial investment values, it is possible to compute benefit/cost ratios for Costa Rica's investment promotion policy.⁴¹ The results of this back of the envelope calculations are shown in Table 9. These results reveal that benefit/cost ratios could range from US\$ 13.7 to US\$48.6 (US\$ 41.7 to US\$ 145.9) of additional FDI for each dollar spent in promotion when considering OLS and instrumental variable estimates (and thus high assistance intensity), respectively, and assuming an average investment of US\$ 5 (US\$ 15) million.⁴² As a reference, the average initial investment for multinational firms established in free trade zones is approximately US\$ 10 millions, in which case the benefit/cost ratio is 35.4 based on the OLS estimates. Further along these lines, the benefit/cost ratio estimated by Harding and Javorcik (2011) —i.e., 189— would correspond in our case to an average investment of US\$ 19.4 millions according

⁴¹Since we are comparing aggregate figures, we use a comprehensive cost measure that includes items other than those associated with personnel compensation. This measure is the ratio between CINDE's annual budget excluding capital expenditures taken from Volpe Martincus and Sztajerowska (2019) and the annual number of assisted firms as reported in Table 1.

⁴²Needless to say, these calculations should be taken with caution. They are based on simplified scenarios. Thus, for instance, they assume average investment values when in fact there is a whole distribution from relatively small to very large values and do not take into account the difference in costs associated with the difference in implicit assistance dosage in the OLS and instrumental variables estimates.

to our instrumental variables estimates.⁴³

In closing, it is worth mentioning that, based on labor costs, information services have the lowest costs.⁴⁴ As seen above, these services have the largest effect on the probability that a multinational firm establishes an affiliate in Costa Rica. Hence, the provision of relevant business information seems to be the most cost-effective specific investment promotion activity.

5. Concluding Remarks

Investment promotion policies are ubiquitous. However, no matter how widespread these policies are and besides valuable insights from a few studies using aggregated data, little is known on whether, and, if so, to what extent and how they affect multinational firms' location decisions. In this paper we attempt to close this gap in the literature by providing, for the first time to our knowledge, microeconomic evidence on the effects of investment promotion and their mechanisms and channels using time-specific, firm-level data on both location decisions and support status over a long period of time for Costa Rica. This evidence reveals that investment promotion assistance has had significant positive effects on the probability that multinational firms establish an affiliate in Costa Rica for the first time. These results are robust to addressing endogeneity concerns through an instrumental variables approach, considering exclusively assistances initiated by the agency, using alternative specifications, including specifically those controlling for other investment promotion agencies (IPAs)' support and other Costa Rican investment attraction policies such as free trade zones. Importantly, the provision of relevant specific information appears to be the main channel through which the IPA affects multinational firms' location decisions. In particular, the positive effects of information seem to be larger for countries and sectors facing higher information barriers, such as countries not sharing a common language with Costa Rica and sectors producing differentiated goods and services.

⁴³We use the instrumental variables estimates in this case because Harding and Javorcik (2011) exploit the IPAs' prioritization strategies for identification purposes.

⁴⁴Labor costs are computed as the number of hours officials actually working in investment promotion devoted to the assistance in question times their hourly compensation. When computed this way, the average cost of assistance is US\$ 3,215, the minimum is US\$ 694 and the maximum is US\$ almost 16,000.

References

- Alfaro, L. and Charlton, A., 2007. Growth and the quality of foreign direct investment: Is all FDI equal? CEP Discussion Paper 830.
- Alfaro, L. and Charlton, A., 2009. Intra-Industry Foreign Direct Investment. *American Economic Review*, vol. 99(5), pp. 2096-2119.
- Alfaro, L. and Chen, M., 2012. Surviving the global financial crisis: Foreign ownership and establishment performance. *American Economic Journal: Economic Policy*, vol. 4(3), pp. 30-55.
- Alfaro, L. and Chen, M., 2014. The Global Agglomeration of Multinational Firms. *Journal of International Economics*, vol. 94(2), pp. 263-276.
- Alfaro, L. and Chen, M., 2018. Transportation Cost and the Geography of Foreign Investment. In *Handbook of International Trade and Transportation*, edited by Bruce Blonigen and Wesley W. Wilson. Edward Elgar Publishing.
- Alfaro-Ureña, A., Manelici, I. and Vasquez, J., 2019. The Effects of Joining Multinational Supply Chains: New Evidence from Firm-to-Firm Linkages. Unpublished April, 2019 Version.
- Allen, T. 2014. Information Frictions in Trade. *Econometrica*, vol. 82, pp. 2041-2083.
- Alvarez, V. 2019. Multinational Production and Comparative Advantage. *Journal of International Economics*, vol. 119(C), pp. 1-54.
- Anderson, J. E. and Van Wincoop, E., 2004. Trade costs. *Journal of Economic literature*, vol. 42(3) pp. 691-751.
- Antras, P., Desai, M. and Foley, F. 2009. Multinational Firms, FDI Flows and Imperfect Capital Markets. *Quarterly Journal of Economics*, vol. 124(3), pp. 1171-1219.
- Antras, P. and Yeaple, S. 2013. Multinational Firms and the Structure of International Trade. *Handbook of International Economics*, edition 1, vol. 4, pp. 55-130.
- Atkin, D. and Khandelwal, A. 2019. How Distortions Alter the Impacts of International Trade in Developing Countries. NBER Working Paper 26230.
- Baldwin, R. and Evenett, S., 2020. COVID-19 and trade policy: Why turning inward won't work. CEPR, London.

- Baltagi, B., Egger, P. and Pfaffermayr, M. 2007. Estimating models of complex FDI: Are there third-country effects? *Journal of Econometrics*, vol. 140(1), pp. 260-281.
- Bessen, J. 2009. NBER PDP Project User Documentation: Matching Patent Data to Compustat Firm. National Bureau of Economic Research.
- Blonigen, B., Davies, R., Waddell, G. and Naughton, H. 2007. FDI in Space: Spatial Autoregressive Relationships in Foreign Direct Investment. *European Economic Review*, vol. 51(5), pp. 1303-1325.
- Blonigen, B., Davies, R., Naughton, H. and Waddell, G. 2008. Spacey Patterns: Spatial Autoregressive Patterns in Inbound FDI. In S. Brackman and H. Garretsen, *Foreign Direct Investment and the Multinational Enterprise*, The MIT Press.
- Blyde, J. S., Pietrobelli, C. and Volpe Martincus, C. 2014. A World of Possibilities: Internationalization for Productive Development, in *Rethinking Productive Development*, pp. 233-278, edited by Crespi. G., Fernández-Arias and Stein, E. Inter-American Development Bank. Palgrave Macmillan.
- Bobonis, G. and Shatz, H., 2007. Agglomeration, adjustment, and state policies in the location of foreign direct investment in the United States. *Review of Economics and Statistics*, vol. 89(1), pp. 30-43.
- Borga, M., Flores, P. and Sztajerowska, M. 2019. Drivers of divestment decisions of multinational enterprises – A cross-country firm-level perspective. *OECD Working Papers on International Investment* 2019/03.
- Broocks, A. and Van Biesebroeck, J. 2017. The impact of export promotion on export market entry. *Journal of International Economics*, 107, pp. 19-33.
- Burchardi, K., Chaney, T., and Hassan, T., 2019. Migrants, ancestors, and foreign investments. *Review of Economic Studies*, 86, pp. 1448-1486.
- Cadot, O., Fernandes, A., Gourdon, J. and Mattoo, A. 2015. Are the benefits of export support durable? Evidence from Tunisia. *Journal of International Economics*, vol. 97(2), pp. 310-324.
- Carballo, J., Graziano, A., Schaur, G., and Volpe Martincus, C., 2016. The border labyrinth: Information technologies and trade in the presence of multiple agencies. IDB Working Paper 706.
- Carballo, J., Marra de Artiñano, I., and Volpe Martincus, C., 2020. Multinational production and "soft" industrial policies. IDB Working Paper 1106.

- Carr, D., Markusen, J. and Maskus, K. 2001. Estimating the knowledge-capital model of the multinational enterprise. *American Economic Review*, vol. 91(3), pp. 693-708.
- Charlton, A., Davis, N., Faye, M., Haddock, J. and Lamb, C. 2004. Industry Targeting for Investment Promotion: A Survey of 126 IPAs. Oxford Investment Research Working Papers
- Charlton, A. and Davis, N. 2007. Does Investment Promotion Work? *The B.E. Journal of Economic Analysis and Policy*, vol. 7(1), pp.1-21.
- Chen, M. 2011. Interdependence in multinational production networks. *Canadian Journal of Economics*, vol. 44(3), pp. 930-956.
- Chen, M. and Moore, M. 2010. Location decision of heterogeneous multinational firms. *Journal of International Economics*, vol. 80(2), pp. 188-199.
- Conconi, P.; Sapir, A.; and Zanardi, M., 2016. The internationalization process of firms: From exports to FDI. *Journal of International Economics*, 99(C) pp.16-30.
- Crescenzi, R., Di Cataldo, M. and Giua, M. 2019. FDI inflows in Europe: does investment promotion work? Mimeo.
- Davies, R. and Francois, J. 2015. Special Tax Treatment as Trade Policy: A Database on Export Processing and Special Economic Zones. Mimeo.
- Davies, R. and Desbordes, 2018. Export Processing Zones and the Composition of Greenfield FDI., Working Papers 201818, University College of Dublin.
- Dun and Bradstreet, 2019. Global Data Collection and WorldBase. Note published at Dun and Bradstreet website: <https://www.dnb.com>
- Egger, P., Fahn, M., Merlo, V. and Wamser, G. 2014. On the genesis of multinational foreign affiliate networks. *European Economic Review*, vol 65(C) pp. 136-163.
- Fajgelbaum, P., Goldberg, P., Kennedy, P., and Khandelwal, 2020. The return to protectionism. *Quarterly Journal of Economics*, 135, 1.
- Farole, T. 2011 Special Economic Zones in Africa: Comparing Performance and Learning from Global Experience. World Bank Publications, Number 2268, September.
- Garetto, S., Oldenski, L. and Ramondo, N. 2019. Multinational Expansion in Time and Space. NBER Working Paper No. 25804. National Bureau of Economic Research.
- Greenstone, M. and Moretti, E. 2003. Bidding for Industrial Plants: Does Winning a Million Dollar Plant Increase Welfare? NBER Working Paper 9844, National Bureau of Economic Research.

- Greenstone, M., Hornbeck, R. and Moretti, E. 2010. Identifying agglomeration spillovers: Evidence from Winners and Losers of Large Plant Openings. *Journal of Political Economy*, vol. 118(3), pp. 536-598
- Harding, T. and Javorcik, B., 2011. Roll out the red carpet and they will come: Investment promotion and FDI inflows. *Economic Journal*, vol. 121, 557, pp. 1445-1476.
- Harding, T. and Javorcik, B., 2012. Foreign direct investment and export upgrading. *Review of Economics and Statistics*, vol. 94(4), pp. 964-980.
- Harding, T. and Javorcik, B., 2013. Investment promotion and FDI inflows: Quality matters. *CESifo Economic Studies*, 59, 2.
- Harding, T., Javorcik, B. and Maggioni, D., 2019. FDI promotion and comparative advantage. Oxford University, mimeo.
- Hayakawa, K., Lee, H. and Park, D., 2014. Are investment promotion agencies effective in promoting outward foreign direct investment? The cases of Japan and Korea. *Asian Economic Journal*, 28, 2.
- Head, K., Ries, J. and Swenson, D., 1999. Attracting foreign manufacturing: Investment promotion and agglomeration. *Regional Science and Urban Economics*, vol. 29(2), pp. 197-218.
- Head, K. and Mayer, T. 2004. Market Potential and the Location of Japanese Investment in Europe. *Review of Economics and Statistics*, vol. 86(4), pp. 959-972.
- Head, K. and Mayer, T. 2019. Brands in Motion: How Frictions Shape Multinational Production, vol. 109(9), pp. 3073-3124.
- Head, K. and Ries, J. 2008. FDI as an outcome of the market for corporate control: Theory and evidence. *Journal of International Economics*, vol. 74(1), pp. 2-20.
- Helpman, E., Melitz, M. and Yeaple, S. 2004. Export versus FDI with heterogeneous firms. *American Economic Review*, vol. 94(1), pp. 300-316.
- Hines, J. 2010. Treasure islands. *Journal of Economic Perspectives*, vol. 24(4), pp. 103-126.
- Huang, R. 2007. Distance and trade: Disentangling unfamiliarity effects and transport cost effects. *European Economic Review*, 51, 1.
- Irrazabal, A., Moxnes, A. and Oromolla, L. 2013. The margins of multinational production and the role of intra firm trade. *Journal of Political Economy*, vol. 121(1), pp. 74-126.

- Javorcik, B. and Poelhekke, S. 2017. Former foreign affiliates: Cast out and outperformed? *Journal of the European Economic Association*, vol. 15(3), pp. 501-539.
- Keller, W. and Yeaple, S. The Gravity of Knowledge. *American Economic Review*, vol. 103(4), pp. 1414-1444.
- Lipsey, R., 2007. Defining and measuring the location of FDI output. NBER Working Paper 12996.
- Loewendahl, H. 2001. *Bargaining with Multinationals: The Investment of Siemens and Nissan in North East England*. Palgrave Macmillan, London.
- Loewendahl, H. 2018. *Innovations in Foreign Direct Investment Attraction*. Inter-American Development Bank. Technical Note IDB-TN-1572.
- López, A., Niembro, A., Ramos, D. and Garcia, P. 2016. Estrategias e instrumentos de promoción de las inversiones: el caso de Costa Rica a la luz de las mejores practicas internacionales. Inter-American Development Bank. Technical Note IDB-TN-1089
- Markusen, J, 2002. *Multinational Firms and the Theory of International Trade*, MIT Press, Cambridge.
- Markusen, J. and Maskus, K. 2002. Discriminating among Alternative Theories of the Multinational Enterprise. *Review of International Economics*, vol. 10(4), pp. 694-707.
- Morales, E., Sheu, G. and Zahler, A. 2019. Extended Gravity. *The Review of Economic Studies*, vol. 86(6), pp. 2668-2712.
- Munch, J. and Schaur, G., 2018. The effect of export promotion on firm-level performance. *American Economic Journal: Economic Policy*, 10, 1.
- Ni, B., Todo, Y. and Inui, T., 2017. How effective are investment promotion agencies? Evidence from China. *Japanese Economic Review*, 68, 2.
- Nunn, N. and Trefler, D. 2008. The Boundaries of the Multinational Firm: An Empirical Analysis. In: Helpmar, E. Marin D. and Verdier, T. *The Organization of Firms in a Global Economy*, pp. 55-83. Harvard University Press, Cambridge.
- Parente, P. and Santos Silva, J. 2012. A cautionary note on tests of overidentifying restrictions. *Economics Letters*, vol. 115(2), pp. 314-317.
- Raffo, J. 2015 Matchit: Stata module to match two datasets based on similar text patterns. Statistical Software Components S457992, Boston College Department of Economics, revised 13 April 2019.

- Ramondo, N. 2014. A Quantitative Approach to Multinational Production. *Journal of International Economics*, vol. 93(1), pp. 108-122.
- Ramondo, N., Rodriguez-Clare, A. and Tintelnot, F. 2015. Multinational Production: Data and Stylized Facts. *American Economic Review, Papers and Proceedings*, vol. 105(5), pp. 530-536.
- Rangan, S. and Lawrence, R. 1999. Search and Deliberation in International Exchange: Learning from Multinational Trade about Lags, Distance Effects and Home Bias. NBER Working Papers No. 7012, National Bureau of Economic Research
- Rangan, S. 2000. The problem of search and deliberation in economic action: When social networks really matter. *Academy of Management Review*, vol. 25(4), pp. 813-828.
- Rauch, J. 1999. Networks versus markets in international trade. *Journal of International Economics*, vol. 48(1), pp. 7-35.
- Rodriguez-Clare, A. 2001. Costa Rica's Development Strategy based on Human Capital and Technology: how it got there, the impact of Intel and lessons for other countries. *Journal of Human Development*, vol. 2(2).
- Stock, J. and Wright, J. 2000. GMM with Weak Identification. *Econometrica*, vol. 68(5), pp. 1055-1096.
- OECD, 2013. OECD Investment Policy Reviews: Costa Rica 2013. OECD Publishing.
- UNCTAD, 2007. Aftercare: A Core Function in Investment Promotion. *Investment Advisory Series, Series A, Number 1*.
- UNCTAD, 2008. Investment Promotion Agencies as Policy Advocates. *Investment Advisory Series, Series A, Number 2*.
- Van Biesebroeck, J., Konings, J., and Volpe Martincus, C. 2016. Did export promotion help firms weather the crisis?. *Economic Policy*, 31(88), pp. 653-702.
- Volpe Martincus, C. and Carballo, J. 2008. Is export promotion effective in developing countries? Firm-level evidence on the intensive and the extensive margins of exports. *Journal of International Economics*, vol. 76(1), pp. 89-106.
- Volpe Martincus, C. and Carballo, J. 2010. Beyond the average effects: The distributional impacts of export promotion programs in developing countries. *Journal of Development Economics*, vol. 92(2), pp. 201-214.

- Volpe Martincus, C. and Sztajerowska, M. 2019. How to Solve the Investment Promotion Puzzle: A Mapping of Investment Promotion Agencies in Latin America and the Caribbean and OECD Countries. IDB, Washington, DC.
- Yeaple, S. 2003. The complex integration strategies of multinationals and cross-country dependencies in the structure of foreign direct investment. *Journal of International Economics*, vol. 60(3), pp. 293-214.
- Yeaple, S. 2009. Firm heterogeneity and the structure of U.S. multinational activity. *Journal of International Economics*, vol. 78(2), pp. 206-215.
- Zeng, D. Z. 2015. Global experiences with special economic zones: focus on China and Africa, World Bank Policy Research Working Paper No 7240.

Table 1
Multinational Firms and Investment Promotion Assistance in Costa Rica

Multinational Firms Established in Costa Rica						
Year	Number of Firms	Number of Foreign Affiliates	Number of Home Countries	Number of Sectors of Activity		
2000	197	267	29	89		
2001	213	285	29	94		
2002	221	297	31	96		
2003	232	314	33	98		
2004	245	332	34	102		
2005	257	354	35	106		
2006	276	380	36	113		
2007	298	410	39	115		
2008	310	429	40	118		
2009	323	450	42	117		
2010	345	478	43	124		
2011	370	506	43	131		
2012	395	535	44	133		
2013	413	558	44	135		
2014	432	587	45	140		
2015	446	604	48	140		
2016	465	627	49	141		

Multinational Firms Assisted by the IPA						
Year	All Assisted Multinational Firms			Multinational Firms Assisted with Information Services		
	Total	First Establishment	Reinvestment	Total	First Establishment	Reinvestment
2000	5	5	0	2	2	0
2001	8	6	2	6	6	0
2002	9	6	3	6	6	0
2003	7	3	4	4	3	1
2004	13	9	4	8	8	0
2005	21	15	6	15	12	3
2006	25	11	14	17	9	8
2007	25	12	13	13	10	3
2008	30	13	17	16	10	6
2009	32	14	18	14	10	4
2010	70	52	18	31	25	6
2011	94	62	32	42	29	13
2012	111	63	48	37	24	13
2013	125	76	49	50	39	11
2014	160	102	58	58	42	16
2015	178	112	66	53	42	11
2016	157	86	71	52	37	15

Source: Authors' calculations based on data from Worldbase and CINDE.

The top panel characterizes the multinational firms established in Costa Rica over time in terms of number of multinational (parent) firms, the number of foreign affiliates, the total number of different home countries, and the total number of different sectors (according to the ISIC Rev. 4 4-digit classification). The bottom panel presents information on the multinational firms assisted by CINDE each year of the sample period, including: the total number of assisted multinational firms, the total number of assisted multinational firms that were not previously present in Costa Rica (*First Establishment*), the total number of firms assisted multinational firms that were already present in Costa Rica (*Reinvestment*), the total number of multinational firms assisted with information services (both total and distinguishing between for *First Establishment* and *Reinvestment*).

Table 2
Impact of Investment Promotion on Multinational Firms' Location Decisions
Baseline Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
First Establishment						
IPA Assistance	0.098*** (0.013)	0.097*** (0.014)	0.109*** (0.016)	0.110*** (0.016)	0.110*** (0.016)	0.113*** (0.017)
Observations	2,529,886	2,529,886	2,529,886	2,529,886	2,529,886	2,529,886
Reinvestment						
IPA Assistance	0.033*** (0.009)	0.032*** (0.008)	0.042** (0.020)	0.043** (0.021)	0.043** (0.022)	0.020 (0.024)
Observations	4,930	4,930	4,930	4,930	4,930	4,930
Firm Fixed Effects	No	No	Yes	Yes	Yes	Yes
Country-Year Fixed Effects	No	Yes	Yes	Yes	Yes	No
Sector-Year Fixed Effects	No	Yes	Yes	Yes	Yes	No
Country-Sector Fixed Effects	No	Yes	No	No	No	No
Country-Sector Year Fixed Effects	No	No	No	No	No	Yes
Firm Size Controls	No	No	No	Yes	Yes	Yes
Firm Network Controls	No	No	No	No	Yes	Yes

Source: Authors' calculations based on data from Worldbase and CINDE.

The table reports OLS estimates of alternative specifications of Equation (1). In the first panel (*First Establishment*) the sample is restricted to those firms that did not have an affiliate in Costa Rica in the previous year. The dependent variable is a binary indicator that takes the value of one if the multinational firm establishes its first affiliate in Costa Rica in the year in question and zero otherwise. In the second panel (*Reinvestment*) the sample is restricted to those firms that have at least one affiliate in Costa Rica in the year in question. The dependent variable is a binary indicator that takes the value of one if the multinational firm opens a new (additional) affiliate in Costa Rica in that year and zero otherwise. The main explanatory variable, *IPA Assistance*, is a binary indicator that takes the value of one if the multinational firm was assisted by the national IPA in the year in question and zero otherwise. No and alternative sets of fixed effects are included (not reported). The (time-varying) *Firm Size Controls* are one lag of the total number of affiliates of the multinational firm worldwide, the total number of countries in which the multinational firm is present worldwide, and the total number of sectors in which the multinational firm's affiliates operate worldwide (not reported). The (time-varying) *Firm Network Controls* are one lag of a series of binary indicators that take the value of one if the multinational firm has an affiliate in a certain country group and zero otherwise. The country groups are: Central American countries bordering Costa Rica, other Central American countries, other Latin American countries (not in Central America), upper-middle income countries, countries in which the same language is spoken, countries with which Costa Rica has a Preferential Trade Agreement (PTA), countries with which Costa Rica has a Bilateral Investment Treaty (BIT), and countries with which Costa Rica has a Double Taxation Treaty (DTT) (not reported). Standard errors clustered by firm are reported below the estimated coefficients. *** denotes significant at the 1% level, ** denotes significant at the 5% level, * denotes significant at the 10% level.

Table 3
Impact of Investment Promotion on Multinational Firms' Location Decisions
Instrumental Variable Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
First Establishment						
IPA Assistance	0.260*** (0.082)	0.262*** (0.090)	0.417*** (0.142)	0.398*** (0.153)	0.400** (0.156)	0.382** (0.152)
Observations	2,529,886	2,529,886	2,529,886	2,529,886	2,529,886	2,529,886
F-Statistic	14.699 [0.001]	14.160 [0.001]	12.882 [0.012]	11.296 [0.023]	11.108 [0.025]	11.581 [0.021]
Hansen J Statistic	3.012 [0.390]	2.657 [0.448]	1.617 [0.656]	1.756 [0.625]	1.736 [0.629]	1.977 [0.577]
Hausman Test Comparison OLS - IV	6.080 [0.014]	4.913 [0.027]	7.513 [0.006]	4.945 [0.026]	4.787 [0.029]	4.193 [0.041]
Reinvestment						
IPA Assistance	0.006 (0.037)	0.107 (0.481)	0.076 (0.382)	0.058 (0.482)	0.077 (0.482)	0.060 (0.597)
Observations	4,930	4,930	4,930	4,930	4,930	4,930
F-Statistic	14.760 [0.005]	2.268 [0.687]	4.872 [0.301]	4.137 [0.388]	3.959 [0.412]	5.440 [0.245]
Hansen J Statistic	2.540 [0.468]	6.228 [0.101]	6.151 [0.104]	6.166 [0.104]	6.517 [0.089]	3.692 [0.297]
Hausman Test Comparison OLS - IV	0.150 (0.699)	0.131 [0.717]	0.041 [0.839]	0.100 [0.752]	0.057 [0.811]	1.329 [0.249]
Firm Fixed Effects	No	No	Yes	Yes	Yes	Yes
Country-Year Fixed Effects	No	Yes	Yes	Yes	Yes	No
Sector-Year Fixed Effects	No	Yes	Yes	Yes	Yes	No
Country-Sector Fixed Effects	No	Yes	No	No	No	No
Country-Sector Year Fixed Effects	No	No	No	No	No	Yes
Firm Size Controls	No	No	No	Yes	Yes	Yes
Firm Network Controls	No	No	No	No	Yes	Yes

Source: Authors' calculations based on data from Worldbase and CINDE.

The table reports IV estimates of alternative specifications of Equation (1). In the first panel (*First Establishment*) the sample is restricted to those firms that did not have an affiliate in Costa Rica in the previous year. The dependent variable is a binary indicator that takes the value of one if the multinational firm establishes its first affiliate in Costa Rica in the year in question and zero otherwise. In the second panel (*Reinvestment*) the sample is restricted to those firms that have at least one affiliate in Costa Rica in the year in question. The dependent variable is a binary indicator that takes the value of one if the multinational opens a new (additional) affiliate in Costa Rica in that year and zero otherwise. The main explanatory variable, *IPA Assistance*, is a binary indicator that takes the value of one if the multinational firm was assisted by the national IPA in the year in question and zero otherwise. The main explanatory variable is instrumented a variable that takes the value of 1 if the firm is part of the Fortune 1000 list of firms and 0 otherwise, along with three lags of such variable. No and alternative sets of fixed effects are included (not reported). The (time-varying) *Firm Size Controls* are one lag of the total number of affiliates of the multinational firm worldwide, the total number of countries in which the multinational firm is present worldwide, and the total number of sectors in which the multinational firm's affiliates operate worldwide (not reported). The (time-varying) *Firm Network Controls* are one lag of a series of binary indicators that take the value of one if the multinational firm has an affiliate in a certain country group and zero otherwise. The country groups are: Central American countries bordering Costa Rica, other Central American countries, other Latin American countries (not in Central America), upper-middle income countries, countries in which the same language is spoken, countries with which Costa Rica has a Preferential Trade Agreement (PTA), countries with which Costa Rica has a Bilateral Investment Treaty (BIT), and countries with which Costa Rica has a Double Taxation Treaty (DTT) (not reported). Standard errors clustered by firm are reported below the estimated coefficients. *** denotes significant at the 1% level, ** denotes significant at the 5% level, * denotes significant at the 10% level.

Table 4
Impact of Investment Promotion on Multinational Firms' Location Decisions
Controlling for Firms' Revenue

	(1)	(2)	(3)	(4)
	OLS	OLS	IV	IV
First Establishment				
IPA Assistance	0.185***	0.185***	0.340**	0.340**
	(0.038)	(0.038)	(0.158)	(0.158)
F-Statistic			11.217	11.212
			[0.024]	[0.024]
Hansen J Statistic			3.141	3.130
			[0.370]	[0.372]
Hausman Test Comparison OLS - IV			1.188	1.190
			[0.276]	[0.276]
Observations	339,322	339,322	339,322	339,322
Reinvestment				
IPA Assistance	-0.023	-0.022	0.590	0.584
	(0.043)	(0.042)	(0.552)	(0.552)
F-Statistic			3.324	3.303
			[0.505]	[0.509]
Hansen J Statistic			4.894	4.815
			[0.179]	[0.186]
Hausman Test Comparison OLS - IV			0.785	0.896
			[0.376]	[0.344]
Observations	2,837	2,837	2,837	2,837
Firm-Year Revenue	No	Yes	No	Yes
Firm Fixed Effects	Yes	Yes	Yes	Yes
Country-Sector-Year Fixed Effects	Yes	Yes	Yes	Yes
Firm Size Controls	Yes	Yes	Yes	Yes
Firm Network Controls	Yes	Yes	Yes	Yes

Source: Authors' calculations based on data from Worldbase, S&P Capital IQ, and CINDE. The table reports OLS and IV estimates of alternative specifications of Equation (1) as obtained on the *S&P Capital IQ*. In the first panel (*First Establishment*) the sample is restricted to those firms that did not have an affiliate in Costa Rica in the previous year. The dependent variable is a binary indicator that takes the value of one if the multinational firm establishes its first affiliate in Costa Rica in the year in question and zero otherwise. In the second panel (*Reinvestment*) the sample is restricted to those firms that have at least one affiliate in Costa Rica in the year in question. The dependent variable is a binary indicator that takes the value of one if the multinational opens a new (additional) affiliate in Costa Rica in that year and zero otherwise. The main explanatory variable, *IPA Assistance*, is a binary indicator that takes the value of one if the multinational firm was assisted by the national IPA in the year in question and zero otherwise. In the IV regressions (Columns 3 and 4), the main explanatory variable is instrumented with a variable that takes the value of 1 if the firm is part of the Fortune 1000 list of firms and 0 otherwise, along with three lags of such variable. All estimations include firm and (home) country-sector-year fixed effects (not reported). Columns 2 (OLS) and 4 (IV) include as a control one lag of the global *revenue* of the multinational (parent) firm (in logs). The other (time-varying) *Firm Size Controls* are one lag of the total number of affiliates of the multinational firm worldwide, the total number of countries in which the multinational firm is present worldwide, and the total number of sectors in which the multinational firm's affiliates operate worldwide (not reported). The (time-varying) *Firm Network Controls* are one lag of a series of binary indicators that take the value of one if the multinational firm has an affiliate in a certain country group and zero otherwise. The country groups are: Central American countries bordering Costa Rica, other Central American countries, other Latin American countries (not in Central America), upper-middle income countries, countries in which the same language is spoken, countries with which Costa Rica has a Preferential Trade Agreement (PTA), countries with which Costa Rica has a Bilateral Investment Treaty (BIT), and countries with which Costa Rica has a Double Taxation Treaty (DTT) (not reported). Standard errors clustered by firm are reported below the estimated coefficients. *** denotes significant at the 1% level, ** denotes significant at the 5% level, * denotes significant at the 10% level.

Table 5
Impact of Investment Promotion on Multinational Firms' Location Decisions
Robustness Checks: Self-Selection

	(1) Proactive vs Reactive	(2) Only Assisted Firms	(3) Linear Trends	(4) Double Differences	(5) Timing Placebo (2000-2007)	(6) Baseline (2000-2007)	(7) Baseline (2009-2016)
First Establishment							
IPA Assistance		0.147*** (0.038)	0.111*** (0.020)	0.071*** (0.017)	-0.001 (0.006)	0.187*** (0.064)	0.119*** (0.020)
IPA Assistance - Proactive	0.100*** (0.018)						
IPA Assistance - Reactive	0.169*** (0.047)						
Observations	2,529,886	2,916	2,529,886	2,433,605	1,319,499	1,319,499	1,506,163
Reinvestment							
IPA Assistance		0.036 (0.031)	0.041 (0.039)	0.016 (0.038)	-0.042 (0.051)	0.255 (0.154)	-0.022 (0.028)
IPA Assistance - Proactive	0.025 (0.022)						
IPA Assistance - Reactive	0.040 (0.044)						
Observations	4,930	1,077	4,930	4,740	2,086	2,086	2,654
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-Sector-Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Level Linear Trends	No	No	Yes	No	No	No	No
Specification in Differences	No	No	No	Yes	No	No	No
Firm Size Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Network Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Authors' calculations based on data from Worldbase and CINDE.

The table reports OLS estimates of alternative specifications of Equation (1) and Equation (3) and for different samples. In the first panel (*First Establishment*) the sample is restricted to those firms that did not have an affiliate in Costa Rica in the previous year. The dependent variable is a binary indicator that takes the value of one if the multinational firm establishes its first affiliate in Costa Rica in the year in question and zero otherwise. In the second panel (*Reinvestment*) the sample is restricted to those firms that have at least one affiliate in Costa Rica in the year in question. The dependent variable is a binary indicator that takes the value of one if the multinational opens a new (additional) affiliate in Costa Rica in that year and zero otherwise. The main explanatory variable, *IPA Assistance*, is a binary indicator that takes the value of one if the multinational firm was assisted by the national IPA in the year in question and zero otherwise. *Proactive vs. Reactive* (Column 1): the effect of investment promotion is allowed to differ depending on whether the contact was initiated by the IPA (*proactive*) or by the multinational firm (*reactive*). *Only Assisted Firms* (Column 2): the sample is restricted to multinational firms that are assisted at least once throughout the sample period. *Linear Trends* (Column 3): the specification includes firm-level linear trends. *Double Differences* (Column 4): the estimation is carried out using differences of the dependent, independent and control variables, along with the firm fixed effects. *Timing Placebo* (Column 5): assistances in the second half of the sample period (2009-2016) are assumed to have taken place in (and accordingly applied to) the first half of that period (2000-2007). *Baseline 2000-2007* and *Baseline 2009-2016* are variants of the baseline specification where the sample is restricted to the years specified. Firm fixed effects and (home) country-sector-year fixed effects are included (not reported). The (time-varying) *Firm Size Controls* are three lags of the total number of affiliates of the multinational firm worldwide, the total number of countries in which the multinational firm is present worldwide, and the total number of sectors in which the multinational firm's affiliates operate worldwide (not reported). The (time-varying) *Firm Network Controls* are three lags of a series of binary indicators that take the value of one if the multinational firm has an affiliate in a certain country group and zero otherwise. The country groups are: Central American countries bordering Costa Rica, other Central American countries, other Latin American countries (not in Central America), upper-middle income countries, countries in which the same language is spoken, countries with which Costa Rica has a Preferential Trade Agreement (PTA), countries with which Costa Rica has a Bilateral Investment Treaty (BIT), and countries with which Costa Rica has a Double Taxation Treaty (DTT) (not reported). Standard errors clustered by firm are reported below the estimated coefficients. *** denotes significant at the 1% level, ** denotes significant at the 5% level, * denotes significant at the 10% level.

Table 6
Impact of Investment Promotion on Multinational Firms' Location Decisions
Robustness Checks: Omitted Variables and Competing Explanations

	(1) Control Other IPA Assistance	(2) Firms Not in FTZ	(3) Firms w/o Ownership Changes	(4) Non- Financial Firms	(5) Non-Tax Haven Firms	(6) All Sample Exclusions
First Establishment						
IPA Assistance	0.113*** (0.017)	0.059*** (0.013)	0.101*** (0.017)	0.112*** (0.019)	0.114*** (0.019)	0.050*** (0.015)
IPA Assistance (Mexico)	0.003 (0.002)					-0.000 (0.000)
Observations	2,529,886	2,528,497	2,507,897	2,246,566	1,530,956	1,397,998
Reinvestment						
IPA Assistance	0.019 (0.024)	0.012 (0.040)	0.025 (0.024)	0.043* (0.025)	0.028 (0.026)	0.049 (0.031)
IPA Assistance (Mexico)	-0.036 (0.042)					-0.036 (0.021)
Observations	4,930	3,713	3,124	3,720	3,799	1,810
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Country-Sector-Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm Size Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm Network Controls	Yes	Yes	Yes	Yes	Yes	Yes

Source: Authors' calculations based on data from Worldbase and CINDE.

The table reports OLS estimates of alternative specifications of Equation (1) and Equation (4) and for different samples. In the first panel (First Establishment) the sample is restricted to those firms that did not have an affiliate in Costa Rica in the previous year. The dependent variable is a binary indicator that takes the value of one if the multinational firm establishes its first affiliate in Costa Rica in the year in question and zero otherwise. In the second panel (*Reinvestment*) the sample is restricted to those firms that have at least one affiliate in Costa Rica in the year in question. The dependent variable is a binary indicator that takes the value of one if the multinational opens a new (additional) affiliate in Costa Rica in that year and zero otherwise. The main explanatory variable, *IPA Assistance*, is a binary indicator that takes the value of one if the multinational firm was assisted by the national IPA in the year in question and zero otherwise. *Other IPA Assistance* (Column 1): control for assistance by Mexico's IPA is included (Mexico is the main competing location for Costa Rica). *Firms Not in FTZ* (Column 2): the sample is restricted to firms that are not established in a free trade zone. *Firms without Changes in Ownership* (Column 3): the sample is restricted to firms that did not experience ownership changes over the sample period. *Non-Financial Firms* (Column 4): the sample is restricted to firms that do not belong to the "Financial service activities, except insurance and pension funding" sector (Division 64 according to the ISIC Rev 4, 2-digit classification). *Non-Tax Heaven Firms* (Column 5): the sample is restricted to firms that are not headquartered in countries that can be considered tax heavens according to Hines (2010). *All Sample Exclusions* (Column 6) controls for all the aforementioned and thus the sample is limited to non-financial firms not in FTZ, without ownership changes and not headquartered in tax havens. Firm fixed effects and (home) country-sector-year fixed effects are included (not reported). The (time-varying) *Firm Size Controls* are three lags of the total number of affiliates of the multinational firm worldwide, the total number of countries in which the multinational firm is present worldwide, and the total number of sectors in which the multinational firm's affiliates operate worldwide (not reported). The (time-varying) *Firm Network Controls* are three lags of a series of binary indicators that take the value of one if the multinational firm has an affiliate in a certain country group and zero otherwise. The country groups are: Central American countries bordering Costa Rica, other Central American countries, other Latin American countries (not in Central America), upper-middle income countries, countries in which the same language is spoken, countries with which Costa Rica has a Preferential Trade Agreement (PTA), countries with which Costa Rica has a Bilateral Investment Treaty (BIT), and countries with which Costa Rica has a Double Taxation Treaty (DTT) (not reported). Standard errors clustered by firm are reported below the estimated coefficients. *** denotes significant at the 1% level, ** denotes significant at the 5% level, * denotes significant at the 10% level.

Table 7
Impact of Investment Promotion on Multinational Firms' Location Decisions
Type of Assistance

	(1)	(2)	(3)	(4)
	First Establishment	All	Reinvestment Recent Previous Opening	Non-Recent Previous Opening
Information Services	0.142*** (0.023)	0.079** (0.035)	0.079 (0.066)	0.147** (0.071)
No Information Services	0.056*** (0.012)	-0.045 (0.028)	-0.068 (0.059)	-0.026 (0.033)
Statistical Significance Difference	[0.000]	[0.017]	[0.237]	[0.022]
Observations	2,529,886	4,930	1,112	3,571
Firm Fixed Effects	Yes	Yes	Yes	Yes
Country-Sector-Year Fixed Effects	Yes	Yes	Yes	Yes
Firm Size Controls	Yes	Yes	Yes	Yes
Firm Network Controls	Yes	Yes	Yes	Yes

Source: Authors' calculations based on data from Worldbase and CINDE.

The table reports OLS estimates of alternative specifications of Equation (1). In Column 1 (*First Establishment*) the sample is restricted to those firms that did not have an affiliate in Costa Rica in the previous year. The dependent variable is a binary indicator that takes the value of one if the multinational firm establishes its first affiliate in Costa Rica in the year in question and zero otherwise. In Column 2 (*Reinvestment*) the sample is restricted to those firms that have at least one affiliate in Costa Rica in the year in question. In Column 3 (*Reinvestment Recent Last Opening*), the sample is restricted to firms that had opened at least another affiliate in the previous five years. In Column 4 (*Reinvestment Non-Recent Last Opening*) the sample is restricted to firms that were already present in the country but did not open an affiliate in the previous five years. The dependent variable in Columns 2-4 is a binary indicator that takes the value of one if the multinational opens a new (additional) affiliate in Costa Rica in that year and zero otherwise. The main explanatory variables. *Information Services* and *Other Services* are binary indicators that take the value of one if the multinational firm was assisted by the national IPA with the respective service in the year in question and zero otherwise. Firm fixed effects and (home) country-sector-year fixed effects are included (not reported). *Firm Size Controls* are three lags of the total number of affiliates of the multinational firm worldwide, the total number of countries in which the multinational firm is present worldwide, and the total number of sectors in which the multinational firm's affiliates operate worldwide (not reported). The (time-varying) *Firm Network Controls* are three lags of a series of binary indicators that take the value of one if the multinational firm has an affiliate in a certain country group and zero otherwise. The country groups are: Central American countries bordering Costa Rica, other Central American countries, other Latin American countries (not in Central America), upper-middle income countries, countries in which the same language is spoken, countries with which Costa Rica has a Preferential Trade Agreement (PTA), countries with which Costa Rica has a Bilateral Investment Treaty (BIT), and countries with which Costa Rica has a Double Taxation Treaty (DTT) (not reported). Standard errors clustered by firm are reported below the estimated coefficients. *** denotes significant at the 1% level, ** denotes significant at the 5% level, * denotes significant at the 10% level.

Table 8
Impact of Investment Promotion on Multinational Firms' Location Decisions
Assistance Type and Countries and Sectors Facing Different Information Frictions

	(1) All Assistances	(2) Assistance with Information Services	(3) Assistance with Other Services
First Establishment			
Common Language	0.053 (0.051)	0.179 (0.152)	-0.096 (0.092)
Different Language	0.115*** (0.018)	0.143*** (0.024)	0.061*** (0.012)
Test of Statistical Significance of the Difference	[0.246]	[0.806]	[0.001]
Differentiated	0.132*** (0.026)	0.162*** (0.027)	0.071*** (0.014)
Non-Differentiated	0.027 (0.018)	0.054 (0.038)	-0.011 (0.018)
Test of Statistical Significance of the Difference	[0.000]	[0.022]	[0.005]
Reinvestment			
Common Language	0.037 (0.023)	0.001 (0.001)	0.032 (0.021)
Different Language	0.019 (0.026)	0.080** (0.036)	-0.047 (0.029)
Test of Statistical Significance of the Difference	[0.609]	[0.028]	[0.130]
Differentiated	0.019 (0.026)	0.081** (0.036)	-0.048 (0.029)
Non-Differentiated	0.024 (0.019)	0.004 (0.003)	0.019 (0.017)
Test of Statistical Significance of the Difference	[0.890]	[0.036]	[0.164]
Firm Fixed Effects	Yes	Yes	Yes
Country-Sector-Year Fixed Effects	Yes	Yes	Yes
Firm Size Controls	Yes	Yes	Yes
Firm Network Controls	Yes	Yes	Yes

Source: Authors' calculations based on data from Worldbase and CINDE.

The table reports OLS estimates of alternative specifications of Equation (1) and Equation (4) and for different samples. In the first panel (*First Establishment*) the sample is restricted to those firms that did not have an affiliate in Costa Rica in the previous year. The dependent variable is a binary indicator that takes the value of one if the multinational firm establishes its first affiliate in Costa Rica in the year in question and zero otherwise. In the second panel (*Reinvestment*) the sample is restricted to those firms that have at least one affiliate in Costa Rica in the year in question. In Column 1 the independent variables are interactions using a binary indicator that takes the value of one if the multinational is assisted by CINDE in that year (*Assistance*) and zero otherwise. In Column 2, they are interactions using a binary indicator that takes the value of one if the multinational is assisted by CINDE using information services (*Assistance with Information Services*). In Column 3 they are interactions using a binary indicator that takes the value of one if the multinational is assisted by CINDE using other services (*Assistance with Other Services*). These variables are interacted with two binary variables that take the value of one if the country of origin of the multinational firm shares a language (*Common Language*) or if it doesn't (*Different Language*) and with binary variables that take the value of one if the majority of affiliates of the multinational companies operate in differentiated sectors (*Differentiated*) or if they don't (*Non-Differentiated*), respectively. Firm fixed effects and (home) country-sector-year fixed effects are included (not reported). *Firm Size Controls* are three lags of the total number of affiliates of the multinational firm worldwide, the total number of countries in which the multinational firm is present worldwide, and the total number of sectors in which the multinational firm's affiliates operate worldwide (not reported). The (time-varying) *Firm Network Controls* are three lags of a series of binary indicators that take the value of one if the multinational firm has an affiliate in a certain country group and zero otherwise. The country groups are: Central American countries bordering Costa Rica, other Central American countries, other Latin American countries (not in Central America), upper-middle income countries, countries in which the same language is spoken, countries with which Costa Rica has a Preferential Trade Agreement (PTA), countries with which Costa Rica has a Bilateral Investment Treaty (BIT), and countries with which Costa Rica has a Double Taxation Treaty (DTT) (not reported). Standard errors clustered by firm are reported below the estimated coefficients. *** denotes significant at the 1% level, ** denotes significant at the 5% level, * denotes significant at the 10% level.

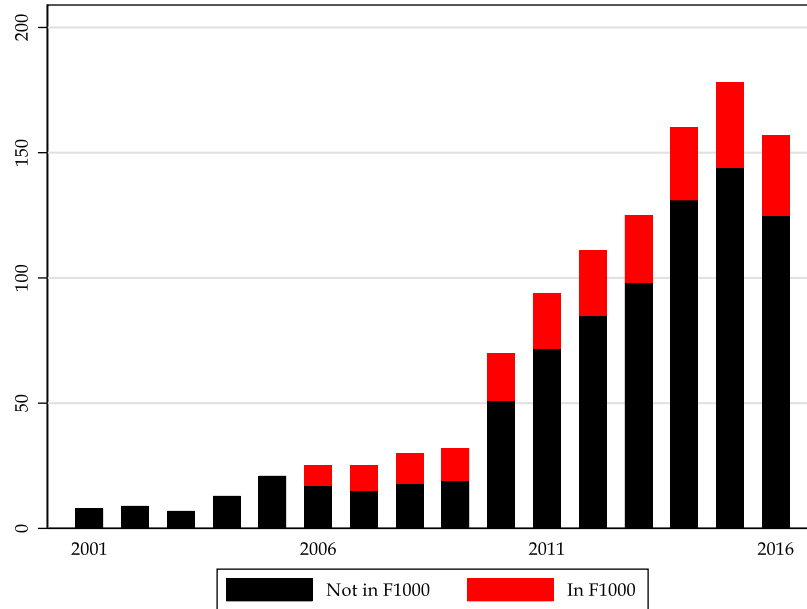
Table 9
Impact of Investment Promotion on Multinational Firms' Location Decisions
Cost-Benefit Back-of-the-Envelope Calculation

	OLS		
	(1)	(2)	(3)
Estimated Average FDI from Establishing an Affiliate	5M USD	10M USD	15M USD
Change in the Probability of Establishing an Affiliate	11%	11%	11%
Average Cost of Assistance	40,073 \$	40,073 \$	40,073 \$
FDI per Dollar Spent in Investment Promotion	13.7 \$	27.4 \$	41.1 \$
	IV		
	(1)	(2)	(3)
Estimated Average FDI from Establishing an Affiliate	5M USD	10M USD	15M USD
Change in the Probability of Establishing an Affiliate	38%	38%	38%
Average Cost of Assistance	40,073 \$	40,073 \$	40,073 \$
FDI per Dollar Spent in Investment Promotion	47.4 \$	94.1 \$	142.2 \$

Source: Authors' calculations based on data from Worldbase and CINDE.

The table reports different back-of-the-envelope calculations for the estimated Foreign Direct Investment (FDI) obtained per dollar spent in investment promotion activities for the first establishment of multinational firms, i.e., for the establishment of multinational companies that did not previously have an affiliate in the country. The FDI per dollar spent in investment promotion is obtained by multiplying the change in the probability of establishing an affiliate in the country for the first time by the estimated average investment when establishing such affiliate and dividing by the average cost of assistance. Columns (1) to (3) in the upper panel use the estimated change in the probability of establishing an affiliate from the baseline OLS estimation of Equation (1) (Column 6 in Table 3). Columns (1) to (3) in the lower panel use the estimated change in the probability of establishing an affiliate from the IV estimation of Equation (1) that relies on the Fortune 1000 lists as instrumental variables (Column 1 in Table 4). Column 1 reports the estimated FDI per dollar spent in promotion activities for an average investment of US\$ 5 million, Column 2 for an average investment of US\$ 10 million, and Column 3 for an average investment of US\$ 15 million. The average cost of assistance is obtained by taking the average of the ratios of CINDE's annual total budget to the total number of multinational firms assisted by the IPA in each year over the period 2007-2016. Total budget is a more comprehensive measure than labor costs and, as such, provides us with more conservative cost-benefit estimates. CINDE's annual budget come from Volpe Martincus and Sztajerowska (2019) and is only available for the period 2007-2016.

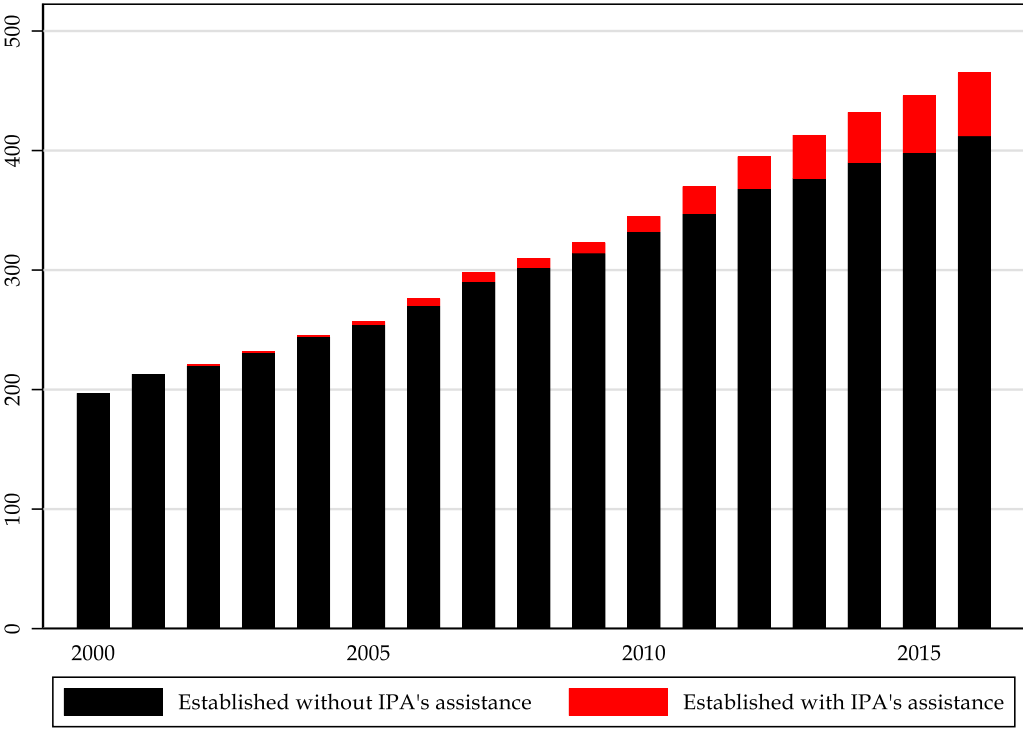
Figure 1
Number of Multinational Firms Assisted by CINDE,
Total and Depending on Whether They or Not Are Part of the Fortune 1000



Source: Authors' calculations based on data from Fortune 1000 lists.

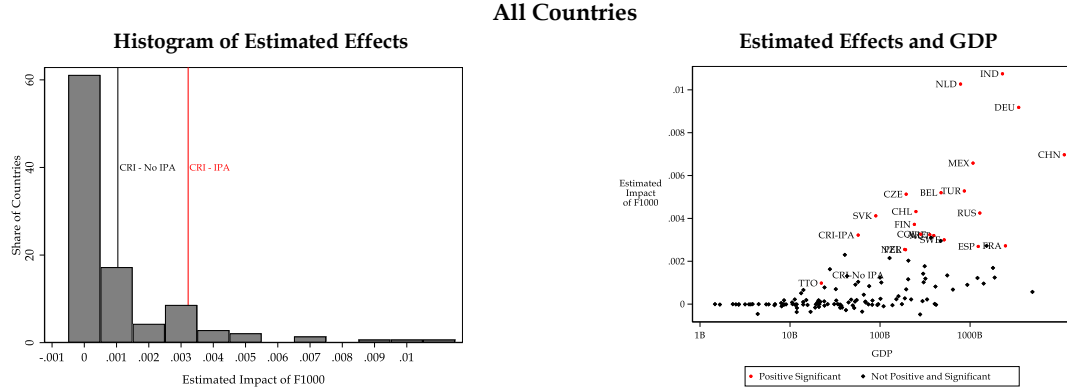
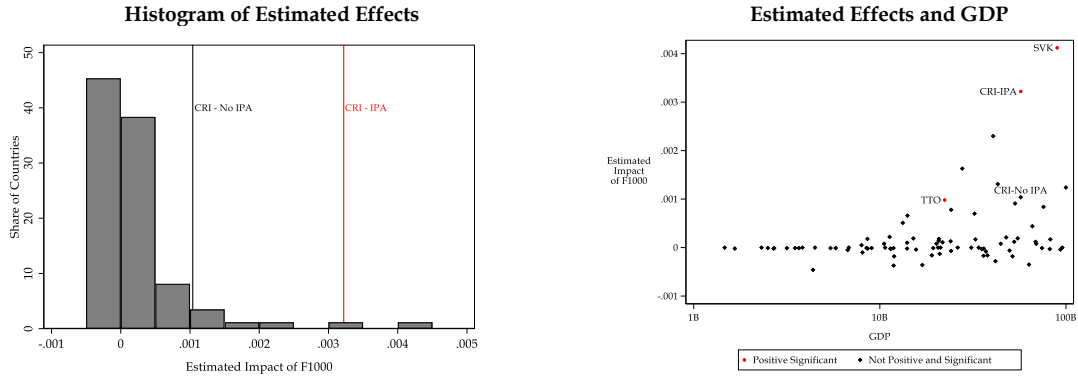
The graph shows the total number of multinational firms assisted by CINDE each year over the period 2000-2016 along with its distribution in two groups: (i) firms that are part of the Fortune 1000 list in the year in question; and (ii) firms that are not part of the Fortune 1000 in the year in question.

Figure 2
Multinational Firms in Costa Rica



Source: Authors' calculations based on data from Worldbase and CINDE.
 IPA's assistance refers to the cumulative number of multinational firms that received assistance in the same year in which they established their first affiliate in Costa Rica.

Figure 3
Direct Effect of Membership to the F1000 on Firms' First Establishment in a Country
Countries with GDP Below US\$ 100 Billion

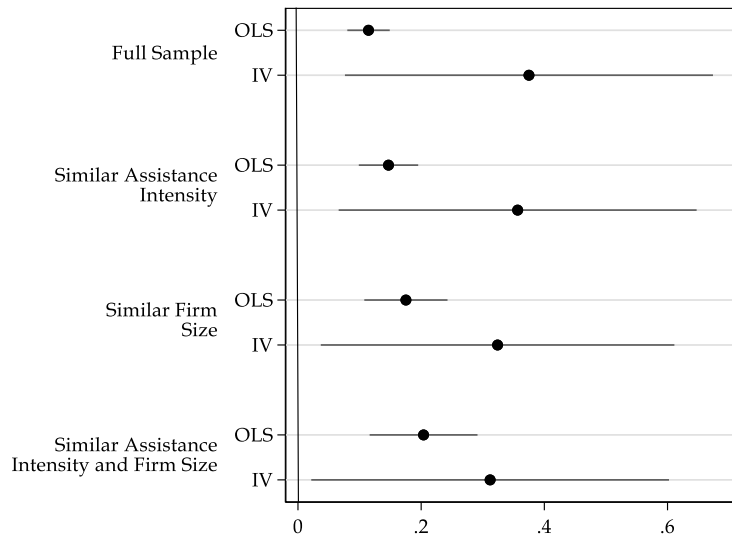


Share of Countries with Significant Estimated Coefficients per Country Category

Country Category	Positive and Significant	Not Positive and Significant	Not Significant	Negative and Significant
All countries	16.5%	83.5%	75.3%	8.2%
All countries excluding tax havens	15.8%	84.2%	74.1%	10.1%
Tax havens	19.4%	80.6%	80.6%	0.0%
Countries below \$US 100B GDP	4.5%	95.5%	84.8%	10.7%
Countries above \$US 100B GDP	39.7%	60.3%	56.9%	3.4%
Countries below \$US 100B GDP excluding tax havens	3.5%	96.5%	82.6%	14.0%
Countries above \$US 100B GDP excluding tax havens	35.8%	64.2%	60.4%	3.8%

Source: Authors' calculations based on data from Worldbase, CINDE, and World Bank's World Development Indicators. The figures exhibit the OLS estimates of Equation (3) for each host country in the world. The dependent variable is a binary variable that takes value one if the multinational firm opens an affiliate in the host country for the first time and zero otherwise. The independent variable is a binary variable that takes value one if the multinational firm is part of the Fortune 1000 list in that year and zero otherwise. The regressions include the same *Firm Size Controls* and *Firm Network Controls* as well as firm- and (home) country-sector-year fixed effects as the baseline specifications. An estimated coefficient is considered significant based on a 95% confidence level and using standard errors clustered by firm. The figures include the data for Costa Rica with (CRI - IPA) and without the assistance of the investment promotion agency (CRI - No IPA).

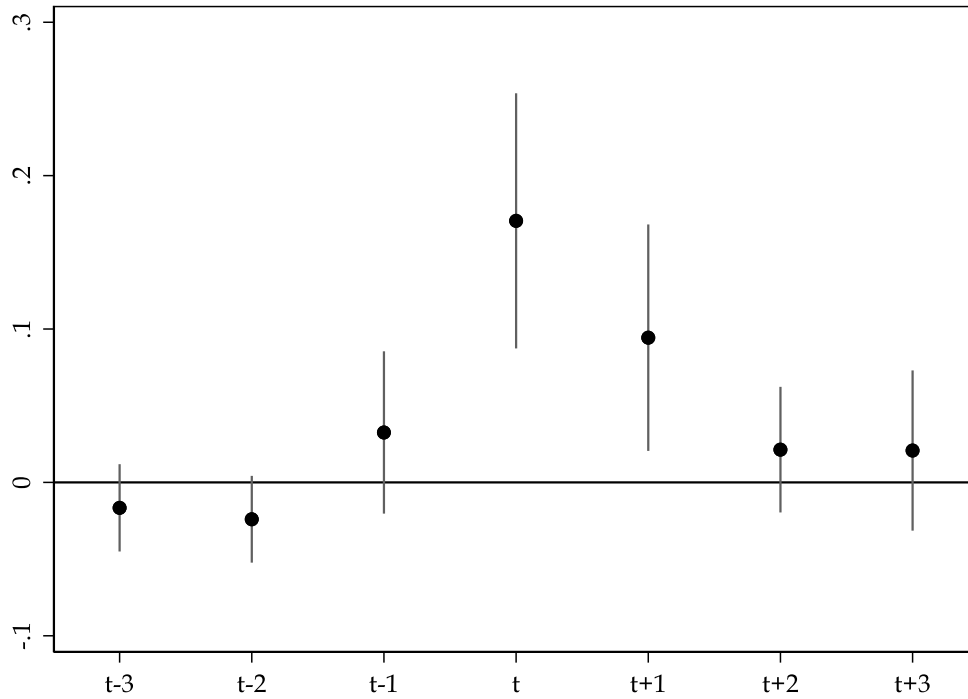
Figure 4
Impact of Investment Promotion on Multinational Firms' Location Decisions
OLS and Instrumental Variables Estimates
Alternative Samples: Full, Similar Assistance Intensity, and Similar Firm Size



Source: Authors' calculations based on data from Worldbase and CINDE.

The figure shows the OLS and IV point estimates reported in Table 5 along with their respective 95% confidence intervals as obtained on four different samples. The dependent variable is a binary indicator that takes the value of one if the multinational firm establishes its first affiliate in Costa Rica in the year in question and zero otherwise. The main explanatory variable, *IPA Assistance*, is a binary indicator that takes the value of one if the multinational firm was assisted by the national IPA in the year in question and zero otherwise. *IPA Assistance* is instrumented a binary indicator that takes the value of one if the multinational firm was part of the Fortune 1000 list (F1000) in the year in question and zero otherwise, along with three lags of such a variable. *Full Sample*: the full baseline sample is considered, i.e., the sample is restricted to those firms that did not have an affiliate in Costa Rica in the previous year. *Similar Assistance Intensity Sample*: the sample is restricted to those multinational firms that did not have an affiliate in Costa Rica in the previous year and were assisted by the national IPA more than once in the year in question (treatment group) and all non-assisted firm (control group). *Similar Firm Size Sample*: the sample is restricted to those multinational firms in the F1000 list and the 50 most similar non-F1000 firms that that did not have an affiliate in Costa Rica in the previous year. *Similar Assistance Intensity and Firm Size Sample*: the sample is restricted to those multinational firms in the F1000 list and the 50 most similar non-F1000 firms that that did not have an affiliate in Costa Rica in the previous year and that either were assisted by the national IPA more than once in the year in question (treatment group) and were never assisted (control group). Firm size similarity among firms (within a given sector) is established using a multidimensional measure of distance based on the total number of affiliates of the multinational firms worldwide, the number of countries in which the multinational firms operate worldwide, and the total number of sectors in which the affiliates of the multinational firms operate worldwide. Firm fixed effects and (home) country-sector-year fixed effects are included (not reported). The (time-varying) *Firm Size Controls* are three lags of the total number of affiliates of the multinational firm worldwide, the total number of countries in which the multinational firm is present worldwide, and the total number of sectors in which the multinational firm's affiliates operate worldwide (not reported). The (time-varying) *Firm Network Controls* are three lags of a series of binary indicators that take the value of one if the multinational firm has an affiliate in a certain country group and zero otherwise. The country groups are: Central American countries bordering Costa Rica, other Central American countries, other Latin American countries (not in Central America), upper-middle income countries, countries in which the same language is spoken, countries with which Costa Rica has a Preferential Trade Agreement (PTA), countries with which Costa Rica has a Bilateral Investment Treaty (BIT), and countries with which Costa Rica has a Double Taxation Treaty (DTT) (not reported). The under-identification robust *F-Statistic* refers to the robust Kleibergen-Paap statistic. The p-values for the *F-Statistic* and the *Hansen J-Statistic* are presented in square brackets below the respective statistic. Standard errors clustered by firm are reported below the estimated coefficients. *** denotes significant at the 1% level, ** denotes significant at the 5% level, * denotes significant at the 10% level.

Figure 5
Impact of Investment Promotion on Multinational Firms' Location Decisions
First Assistance and First Establishment
Placebo and Dynamics



Source: Authors' calculations based on data from Worldbase and CINDE.

The figure shows the OLS point estimates of Equation (1) along with their respective 99% confidence intervals for forwarded (placebo), contemporaneous (baseline), and lagged (dynamics) assistance. *The sample is restricted to multinational firms that have existed since the first sample year, have been assisted by national IPA at least once throughout the sample period, and did not have an affiliate in Costa Rica before their first assistance.* Each confidence interval corresponds to a different regression. The dependent variable is a binary indicator that takes the value of one if the multinational firm establishes its first affiliate in Costa Rica in the year in question and zero otherwise. The main explanatory variable, *IPA Assistance*, is a binary indicator that takes the value of one in year $t-n$ ($t+n$) if the multinational firm was assisted by the national IPA for the first time in year t and zero otherwise. For instance, for a multinational firm whose first assistance took place in 2005, *IPA Assistance* takes the value of one in year 2000 (2010). All estimations include firm fixed effects and (home) country-sector-year fixed effects, *firm size controls*, and *firm network controls*. *Firm Size Controls* are three lags of the total number of affiliates of the multinational firm worldwide, the total number of countries in which the multinational firm is present worldwide, and the total number of sectors in which the multinational firm's affiliates operate worldwide. The (time-varying) *Firm Network Controls* are three lags of a series of binary indicators that take the value of one if the multinational firm has an affiliate in a certain country group and zero otherwise. The country groups are: Central American countries bordering Costa Rica, other Central American countries, other Latin American countries (not in Central America), upper-middle income countries, countries in which the same language is spoken, countries with which Costa Rica has a Preferential Trade Agreement (PTA), countries with which Costa Rica has a Bilateral Investment Treaty (BIT), and countries with which Costa Rica has a Double Taxation Treaty (DTT). Standard errors are clustered by firm.