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Inter-American Development Bank  
Integration and Trade Sector

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# Multinational Production and "Soft" Industrial Policies\*

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## Abstract

Multinational production has become increasingly important in recent decades. Countries resort to different industrial policies to influence the geography of this production. In this paper, we focus on a ubiquitous “soft” industrial policy that aims at reducing information barriers - investment promotion. We present evidence on the impact of this policy on multinational firms’ location decisions using -for the first time to our knowledge- firm-level data. To do so, we carry out difference-in-differences and instrumental variables estimations on data on the establishment and location of affiliates of multinational firms and assistance by the investment promotion agency (IPA) in Costa Rica over the period 2000-2016. Estimates suggest that investment promotion has been effective: support from the IPA is associated with an increase of 11 percentage points in the probability that a multinational firm establishes its first affiliate in the country. This effect is stronger on firms from countries facing more severe information frictions.

**Keywords:** Multinational Production, Industrial Policy, Investment Promotion

**JEL-Codes:** F23, F13, F14, L23, L25, L52, O25

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## 1. Introduction

Multinational production -i.e., production that is carried out by firms outside of their country of origin- is an important distinguishing feature of current global economic landscape. Sales from foreign affiliates amount to approximately 40% of global GDP and are 40% larger than world exports (see UNCTAD, 2018). The extensive margin accounts for a large share of the variation of multinational 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).<sup>1</sup>

Government around the world have resorted to industrial policy to attract these multinational firms. This policy can encompass incentives to foreign firms in the form of income tax holidays, tariff exemptions, and subsidies for infrastructure, not infrequently bundled in the framework of free zone regimes (see, e.g., Greenstone and Moretti, 2003; Greenstone et al., 2010; Farole, 2011; Davies and Francois, 2015; Zeng, 2015; and Davies and Desbordes, 2018). These kinds of interventions imply deviations from policy neutrality that create price distortions (see Harrison and Rodriguez-Clare, 2010). In addition to these interventions, there are other, "softer" and less controversial, industrial policies that do not involve direct financial support. This is for instance the case with *investment promotion*, a public policy purposely designed to reduce information frictions affecting location decisions across borders. Despite being omnipresent through the world, rigorous microeconomic evaluations of the causal impact of this policy on the geography of multinational production are virtually non-existent.

In this paper, we precisely examine whether and how such a "soft" industrial policy affects multinational firms' location decisions and the spatial patterns of multinational production's extensive margin. In so doing, we apply quasi-experimental methods on a unique firm-level dataset over a long period of time that combines, for the first time to our knowledge, data on *both* these firms' location decisions and their policy assistance status. Our results complement the literature on multinational production; the impact of "hard", tax break- and subsidy-based industrial policies on firms' location choices; and the effects of "soft", services-based industrial policies that pursue to reduce frictions to firms' internationalization.

Gravity factors, in general, and trade costs, in particular, influence the level of multinational production and particularly its extensive margin (see, e.g., Carr et al., 2001; Razin et al., 2003; Head and Mayer, 2004; Head and Ries, 2008; Ramondo, 2014; and Ramondo et al., 2015). Despite the new and emerging technologies, one important component of these costs and, as such, a major determinant of the geography of this

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<sup>1</sup>In the first case, the extensive margin is proxied by the number of foreign affiliates, whereas in the second case is captured by penetration of new markets (see Ramondo et al., 2015; and Garetto et al., 2019).

production are information barriers (see Rauch, 1999; Anderson and van Wincoop, 2004; Head and Ries, 2008; Oldenski, 2012; Keller and Yeaple, 2013; Allen, 2014; Alfaro and Chen, 2014, 2018).<sup>2</sup>

More specifically, firms seeking to invest abroad must learn about the general and sector-specific regulations that need to be complied with and the costs and conditions implied when establishing and operating in the destination country. These include projected demand for their products and services in that country and from relevant partner countries, tax treatments, the processes and costs of exporting and importing their inputs, and the network of local suppliers along with the quality of their products and services. Crucially, firms pursuing cross-border economic opportunities must engage in a costly process of identifying business partners and assessing their reliability, trustworthiness, timeliness, and capabilities (see Rangan and Lawrence, 1999; and Rangan, 2000).

Information in these regards can be highly incomplete and gathering it can be very costly, particularly 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.<sup>3</sup> As a result, multinational firms may end up considering a small range of locations and disregard several potentially convenient alternatives (see Loewendahl, 2018).<sup>4</sup>

Almost if not 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 (see, e.g., Alfaro and Charlton, 2007; and Harding and Javorcik, 2011; and Volpe Martincus and Sztajerowska, 2019). IPAs primarily provide these firms with a series of information services that can be grouped into four main categories: (i) national image building, which encompasses actions that seek to improve the perception of the country as an attractive location; (ii) investment generation, which entails identifying and approaching potential investors; (iii) investment facilitation and retention, which consists of assistance to investors in analyzing business opportunities, obtaining permits for establishing a business in the country, and

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<sup>2</sup>It has been estimated that two countries that share a common language have 65% more bilateral affiliates than their counterparts with different languages (see Ramondo et al., 2015).

<sup>3</sup>These figures come from a market study conducted by Costa Rica's national investment promotion agency, CINDE. 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 their senior managers, etc.

<sup>4</sup>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. More specifically, the returns accruing to the firms carrying out these new investments (private returns) would be lower than the corresponding returns for the economy as a whole (social returns), and investment in their development would then be suboptimal-thereby potentially providing a rationale for public intervention (see Blyde et al., 2014).

disseminating information on regulations and available incentives, as well as support in complying and accessing them, respectively; and investment aftercare for already established multinational firms; and (iv) policy advocacy, which comprises all activities that pursue to enhance the investment climate, identifying the public inputs needed by the private sector, and coordinating with the rest of the public sector to deliver those inputs (see, e.g., UNCTAD, 2007, 2008; Harding and Javorcik, 2011; Blyde et al., 2014).<sup>5</sup>

When properly designed and executed, investment promotion services can potentially affect firms' location decisions.<sup>6</sup> Thus, national image building and investment generation services can make a difference in the early stages of such a decision process by helping the country to be included in the typical long list of 10-20 possible locations that firms (or their site selection consultants) prepare. Investment facilitation, in turn, can impact the latter phases of such a decision-making process by, first, contributing to increase the probability that the country is selected for the short list of locations that are visited and, second, it is actually chosen among these locations. Through investment aftercare services, facilitation can also specifically affect investment by already established firms, i.e., reinvestment. Policy advocacy can also play a role in these regards (see, e.g., Loewendahl, 2001, 2018; Harding and Javorcik, 2011).

In this paper, we address three main questions: What is the impact of "soft" policies such as investment promotion on the likelihood that multinational firms establish an affiliate in the respective country and hence on the spatial pattern of multinational production? To what extent the effects of these policies are heterogeneous across firms from different home countries and sectors? Does the dosage and the specific combination of policy instruments matter?

In answering these questions, we use a rich dataset that combines data on the distribution of multinational firms' foreign affiliates across countries including information on the main sector and the year of establishment and data on Costa Rica's IPA assistance to multinational firms including information on the specific type of activity through which the support actually took place and the associated costs over the period 2000-2016. In order to identify the effects of investment promotion activities on these firms' location decisions, we primarily apply difference-in-differences and instrumental variables strategies.

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<sup>5</sup>A priori, these activities can be considered aligned with correcting market failures. Thus, national image building and investment generation are primarily information services that can be viewed as a means of subsidizing location searches, which counter the disincentives arising from potential free riding. Similarly, facilitation and policy advocacy are essentially actions which aim at solving coordination problems in the provision of public sector inputs that facilitate investments.

<sup>6</sup>Needless to say, investment promotion support is only one of the determinants of such decisions. These determinants include costs, the quality of the business environment, additional investment attraction policies, among others. Our estimation strategy will account for these other factors (see Sections 4 and 5).



We focus on Costa Rica for several reasons. First, the country experienced substantial changes in the extensive margin of the multinational production taking place within its territory. More than half of the multinational firms present in Costa Rica (around 460) established their first affiliate in the country over our sample period. Relative to its population, this number of multinational firms makes Costa Rica comparable to other middle and upper-middle developing countries, for which this analysis can thus shed light on the rationale and effects of investment promotion. Also important, firms have about 50 home countries and operate in almost 140 sectors, which provides with us with significant variation along these dimensions. Second, Costa Rica has a well-established national IPA with a long trajectory, CINDE, whose assistance activities can be consistently tracked over time (see Rodríguez-Clare, 2001). Further in this regard, there are neither other national IPAs nor subnational IPAs, which eliminates the risk of biases in estimates due to unobserved additional domestic assistance (see Volpe Martincus and Sztajerowska, 2019). Third, the country has a single main investment incentive regime - the free trade zone (see López et al., 2016). Firms using this regime can be perfectly identified based on available data so that the incidence of other investment attraction policies can be accounted for. Fourth, the relevant legislation on investment, the 1964 Commercial Code, establishes a non-discriminatory principle so that domestic and foreign investment receive the same treatment. Fifth, Costa Rica is open to FDI. It has a level of restrictions comparable to the median OECD country (see OECD, 2013).

Our main estimation results indicate that investment promotion has been effective in attracting multinational firms to Costa Rica. More precisely, support from CINDE has been associated with an increase of 11 percentage points in the probability that these firms establish a first affiliate in the country. This estimated impact increases with the intensity of such a support as proxied by the number of services provided and is largest when firms are assisted in gathering relevant and accurate information on local business conditions, in general, and installation-related matters, in particular. Interestingly, this kind of service is the least expensive (in terms of labor costs) and hence appears to be the most cost-effective. Moreover, the estimated effects are larger on multinational firms from home countries that can be considered to face more severe information barriers. In contrast, CINDE's assistance does not seem to have generally affected firms' reinvestment decisions -as measured through the opening of subsequent affiliates or plants-, except only through information services and to a significantly lesser extent than first establishments. Taken together, these results would suggest that investment promotion may operate by reducing information-related, location-specific fixed costs associated with starting new firms and especially with opening a first affiliate in a different country.

There are three main econometric issues that may affect our results: (i) omitted variable biases; (ii) self-selection into investment promotion support; and (iii) external validity. We carefully address each of these concerns. First, our baseline specification relates a firm-level binary indicator of affiliate establishment with a firm-level binary indicator of IPA assistance along with multiple covariates that capture firms' size and geography of their network of affiliates and firm (-home country-sector) and home country-sector-year fixed effects. Albeit this specification accounts for the main determinants of multinational firms' location decisions according to the existing theory, there may be in fact additional factors playing a role in these decisions which may be correlated with support status, thus creating omitted variable biases. Hence, in robustness check exercises, we estimate alternative specifications that either expand such a baseline to incorporate firm linear trends or assistance from the main competing IPA, or consist of a first-difference version thereof that additionally includes firm fixed effects. Moreover, we remove all firms established in free trade zones and those experiencing ownership changes over our sample period. Remarkably, the results from all these estimations corroborate our main findings.

Second, even though the fixed effects and the time-varying firm-level controls absorb multiple factors that may result in self-selection, we cannot entirely rule it out. To deal with this issue, we also implement an instrumental variable strategy that exploits CINDE's prioritization approach. More precisely, CINDE 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 (and internal) lists of companies. We accordingly instrument firms' investment promotion assistance status with the Fortune 1000 (F1000) list, which includes the 1,000 largest American companies by revenue in a specific year. In particular, we use a series of binary indicators that capture firms' contemporaneous and lagged membership to the F1000 lists (i.e., in the year in question and the three previous years). These instruments are strong predictors of IPA support and instrumental variables estimates of the impact of such a support on first establishment confirm our baseline. Admittedly, this identification strategy faces one main challenge: 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 because, as mentioned above, the baseline specification controls for the relevant determinants of multinational firms' geographical expansion identified in the literature (see, e.g., Antras and Yeaple, 2013; Egger et al.,

2014). Furthermore, results remain the same when we replicate the estimations on samples exclusively consisting of firms that are comparably large to those in the F1000 list. More formally, the Hansen J test statistics suggest that our overidentifying restrictions cannot be rejected. In addition, conditional on the covariates and the benchmark fixed effects, the F1000 indicator does not have an effect on the probability to establish an affiliate in the sample of non-assisted firms. Moreover, we also resort to an alternative instrumental variable strategy whereby we use time-varying lists of firms that CINDE was interested in attracting to Costa Rica, both alone and in combination with the F1000 list, as instruments for IPA support. The resulting instrumental variables estimates are also in line with the baseline.

Third, we additionally explore the external validity of our results by reproducing the analysis on similar firm-level data from Uruguay over the same sample period. As with Costa Rica, difference-in-differences estimates suggest that investment promotion assistance increases the probability that multinational firms establish a first affiliate in the country. Interestingly, Uruguay's national IPA, URUGUAY XXI, does not prioritize large firms and, consistently, the F1000-based instrument is significantly weaker and leads to highly imprecise estimates.

The remainder of this paper is organized as follows. Section 2 discusses the related literature and our contributions. Section 3 provides a background on multinational production and investment promotion in Costa Rica along with a description of the databases. Section 4 explains the empirical strategy. Section 5 presents the estimation results, and Section 6 concludes.

## **2. Multinational Production and Firm-Level Public Policies: Related Literature**

Our study contributes to three main strands of the literature. First, a growing number of papers have examined the patterns, determinants, and implications of multinational production (see, e.g., 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 and Yeaple, 2013; Irarrazabal et al., 2013; Alfaro and Chen, 2014; Egger et al., 2014; Ramondo, 2014; Ramondo et al., 2015; Conconi et al., 2016; Alviarez, 2019; Garetto et al., 2019; Head and Mayer, 2019). We complement these papers by incorporating a public policy angle into the analysis. More specifically, we assess the role of investment promotion, a widely used policy aiming at lowering an important source of trade costs—information barriers—in shaping the geography of multinational production.

Second, there is a large group of studies that assess the effect of industrial policies in the form of tax breaks or subsidies on firms' location choices, both across regions within countries and across countries (see, e.g., Büttner and Ruf, 2007; Griffith et al., 2007;

Brühlhart et al., 2012; Button, 2019; Criscuolo et al., 2019; Mast, 2020; and Slattering and Zidar, 2020). We add to this literature by examining a “softer” industrial policy that do not involve direct financial support for firms but primarily information provision and presenting new rigorous microeconomic evidence on how it affects firms’ location decisions across borders.

Third, an also increasing number of papers evaluate the impact of public policies that primarily help firms overcome obstacles to their internationalization. This is particularly the case with export promotion, which aims at reducing information-related trade costs to make it easier for domestic firms to start selling and to expand their sales abroad (see, e.g., Volpe Martincus and Carballo, 2008, 2010; Cadot et al., 2015; van Biesebroeck et al., 2016; van Biesebroeck and Broocks, 2017; Munch and Schaur, 2018). In contrast, available evidence on the effects of investment promotion, which operates on similar costs but to facilitate the arrival of foreign firms, is substantially more limited and, when it comes to micro data, is directly absent.

In this limited existing literature, investment promotion has been captured using various aggregate indicators in different settings. Broadly speaking, two main approaches have been followed to proxy investment promotion: a binary variable indicating the existence of an IPA or an IPA’s office (in the host or home country) and whether specific sectors are targeted by the IPA. As defined here, Head et al. (1999) associate investment promotion with the existence of an office of an US state in Japan to explore its impact on the distribution of Japanese manufacturing firms’ FDI across these states between 1980 and 1992. The estimates of the specification derived from a location choice model indicate that US investment promotion offices did not appear to have been effective in attracting FDI from Japan. According to the authors, a possible explanation of this result is that Japanese investors may have been already well informed about the states, in which case information provided by the agencies would not have made a difference. In contrast, working with a sample of eight home countries and using a linear dynamic panel estimator, Bobonis and Shatz (2007) find that state offices in these countries did influence FDI into US states between 1976 and 1996.<sup>7</sup> Hayakawa et al. (2014) also assess the effects of investment promotion but through the presence of offices of an IPA in potential destinations and accordingly focusing on outward FDI from Japan and Korea. Their results reveal that such a promotion had a positive effect, but circumscribed to politically risky economies, where the local business environment is harder to navigate and hence the need of accurate information is stronger. Based on a similar proxying approach, Ni et al. (2017) examine instead whether city-level investment promotion as

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<sup>7</sup>The countries included in this study are Australia, Canada, France, Germany, Japan, the Netherlands, Switzerland, and the United Kingdom.

captured by the presence of an IPA in the city leads to more firm-level and city-level FDI in China over the period 2002-2007. Using a first-difference two stage least square estimation, they find that so-measured investment promotion has no significant impact on new FDI in either level.

Most IPAs target some sectors (see Charlton et al., 2004). These are sectors in which their countries have comparative advantage and sectors that allow for diversification, thereby bringing new technologies and skills to the host economies (see Alfaro and Charlton, 2007). Changing IPAs' sector targeting has been used to identify the impact of investment promotion on FDI inflows (see Charlton and Davis, 2007, and Harding and Javorcik, 2011). It has also been used as an instrument to identify the effects of sectoral FDI on sectoral growth (see Alfaro and Charlton, 2007). These studies apply a difference-in-differences strategy on host country-sector-year data, while controlling for host country-sector, home country-year, and sector-year fixed effects, and home country, sector, and year fixed effects, respectively. Results from these studies indicate that FDI inflows have been larger in those prioritized sectors. For instance, based on sectoral FDI data from the US over the period 1990-2004, targeted sectors have been estimated to register 155% more FDI after acquiring that condition. This translated into an additional annual inflow of US\$ 17 million for the median country-sector combination. Such estimated effects are even more pronounced in countries where information barriers and transaction costs are higher (see Harding and Javorcik, 2011). Similarly, less developed European regions have been reported to be more likely to receive as well as to experience larger FDI inflows in given sectors when their respective subnational IPA started targeting these sectors over the period 2003-2017 (see Crescenzi et al., 2019). Available analyses further suggest that IPAs that handle investors' inquiries in a more professional manner and have higher-quality websites attract larger volumes of FDI (see Harding and Javorcik, 2013).

While certainly insightful, the literature reviewed above has limitations, which makes the evidence on how investment promotion affects firms' location decisions preliminary and incomplete. In particular, these limitations concern identification of the effects of interest and the channels of these effects. Lacking firm-level data on both location decisions and policy, identification needs to rely on cross-country-sector variation. This identification strategy has the drawback that unobserved time-varying country-sector characteristics that are relevant for investment and potentially correlated with investment promotion are not satisfactorily controlled. More generally, estimates may be subject to endogeneity biases. Also importantly, existing studies cannot properly examine whether and how investment promotion influences the firms' margin of multinational production, which, as mentioned above, plays a major role in the expansion of this

production.

We contribute to this literature in multiple ways. First, we assess, to our knowledge for first time, the effectiveness of public interventions specifically designed to attract multinational firms using firm-level data on *both* location decisions and assistance statuses. Unlike studies based on aggregate data, we can specifically observe all four possible combinations of policy treatments and outcomes: assisted multinational firms that locate in the host country, assisted multinational firms that never locate in the host country, non-assisted multinational firms that locate in the host country, and non-assisted multinational firms that never locate in the host country. In this framework, we can account for unobserved time-varying country-sector and, in addition, unobserved time-invariant and observed time-varying firm-level factors. Second, in so doing, we characterize, also to our knowledge for the first time, the extensive margin of investment promotion policies (i.e., absolute and relative numbers of supported firms) and provide completely new evidence on the relative effects of different promotion instruments and their dosage. Third, we examine potential heterogeneous effects across groups of firms depending on the severity of information problems associated with their home countries or sectors.

### 3. Multinational Production and Investment Promotion in Costa Rica<sup>8</sup>

To characterize the patterns and evolution of multinational production in Costa Rica we rely on two main databases: the WorldBase (see, e.g., Alfaro and Chen, 2012 and 2014) and a database which was kindly shared with us by CINDE.

The WorldBase is compiled by Dun and Bradstreet (DB). Data come from a wide range of sources including public, local mercantile, and chamber of commerce' registers, telephone directory and insolvency records, legal fillings, websites, and dedicated investigations, and their quality is verified centrally through multiple automated and manual checks (see, e.g., Alfaro and Chen, 2012; and DB, 2019). Comparisons with other databases such as those of UNCTAD and US' Bureau of Economic Analysis (BEA) suggest that the WorldBase can be considered one of the best estimations of the global population of multinational firms (see Alfaro and Charlton, 2009). For instance, in 2010 the WorldBase sample consisted of almost 150,000 multinational firms, 500,000 foreign affiliates, and around 1 million foreign plants. UNCTAD data for the same year recorded 103,000 multinational firms and approximately 900,000 foreign affiliates/plants.

As of 2016, the WorldBase included about 260 million public and private firms in over 200 countries and territories. Most of these companies are stand-alone businesses

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<sup>8</sup>The information on CINDE presented in this section comes from the IDB-OECD IPA survey (see Volpe Martincus and Sztajerowska, 2019).

with no formal linkages to other firms. We will work with the sub-group of all parent firms that, at some point of the sample period, have at least one subsidiary or branch in a different country (i.e., roughly 200,000 firms).<sup>9</sup> For these multinational firms, the WorldBase furnishes us with data on home country, year of establishment and sector of activity as well as data on location-i.e., host country-, year of establishment, and sector of activity for each of its affiliates.

Now, admittedly, the coverage of the WorldBase is not perfect. This is particularly the case for developing countries such as Costa Rica (see, e.g., Ramondo et al., 2015).<sup>10</sup> We therefore complement these data using a database kindly shared by CINDE, which also provides us with data on parent firm, home country, sector of activity, and starting year for the foreign affiliates established in the country.<sup>11</sup> A third database, also from CINDE, informs all firms in free trade zones. This allows us to identify foreign affiliates operating under such a regime.

Table 1 shows 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.<sup>12</sup> These firms from approximately 50 countries have more than 600 affiliates that are active in 141 sectors.<sup>13</sup> 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 administrative, office support, and other business support activities (ISIC 82) sectors.<sup>14</sup>

In Costa Rica, responsibility for national investment promotion has been assigned to CINDE. This agency was established in 1982 as a private organization whose unique mandate is to promote inward FDI, is headquartered in San Jose, and has a single overseas office located in the United States (New York). Its highest governing body is the Board of Directors, which is exclusively composed of nine representatives from the private sector. In addition to the board, CINDE's organizational structure consists of a general manager and four departments which are responsible for investment promotion, research, international affairs, and aftercare.

<sup>9</sup>In particular, we will focus on global ultimate parent firms.

<sup>10</sup>In these countries, sales of US foreign affiliates according to the WorldBase tend to be smaller than those reported in the US BEA database (see Alfaro and Charlton, 2009).

<sup>11</sup>In this regard, it is worth stressing that 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.

<sup>12</sup>This figure is comparable to that reported in Alfaro-Ureña et al. (2019) who use data from Costa Rica's Central Bank.

<sup>13</sup>Sectors are identified using the ISIC Revision 4 4-digit classification.

<sup>14</sup>It is worth mentioning that all estimation results presented in the paper are robust to excluding all multinational firms whose reported home country can be classified as tax heaven (see, e.g., Hines, 2010). These estimation results are presented in Subsection 5.2.

As of 2016, the agency's budget was US\$4.7 million. Around 70% of the budget was provided by the public sector through the Ministry of Foreign Trade (COMEX) and the remaining resources come from contributions from the private sector.<sup>15</sup> In that year, the agency had 47 employees, most of whom had previous experience in the private sector in general and in multinational firms in particular and speak a foreign language. More than three quarters of the financial resources and the personnel were assigned to two core investment promotion functions: investment generation and investment facilitation and retention (i.e., primarily attraction of new investment and keep and expand existing investments).<sup>16</sup> In the empirical analysis below, we accordingly focus on the impact of CINDE's assistance services on the first establishment of a foreign firm in Costa Rica and on the opening of additional affiliates by foreign firms that are already present in the country.

In promoting FDI into Costa Rica, CINDE provides multinational firms with different services. These services include: (i) *information services* through which CINDE supports firm in gathering specific information on local business conditions, in general, and the installation process, in particular (e.g., 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 sector-specific installation process, and simulations of expected profits and losses for concrete business models; and organization of meetings with potential clients and providers to learn about prices and conditions and with government officials); (ii) *procedural services* through which CINDE assists firm in completing relevant procedures (e.g., assistance for registration, acquisition of licenses and construction, health, and environmental permits including scheduling of meetings with government officials); and (iii) *human capital services* through which CINDE helps firms find and hire personnel (e.g., assistance to hire and programs to train their local personnel).<sup>17</sup> These services to multinational firms are provided free of charge.

CINDE's promotional efforts have a sectoral focus. Priority sectors, which slightly changed over our sample period, include various manufacturing activities; recycling; computer programing and related activities; research and experimental development on natural sciences and engineering; architectural, engineering and other technical activi-

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<sup>15</sup>More precisely, COMEX financed directly 42% of the budget. The additional funds come from the national trade promotion organization PROCOMER. The legal framework is a formal inter-institutional agreement that seeks to combine public and private resources to promote inward FDI. In this regard, it is worth mentioning that PROCOMER manages the country's free trade zone regime.

<sup>16</sup>The remaining resources were assigned to national image building and policy advocacy.

<sup>17</sup>CINDE also executes national image building and policy advocacy actions such as advertisement campaigns and investment climate monitoring and formal and informal suggestions to the government on how to improve such a business climate.



ties; advertising; business activities; and higher education.<sup>18</sup> While declaredly CINDE does not target specific home countries, it could be considered to do it given the location of its single office abroad, the United States. Importantly, CINDE prioritizes large foreign firms. In our estimations, we will proxy this firm prioritization with F1000 lists and CINDE's own year-specific lists of target firms. The latter are put together based on in-house research conducted by sectoral specialists and primarily include large multinational firms operating in priority sectors.

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.

The databases on multinational production and investment promotion assistance have been merged using firms' names. These names generally differ in the databases. This could be due to the type of business structure or due to spelling. To deal with these issues, we first harmonize firm names in each database separately. In particular, we modify the procedure in Bessen (2009).<sup>19</sup> Second, we use a fuzzy matching algorithm to compare the harmonized names across datasets.<sup>20</sup>

Using these merged data, the last column of Table 1 and Figure 1 show the number of multinational firms assisted by CINDE and the number of those firms that opened their first affiliate in Costa Rica relative to the total number of multinational firms present in

<sup>18</sup>Targeted manufacturing activities include: manufacture of food products and beverage; manufacture of textiles; manufacture of rubber and plastic products; manufacture of basic metals; manufactured of fabricated metal products; manufacture of office, accounting and computing machinery; manufacture of electrical machinery and apparatus; manufacture of medical, precision and optical instruments, watches and clocks; manufacture of parts and accessories for motor vehicles and their engine.

<sup>19</sup>This procedure was designed to match US patent data with COMPUSTAT data. It consists of several steps. In a first step, we get rid of special and punctuation characters and conjunctions. In a second step, we replace business structures by their acronyms. In a third step, we eliminate from the firm's name all the abbreviations generated in the second previous step. We do this in order to match those firms that appear with their corresponding business structure in one database but not in the other or firms that appear with different business structures in each database.

<sup>20</sup>We use a command called *matchit* written in STATA by Raffo (2015). The algorithm splits the names into bigrams, which are sequences of two adjacent moving characters. For each standardized firm name in one database, the algorithm finds the best match (or group of matches) in the other standardized database, up to a similarity score of 80%. The final step is a clerical review to validate the matches that are identical (100%) similar and to decide on the matches that are in a range of 80% to 99% of similarity. In the end, all assisted firms could be identified in the base of multinational firms. Having said that, 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.

the country in each year of the sample period, respectively.<sup>21</sup> Firms annually supported by CINDE grew significantly in these years. Their number increased from less than 10 at the beginning of the 2000s to more than 150 in most recent years. As 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. More specifically, Figure 1 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. Thus, 6.6% of the assistance instances are associated with the establishment of a multinational firm in the same year and 20.1% of all establishments are linked to an assistance.

The results of CINDE's customer satisfaction survey in recent year provide further anecdotal support to that presumption. Thus, the 270 multinational firms that replied to the 2015/2016 questionnaire graded the agency with an average score of 9.83 out of 10.<sup>22</sup> Importantly, the survey contains several testimonials that highlight how firms assessed CINDE's services and thereby give insights on the channels through which these services would have influenced their location decisions. Table 2 includes some of these testimonials. They consistently indicate that firms highly valued CINDE's provision of information on local business conditions and perceived it as an effective means to address the information incompleteness they faced when deciding on the location of their affiliates. Specific firms' comments precisely highlight such information services' additionality. For example, representatives from a firm operating in the pharmaceutical sector stated *"CINDE is a great resource for collecting facts and getting introduced to other operating companies. Having a third party integrate the introductions and navigate the process was value added. All the meetings were relevant and informative"*, where counterparts from a food manufacturing firm declared *"CINDE has eliminated the guess work and made our initiatives possible"*.<sup>23</sup> 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.

#### 4. 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

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<sup>21</sup>The former includes all assisted multinational firms that either located or have not located in Costa Rica.

<sup>22</sup>The response rate of the survey was 77.1%.

<sup>23</sup>Testimonials from assisted multinational firms that did not ultimately establish an affiliate in Costa Rica also praised CINDE's support and identified cost considerations as the main reason for their decisions (e.g., freight costs for bulky products and labor costs for highly qualified personnel). Note that the latter will be accounted for by fixed effects in our estimations.

for other relevant observed and unobserved factors such as multinational firms' size, changing countries' comparative advantages, time-varying, country pair- and sector-specific trade policies that may affect both location decisions and use of investment promotion services. In so doing, we use the following baseline general linear probability model:<sup>24</sup>

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

where  $\mathbb{I}(E)_{\text{fhst}}$  is a binary indicator of either first establishment or expansion of a multinational firm in the country.<sup>25</sup> 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.<sup>26</sup> 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).<sup>27</sup> Furthermore, the extensive margin appears to be significantly more responsive to changes in standard gravity forces capturing bilateral trade costs, including those related to information barriers such as common language (see Ramondo et al., 2015).<sup>28</sup>

$\mathbb{I}(\text{IPA})_{\text{fhst}(-k)}$  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  $\mathbb{I}(\text{IPA})$ ,  $\alpha$ , is accordingly our parameter of interest. If  $\alpha > 0$  ( $\alpha = 0$ ), then investment promotion

<sup>24</sup>While certainly not free from issues (e.g., predicted probabilities outside of the range of the dependent variable), we resort to the linear probability model (LPM) 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. Still, we have also estimated bias-corrected fixed effects probit and logit and conditional logit models. The estimation results, which are presented in the Appendix, are consistent with our baseline based on the LPM.

<sup>25</sup>We estimate this equation and their variants using the command *reghdfe* written by Correia (2017).

<sup>26</sup>Unfortunately, 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.

<sup>27</sup>Using 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.

<sup>28</sup>Ramondo et al. (2015) show that having a common language increases the number of affiliates by 65% and sales per affiliate by only 11%.

support has a positive (no) impact on 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 up to three lags of time-varying firm-level characteristics that capture (i) firm's size such as the parent firm's total number of affiliates, 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 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, a bilateral investment treaty, or double taxation treaty 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).<sup>29</sup>

$\lambda_{fhs}$  and  $\rho_{hst}$  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 Costa Rica and the home country. The latter account for 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, and 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); preferential trade agreements, bilateral investment treaties, double taxation treaties, and tax rates differentials between Costa Rica and the home countries.  $\varepsilon$  is the error term.<sup>30</sup>

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.<sup>31</sup> In particular, these sets of fixed effects are stricter than those

<sup>29</sup>Estimation results are robust to including fewer or more lags of these variables. These results are available from the authors upon request.

<sup>30</sup>Costa Rica signed several preferential trade agreements, bilateral investment treaties, and double taxation treaties that entered into force during our sample period (see López et al., 2016).

<sup>31</sup>Admittedly, multinational firms can receive support through other policies in Costa Rica (in particular, the free trade zone regime) as well as from other countries' IPAs. In the empirical analysis we check the robustness of our baseline results to controlling for these kinds of assistance.

previous studies using more aggregated data could rely on to deal with unobserved heterogeneity.<sup>32</sup> The issue remains, though, that actual support can be endogenous 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 3. 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 and internal multinational firms' lists. More specifically, according to our interviews with CINDE's management, the IPA started to actively use the F1000 lists to target firm in 2006 and did so with its own lists in 2011. This can be seen in Figure 2 which shows the number of assisted firms by CINDE in each year of our sample period along with the share that corresponds to F1000 and CINDE's lists. Thus, the average F1000 share raised from 0.293 in 2003-2005 to 0.402 in 2006-2008.<sup>33</sup> Similarly, the average share of firms in CINDE's lists went from 0.096 in 2008-2010 (being literally zero before 2008) up to 0.173 in 2012-2014.<sup>34</sup> These are the maximum increases in such shares from 2000 to 2016. We accordingly estimate Equation (1) by instrumental variables using annual F1000 and CINDE's lists as instruments for investment promotion assistance status starting in 2006

<sup>32</sup>For 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.

<sup>33</sup>We matched the annual F1000 lists from 2000 to 2016 with the ultimate owner firms in the WorldBase using a fuzzy matching algorithm followed with a clerical review of the matches. Based on this exercise and additional research, we identified three groups of firms: (i) firms that do not have affiliates abroad; (ii) firms that have gone bankrupt; and (iii) firms that have merged or have been acquired, over our sample period. We excluded firms in groups (i) and (ii) and retained and linked those in group (iii) to their current ultimate owner (still, estimates are robust to excluding these firms). We ended up with 1,104 different ultimate owner firms that have been part of the F1000 lists from 2006 to 2016, with an average of 771 per year. Almost 8% of this sample rotated every year and 30% did so over 10 years.

<sup>34</sup>CINDE's lists are compiled using a strategy that resembles the production of the F1000 lists. Thus, the IPA identifies the largest firms -according to a relevant metric such as revenue- within a given (priority) sector. Sector-level lists include "Consulting", "Digital Technology", "Electronic Manufacturing", "Engineering and Architecture", "Food Industry", and "Medical". As with the F1000 counterparts, firms in these lists were matched with the ultimate owner firm in the WorldBase using a fuzzy matching algorithm complemented with a subsequent clerical review. Unlike with the F1000 lists, once incorporated, firms do not exit CINDE's lists. Thus, variation comes from the inclusion of new firms in these lists. On average, 85 new firms were added every year. As of 2016, there were 1,322 firms in these lists.

and 2011 respectively.<sup>35</sup> Formally, the first-stage equation is as follows:

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

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 or CINDE's target large firms' list in the year in question and zero otherwise. In particular, we consider the contemporaneous and three lags of these binary indicators to allow for targeting of firms that have grown and become more visible in recent and not just the current year.<sup>36</sup>

To be valid instruments, F1000 (and CINDE's) lists 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 (CINDE's) lists are more likely to be targeted for attraction and assisted by CINDE. Second, being in the list in question must be uncorrelated with the error term once conditioned on all other relevant explanatory variables. In other words, it must be exogenous, which requires properly controlling for factors that influence multinational firms' location decisions and are correlated with support from CINDE. True, in this regard, it may be argued that foreign firms joining the F1000 (CINDE's) lists are growing and specifically expanding and are therefore more likely to open affiliates in other countries, in general, and in Costa Rica, in particular. Note, however, the firm(-home country-sector) and home country-sector-year fixed effects and the firm-level variables (e.g., total number of affiliates, total number of countries, total number of sectors, and the spatial distribution of their preexisting affiliates) precisely control for the main determinants of such as a geographical (and sectoral) spread. Hence, this 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 (or CINDE's) list could directly affect the likelihood to establish a first or subsequent affiliate in Costa Rica. More formally, we test the imposed overidentifying restrictions using the Hansen test. Furthermore, we also examine whether our instruments have a direct effect on the location decisions of non-assisted

<sup>35</sup>It is worth stressing that instrumental variable estimates are virtually identical if we alternatively use as starting years 2005 or 2007 for F1000 and 2010 or 2012 for CINDE's lists. These estimation results are available from the authors upon request.

<sup>36</sup>The instrumental variables estimations are carried out using the command *ivreghdfe* written by Correia (2017).

multinational firms.

Finally, the baseline equations assume that the effect of investment promotion on multinational firms' location decisions is symmetric across home countries and sectors. However, there are reasons to believe that these effects may differ along these dimensions. In particular, impacts can be larger when higher information barriers are involved. This could be the case, for instance, for more distant, more dissimilar, and thus less familiar home countries (see, e.g., Huang, 2007) or in sectors with higher degree of differentiation or lower degree of contractability (see, e.g., Antràs and Yeaple, 2013). Hence, we also generalize this equation to explore the existence of heterogeneous effects across those groups as follows:

$$\mathbb{I}(E)_{\text{fhst}} = \sum_{l=1}^L \sum_{k=0}^K \alpha_k^l \Phi_l \mathbb{I}(\text{IPA})_{\text{fhst}-k} + \sum_{j=1}^J \sum_{k=1}^K \beta_k^j X_{\text{fhst}-k}^j + \lambda_{\text{fhs}} + \rho_{\text{hst}} + \varepsilon_{\text{fhst}} \quad (3)$$

where  $l$  indexes the groups of firms, home countries, or sectors; and  $\Phi_l$  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.

## 5. Estimation Results

### 5.1. Baseline Estimates

Table 3 reports OLS estimates of alternative specifications of Equation (1) that focus on contemporaneous support.<sup>37</sup> Moving from Column 1 to Column 7, 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(-home country-sector) fixed effects; Columns 4 and 5 add time-varying firm-level covariates capturing size and geographical distribution of affiliates, lagged one, two, and three years, respectively; 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; and Column 7 expands the latter with a linear trend. Finally, Column 8 presents estimates of

<sup>37</sup>Table A1 in the Appendix presents OLS estimates of the respective full specifications that additionally include three lags of the investment promotion support indicator for first establishment. These estimates fully coincide with those shown in Table 3. In particular, lagged support does not seem to have a significant effect. We will therefore retain the basic specification hereafter.

a first-difference version of Equation (1) augmented with firm fixed effects (i.e., double difference estimation).<sup>38</sup> 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.<sup>39</sup>

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.<sup>40</sup> 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. The estimated impact on reinvestment is weaker and substantially less robust.<sup>41</sup> 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.<sup>42</sup> We will come back to this issue in Subsection 5.4.<sup>43</sup> OLS estimates assume that, conditional on our sets of fixed effects (and time-varying firm-level covariates), there is no self-selection into investment promotion assistance. While these fixed effects and covariates go a long way in controlling for variables that may result in such

<sup>38</sup>The 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).

<sup>39</sup>Note that the 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 through at least one affiliate.

<sup>40</sup>We have also resorted to non-linear estimators (e.g., bias-corrected fixed effect probit and logit and conditional logit) to explicitly take into account the binary nature of the dependent variable. Unfortunately, our baseline specification could be estimated with these non-linear estimators. The main reason are their large sets of fixed effects. Hence, we only report the marginal effects of a less demanding specification along with the OLS counterpart for comparison purposes (see Table A2 in the Appendix). Based on these estimated marginal effects, our main findings can be considered to remain the same.

<sup>41</sup>Such a support could potentially lead to reinvestment in the form of additional investments in existing affiliates. This would result in larger FDI, sales, or number of employees. Unfortunately, we cannot estimate these effects since, as mentioned above, we do not have access to data on these variables.

<sup>42</sup>This 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).

<sup>43</sup>Given 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.



a self-selection, they might arguably not be enough to entirely preclude it. We therefore resort to instrumental variables estimation. As discussed above, we take advantage of the fact that CINDE targets large non-established multinational firms and use annual F1000 and CINDE's lists as instruments for the IPA assistance. More precisely, we consider four alternative instruments: a set of binary indicator of membership to F1000 lists, a set of binary indicators of membership to CINDE's lists, a set of binary indicators of membership to F1000 or CINDE's lists, and a set of binary indicators of membership to F1000 and CINDE's lists, whereby in all cases these sets include the contemporaneous and three lags of the indicators in question.

Table 4 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 had a positive and significant impact on the probability that a multinational firm establishes a first affiliate in the country. In contrast, and also 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. Table A3 in the Appendix shows the respective first stage estimates. Consistent with a priori expectations, these estimates reveal that becoming a F1000 firm or part of CINDE's lists significantly increases the likelihood of being assisted by CINDE. 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.<sup>44</sup> As for the exclusion restriction, fixed effects and firm-level covariates can be considered to account for any direct effect of belonging to the former lists on the likelihood of establishing an affiliate in Costa Rica. The Hansen J test statistic is consistently non-significant. This indicates that our identifying restrictions cannot be rejected.<sup>45</sup> Further in this regard, when we estimate a variant of Equation (1) whereby we replace the IPA assistance indicator with its instruments -the F1000 indicators, the CINDE's list indicators, or their combination- on a sample excluding assisted firms we find that the estimated coefficient on the latter is not significantly different from zero (see Table A4 in the Appendix).

The instrumental variables estimated impact is larger than the OLS counterpart in the case of first establishment. In particular, the former are between 3.3 and 3.9 times

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<sup>44</sup>The 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 lists 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. CINDE's own lists, instead, appear to be used for both groups of firms.

<sup>45</sup>The test for overidentifying restrictions is a test of joint-exogeneity and, as such, do 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).

larger than the latter for our baseline specification. Several reasons could potentially explain the discrepancy between these estimates.

First, the difference could reflect possible mismeasurement of assistance, particularly in the early years of our sample period. Nevertheless, this does not appear to be the case as OLS estimates of Equation (1) over the period 2000-2007 are comparable (even larger) than those obtained over the period 2008-2016.<sup>46</sup>

Second, our instrumental variables estimations exploit the IPA's targeting approach. Now, 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 dosage - average in the case of OLS estimates and high in the case of the instrumental variables estimates. Such a difference in dosage 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 column 2 in Table 5 and Figure 3).<sup>47</sup> Thus, estimations of the impact of investment promotion that make use of IPA's prioritization strategies could be considered to produce upper bound estimates linked to stronger promotional efforts.<sup>48</sup>

Third, it might be argued that instrumental variables estimates are driven by the fact that larger firms are more likely to invest and establish affiliates anywhere. However, these instrumental variables estimates remain similar when we restrict the sample to the F1000 firms and the 50 most similar non-F1000 peers in terms of size within the respective home country-sector combinations.<sup>49</sup> Further, the gap between the OLS and the instrumental variables estimates becomes smaller in this sample (see Column 3 in Table 5 and Figure 3).<sup>50</sup> 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 Column 4 in Table 5). More specifically, the latter is only 50% larger than

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<sup>46</sup>These estimates are reported in Table A5 in the Appendix.

<sup>47</sup>The first stage estimates of the instrumental variable estimations are shown in Table A6 in the Appendix.

<sup>48</sup>We will come back to the effect of dosage in Subsection 5.4.

<sup>49</sup>The most similar firms are identified using a Mahalanobis measure of multidimensional distance computed with the command *mahapick* written by Kantor (2006). 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. These results, along with the respective first stage estimates, are reported in Table A7 in the Appendix.

<sup>50</sup>Similar results are obtained when considering only firms that are expanding. These estimation results are available from the authors upon request.

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 (see Figure 3).

## 5.2. Robustness

We next present further supporting evidence that rules out other competing explanations, which is particularly relevant for our OLS estimates.

First, as discussed above, a specific important threat to our baseline estimation strategy is that multinational firms can self-select into investment promotion assistance. In other words, firms that are already interested in investing in the country for some reason approach the respective national IPA and end up receiving its support. As an alternative way to address this concern, we use information from CINDE's CRM system which allows us to distinguish assisted multinational firms between those which contacted the agency (*services initiated by the firm*) and those which 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 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 6 reports estimates of a variant of Equation (3) 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 concerns, has had a positive and significant effect on first establishment, thus corroborating our initial findings. Second, as another strategy to reduce the scope for unobserved firm heterogeneity to play a role, we re-estimate Equation (1) on the sample of firms that were assisted at some point over the period 2000-2016. The results from these estimations, which primarily exploit the timing of assistance, are fully in line with the baseline (see second column of Table 6).

Third, 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 firm before such an 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 the third column of Table 6. Reassuringly, the estimated coefficients are not significantly different from zero. Note that, in contrast, estimates for the real 2000-2007 and 2009-2016 samples are positive and significant.<sup>51</sup> 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 4 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.<sup>52</sup>

Fourth, we carry out another falsification test to further validate our estimation strategy using similar assistance data from Uruguay's national IPA URUGUAY XXI. More specifically, we re-estimate Equation (1) considering support status with URUGUAY XXI instead of with CINDE as the main explanatory variable. Estimates are shown in Column 4 of Table 6. Also encouraging, estimated effects are not significant in this case.

Fifth, admittedly, multinational firms can be assisted by other countries' IPAs or supported through other policies in Costa Rica itself. Such an 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 former national IPA PROMEXICO over our sample period and estimate a modified version of Equation (1) augmented to include a binary indicator capturing such a support.<sup>53</sup> The estimation results, which are presented in Column 5 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

<sup>51</sup>These estimates are presented in Table A8 in the Appendix.

<sup>52</sup>We have also performed an event study. Also in this case, estimates are not significant before the first support instance and become significant once the firm was supported. These estimates are available from the authors upon request.

<sup>53</sup>PROMEXICO was closed in 2019, i.e., after the end of our sample period.

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 and that were accordingly also granted additional advantages in the form of tax deductions. Estimates are reported in the sixth column of Table 6. These estimates indicate that, while relatively smaller, investment promotion assistance has had a direct, independent positive impact on the probability of first establishment.

Sixth, 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 6-8 of Table 6 reveal that the baseline results are robust to excluding these firms.<sup>54</sup>

Finally, although estimation results consistently indicate that assistance from CINDE has had a significant positive impact on the probability that multinational firms establish a first affiliate in Costa Rica, it is possible that the effects, if any at all, could be different in other economies. In order to address this concern regarding the external validity of our estimates, we look at the experience of another country: Uruguay.<sup>55</sup> To carry out the analysis, we use annual lists of IPA-assisted multinational firms similar to those for Costa Rica over the period 2000-2016 and a census of multinational firms with affiliates in the country, which were kindly provided by URUGUAY XXI, along with firms' location data from the WorldBase. We specifically replicate the basic OLS and instrumental variables estimations whose results are presented in Tables 3 and 4 and perform two placebo tests. Estimates are reported in Table 7. These estimates indicate that assistance from URUGUAY XXI has had a positive and significant effect on the probability that a multinational firm establishes its first affiliate in the country -albeit smaller than in Costa Rica- and no significant impact on the probability that a multinational firm already present in Uruguay opens an additional affiliate (see Column 1 in Table 7). This is in line with our findings for Costa Rica. Furthermore, no significant effects are observed when replacing contemporaneous support from URUGUAY XXI either with future support from the same IPA (i.e., 2009-2016 in 2000-2007) (*timing placebo*) or with support from Costa Rica's CINDE (*country placebo*) (see Columns 2 and 3 in Table 7). Last, instrumental variable estimates offer an interesting insight. Different from CINDE, URUGUAY XXI does not prioritize large firms (see Volpe Martincus and

<sup>54</sup>Firms 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.

<sup>55</sup>Available Uruguayan (and Mexican) data are not as detailed as those from Costa Rica.

Sztajerowska, 2019). Consistently, the instrument based on the F1000 lists is substantially weaker -in fact, literally weak- and, when used, estimates are very imprecise and accordingly no significant impacts are detected (see Column 4 in Table 7). This would also suggest that our estimates for Costa Rica are not mechanical.

### 5.3. *Heterogeneous Effects: Mechanisms*

Investment promotion assistance can have heterogeneous effects depending on the specific home countries and sectors. For instance, we could expect the impact to be larger on location decisions by multinational firms from home countries for which the host country is less familiar 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 different degrees of differentiation. We examine whether this is the case in Table 8. More specifically, this table shows estimates of variants of Equation (3) 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; (ii) home countries that share/do not share a border with Costa Rica; (iii) home countries with a relatively large/small number of migrants in Costa Rica; and (iv) differentiated and non-differentiated sectors (see Rauch, 1999). These estimates indicate that promotion efforts are more effective in attracting multinational firms from countries whose population speak a different language, are not neighbors, and have a relatively small number of nationals in Costa Rica, and operating in differentiated sectors. These estimation results consistently point to stronger effects of investment promotion on the extensive margin of multinational production when information obstacles are important.<sup>56</sup>

### 5.4. *Dosage, Different Services, Costs, and Benefits*

IPAs support multinational firms through a wide variety of services. In this subsection, we explore the effects of different assistance intensity levels, different types of assistance, and the implied costs. In the first panel of Table 9 we show estimates of a

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<sup>56</sup>We have also explored the existence of possible interactions between investment promotion assistance and economic integration agreements such as preferential trade agreements (PTAs), bilateral investment treaties (BITs), and double taxation treaties (DTTs). The estimation results indicate that the impact of investment promotion on the multinational production extensive margin is larger for countries with which Costa Rica has a preferential trade agreement. No significant differences are observed across home countries with and without BITs or DTTs with Costa Rica. These estimation results are available from the authors upon request.

variant of Equation (1) that includes binary indicators for alternative levels of investment promotion support (one and two or more services per year). These estimates reveal that a higher dosage is associated with stronger effects on the multinational production extensive margin.

As mentioned in Section 3, in the case of Costa Rica, main services can be broadly classified in three main categories: assistance to gather relevant information on local business conditions and installation process (*information services*), assistance to complete relevant administrative procedures (*procedural services*), and assistance to find and recruit properly trained employees (*human capital services*). Given their different nature and purpose, these services predictably have different effects depending on the investment outcomes in question. Evidence presented in the second panel of Table 9 suggests that information services have the strongest effect on establishing the first affiliate, followed by human capital services. 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), although smaller in magnitude. In contrast, support to complete procedures has neither an impact on first establishment nor on subsequent ones. 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 and, to a lesser extent, by opening additional affiliates in the country. This would be consistent with a reduction in information-related fixed costs associated with each of these location decisions. Also important, this alignment between instruments and outcomes provides further informal support to our identification of the effects of interest and the channels thereof.

In the third panel of Table 9, we show that, as expected, providing more services is costlier. In particular, doubling the number of services results in a doubling of incurred costs.<sup>57</sup> This last panel of Table 9 also reveals that services related to human capital have the largest costs whereas information services have the lowest costs. As seen above, the latter have the largest effect of the probability that a multinational firms establishes its first -and subsequent- affiliate in the Costa Rica (see the second panel of Table 9), and, as such, seem to be the most cost-effective investment promotion activity.

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 assis-

<sup>57</sup>In this regard, it is worth mentioning that cost figures primarily correspond to labor costs. More precisely, these figures have been 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.

tance, and alternative initial investment values, it is possible to compute benefit/cost ratios for Costa Rica's investment promotion policy.<sup>58</sup> The results of this back of the envelope calculations are shown in Table 10.<sup>59</sup> 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 dosage), respectively, and assuming an average investment of US\$ 5 (US\$ 15) million. 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 to our instrumental variables estimates.<sup>60</sup>

## 6. Concluding Remarks

Investment promotion policies are ubiquitous. However, no matter how widespread these policies are and besides valuable insights from a few aggregate studies, 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 channels and mechanisms 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, using alternative specifications, considering exclusively assistances initiated by the agency, and controlling for other investment promotion agencies (IPAs)' support and other Costa Rican investment attraction policies such as free trade zones. Importantly, provision of relevant specific information appears to be the main channel through which the IPA affects multinational firms' location decisions. Finally, effects appear to be heterogeneous across home countries and sectors.

<sup>58</sup>In this case, since 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.

<sup>59</sup>Needless 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.

<sup>60</sup>We use the instrumental variables estimates in this case because Harding and Javorcik (2011) exploit the IPAs' prioritization strategies for identification purposes.



In particular, these effects 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.

## 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.
- Alviarez, 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.
- 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.
- 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.
- 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.
- Correia, Sergio. 2017. "Linear Models with High-Dimensional Fixed Effects: An Efficient and Feasible Estimator" Working Paper.
- 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. Published in <https://www.dnb.com/collections/solutions/dnb-worldbase.pdf>.
- 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.
- 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.
- 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.
- Kantor, D. 2006. MAHAPICK: Stata module to select matching observations based on a Mahalanobis distance measure, Statistical Software Components S456703, Boston College Department of Economics.
- Keller, W. and Yeaple, S. The Gravity of Knowledge. *American Economic Review*, vol. 103(4), pp. 1414-1444.
- 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: Helpman, 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.
- Razin, A., Rubinstein, Y. and Sadka, E., 2003. Which countries export FDI, and how much? NBER Working Paper No. 10145. National Bureau of Economic Research.
- 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**

<b>Year</b>	<b>Number of Firms</b>	<b>Number of Affiliates</b>	<b>Number of Countries</b>	<b>Number of Sectors</b>	<b>Number of Assisted Firms</b>
2000	197	267	29	89	5
2001	213	285	29	94	8
2002	221	297	31	96	9
2003	232	314	33	98	7
2004	245	332	34	102	13
2005	257	354	35	106	21
2006	276	380	36	113	25
2007	298	410	39	115	25
2008	310	429	40	118	30
2009	323	450	42	117	32
2010	345	478	43	124	70
2011	370	506	43	131	94
2012	395	535	44	133	111
2013	413	558	44	135	125
2014	432	587	45	140	160
2015	446	604	48	140	178
2016	465	627	49	141	157

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

*"Number of Firms"* refers to the total number of multinational (parent) firms established in Costa Rica.

*"Number of Affiliates"* refers to the total number of affiliates of multinational firms established in Costa Rica.

*"Number of Countries"* refers to the total number of different countries of origin of the multinational firms established in Costa Rica. *"Number of Sectors"* refers to the total number of different sectors of the multinational firms established in Costa Rica (according to the ISIC Rev. 4-4 digit classification).

*"Number of Assisted Firms"* refers to the total number of multinational firms assisted by CINDE in that year.

**Table 2**  
**CINDE's Customer Satisfaction Survey: Comments from Selected Multinational Firms**

Firm	Comment	Number of Affiliates	Number of Countries	Main Sector of Activity	Home Country
1	"Very good information with a whole picture of the country capabilities and suppliers that have come to support the sector cluster."	186	75	2100	DEU
2	"The best promotion agency I have ever worked with. The agent understood exactly our needs and the meeting and recommendations provided an extremely useful overview and information."	23	14	6420	DEU
3	"I found the service very professional, well-structured and took actions to obtain missing information. The agent understood our needs and re-adjusted when required in order to ensure full support."	74	22	3030	CAN
4	"CINDE obviously took the time to understand our firm as a client and listened effectively to our needs. I really appreciated the presentation and information the team presented as well as the connections to others in Costa Rica with similar challenges. Excellent discussion of service offerings, availability of qualified personnel and capabilities."	322	55	4620	USA
5	"CINDE is a good counterbalance to the complexity of starting business operations in Costa Rica. All CINDE personnel who assisted our firm were very responsive and provided great guidance on all topics."	44	30	5820	USA
6	"CINDE is the best partner one can have. Their agents gave us the possibility to fully understand the different alternatives of properties and projects available that fit our initiatives. They did an excellent job selecting alternatives and preparing the visits to fulfill our needs."	165	50	1030	USA
7	"CINDE continues to be a <i>"best-in-class"</i> investment promotion agency and an example to others. The agent is a pleasure to work with: professional, courteous, knowledgeable and diligent with the way she answers questions and follows up with extra information."	11	3	6820	GBR
8	"CINDE is very customer focused, they have an effective and excellently organized agenda, well-structured presentations and information. The agents were very service oriented, with a strong knowledge about the situation of different industries of Costa Rica and a good network of local and international companies and universities. "	61	20	2930	DEU
9	"CINDE is a great resource for collecting facts and getting introduced to other operating companies. Having a third party integrate the introductions and navigate the process was value added. All the meetings were relevant and informative."	20	16	2100	USA
10	"I feel very comfortable with the professionalism with which CINDE works. They are an important powerhouse for any company wishing to locate in Costa Rica that is unfamiliar with the country's bureaucracy."	50	20	2651	USA
11	"CINDE has eliminated the guess work and made our initiatives possible. The agents have done an amazing job at coordinating solutions for our project."	1	1	0122	CAN
12	"We would absolutely recommend CINDE as the number one contact for Costa Rican business opportunities. The agents are very knowledgeable and a great resource of information and contacts."	326	56	6420	FRA
13	"All CINDE contacts have been collaborative, responsive, open, constructive and genuinely supportive of our mission and needs. CINDE has provided us with reliable market intelligence, trend information and useful best practice considerations and hints."	672	99	2651	DEU
14	"Excellent investment promotion agency. One of the best we have worked with globally. The agents are great, showed excellent knowledge of the area and are very interactive with the client"	245	40	2651	USA
15	"The knowledge and information the agency provides to potential investors are invaluable. The team, resources and presentations are very professional. We can say from experience that the data and insight CINDE provides saves companies like us a lot of time we would otherwise use to research on our own (and not as effectively as CINDE)."	1	1	7020	USA

Source: CINDE's Customer Satisfaction Survey and authors' calculations based on data from the WorldBase and CINDE.

"Number of Affiliates" refers to the total number of affiliates of the multinational firm worldwide. "Number of Countries" refers to the total number of countries in which the affiliates of the multinational firm operate worldwide. "Main Sector of Activity" refers to the main sector of activity of the multinational firm (according to the ISIC Rev. 4-4 digit classification). "Home Country" refers to the country in which the multinational firm is headquartered.

**Table 3**  
**Impact of Investment Promotion on Multinational Firms' Location Decisions**  
**Baseline Estimates**

<b>First Establishment</b>								
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>	<b>(8)</b>
<b>IPA Assistance</b>	0.096*** (0.014)	0.097*** (0.014)	0.109*** (0.016)	0.110*** (0.016)	0.109*** (0.016)	0.115*** (0.018)	0.110*** (0.020)	0.072*** (0.017)
<b>Observations</b>	2,714,012	2,714,012	2,714,012	2,529,886	2,529,886	2,529,886	2,529,886	2,433,605
<b>Reinvestment</b>								
<b>IPA Assistance</b>	0.032*** (0.009)	0.032*** (0.008)	0.042* (0.021)	0.043** (0.021)	0.041** (0.021)	0.020 (0.024)	0.039 (0.038)	0.016 (0.038)
<b>Observations</b>	5,438	5,438	5,438	4,930	4,930	4,930	4,930	4,740
<b>Firm Fixed Effects</b>	No	No	Yes	Yes	Yes	Yes	Yes	Yes
<b>Country-Year Fixed Effects</b>	No	Yes	Yes	Yes	Yes	No	No	No
<b>Sector-Year Fixed Effects</b>	No	Yes	Yes	Yes	Yes	No	No	No
<b>Country-Sector Fixed Effects</b>	No	Yes	No	No	No	No	No	No
<b>Country-Sector Year Fixed Effects</b>	No	No	No	No	No	Yes	Yes	Yes
<b>Firm Linear Trends</b>	No	No	No	No	No	No	Yes	No
<b>Specification in Differences</b>	No	No	No	No	No	No	No	Yes
<b>Firm Size Controls</b>	No	No	No	Yes	Yes	Yes	Yes	Yes
<b>Firm Network Controls</b>	No	No	No	No	Yes	Yes	Yes	Yes

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 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 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 4**  
**Impact of Investment Promotion on Multinational Firms' Location Decisions**  
**Instrumental Variable Estimates**

	(1)	(2)	(3)	(4)
	F1000 Lists	CINDE Lists	F1000 <i>or</i> CINDE Lists	F1000 <i>and</i> CINDE Lists
<b>First Establishment</b>				
<b>IPA Assistance</b>	0.375** (0.152)	0.378** (0.179)	0.445*** (0.154)	0.381** (0.130)
<b>F-Statistic</b>	11.373 [0.023]	10.799 [0.029]	12.269 [0.016]	18.732 [0.016]
<b>Hansen J Statistic</b>	2.005 [0.571]	1.707 [0.635]	4.564 [0.207]	3.829 [0.800]
<b>Observations</b>	2,529,886	2,529,886	2,529,886	2,433,605
<b>Reinvestment</b>				
<b>IPA Assistance</b>	0.015 (0.562)	0.043 (0.231)	-0.132 (0.237)	0.037 (0.236)
<b>F-Statistic</b>	5.372 [0.251]	13.181 [0.010]	12.705 [0.012]	17.624 [0.024]
<b>Hansen J Statistic</b>	3.249 [0.355]	2.726 [0.436]	2.497 [0.476]	7.158 [0.413]
<b>Observations</b>	4,930	4,930	4,930	4,930
<b>Firm Fixed Effects</b>	Yes	Yes	Yes	Yes
<b>Country-Sector-Year Fixed Effects</b>	Yes	Yes	Yes	Yes
<b>Firm Size Controls</b>	Yes	Yes	Yes	Yes
<b>Firm Network Controls</b>	Yes	Yes	Yes	Yes

The table reports IV estimates of Equation (1) along with the respective relevant specification tests. 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. *IPA Assistance* is instrumented with four different sets of instrumental variables. *F1000 Lists* (Column 1): a binary indicator that takes the value of one if the multinational firm was part of the Fortune 1000 list in the year in question and zero otherwise, along with three lags of such a variable. *CINDE Lists* (Column 2): a binary indicator that takes the value of one if the multinational firm was part of CINDE's own lists in the year in question and zero otherwise, along with three lags of such a variable. *F1000 or CINDE Lists* (Column 3): a binary indicator that takes the value of one if the multinational firm was part of the Fortune 1000 list or CINDE's own lists in the year in question and zero otherwise, along with three lags of such a variable. *F1000 and CINDE Lists* (Column 4): a binary indicator that takes the value of one if the multinational firm was part of the Fortune 1000 list in the year in question and zero otherwise and a binary indicator that takes the value of one if the multinational firm was part of CINDE's own lists in the year in question and zero otherwise, along with three lags of such variables. 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.

**Table 5**  
**Impact of Investment Promotion on Multinational Firms' Location Decisions**  
**OLS and Instrumental Variables Estimates under Similar Assistance Intensity and Firm Size**  
**First Establishment**

	Sample			
	(1)	(2)	(3)	(4)
	Full	Similar Assistance Intensity	Similar Firm Size	Similar Assistance Intensity and Firm Size
<b>OLS</b>				
IPA Assistance	0.115*** (0.018)		0.175*** (0.034)	
IPA Assistance with More than 1 Service		0.156*** (0.025)		0.216*** (0.045)
<b>IV (F1000)</b>				
IPA Assistance	0.375** (0.152)		0.324** (0.146)	
IPA Assistance with More than 1 Service		0.357** (0.149)		0.306** (0.147)
Observations	2,529,886	2,529,761	326,597	326,535
F-Statistic	11.373 [0.023]	9.793 [0.043]	11.687 [0.020]	10.115 [0.039]
Hansen J-Statistic	2.005 [0.571]	1.521 [0.678]	2.044 [0.563]	1.337 [0.720]
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

The table reports OLS and IV estimates of Equation (1), along with the relevant specification tests for the latter, for 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* (Column 1): 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* (Column 2): 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* (Column 3): 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* (Column 4): 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 (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.

**Table 6**  
**Impact of Investment Promotion on Multinational Firms' Location Decisions**  
**Robustness Checks**

	(1) Proactive vs. Reactive	(2) Only Assisted Firms	(3) Timing Placebo	(4) Country Placebo	(5) Control Other IPA Assistance	(6) Firms Not in FTZ	(7) Firms w/o Ownership Changes	(8) Non- Financial Firms	(9) Non-Tax Haven Firms
<b>First Establishment</b>									
IPA Assistance		0.142*** (0.038)	0.000 (0.006)		0.115*** (0.018)	0.060*** (0.013)	0.103*** (0.018)	0.113*** (0.019)	0.115*** (0.020)
IPA Assistance (Uruguay)				0.002 (0.002)					
IPA Assistance (Mexico)					0.003 (0.002)				
IPA Assistance – Proactive	0.101*** (0.018)								
IPA Assistance – Reactive	0.171*** (0.047)								
Observations	2,529,886	2,667	1,319,499	2,529,886	2,529,886	2,528,497	2,507,897	2,246,566	1,530,956
<b>Reinvestment</b>									
IPA Assistance		0.053* (0.030)	-0.053 (0.054)		0.019 (0.024)	0.013 (0.040)	0.029 (0.024)	0.041* (0.025)	0.028 (0.026)
IPA Assistance (Uruguay)				-0.028 (0.028)					
IPA Assistance (Mexico)					-0.042 (0.043)				
IPA Assistance – Proactive	0.023 (0.022)								
IPA Assistance – Reactive	0.033 (0.047)								
Observations	4,930	1,073	2,086	4,930	4,930	3,713	3,124	3,720	3,799
Firm Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country-Sector-Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Size Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Network Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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. *Timing Placebo* (Column 3): 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). *Country Placebo* (Column 4): assistance by CINDE is substituted for assistance by Uruguay's national IPA, URUGUAY XXI. *Other IPA Assistance* (Column 5): control for assistance by Mexico's IPA is included (Mexico is the main competing location for Costa Rica). *Firms Not in FTZ* (Column 6): the sample is restricted to firms that are not established in a free trade zone. *Firms without Changes in Ownership* (Column 7): the sample is restricted to firms that did not experience ownership changes over the sample period. *Non-Financial Firms* (Column 8): 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 Haven Firms* (Column 9): the sample is restricted to firms that are not headquartered in countries that can be considered tax heavens according to Hines (2010). 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**  
**External Validity: Uruguay**

	(1) Baseline OLS	(2) Timing Placebo	(3) Country Placebo	(4) IV (F1000)
<b>First Establishment</b>				
<b>IPA Assistance</b>	0.015*** (0.004)	0.003 (0.003)		0.172 (0.169)
<b>IPA Assistance (Costa Rica)</b>			-0.001 (0.002)	
<b>F-Statistic</b>				5.976 [0.201]
<b>Observations</b>	2,529,886	1,319,499	2,529,886	2,529,886
<b>Reinvestment</b>				
<b>IPA Assistance</b>	-0.039 (0.033)	-0.023 (0.017)		0.034 (0.292)
<b>IPA Assistance (Costa Rica)</b>			-0.061 (0.048)	
<b>F-Statistic</b>				4.287 [0.367]
<b>Observations</b>	8,648	3,294	8,648	8,648
<b>Firm Fixed Effects</b>	Yes	Yes	Yes	Yes
<b>Country-Sector-Year Fixed Effects</b>	Yes	Yes	Yes	Yes
<b>Firm Size Controls</b>	Yes	Yes	Yes	Yes
<b>Firm Network Controls</b>	Yes	Yes	Yes	Yes

The table reports OLS and IV estimates of Equation (1), along with the relevant specification tests for the latter, and the results of two placebo exercises for Uruguay as obtained using data for the period 2000-2016. 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. *Baseline OLS* (Column 1): the column reports the OLS estimates of Equation (1). *Timing Placebo* (Column 2): the column reports the result of a placebo exercise whereby 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). *Country Placebo* (Column 3): the column reports the result of a placebo exercise whereby assistances by URUGUAY XXI is substituted for assistance by CINDE. IV (F1000) (Column 4): the column reports IV estimates of Equation (1). *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. 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: South American countries bordering Uruguay, other South American countries, other Latin American countries (not in South America), upper-middle income countries, countries in which the same language is spoken, countries with which Uruguay has a Preferential Trade Agreement (PTA), countries with which Uruguay has a Bilateral Investment Treaty (BIT), and countries with which Uruguay 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.

**Table 8**  
**Impact of Investment Promotion on Multinational Firms' Location Decisions**  
**Heterogeneity Effects across Multinational Firms from Different Home Countries and in Different Sectors**

<b>Home Country-Level</b>		
	<b>(1)</b>	<b>(2)</b>
	<b>First Establishment</b>	<b>Reinvestment</b>
IPA Assistance - Common Language	0.053 (0.051)	0.035* (0.021)
IPA Assistance - Different Language	0.116*** (0.018)	0.023 (0.025)
IPA Assistance - Common Border	-0.001 (0.001)	0.000 (0.000)
IPA Assistance - No Common Border	0.114*** (0.001)	0.024 (0.024)
IPA Assistance - Above Median Migrant Stock	0.108*** (0.019)	0.015 (0.028)
IPA Assistance - Up to Median Migrant Stock	0.133*** (0.040)	-0.043 (0.040)
<b>Sector-Level</b>		
IPA Assistance - Non-Differentiated	0.103*** (0.026)	0.040 (0.028)
IPA Assistance - Differentiated	0.120*** (0.023)	-0.041 (0.028)
<b>Observations</b>	<b>2,529,886</b>	<b>4,930</b>
<b>Firm Fixed Effects</b>	<b>Yes</b>	<b>Yes</b>
<b>Country-Sector-Year Fixed Effects</b>	<b>Yes</b>	<b>Yes</b>
<b>Firm Size Controls</b>	<b>Yes</b>	<b>Yes</b>
<b>Firm Network Controls</b>	<b>Yes</b>	<b>Yes</b>

The table reports OLS estimates of variants of Equation (3). 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. 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, interacted with alternative binary indicators capturing different home country or characteristics: countries that share/do not share a common language with Costa Rica, countries that share/do not share a geographical border with Costa Rica, countries whose stocks of migrants in Costa Rica relative to its own population is above/up to the median of the respective distribution, and sectors whose products are differentiated/not differentiated according to the classification proposed by Rauch (1999). 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**  
**Assistances: Dosage, Type, and Costs**

<b>Dosage</b>		
	(1)	(2)
	<b>First Establishment</b>	<b>Reinvestment</b>
<b>IPA Assistance=1</b>	0.051*** (0.014)	0.021 (0.031)
<b>IPA Assistance&gt;1</b>	0.151*** (0.024)	-0.005 (0.026)
<b>Type of Assistance</b>		
<b>Information Services</b>	0.151*** (0.024)	0.105*** (0.037)
<b>Procedural Services</b>	0.010 (0.016)	-0.043 (0.027)
<b>Human Capital Services</b>	0.097*** (0.028)	-0.002 (0.021)
<b>Observations</b>	2,529,886	4,930
<b>Firm Fixed Effects</b>	Yes	Yes
<b>Country-Sector-Year Fixed Effects</b>	Yes	Yes
<b>Firm Size Controls</b>	Yes	Yes
<b>Firm Network Controls</b>	Yes	Yes
<b>Labor Costs</b>		
<b>Number of Services</b>	1.065*** (0.012)	
<b>Information Services</b>		0.398*** (0.049)
<b>Procedural Services</b>		0.493*** (0.056)
<b>Human Capital Services</b>		1.116*** (0.047)
<b>Observations</b>	1,065	1,065
<b>Country-Sector-Year Fixed Effects</b>	Yes	Yes

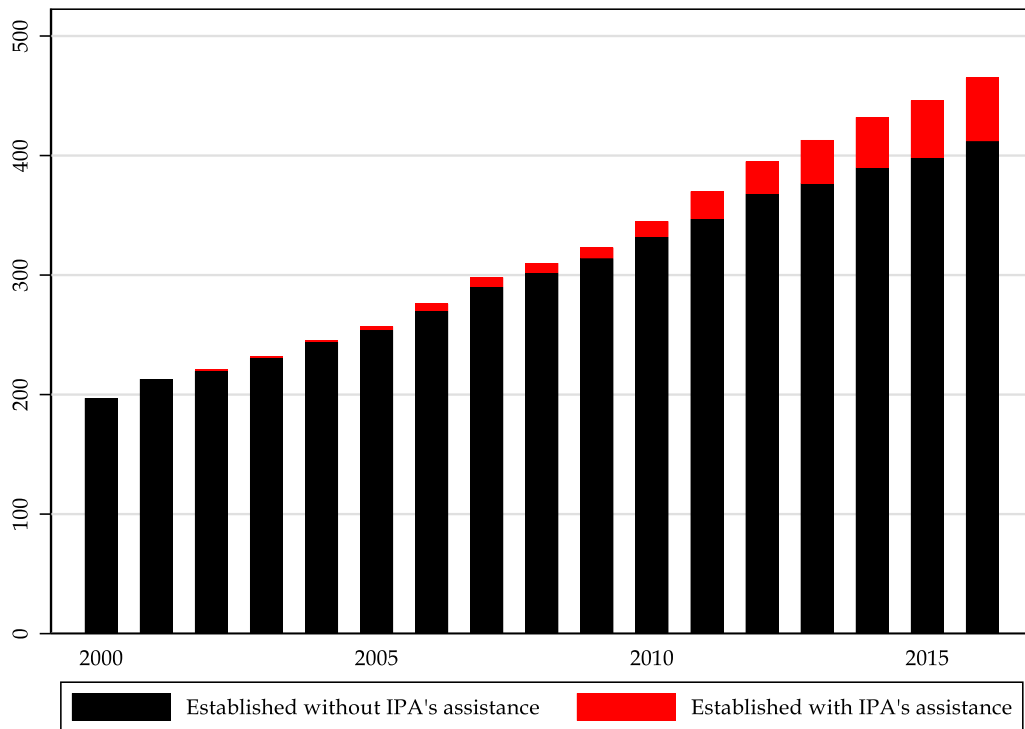
The first and second panels of the table report OLS estimates of alternative specifications of Equation (1). In Column 1 (*First Establishment*) the sample is restricted to those firms that did not have an affiliate in Costa Rica in the previous year. The dependent variable is a binary indicator that 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. 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. In the first panel the main explanatory variables, *IPA Assistance=1* and *IPA Assistance>1*, are binary indicators that take the value of one if the multinational firm was assisted by the national IPA once and more than once in the year in question and zero otherwise, respectively. In second panel the main explanatory variables, *Information Services*, *Procedural Services*, and *Human Capital 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). The third panel of the table presents OLS estimates of the relationship between the labor cost of assistance (in natural logarithm) and the number of services provided (in natural logarithm) and the type of service provided. In this case, the sample is accordingly restricted to observations that correspond to multinational firm's assistance instances. (Home) Country-sector-year fixed effects are included (not reported). The average labor cost of assistance is US\$ 3,214.7 (with a minimum of US\$ 694.3 and maximum US\$ \$15,978.2). Labor costs refers to the costs of the hours devoted by the IPA agents to assist the multinational firm in the year in question. 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 10**  
**Impact of Investment Promotion on Multinational Firms' Location Decisions**  
**Cost-Benefit Back-of-the-Envelope Calculation**

	OLS			IV		
	(1)	(2)	(3)	(4)	(5)	(6)
Estimated Average FDI from Establishing an Affiliate	5M USD	10M USD	15M USD	5M USD	10M USD	15M USD
Change in the Probability of Establishing an Affiliate	11%	11%	11%	37%	37%	37%
Average Cost of Assistance	40,073 \$	40,073 \$	40,073 \$	40,073 \$	40,073 \$	40,073 \$
FDI per Dollar Spent in Investment Promotion	13.7 \$	27.4 \$	41.1 \$	48.6 \$	97.3 \$	145.9 \$

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) 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 (4) to (6) 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). Columns 1 and 4 report the estimated FDI per dollar spent in promotion activities for an average investment of US\$ 5 million, Columns 2 and 5 for an average investment of US\$ 10 million, and Columns 3 and 6 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.

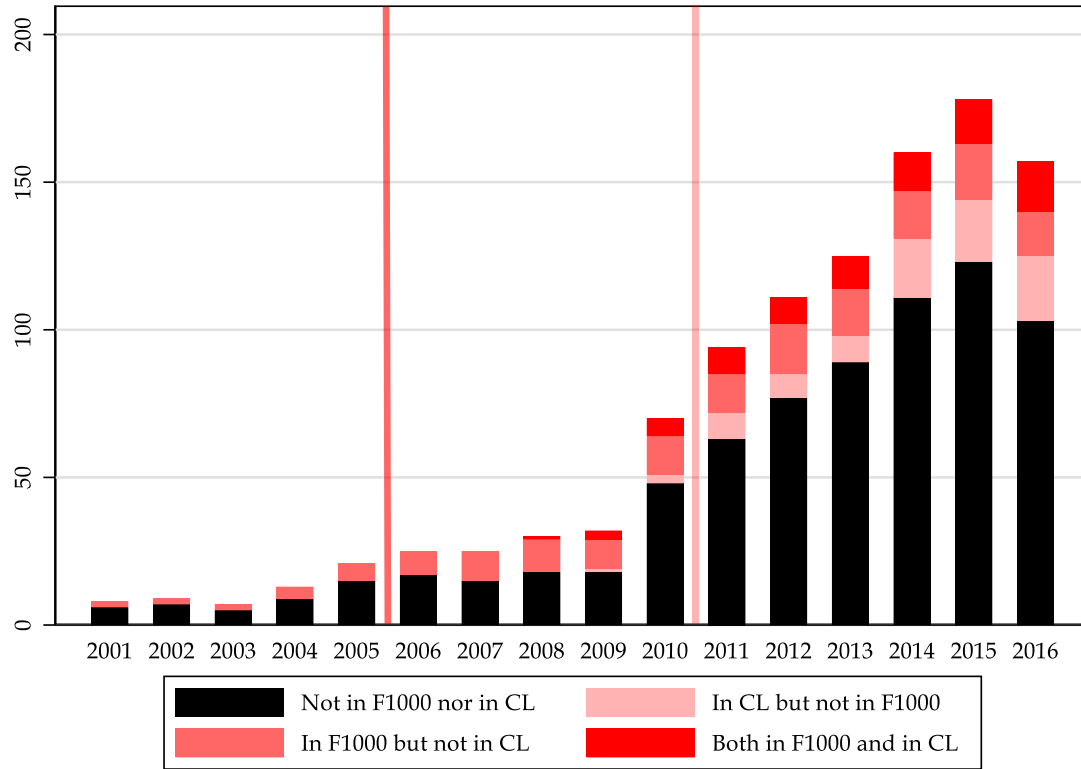
**Figure 1**  
**Multinational Firms in Costa Rica**



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.

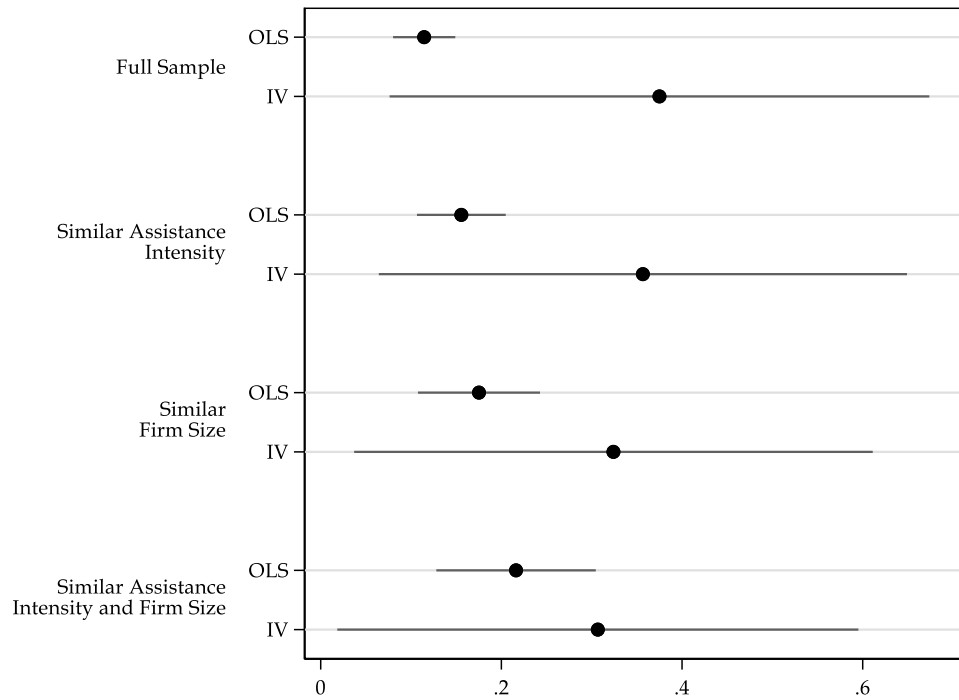
**Figure 2**  
**Number of Multinational Firms Assisted by CINDE per Year,**  
**Total and Distribution Depending on Whether They Are Part of the Fortune 1000 and/or the CINDE Lists**



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

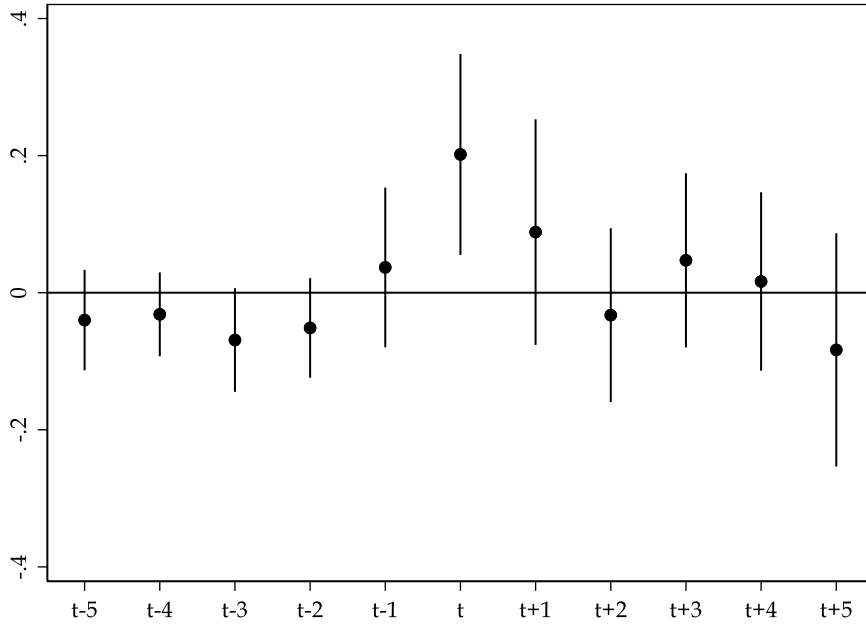
The graph shows the total number of multinational firms assisted by CINDE over the period 2000-2016 along with its distribution in four groups: (i) firms that are neither part of the Fortune 1000 list nor of CINDE's own list in the year in question; (ii) firms that are part of the Fortune 1000 list but not of CINDE's own list in the year in question; (iii) firms that are part of CINDE's own list but not part of the Fortune 1000 list in the year in question; and (iv) firms that are part of both lists in the year in question.

**Figure 3**  
**Impact of Investment Promotion on Multinational Firms' Location Decisions**  
**OLS and Instrumental Variables Estimates**  
**Alternative Samples: Full, Similar Assistance Intensity, and Similar Firm Size**



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 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 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 4**  
**Impact of Investment Promotion on Multinational Firms' Location Decisions**  
**First Assistance and First Establishment**  
**Placebo and Dynamics**



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.

**Appendix**  
**Not for Publication**

**Table A1**  
**Impact of Investment Promotion on Multinational Firms' Location Decisions**  
**First Establishment**

	Full Available Sample				Common Sample			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<b>IPA Assistance in <math>t</math></b>	0.115*** (0.018)	0.116*** (0.020)	0.116*** (0.020)	0.115*** (0.020)	0.114*** (0.018)	0.116*** (0.020)	0.115*** (0.020)	0.115*** (0.020)
<b>IPA Assistance in <math>t-1</math></b>		-0.005 (0.017)	0.002 (0.019)	0.003 (0.019)		-0.004 (0.017)	0.003 (0.019)	0.003 (0.019)
<b>IPA Assistance in <math>t-2</math></b>			-0.015 (0.015)	-0.017 (0.015)			-0.015 (0.015)	-0.017 (0.015)
<b>IPA Assistance in <math>t-3</math></b>				0.005 (0.012)				0.005 (0.012)
<b>Observations</b>	2,529,886	2,433,605	2,306,852	2,175,322	2,175,322	2,175,322	2,175,322	2,175,322
<b>Firm Fixed Effects</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Country-Sector-Year Fixed Effects</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Firm Size Controls</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Firm Network Controls</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

The table reports OLS estimates of alternative specifications of Equation (1). The sample is restricted to those firms that did not have an affiliate in Costa Rica in the previous year. In the left panel, all available observations are included in each estimation, whereas in the right panel a common sample is used across estimations. 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. Up to one, two, and three lags of this variable are included in Columns 1, 2, and 3, respectively. Firm fixed effects and (home) country-sector-years 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 A2**  
**Impact of Investment Promotion on Multinational Firms' Location Decisions**  
**Non-Linear Models with Firm-Fixed Effects and Bias-Correction**

Model	(1) Benchmark OLS	(2) Conditional Logit	(3) Fixed Effects Logit	(4) Fixed Effects Probit
Bias Correction		No	Yes	Yes
<b>First Establishment</b>				
IPA Assistance	0.101*** (0.016)	5.221*** (0.739)	1.052*** (0.346)	1.729*** (0.202)
Average Marginal Effect of Assistance		0.495*** (0.004)	0.178** (0.094)	0.603*** (0.053)
Observations	2,714,012	2,714,012	2,714,012	2,714,012
<b>Reinvestment</b>				
IPA Assistance	0.034** (0.016)	1.320** (0.549)	1.321** (0.521)	0.612*** (0.260)
Average Marginal Effect of Assistance		0.289*** (0.091)	0.151* (0.077)	0.127* (0.066)
Observations	5,438	5,438	5,438	5,438
Firm Fixed Effects	Yes	Yes	Yes	Yes

The table reports OLS and non-linear estimates of a modified version 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. Firm fixed effects are included (not reported). *OLS Benchmark* (Column 1): The column reports OLS benchmark estimates. *Conditional Logit* (Column 2): The column reports the estimated coefficients and the margin effects obtained when using a conditional logit model. *Fixed Effects Logit* (Column 3): The column reports the estimated coefficients and the margin effects obtained when using a fixed effect logit model. *Fixed Effects Probit* (Column 4): The column reports the estimated coefficients and the margin effects obtained when using a fixed effect probit model. The incidental parameter bias-correction for fixed effects logit and fixed effects probit is based on Fernandez-Val (2009) and has been implemented with the R command "*bife*" (see Stammann et al., 2019). Standard errors clustered by firm are reported below the estimated coefficients and marginal effects. \*\*\* denotes significant at the 1% level, \*\* denotes significant at the 5% level, \* denotes significant at the 10% level.



**Table A3**  
**Impact of Investment Promotion on Multinational Firms' Location Decisions**  
**Instrumental Variables Estimation for First Establishment**  
**First-Stage Estimates**

	(1) F1000 Lists	(2) CINDE Lists	(3) F1000 or CINDE Lists	(4) F1000 and CINDE Lists
<b>First Establishment</b>				
F1000 at t	0.003 (0.002)			0.003 (0.002)
F1000 at t-1	0.005*** (0.002)			0.005*** (0.002)
F1000 at t-2	0.001 (0.002)			0.001 (0.002)
F1000 at t-3	0.001 (0.002)			0.001 (0.002)
CINDE List at t		0.006** (0.003)		0.006** (0.003)
CINDE List at t-1		-0.003** (0.002)		-0.004** (0.002)
CINDE List at t-2		0.006* (0.003)		0.006* (0.004)
CINDE List at t-3		-0.001 (0.004)		-0.001 (0.004)
F1000 or CINDE Lists at t			0.003** (0.001)	
F1000 or CINDE Lists at t-1			0.001 (0.001)	
F1000 or CINDE Lists at t-2			0.002 (0.001)	
F1000 or CINDE Lists at t-3			0.001 (0.002)	
<b>Observations</b>	2,529,886	2,529,886	2,529,886	2,529,886
<b>Firm Fixed Effects</b>	Yes	Yes	Yes	Yes
<b>Country-Sector-Year Fixed Effects</b>	Yes	Yes	Yes	Yes
<b>Firm Size Controls</b>	Yes	Yes	Yes	Yes
<b>Firm Network Controls</b>	Yes	Yes	Yes	Yes

The table reports the first stage estimates of the IV estimations of Equation (1) whose results are presented in Table 4. The sample is restricted to those firms that did not have an affiliate in Costa Rica in the previous year. The dependent 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. *F1000 Lists* (Column 1): the main explanatory variables are a binary indicator that takes the value of one if the multinational firm was part of the Fortune 1000 list in the year in question and zero otherwise and three lags of such a variable. *CINDE Lists* (Column 2): the main explanatory variables are a binary indicator that takes the value of one if the multinational firm was part of CINDE's own lists in the year in question and zero otherwise and three lags of such a variable. *F1000 or CINDE Lists* (Column 3): the main explanatory variables are a binary indicator that takes the value of one if the multinational firm was part of the Fortune 1000 list or CINDE's own lists in the year in question and zero otherwise and three lags of such a variable. *F1000 and CINDE Lists* (Column 4): the main explanatory variables are a binary indicator that takes the value of one if the multinational firm was part of the Fortune 1000 list in the year in question and zero otherwise, a binary indicator that takes the value of one if the multinational firm was part of CINDE's own lists in the year in question and zero otherwise, and three lags of such variables. 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 A4**  
**Effects of Instruments on Multinational Firms' Location Decisions,**  
**Excluding Firms Assisted by the National IPA**  
**First Establishment**

	(1) F1000 Lists	(2) CINDE Lists	(3) F1000 or CINDE Lists	(4) F1000 and CINDE Lists
<b>First Establishment</b>				
<b>F1000 at t</b>	0.000 (0.001)			0.000 (0.001)
<b>F1000 at t-1</b>	0.000 (0.001)			0.000 (0.001)
<b>F1000 at t-2</b>	0.001 (0.001)			0.001 (0.001)
<b>F1000 at t-3</b>	-0.001 (0.001)			-0.001 (0.001)
<b>CINDE Lists at t</b>		0.000 (0.001)		0.000 (0.000)
<b>CINDE Lists at t-1</b>		-0.001 (0.001)		-0.001 (0.001)
<b>CINDE Lists at t-2</b>		-0.000 (0.000)		-0.000 (0.000)
<b>CINDE Lists at t-3</b>		0.002 (0.001)		0.002 (0.001)
<b>F100 or CINDE Lists at t</b>			0.000 (0.001)	
<b>F100 or CINDE Lists at t-1</b>			-0.000 (0.001)	
<b>F100 or CINDE Lists at t-2</b>			0.000 (0.001)	
<b>F100 or CINDE Lists at t-3</b>			-0.000 (0.001)	
<b>Observations</b>				
<b>Firm Fixed Effects</b>	Yes	Yes	Yes	Yes
<b>Country-Sector-Year Fixed Effects</b>	Yes	Yes	Yes	Yes
<b>Firm Size Controls</b>	Yes	Yes	Yes	Yes
<b>Firm Network Controls</b>	Yes	Yes	Yes	Yes

The table reports OLS estimates of the direct effects of the instrumental variables on the probability that a multinational firm establishes its first affiliate in the country as obtained in different samples. The sample is restricted to those firms that did not have an affiliate in Costa Rica in the previous year and have been never assisted by CINDE. 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. *F1000 Lists* (Column 1): the main explanatory variables are a binary indicator that takes the value of one if the multinational firm was part of the Fortune 1000 list in the year in question and zero otherwise and three lags of such a variable. *CINDE Lists* (Column 2): the main explanatory variables are a binary indicator that takes the value of one if the multinational firm was part of CINDE's own lists in the year in question and zero otherwise and three lags of such a variable. *F1000 or CINDE Lists* (Column 3): the main explanatory variables are a binary indicator that takes the value of one if the multinational firm was part of the Fortune 1000 list or CINDE's own lists in the year in question and zero otherwise and three lags of such a variable. *F1000 and CINDE Lists* (Column 4): the main explanatory variables are a binary indicator that takes the value of one if the multinational firm was part of the Fortune 1000 list in the year in question and zero otherwise, a binary indicator that takes the value of one if the multinational firm was part of CINDE's own lists in the year in question and zero otherwise, and three lags of such variables. 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 A5**  
**Impact of Investment Promotion on Multinational Firms' Location Decisions**  
**Different Sample Periods: 2000-2007 vs 2008-2019**  
**First Establishment**

	(1) 2000-2007	(2) 2008-2016
<b>IPA Assistance</b>	0.187*** (0.064)	0.119*** (0.020)
<b>Observations</b>	1,319,499	1,506,163
<b>Firm Fixed Effects</b>	Yes	Yes
<b>Sector-Country-Year Fixed Effects</b>	Yes	Yes
<b>Firm Size Controls</b>	Yes	Yes
<b>Firm Network Controls</b>	Yes	Yes

The table reports OLS estimates of Equation (1) on different sample periods 2000-2007 and 2008-2016. In both cases, the sample is restricted to those firms that did not have an affiliate in Costa Rica in the previous year. In the left panel, all available observations are included in each estimation, whereas in the right panel a common sample is used across estimations. 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. Firm fixed effects and (home) country-sector-years 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 A6**  
**Impact of Investment Promotion on Multinational Firms' Location Decisions**  
**Instrumental Variables Estimation for First Establishment under Similar Assistance Intensity and Firm Size**  
**First-Stage Estimates**

	Samples			
	(1)	(2)	(3)	(4)
	Full	Similar Assistance Intensity	Similar Firm Size	Similar Assistance Intensity and Firm Size
<b>First Establishment</b>				
<b>F1000 at t</b>	0.003 (0.002)	0.003* (0.002)	0.003 (0.002)	0.003* (0.002)
<b>F1000 at t-1</b>	0.005*** (0.002)	0.004*** (0.001)	0.005*** (0.002)	0.004*** (0.001)
<b>F1000 at t-2</b>	0.001 (0.002)	0.002 (0.001)	0.001 (0.002)	0.002 (0.001)
<b>F1000 at t-3</b>	0.001 (0.002)	0.002 (0.002)	0.001 (0.002)	0.002 (0.002)
<b>Observations</b>	2,529,886	2,529,886	326,597	326,597
<b>Firm Fixed Effects</b>	Yes	Yes	Yes	Yes
<b>Country-Sector-Year Fixed Effects</b>	Yes	Yes	Yes	Yes
<b>Firm Size Controls</b>	Yes	Yes	Yes	Yes
<b>Firm Network Controls</b>	Yes	Yes	Yes	Yes

The table reports the first stage estimates of the IV estimations of Equation (1) whose results are presented in Table 5. The sample is restricted to those firms that did not have an affiliate in Costa Rica in the previous year. The dependent 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 variables are a binary indicator that takes the value of one if the multinational firm was part of the Fortune 1000 list in the year in question and zero otherwise and three lags of such a variable. *Full Sample* (Column 1): 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* (Column 2): 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* (Column 3): 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* (Column 4): 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). 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 A7**  
**Impact of Investment Promotion on Multinational Firms' Location Decisions**  
**OLS and Instrumental Variables Estimates**  
**Alternative Samples: Different Number of Similar-Size Firms**

	10 Most Similar- Size Firms per F1000 Firm	50 Most Similar- Size Firms per F1000 Firm	100 Most Similar- Size Firms per F1000 Firm
<b>OLS</b>			
<b>IPA Assistance</b>	0.174*** (0.042)	0.175*** (0.034)	0.149*** (0.029)
<b>IV (F1000)</b>			
<b>IPA Assistance</b>	0.341** (0.160)	0.324** (0.146)	0.357** (0.152)
<i>IV First Stage</i>			
<b>F1000 at t</b>	0.004 (0.002)	0.003 (0.002)	0.003 (0.002)
<b>F1000 at t-1</b>	0.005*** (0.002)	0.005*** (0.002)	0.005*** (0.002)
<b>F1000 at t-2</b>	0.001 (0.002)	0.001 (0.002)	0.001 (0.002)
<b>F1000 at t-3</b>	-0.001 (0.003)	0.001 (0.002)	0.000 (0.002)
<b>F-Statistic</b>	11.496 [0.021]	11.687 [0.020]	12.057 [0.017]
<b>Hansen J-Statistic</b>	1.677 [0.642]	2.044 [0.563]	1.792 [0.617]
<b>Observations</b>	94,134	326,597	539,224
<b>Firm Fixed Effects</b>	Yes	Yes	Yes
<b>Sector-Country-Year Fixed Effects</b>	Yes	Yes	Yes
<b>Firm Size Controls</b>	Yes	Yes	Yes
<b>Firm Network Controls</b>	Yes	Yes	Yes

The table reports OLS and IV estimates of Equation (1), along with the relevant specification tests and the first stage estimates for the latter, for 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. The sample is restricted to those multinational firms in the F1000 list and the 10, 50, and 10 most similar non-F1000 firms that that did not have an affiliate in Costa Rica in the previous year (Columns 1, 2, and 3, respectively). Firm-size similarity (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.

**Table A8**  
**Impact of Investment Promotion on Multinational Firms' Location Decisions**  
**Timing Placebo and Time-Correct Assistances**

	(1) <i>Timing Placebo</i> 2009-2016 Applied to 2000-2007	(2) 2000-2007	(3) 2009-2016
<b>First Establishment</b>			
IPA Assistance	0.000 (0.006)	0.187*** (0.064)	0.117*** (0.021)
Observations	1,319,499	1,319,499	1,402,281
<b>Reinvestment</b>			
IPA Assistance	-0.053 (0.054)	0.255 (0.154)	-0.022 (0.028)
Observations	2,086	2,086	3,138
Firm Fixed Effects	Yes	Yes	Yes
Sector-Country-Year Fixed Effects	Yes	Yes	Yes
Firm Size Controls	Yes	Yes	Yes
Firm Network Controls	Yes	Yes	Yes

The table reports OLS estimates of Equation (1) on different sample periods. 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. Column 1 (*Timing Placebo*) reports the results of a placebo exercise whereby 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). Column 2 (2000-2007) reports OLS estimates of Equation (1) when the sample period is restricted to 2000-2007. Column 3 (2009-2016) reports OLS estimates of Equation (1) when the sample period is restricted to 2009-2016. Firm fixed effects and (home) country-sector-years 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.