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Export Processing Zones and the Composition of Greenfield FDI

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Abstract

Export processing zones (EPZs) are an increasingly common type of special economic zone. They are designed to facilitate international trade by lowering trade costs, such as import duties and/or export taxes. EPZs should thus be particularly attractive locations for multinational enterprises engaging in vertical, trade-intensive, foreign direct investment (FDI). Using data on worldwide greenfield FDI projects over the period 2003-2014, we find patterns consistent with this hypothesis. EPZs have a large positive effect on manufacturing FDI projects with a production focus, especially in trade- and labour-intensive sectors. Overall, our results suggest that EPZs are an effective tool to attract manufacturing FDI which exploit the opportunities offered by global value chains.

JEL Classification: F23; F13.

Keywords: Export Processing Zone; Special Economic Zone; Greenfield FDI; Global Value Chain

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1 Introduction

Foreign direct investment (FDI) has long been seen as a catalyst of economic growth, in no small part because of the hopes for job creation.[1] With this in mind, governments have used a number of policies to attract investment to their shores. Although the use of tax policy has received the lion's share of attention in both the popular and academic discussion on competition for FDI, other policies exist. An increasingly utilized policy instrument is the establishment of a special economic zone (SEZ). Farole (2011) defines an SEZ as a defined geographic area in which special incentives and/or policies apply that are not available outside the zone. It is believed that there were over 3000 SEZs in 2008, 75% of which were in developing and transition economies, generating 68 million jobs and over $500 billion in trade-related value added (World Bank, 2008). By 2015, this number had swelled to more than 4000 (The Economist, 2015), underlining the growing popularity of this policy instrument. Common SEZ features include streamlined processing of goods ready for export, lower export fees, and reductions in taxes and import tariffs on intermediates used in the production of goods for exports, all of which describe a particular type of SEZ, the export processing zone (EPZ) (Zeng, 2015).[2] One rationale for establishing these EPZs is that, by enhancing the ability of firms to participate to global value chains, they can serve to attract trade-intensive vertical (TVI) FDI, that is, investment projects that import intermediates, process them, and then export the bulk of that output to other countries.[3] These manufacturing activities are typically labour intensive (something we demonstrate below). An EPZ may be therefore a viable strategy to shift the composition of FDI inflows towards job-creating FDI and, in that way, foster inclusive economic development.

Surprisingly, despite the popularity of SEZs, cross-country studies investigating their impact are fairly scarce.[4] Much of the extant empirical literature is primarily descriptive, offering qualitative case studies on the regional impact of SEZs (including both EPZs and other types of zones). Examples include Bräutigam and Tang (2014), Ge (1999), Amirahmadi and Wu (1995), Farole (2011), Farole and Akinci (2011), and CIIP (2017). On the whole, the success of SEZs is unclear, with some studies finding that SEZs increase trade and welfare and others finding the opposite.

This is not to say that regression analyses of SEZs do not exist. An early contribution is Johansson and Nilsson (1997) who estimate the impact of SEZs on aggregate exports for eleven developing countries, putting forward very heterogenous effects. Building from this, subsequent studies on the trade effects of SEZs have moved towards the use of increasingly disaggregated data. For example, Yücer and Siroën (2017) look at aggregate bilateral exports

[1] See, for example, Jude and Slihagi (2016) or Pandya and Sisombat (2017). Chowhudry and Mavrotas (2006) provide an overview of the discussion on FDI and growth.

[2] Other categorizations of SEZs include freeports, free trade zones, export promotion zones and industrial parks. The distinction between these, however, is rather imprecise and varies across studies (see Akinci and Farole (2011) for deeper discussion).

[3] As formalized by Helpman (1984), this type of FDI is deterred by trade barriers, both into and out of the host country. This is then distinct from market-seeking horizontal FDI ala Markusen (1984) where the goal is to sell to consumers in the host economy.

[4] See Zeng (2015), Farole and Akinci (2011), and Farole (2011) for examples and surveys of the literature. More recent contributions, discussed further below, include Davies and Francois (2015) and Davies and Mazhikeyev (2015).

and higlight that the EPZ impact varies according to MFN import tariffs. Going further, Davies and Mazhikeyev (2015) examine similar issues at the firm level for thirteen developing countries whereas Defever, et al. (2017) provide an in-depth analysis of SEZs and disaggregated exports in the Dominican Republic.

A few other studies have looked at the impact of SEZs on FDI. Jensen and Winiarczyk (2014) consider the impact of SEZs on Polish regions. They find that although SEZs there have attracted FDI, they have contributed little to employment or wage improvements. Davies and Francois (2015) find no effect of SEZs on aggregate inbound affiliate income; it should be noted, however, that their analysis is somewhat limited by their data which limits them to estimating the aggregated-cross sectional effect. Leong (2013) estimates the impact of trade and foreign direct investment (FDI) on growth in Chinese and Indian regions, using SEZs as an instrument for these endogenous variables with the intuition being that SEZs drive FDI and trade. Unfortunately, he does not report the first stage results, and thus the impact of SEZs on FDI, for his estimation.[5] Finally, for 55 countries, CIIP (2017) estimate the impact of an SEZ on night light intensity (a proxy for growth in economic activity) in a zone in comparison to outside it. They find that SEZs increases economic activity both in themselves and the surrounding area. Most interesting for our analysis is that, for Vietnamese data, they find that SEZ imposing export requirements to take advantage of their incentives have a weaker effect on neighboring regions.

Overall, the strong interest of policymakers in using EPZs to attract FDI is not grounded in solid empirical evidence. In response, we propose to examine this issue by using detailed information on greenfield FDI projects taking place worldwide in the last decade. In contrast to existing literature, we use a global set of countries, examine bilateral rather than aggregate inbound FDI, look at multiple measures of affiliate activity, and decompose investment according to its sector and function. The latter decomposition is made possible by the richness of our greenfield FDI data and is crucially important, since it is only in certain sectors and functions that we should expect a significant relationship between the existence of an EPZ and the level of FDI activity. For example, even when the parent firm is in manufacturing, the affiliate can have a manufacturing role or some other role such as customer support or research and development. Because EPZs are often focused on making import and export of tangibles easier, these are more likely to affect more the location of manufacturing production-focused foreign affiliates than other affiliates. Furthermore, there are two additional benefits of working with greenfield FDI. First, the evidence (e.g. Harms and Meon, forthcoming) suggests that greenfield FDI has more significant growth effects on the host economy than mergers and acquisitions (M&A). As one of the purposes of our analysis is to examine the extent to which EPZs may achieve their goal of encouraging development, focusing on greenfield investment gives a clearer indication of such possibilities. Second, although the majority of the value of FDI investment is via M&A, greenfield FDI is both the majority of investment projects (i.e. the number of investments irrespective of size) and more prevalent in developing countries

[5]Similar to Leong, Wang (2013) uses regional Chinese data to estimate the impact of FDI and exports on capital investment and productivity growth, finding that the impact of these is enhanced in the presence of an SEZ. Ebenstein (2012) utilizes firm-level information for China to examine the impact of SEZs on firm employment, productivity, and wages, finding positive effects on the first two.

(Davies, Desbordes, and Ray, forthcoming).[6] Since these nations are also those that heavily view EPZs as a method of attracting FDI, this again tightens the conclusions that can be drawn from our estimates.

Using information on greenfield FDI across about 121 destination countries over the period 2003-2014, we estimate increasingly granular difference-in-differences equations, with the aim of getting closer to causal identification by looking at specific relationships between the nature of EPZs and the nature of FDI attracted by a given country. We find that the presence of EPZs is associated with more FDI when the latter belongs to a manufacturing sector and has a production focus. This relationship varies across manufacturing sectors and is strongest in industries that are labour- and trade-intensive. These differential impacts are fully in line with the incentives provided by EPZs and therefore our findings suggest that EPZs are indeed an effective tool for attracting TVI FDI.

The rest of the paper proceeds as follows. Section 2 offers a discussion for the mechanisms by which EPZs can affect the relative mix of manufacturing and non-manufacturing FDI. We discuss our data and regression approach in Section 3. The results are in Section 4. Section 5 concludes.

2 The nature of EPZs and the composition of FDI

As indicated above, the defining feature of an EPZ is the trade cost reductions it provides to eligible firms in the form of a mix of reduced tariffs on intermediate imports, lower export taxes, and swifter processing of trade permits. Thus, an EPZ is likely to be especially beneficial to a foreign affiliate which heavily relies on international trade in the daily conduct of its operations. This is arguably FDI with a vertical nature engaged in manufacturing, that is, in the transformation of physical inputs.[7] The vertical aspect of this expectation comes from a combination of two things. First, the reduction in import taxes is almost always specifically tied to an export requirement, meaning that this is for the importation of intermediate inputs which are then processed into exports. Although some EPZs offer reduced import tariffs on inputs used to produce for domestic consumption, there are strict limits on how much of the production can be sold domestically.[8] Second, while reduction in export barriers does not necessarily require that the exports either use imported intermediates or be intermediates themselves, as discussed below nearly all EPZs are in developing countries. In such destination countries, Helpman's (1984) model of vertical investment which combines intermediates that are produced in different locations according to local comparative advantages is generally expected to dominate, with examinations such as Davies (2008) confirming this pattern. Thus, we expect that an EPZ effectively influencing FDI would tilt the composition of FDI

[6] In addition, as they note, the motivations for the two FDI modes differ significantly. For EPZs, which are geographically limited, this may be important because whereas greenfield FDI has no fixed location prior to investment, this is not true for potential M&A targets.

[7] In contrast, international trade in services, while facing potentially significant non-tariff barriers, does not incur import or export taxes. See Francois and Hoekman (2010) for a discussion of the literature on non-tariff barriers in services trade

[8] See Yücer and Siroën (2017) for example of these export-import processing zones.

towards vertical FDI, especially in sectors where the vertically-fragmented production structure involves both a good deal of trade in dutiable intermediates and a large use of labour relative to capital.

A key challenge is how we can distinguish vertical FDI from other types of FDI projects. One delineation is by sector of investment. For example, although affiliates in a service industry may still import intermediates and provide exports, the non-tangible, non-dutiable nature of their activities suggests that relative to those in manufacturing sectors, they are unlikely to benefit as much from an EPZ. While this goes some way towards identifying FDI likely to respond to an EPZ, an important aspect of investment – and one which our data is able to address – is that even within a manufacturing sector, an affiliate need not actually be involved in the types of vertical activities where trade barriers should matter most. For example, consider a firm with two affiliates in India, one producing auto parts and one providing customer support via a call centre. While the auto parts affiliate potentially benefits from an EPZ via duty-free imports and export incentives, this is not the case for the other affiliate. Therefore, even within manufacturing sectors, we expect that affiliates with manufacturing functions are those most likely to be encouraged by an EPZ. This distinction by sector and function informs our data analysis.

The impact of an EPZ should also depend on sector-specific characteristics. Given that we expect EPZs to be more impactful on vertical *trade-intensive* FDI, the EPZ effect ought to rise in the trade intensity of the sector. Another distinction across sectors can arise from differences in contract intensity, that is, in the use of intermediates which are very relationship specific. In these industries, firms may have a greater incentive to produce such intermediates in-house rather than outsource it, potentially giving rise to increased intra-firm trade. As such, those sectors might be particularly responsive to EPZs. Similarly, since EPZs are concentrated in developing (i.e. labour-abundant) countries, more labour-intensive vertical FDI should be more likely to take advantage of the opportunities provided by an EPZ.

Finally, some country-specific characteristics may also influence the effect of an EPZ. There is a well-documented negative relationship between both trade and bilateral FDI and the distance between the origin and destination countries (see Blonigen and Piger, 2014). Because of this, in a distant destination that is already unattractive to FDI, an EPZ may not do as much on the margin to encourage investment, meaning that the shift towards vertical FDI is smaller in a distant destination. In contrast, if the destination has a strong comparative advantage in a given industry, an EPZ may be even more effective in attracting vertical FDI given the cost-driven nature of such investments.

Combining the above, we arrive at three hypotheses that we expect to validate if EPZs has truly sa causal impact on FDI.

Hypothesis 1 *EPZs increase vertical FDI with dutiable trade, i.e. that in manufacturing sectors with a manufacturing function, more than other types of FDI.*

Hypothesis 2 *The impact of EPZs on FDI is larger in sectors where vertical trade-intensive FDI is more attractive due to the sector's trade intensity, the desire to maintain control of production, or vertical motivations for fragmentation.*

Hypothesis 3 *The impact of EPZs on FDI is larger in destinations more attractive to vertical trade-intensive FDI due to smaller distances between countries or stronger comparative advantages.*

These are the ideas we will examine using the data described in the next section.

3 Data and Methodology

In this section, we describe our data and our estimation approach.

3.1 EPZ and SEZ Data

Our data on EPZs comes from Yücer and Siroën (2017). They compile an indicator equal to one when there is an active export-import processing zone or exclusively export processing zone in the country *circa* 2008. We combine these into a single indicator EPZ which equals one if either of these is present.[9] This database was constructed by augmenting WTO documentation with additional resources (see their paper for full discussion). EPZs are mainly in developing countries: of the 62 countries with active EPZs, only four are OECD members (Korea, Mexico, Turkey, and the USA).[10]

The data provided by Yücer and Siroën (2017) do not indicate precisely what type of incentives are offered (although by nature of their construction, they all include tariff reductions, hence their EPZ, in contrast to the more general SEZ, designation). As described by Milberg and Amengual (2008), SEZ incentives can extend beyond import/export duty reductions to allow for VAT or property tax reductions, eased restrictions on repatriations and currency controls, and more. Since by their nature multinationals would find features such as eased currency requirements and easy repatriation attractive, considering these alternatives is useful for our analysis. With this in mind, we additionally use data from the World Bank's (2012) Investing Across Borders database that covers issues related to starting a foreign investment.[11] This database covers 104 countries and allows us to generate dummy variables equal to one when the nation offers inbound investors reduced customs duties, eased repatriation of earnings, export incentives, reduced income taxes, property tax incentives, sales tax incentives, subsidized utility charges, VAT exemptions, subsidized land costs, expedited visa processing, and/or a catch-all other category. Note that this database is constructed using a hypothetical firm that is assumed to locate in the most populous city but not in an SEZ, thus the incentives offered are not explicitly restricted to investment in an SEZ. With that in mind, as shown in Table 1, in our sample the correlation between the presence of a zone and these additional incentives varies across the different incentives. Given the definition of the EPZ variable, it is reassuring that the correlation between it and the trade related measures – customs duties and export incentives – are the highest (0.63 and 0.68 respectively). Countries with EPZs are also likely to offer income tax reductions. At the other end of the

[9] The distinction between the two is that, whereas the former provides incentives so long as domestic sales do not exceed a given level, the latter requires that all production be exported.

[10] In their data, they report 62 countries with an active EPZ, with a further nine with inactive EPZs (zones which have no participating firms, potentially due to other prohibitive policies). We code these latter as non-EPZ countries.

[11] These can be found at `http://iab.worldbank.org/data/fdi-2012-data`.

spectrum, although EPZs are still positively correlated with subsidized land or utilities, this correlation is relatively weak. Thus, although not dealing with EPZs *per se*, this alternative measure gives us a picture of the additional policies a country can use to attract investment. Further, by examining changes in the coefficients when including both measures, i.e. the extent of omitted variable bias, it provides an indication of which EPZ aspects may be the most important.

Although the Yücer and Siroën (2017) data is our main source, for a robustness check we use the SEZ indicator available in the Institutional Profiles Database (2016). This measure lacks the specificity of Yücer and Siroën's in that it does not specify the type of SEZ, i.e. it could offer the trade cost reductions needed to qualify as an EPZ but need not do so. On the other hand, this index includes a "depth" dimension where deeper SEZs provide greater incentives. Thus, while the relationship between this measure and the particular sensitivity of trade-intensive vertical FDI should be less precise than with the Yücer and Siroën one, it serves both to provide an alternative to test for robustness and yield further insight into the SEZ/FDI relationship.

Unfortunately all these datasets lack information on the date of the EPZs establishment, a feature which drives our treatment of the FDI data. Table 2 lists the destination countries in our baseline sample. It also indicates which countries had an EPZ in the Yücer and Siroën (2017) data and which had at least some incentive in the World Bank (2012) data. A further issue with the data is they indicate whether a country has an EPZ, not where in the country it is (or they are if there are multiple ones).

3.2 FDI Data

Our dependent variable is the number of greenfield investment projects taken from *fDi Markets*, a commercial database tracking cross-border greenfield FDI that covers all sectors and countries worldwide since 2003.[12] The list of countries in our analysis, including which count as developing, use an EPZ, and/or utilize one of the other World Bank (2012) incentives, is found in Table 2.

For each new investment in the data, which span 2003-2014, several items of information are available.[13] First, it records the origin o (where the parent firm is located) and the destination d (where the affiliate is located) for the project. In the data used in our estimation, 52.4% of the 130,559 projects globally are located in countries with EPZs. Second, it records the sector s of the affiliate which includes both manufacturing and non-manufacturing sectors.[14] Our data covers 54 ISIC Rev2 sectors at the three digit level, of which 26 are manufacturing sectors that account for 45.8% of projects. Within manufacturing sectors, 57.5% of projects are in an EPZ destination. In contrast, in the non-manufacturing sectors only 48.1% of affiliates are in EPZ countries, a statistic which provides an initial indication of the

[12] *fDi Markets* can be found at `http://www.fdimarkets.com/` and are notably the exclusive source of greenfield FDI data for the UNCTAD World Investment Report (e.g. UNCTAD, 2014). The limitations on the start date of these data limit the start date time period.

[13] The dataset also reports initial capital expenditures and employment. However, as these values are estimated for a significant number of projects, we only use them in some regressions, as discussed below.

[14] Unfortunately, the data do not list the industry of the parent firm.

relationship between EPZs and the composition of FDI. Third, it lists the function f of the affiliate. These functions describe the primary activity of the affiliate, e.g. manufacturing (defined as production or processing of any good, including manufacturing plants, processing plants, and production facilities), customer support, research and development, distribution, and more. We classify these functions into five groups building from Davies and Desbordes (2015):

1. *Manufacturing Activities*: Design, Development and Testing (e.g.:technology centres, application centres, testing centres); Production or processing of any good (e.g.: manufacturing plant, processing plant, production facility).

2. *Business Services*: Business to Business professional services (e.g.: consultancy, marketing, legal, financial services, recruitment).

3. *Support Services*: Customer Support Centres (e.g.: call centres); Sales; Marketing and Support Centres (e.g.: sales and support office); Shared Service Centre (e.g.: accounts processing, HR/payroll processing, back-office activities).

4. *Knowledge Services*: Education and Training (e.g.: internal training centre); National or Regional Headquarters; Research and Development.

5. *Infrastructure Services*: ICT Infrastructure (e.g.: broadband infrastructure, Internet data centres, data recovery centres); Logistic, Distribution and Transportation (e.g.: logistics hub, distribution centre).

A key focus for the current discussion is the comparison between manufacturing and non-manufacturing functions. The function is distinct from the sector of the affiliate; for example an affiliate in the manufacturing sector can be carrying out a non-manufacturing function such as support services. That said, there are very few affiliates in non-manufacturing sectors with manufacturing functions. In our data, within the manufacturing sectors, 53.1% of projects have manufacturing functions. Further, of those manufacturing function affiliates, 64.3% are in an EPZ destination. In contrast, for affiliates in the manufacturing sectors without manufacturing functions, only 49.9% of projects are in an EPZ destination.

Finally, for some of the investments, it lists the value of the investment (which we converted to US dollars) and the number of jobs (in thousands). For many projects, these data are projections rather than actual values. Thus, while we make some use of this information, we acknowledge the limitations of the data and caution that the results should be interpreted accordingly.

3.3 Country and Sector Controls

In our estimation, we will control for several additional country- and sector-level factors. These serve two purposes. First, when using a "gravity" approach to the data, they control for other features that influence FDI flows. Second it allows us to test whether the effect of EPZ on FDI varies according to sector-specific or country-specific characteristics, as hypothesised above.

Our country-level controls follow the literature's standard (see Blonigen and Piger (2014) for an overview). Specifically, we include logged GDP and population of the origin and

destination countries to control for country size.[15] We use their 2014 values to match the cross-sectional approach mandated by the EPZ variable. To control for the distance between countries, we use the logged weighted distance between major population centers and the time zone difference between capitals. Beyond these, we include a large set of dummy variables which are equal to one if the partner countries are contiguous, share a common language covering at least 9% of the population, are members of a former colonial relationship, share a common currency, share a common religion, are individually members of the WTO, or are jointly part of a further free trade area. These come from the CEPII database (see Mayer and Zignago (2006) for details).[16]

Turning to our sector variables, recall that the purpose of their inclusion (as interaction variable) is to examine whether we find sector-specific, differential, effects in line with the nature of EPZs. The bulk of these measures are only available for manufacturing sectors and therefore when using them, we will restrict our sample to the manufacturing industry, differentiating between manufacturing and non-manufacturing functions within a manufacturing sector. The first measure is sector-level trade openness, measured by exports plus imports relative to value added (see de Sousa, Mayer, and Zignago, 2012).[17] 'Effective' EPZs ought to have a larger impact on affiliates engaged in a manufacturing function, especially if they are heavily reliant on international trade. The second sector variable is Nunn's (2007) measure of contract intensity, defined as the share of the sector's intermediates that are relationship-specific. A greater need for customised intermediates may possibly lead firms in contract-intensive sectors to engage in greater intra-firm trade, making them more responsive to EPZs.[18] The third sector-specific characteristic is labour intensity (the log of the inverse of Kroszner, Laeven, and Klingebiel's (2007) capital intensity).[19] SEZs are more often found in developing, labour-abundant, countries and therefore an EPZ should be more attractive to sectors which are relatively more intensive in labour than in capital. Along similar lines, we make use of the Balassa (1965) revealed comparative advantage (RCA) index for the origin and destination countries, which is the share of a sector in a country's exports relative to the global share.[20] Here, following Davies, Desbordes, and Ray (forthcoming) we expect that higher RCA in either increases the amount of FDI in the sector overall.[21] Further, we anticipate that an EPZ has a larger marginal effect in high RCA countries on the premise that a high RCA means lower overall production costs.

We use two country-level measures of a country's suitability as a base for exporting. First, we use logged distance with the expectation that larger distances between origin and

[15] As GDP and population are in logs, we are implicitly controlling for per-capita GDP.

[16] These can be found at `http://www.cepii.fr`.

[17] We use the log of the median across countries for the 2000 values.

[18] Note that this refers to the sensitivity to EPZs, not whether there is more FDI in such sectors. Indeed, one might expect that such contract incentive sectors may have less FDI overall because of an increased desire to keep sensitive production close to the parent firm but that what investment the sector does send out is especially oriented towards EPZs.

[19] In unreported results, we used de Sousa, Mayer, and Zignago's (2012) sector-country specific wages. This, however, yielded no wage-varying EPZ effects and we therefore omit them.

[20] Data on RCA are for the year 2000 and calculated using data from Sousa, Mayer, and Zignago's (2012). Values are expressed in log.

[21] As this varies by sector-country, unlike the sector variables in Table 9 this is not absorbed by the sector fixed effect.

destination lower the impact of an EPZ given that vertical FDI is less likely. Second, we also look at the mediating effect of surrounding market potential (the log of the distance weighted sum of non-destination GDPs in 2014).[22] Here, we anticipate that countries that are nearer to other markets are those that are more attractive to trade-intensive vertical FDI and therefore places where EPZs may be a particularly attractive location for manufacturing production.

Finally, we include four measures of governance from the Heritage Foundation (2018): business freedom, investment freedom, property rights, and trade freedom.[23] All of these are measured so that a higher index means better protections (0-100, worst to best).[24] These variables may proxy for the quality of the management of the EPZs as well as the sustainability of the incentives that they provide, increasing the attractiveness of a given EPZ. On the other hand, it could be argued that EPZs are special 'enclaves' which are more valuable in countries with a poor business environment. Hence, the sign of the interaction terms involving the various governance measures is ambiguous.

Table 3 presents summary statistics for our data. Due to the differential availability of various controls, the number of observations differs slightly across variables and therefore samples used in estimation. Also, interaction variables are demeaned so that the coefficients can be interpreted as the impact at the average of the non-EPZ variable.

3.4 Estimation Approach

Our baseline estimation specification, at its most disaggregated level, deals with the determinants of the number of greenfield projects during 2003-2014 from origin country o in destination d in sector s where the affiliate fulfills function f:

$$Projects_{odsf} = exp\left(X_{od}\alpha_1 + \alpha_2 EPZ_d + \alpha_3 EPZ_d * MANF_{sf} + \beta_{od} + \beta_s + \beta_f\right)\varepsilon_{odsf} \quad (1)$$

where in some specifications this is aggregated up to the *ods* or *od* levels as indicated below. In this, X_{od} is a vector of origin, destination, and country pair variables which, depending on the specification, are instead absorbed by a vector of country pair dummies β_{od}. Likewise, depending on the inclusion of these fixed effects, the direct impact of the destination EPZ may be absorbed. Our variable of interest is the interaction of the EPZ_d dummy with a 'manufacturing' dummy variable $MANF_{sf}$ which equals one when considering projects in a manufacturing sector/function depending on the specification. This is then further modified by interacting it with country or sector variables to test for heterogenous responses.Many specifications include sector (β_s) and/or function (β_f) fixed effects as specified below. Finally, ε_{odsf} is the error term which we cluster at the country pair level. Given the count nature of our measure of FDI (the number of projects), we use a fixed effects poisson estimator.

It is worth emphasizing that our main focus is on the coefficient α_3 associated with the interaction term $EPZ_d * MANF_{sf}$ (or variants of this interaction term). It is a difference-in-difference estimator which identifies differential effects that we expect to find if EPZs have a

[22] See Blonigen, et. al (2008) for a discussion of export platform and complex vertical FDI. This is constructed using the same distance and GDP data as above.

[23] These are found at `https://www.heritage.org/index/explore`.

[24] We use their 2000 values.

causal impact on FDI. In other words, the absence of such 'smoking gun' effects would suggest that EPZs have no real effects on FDI.

While our identification strategy addresses, to a larger extent, the issue of an omitted variable bias, it is possible that reverse causality could be at play, that is, EPZs are introduced when there is a large number of projects. Wee partly deal with this potential endogeneity bias by redefining our dependent variable, in robustness checks, to be the cumulated number of FDI projects over the period 2010-2014. Nevertheless, we acknowledge that our estimates may not be purely interpreted as causal.

4 Results

We begin with a broad gravity style approach to examine the correlation between an EPZ in a given destination country and the number of projects it receives, before progressing to more parsimonious specifications using fixed effects in which we can only identify the differential effect across sectors/functions. As our identification strategy is to examine the relationship between an EPZ and the composition of FDI, such specifications are particularly useful since they subsume many other factors that could influence the relative importance of trade-intensive vertical FDI within a country pair.

4.1 Baseline Estimates

In Table 4's column 1 we begin by presenting estimates using data aggregated to the origin, destination level, i.e. the total number of bilateral projects. While this does not consider the composition of FDI, we do so in order to better compare our controls to the existing literature.[25] Although we do not discuss them in detail for brevity's sake, coefficients on our controls match what is commonly found in the literature (see the discussion in Blongien and Piger (2014) for comparison). Roughly, they indicate that FDI comes from large, wealthy countries, goes to large destinations, and tends to thrive when barriers are low.

Focusing on the EPZ variable, we find that its coefficient is positive albeit insignificant. In column 2, we disaggregate by sector and introduce sector fixed effects. When doing so, we find the same results, with same point estimates.[26] Together, these results cast some doubt on the effectiveness of EPZs in attracting FDI. These specifications, however, presume that EPZs impact both manufacturing and non-manufacturing investments equally. Given that EPZs lower trade barriers on tangibles, we do not expect this to be the case. Therefore in column 3, we relax this assumption by including both the EPZ variable and its interaction with a dummy variable taking the value of one when the sector belongs to the manufacturing industry. We now find that EPZs have a large, positive, and statistically significant effect for FDI in the manufacturing sectors, and no effect for other sectors. This is consistent with Hypothesis 1. In terms of the magnitude of the estimated coefficient, it is roughly half the size of that for common language or colonial history, two established positive correlates with FDI activity. In

[25] Recall that here, as well as throughout the estimates, we aggregate over time due to the non-time varying EPZ variable.

[26] See Rabe-Hesketh and Skrondal (2012) for an intuitive explanation of the absence of effect of using more disaggregated data on our estimates.

column 4, we again include sector fixed effects but also introduce country pair effects. While this eliminates the ability to estimate the effect of country-wide variables, including the EPZ dummy variable itself, this hopefully absorbs other confounding effects. When doing so, we continue to find that relative to non-manufacturing, manufacturing projects are significantly higher when the destination has an EPZ. Furthermore, the point estimate is nearly the same in columns 3 and 4, suggesting that omitted variable biases dealt with by the country-pair effects were not driving the estimated link between EPZs and manufacturing FDI.

In columns 5 through 7, we repeat columns 2 through 4 but focus only on the manufacturing sectors. Here, however, we further disaggregate by function and introduce function dummies alongside the sector dummies (and country-pair dummies in column 7).[27] As per Hypothesis 1, we expect that the correlation between an EPZ and the number of projects is significantly larger in the manufacturing function since, arguably, production-focused FDI are more likely to be TIV investments for which reductions in trade barriers are the most valuable. When doing so, we find a very similar pattern – EPZs are positively correlated with manufacturing FDI overall, but this relationship is actually driven by affiliates performing a manufacturing function. These findings are then consistent with our expectations.[28]

In Table 5, we repeat the estimations in Table 4 but recalculate the dependent variable so that it only includes projects during 2010-2014. The purpose behind this is that, as these investments come towards the end of the full sample, hopefully fewer of them pre-date the introduction of the EPZs, thus helping to mitigate reverse causality. When doing so, the primary difference is that in columns 1 and 2, we now find significant coefficients for the total number of projects (column 1) and sector-level projects when restricting the coefficient to be the same for manufacturing and non-manufacturing sectors (column 2). This might suggest that there is a time lag in the impact EPZs have on investment, i.e. it takes time before investments increase following the introduction of an EPZ.[29] Alternatively, it could represent a general shift in the composition of FDI towards manufacturing sectors, although this runs counter to the evidence presented in Davies, Desbordes, and Ray (forthcoming). In any case, we again see that this is driven by manufacturing sectors and that even within those sectors, by affiliates with a manufacturing function. Thus, at least relative to this alternative, it appears that the baseline results were not driven by our inability to observe the timing of EPZs.

As noted above, most of the EPZs in our data are found in developing countries. With this in mind, in 6 we restrict our sample to the non-industrial countries (the list of which is found in Table 2). When doing so, we find the same pattern of results that we found in Table 4 where, as consistent with Hypothesis 1, EPZs have a larger effect on FDI in sectors/functions more likely to host TIV FDI. Therefore the results are not driven by the inclusion of both developed and developing destinations in the same sample.

[27] Recall that in the non-manufacturing sectors, we had essentially no affiliates that had a manufacturing function, hence the restriction to just the manufacturing sectors.

[28] It is also worth noting that although the bulk of the other controls are comparable between the full sample results and these manufacturing-only ones some differences, e.g. the insignificance of common language, are found.

[29] See Davies, Desbordes, and Ray (forthcoming) for a discussion on the time responsiveness of greenfield FDI.

Given that the results seem strongest in the manufacturing function, which is almost entirely in manufacturing sectors, from this point forward we focus on the approach of Table 4 to 6's column 7, that is a parsimonious estimation at the origin, destination, sector, function level within manufacturing sectors only.

4.2 Alternative Policy Measures

In Table 7, we replace the Yücer and Siroën EPZ measure with the SEZ measure from the Institutional Profiles Database (2016). As previously explained, this indicator is less precise because, unlike the EPZ dummy, it does not identify the policies in the zone. However, this measure does include an indication of the depth of the overall benefits the zone provides. In column 1, we use this alternative to construct a continuous variable running from zero (no SEZ) to four (a deep one). When doing so, again consistent with Hypothesis 1, we find that within manufacturing sectors, the correlation between affiliates with a manufacturing function and an SEZ is stronger than for affiliates with other functions with the impact growing in the depth of the SEZ. Thus, this serves as an alternative measure of zone-centric policies that supports our main findings. In column 2, we use four different categories for the depth of an SEZ. Here, we find an interesting non-monotonic impact of depth with the manufacturing function-specific SEZ effect initially increasing in depth and then declining. This could arise if the most salient features of an SEZ to non-TIV FDI are introduced only in the deepest zones. Thus, initially as a zone becomes deeper and expands trade cost reductions, this increases the benefits primarily for TIV FDI; after that, however, TIV FDI has benefitted all it can and further increases are contain a larger number non-TIV investments. In any case, we again find that TIV FDI is most sensitive to SEZs when using this alternative measure.

To further follow up on this, Table 8 introduces the World Bank's (2012) incentive measures interacted with the manufacturing function dummy variable. Whereas Yücer and Siroën's is explicitly an EPZ measure, the World Bank's includes information on other types of incentives. This positive, however, is weighed against the fact that the World Bank measure is for a foreign firm in the most populous city and, as such, does not preclude the possibility that the incentive is not bound by geography (i.e. it would not meet the definition of an SEZ). With this caveat in mind, Table 8 shows two sets of estimates for each incentive, one with this incentive interacted with the manufacturing dummy variable by itself (the top row) and one including both this and the EPZ-manufacturing function interaction. Starting with the top panel, we find the effect of all these measures is significantly larger for FDI more likely to be TIV. Further, note that the estimated coefficient is highest for the two incentives inherent to EPZs, customs duties (column 1) and export taxes (column 2), as well as for subsidized utilitiea (column 7). When introducing the EPZ interaction, we find that this reduces the point coefficient for these estimates across the board. The EPZ variable, meanwhile, is positive and significant in each case. This tells us two things. First, the World Bank incentives were capturing part of the EPZ effect in the top panel. Second, the effect of an EPZ on the composition of FDI is robust to the inclusion of additional incentives to foreign investors.

Combining the above results, our estimates suggest that EPZs do seem to have a positive effect on FDI, but only when that investment is related to manufacturing production, i.e an investment for which trade-intensive vertical FDI has a significant role. Thus, the introduction

of an EPZ may be expected to shift the composition of inbound FDI flows towards TIV FDI as per Hypothesis 1. From here, we explore the granularity of this result by allowing the EPZ effect to vary with sector and/or country characteristics, allowing us to investigate Hypotheses 2 and 3.

4.3 Sector-level Heterogeneity

In Hypothesis 2, we posited that the sensitivity of TIV FDI to an EPZ ought to vary with sector-specific characteristics. In particular, when trade in intermediates is a relatively important aspect of a sector, we expect that the effect of an EPZ on FDI to be stronger since the EPZ enhances the already strong desire to offshore the production side of a firm's activity. With this in mind, in Table 9 we begin to explore aspects of cross-sector heterogeneity and how this influences the relative impact of an EPZ on manufacturing FDI in the manufacturing function ('manufacturing affiliates'). We do so by including three additional interactions: the sector-specific characteristics with the EPZ variable, the sector variable with the manufacturing function dummy, and the three-way interaction.[30]

In column 1, we begin by using sector-specific trade openness. Here, we expect that an EPZ would have a particularly large impact on the most trade-intensive sectors. This is precisely what we find: manufacturing affiliates are more prevalent when there is an EPZ and this relationship grows stronger as the sector's trade openness increases. Column 2 instead uses the sector's contract intensity where we hypothesize that contract intensive sectors may be more involved in intra-firm trade and thus benefit more from EPZs. As with the trade intensity measure, this is what we find although the significance of the differential effect is marginal.[31]

In columns 3 and 4, we turn to the labour intensity of the sector. Since developing countries are likely to be labour abundant, we expect that the effect of an EPZ tends to be larger for manufacturing affiliates operating in labour intensive sectors. In column 3, we find a negative coefficient on the interaction between EPZs and labour intensity and a positive one on the triple interaction between these and the manufacturing dummy variable. This suggests that, as labour intensity rises, EPZs lower the number of non-manufacturing affiliates and on net increase the number of manufacturing affiliates. This first result is somewhat unexpected but is due to an outlier in the labour intensity measure – sector 353 (petroleum refineries). When omitting that sector in column 4, the negative coefficient on the EPZ-labour intensity interaction becomes insignificant whereas the triple interaction remains significantly positive (and increases somewhat in magnitude). Thus, we find that the effect of EPZs on production-focused manufacturing FDI is particularly strong when the sector is labour intensive. This is worth recognizing because one of the stated goals of many EPZs is to encourage local employment by foreign firms.

[30] Recall that as all our specifications include country pair, sector, and function dummies, that we cannot include the EPZ dummy, manufacturing dummy, or the sector-specific variable itself.

[31] Like Roelfsema and Zhang (2012), we find that regardless of the presence of an EPZ, it seems that offshoring manufacturing is more difficult in contract intensive industries.

4.4 Country-level Heterogeneity

In Tables 10 and 11 rather than examining the heterogenous impact across sectors, we do so across countries by interacting the EPZ variable and the manufacturing function dummy variables with country-level characteristics. We begin in Table 10, by focusing on three trade-related country characteristics: Balassa's (1965) country-sector measure of revealed comparative advantage (RCA), distance between origin and destination, and destination market potential. Beginning with the RCA results in column 1, we find that, as one might expect, regardless of function, FDI is higher when the origin and/or destination has a comparative advantage in the sector. Further, this relationship is even stronger for manufacturing affiliates. Looking at the EPZ variables, we again obtain a positive effect of EPZs on the relative number of projects in the manufacturing function. This impact, however, is declining in the origin/destination's RCA. When the origin has a stronger RCA in a firm's sector, there may be less desire to export from the destination since the origin has an advantage in the industry. This would reduce the value of the exporting benefits of an EPZ. A higher destination RCA, on the other hand, could reduce the import benefits of an EPZ because more inputs may be sourced locally.

Columns 2 through 4 consider geographic controls related to trade. Column 2 includes bilateral distance where we find that larger distances lower the number of manufacturing projects in comparison to others, a result that is expected if distance acts as a proxy for trade costs for tangible goods. Under Hypothesis 3, we would also expect a negative coefficient on the interaction between distance, the EPZ dummy, and the manufacturing dummy.[32] While this is indeed what we find, the coefficient is imprecisely estimated. Including these, however, do not affect the relationship between an EPZ and the relative number of manufacturing affiliates. Column 3 instead uses market potential, that is, proximity to other markets. One might expect that this would be an attraction for TIV FDI with an export-platform or complex vertical structure. The estimates indicate that this is in fact the case. Similar to distance, however, market potential does not appear to influence the relative attractiveness of an EPZ. Since market potential is largely driven by countries surrounding the destination, nations with which it might already have a regional trade agreement and thus low barriers to begin with, this might mean that the trade barrier reductions of an EPZ may not matter much for exports to those nearby nations. Column 4 include both bilateral distance and market potential, where we again find that neither of these appear to matter with respect to EPZs. This suggests that although the destination's proximity relative to the home or other large economies attracts manufacturing relative to non-manufacturing, this does not significantly alter the correlation between EPZs and the number of manufacturing affiliates.

Table 11 begins with another geographic exercise where we allow the relation between EPZs and TVI FDI to vary by region. Here, we again find that regardless of the destination's region, there is a stronger positive effect of EPZs on manufacturing affiliates than on those with other functions. Further, with the exception of Africa where the differential EPZ effect is slightly less positive, there is no evidence of variation across regions. This is then consistent with the geographic results of Table 10.

[32] Recall that the EPZ-distance interaction is absorbed by the country pair dummies.

Columns 2 through 5 examine the heterogeneous effects according to four measures of governance for the origin and destination. For business rights in column 2, we find little impact from the governance interactions. This does not mean that countries with stronger rights do not have more FDI, but that there is no differential effect between manufacturing and non-manufacturing affiliates. Turning to the other governance measures, we find that origins with better governance tend to send out relatively more manufacturing affiliates. Destinations with better governance exhibit the opposite pattern. However, it must be remembered that this is relative to non-manufacturing investments. If the relatively intangible-intensive non-manufacturing projects are more dependent on a strong rule of law, this would be consistent with this negative interaction effect. Looking at the EPZ variables, we find that, regardless of the measure of governance, an EPZ is relatively more attractive for manufacturing affiliates in good governance destinations, suggesting that EPZs are perceived to perform better in well-governed countries. This effect is muted, however, when the origin also has good governance, perhaps because there is less incentive for the parent to offshore. In any case, these interactions are small in magnitude, meaning that the net effect remains both positive and fairly stable across country pairs.

Thus, in comparison with the sector-level heterogeneity, we find that the relationship between EPZs and the composition of FDI is relatively stable across nations. This may be because, as discussed in CIIP (2017), many SEZs are specifically designed to appeal to certain industries, including those with strong export potential and those perceived to be high-value added (and thus arguably contract intensive).

4.5 Intensive Margins

To this point we have focused on the number of projects as our measure of FDI. In the raw data, the value of investment and number of workers are reported, however many of these values are estimated by the data agency rather than actual figures. We have not used them up to this point because of concerns regarding these estimated values (include worries that the pattern of estimation is not random across functions and between EPZ and non-EPZ countries or across functions). Setting those issues aside, in Table 12 we use this information in two ways. First, in columns 1 and 2, we examine how the composition of the value of investment or the number of jobs in a country-pair, sector, function is related to an EPZ in the destination.[33] When doing so, we confirm that EPZs are associated with a greater volume of manufacturing FDI.

In columns 3 and 4, we examine the average size of the investment and jobs per project, where the estimates indicate that, relative to non-manufacturing projects in EPZ countries, manufacturing projects are larger in terms of the number of jobs and the accompanying investment.[34] Finally, column 5 considers the jobs per millions of investment, i.e. labour intensity. Here, we find that, in countries with an EPZ, the labour intensity of manufacturing affiliates tends to be greater than non-manufacturing affiliates. This is also in line with the results of Table 9. Since job creation is a common rationale for attracting FDI via EPZs, this gives some indication of such an effect.

[33] Again, we focus on the manufacturing sectors only and compare affiliates with manufacturing functions to those without them.

[34] These differences are also interpreted relative to the inclusion of the sector and function fixed effects.

5 Conclusion

Inbound foreign direct investment has long been viewed as a means to encourage economic growth via an influx of new technology, investment, and jobs. In particular, for developing countries, the ability to attract labour intensive investment is viewed as a key part of job creation and governments have responded by introducing an array of policies intended to attract foreign firms. Among these, special economic zones have gained increasing popularity, in part due to the presumed local job creation nature of their effects. Despite the assumed effectiveness of these SEZs, there is scant cross-country analysis of their impact. This study contributes to the debate by examining the relationship between export processing zones, a type of SEZ especially geared towards attracting trade-intensive vertical FDI that is part of a global supply chain, and greenfield investments for a large sample of countries over 2003-2014. We find that the FDI attraction of these EPZs is primarily confined to investments with a manufacturing orientation, i.e. those in manufacturing sectors and particularly those with a manufacturing function. Further, this relationship is especially strong in manufacturing sectors that are trade and labour intensive. Thus, this suggests that EPZs may well have a role to play in government strategies to boost employment. While the limitations of the data on EPZs do require caution in such optimistic assessments, we hope that this analysis is a useful initial foray into an underexplored but important policy tool.

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Table 1: Correlation Between EPZ and Other Incentives

	EPZ
Customs Duties	0.63
Earnings Repatriation	0.38
Export Incentives	0.68
Income Tax	0.57
Property Tax	0.33
Sales Tax	0.56
Subsidized Utility charges	0.32
VAT	0.52
Subsidized Land	0.11
Expedited Visas	0.29
Other	0.27

EPZ variable from Yücer and Siroën (2017). Incentives from the World Bank (2012). Data at origin, destination, sector, function level, using the data in Table 8.

Table 2: Countries in Sample

ISO	DVPING	EPZ	WBINCEN	ISO	DVPING	EPZ	WBINCEN	ISO	DVPING	EPZ	WBINCEN	ISO	DVPING	EPZ	WBINCEN
AGO	1	0	1	DNK	0	0	x	KGZ	1	1	1	PHL	1	1	1
ALB	1	0	1	DOM	1	1	1	KHM	1	1	1	PNG	1	0	x
ARE	0	1	x	ECU	1	1	1	KOR	1	1	1	POL	0	0	1
ARG	1	1	1	EGY	1	1	1	KWT	0	1	x	PRT	0	0	x
ARM	1	0	1	ESP	0	0	1	LKA	1	1	1	PRY	1	1	x
AUS	0	0	0	EST	0	0	x	LTU	0	0	x	QAT	0	0	x
AUT	0	0	0	FIN	0	0	x	LUX	0	0	x	ROM	0	0	1
BDI	1	1	1	FJI	1	0	x	LVA	0	0	x	RWA	1	0	0
BEL	0	0	x	FRA	0	0	1	MAR	1	1	1	SAU	1	0	1
BEN	1	1	x	GAB	1	0	x	MDA	1	1	1	SEN	1	1	1
BFA	1	0	0	GBR	0	0	1	MDG	1	1	1	SGP	0	0	0
BGD	1	1	1	GHA	1	1	1	MDV	1	0	x	SUR	1	0	x
BGR	0	0	1	GIN	1	0	x	MEX	1	1	1	SVK	0	0	1
BHR	1	1	x	GMB	1	1	x	MLI	1	0	1	SVN	0	0	x
BLZ	1	1	x	GNB	1	0	x	MLT	0	0	x	SWE	0	0	x
BOL	1	1	1	GRC	0	0	0	MNG	1	0	x	TGO	1	1	x
BRA	1	1	1	GTM	1	1	1	MOZ	1	1	1	THA	1	1	1
BRN	0	0	0	HKG	0	0	x	MRT	1	0	x	TUN	1	1	1
CAN	0	0	0	HND	1	1	1	MUS	1	1	1	TUR	1	1	1
CHE	0	0	x	HRV	0	1	1	MWI	1	1	x	TZA	1	1	1
CHL	1	1	1	HTI	1	1	x	MYS	1	1	1	UGA	1	0	0
CHN	1	1	x	HUN	0	0	x	NER	1	0	x	URY	1	1	x
CIV	1	0	1	IDN	1	1	1	NGA	1	1	1	USA	0	1	0
CMR	1	1	1	IND	1	1	1	NIC	1	1	1	VNM	1	1	1
COL	1	1	1	IRL	0	0	1	NLD	0	0	0	ZAF	1	1	1
CPV	1	0	x	ISR	0	0	x	NPL	1	0	1	ZAR	1	0	0
CRI	1	1	1	ITA	0	0	1	NZL	0	0	0	ZMB	1	1	1
CYP	0	0	1	JAM	1	1	x	OMN	1	1	x	ZWE	1	1	x
CZE	0	0	0	JOR	1	1	1	PAK	1	1	1	x	x	x	x
DEU	0	0	0	JPN	0	0	1	PAN	1	1	x	x	x	x	x
DJI	1	0	x	KEN	1	1	1	PER	1	1	1	x	x	x	x

DVPING: denotes a developing destination. EPZ: denotes a destination with an EPZ according to Yücer and Siroën (2017). WBINCEN: denotes a destination using at least one incentive according to the World Bank (2012); 'x': not covered. Sample corresponds to Table 4's column 1.

Table 3: Summary Statistics

	Obs.	Mean	Std. Dev.	Min	Max
Projects_{od}	21,659	6.0279	63.2588	0	3952
EPZ_{d}	21,659	0.5041	0.5	0	1
GDP_{o}	21,659	24.3455	2.3988	17.4334	30.4871
Pop_{o}	21,659	1.86	2.0897	-4.6159	7.2184
GDP_{d}	21,659	25.0844	2.0742	20.5597	30.4871
Pop_{d}	21,659	2.4878	1.6357	-1.045	7.2184
Distance_{od}	21,659	8.7469	0.7609	4.1071	9.8925
Contiguity_{od}	21,659	0.0178	0.1323	0	1
Language_{od}	21,659	0.1362	0.343	0	1
Colony_{od}	21,659	0.0077	0.0875	0	1
Time_{od}	21,659	4.5227	3.3673	0	12
Currency_{od}	21,659	0.0193	0.1377	0	1
Religion_{od}	21,659	0.1696	0.2449	0	0.997
WTO_{o}	21,659	0.8548	0.3523	0	1
WTO_{d}	21,659	0.9917	0.0905	0	1
FTA_{od}	21,659	0.1605	0.3671	0	1
$\text{Customs Duties}_{d}$	364662	.6375	.4807	0	1
$\text{Earnings Repatriation}_{d}$	364662	.3385	.4732	0	1
$\text{Export Incentives}_{d}$	364662	.6011	.4897	0	1
Income Tax_{d}	364662	.6522	.4763	0	1
Property Tax_{d}	364662	.4331	.4955	0	1
Sales Tax_{d}	364662	.4034	.4906	0	1
$\text{Subsidized Utilities}_{d}$	364662	.1915	.3935	0	1
VAT_{d}	364662	.554	.4971	0	1
$\text{Subsidized Land}_{d}$	364662	.2319	.422	0	1
$\text{Expedited Visas}_{d}$	364662	.3061	.4609	0	1
$\text{Other Incentives}_{d}$	364662	.6135	.4869	0	1
Open_{s}	472368	1.0394	.9797	-1.6314	2.4566
Contract_{s}	472368	.4884	.2086	.0577	.8587
LabInt_{s}	447900	-3.177	.7307	-5.4998	-1.9629
RCA_{os}	437976	-.0006	1.2262	-8.5577	4.8502
RCA_{ds}	437976	-.0073	1.4425	-7.761	5.106
MktP_{d}	491670	23.4883	.4872	22.5867	24.5326
$\text{Business Rights}_{d}$	457812	71.9958	11.4337	40	100
$\text{Investment Rights}_{d}$	457812	61.0828	15.5221	10	90
$\text{Property Rights}_{d}$	457812	71.6454	21.0184	10	90
Trade Rights_{d}	457812	70.7531	14.1734	15	85
Investment_{odsf}	491670	7.207	207.7179	0	52915.37
Jobs_{odsf}	491670	7.207	207.7179	0	52915.37

Summary statistics refer to the sample in Table 4 excepting the World Bank (2013) incentives which correspond to Table 8 and other sector/country controls which correspond to subsequent tables. CEPII data can be found at `http://www.cepii.fr`.

Table 4: Baseline Estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Country level	*All sectors; sector level*			*Manf. sectors; function level*		
EPZ_d	0.116	0.116	-0.0567		0.281**	-0.0643	
	(0.106)	(0.106)	(0.117)		(0.112)	(0.117)	
EPZ_d*$MANF_s$			0.379***	0.377***			
			(0.0935)	(0.0930)			
EPZ_d*$MANF_f$						0.603***	0.604***
						(0.0702)	(0.0700)
GDP_o	1.523***	1.523***	1.523***		1.629***	1.629***	
	(0.0453)	(0.0453)	(0.0453)		(0.0475)	(0.0475)	
Pop_o	-0.601***	-0.601***	-0.601***		-0.657***	-0.657***	
	(0.0421)	(0.0421)	(0.0421)		(0.0442)	(0.0442)	
GDP_d	0.605***	0.605***	0.605***		0.630***	0.630***	
	(0.0376)	(0.0376)	(0.0376)		(0.0432)	(0.0432)	
Pop_d	0.160***	0.160***	0.160***		0.211***	0.211***	
	(0.0492)	(0.0492)	(0.0492)		(0.0483)	(0.0483)	
$Dist_{od}$	-0.686***	-0.686***	-0.686***		-0.661***	-0.661***	
	(0.0682)	(0.0682)	(0.0682)		(0.0813)	(0.0813)	
$Contig_{od}$	-0.231*	-0.231*	-0.231*		-0.0849	-0.0849	
	(0.128)	(0.128)	(0.128)		(0.139)	(0.139)	
$Lang_{od}$	0.541***	0.541***	0.541***		0.0875	0.0875	
	(0.111)	(0.111)	(0.111)		(0.119)	(0.119)	
$Colony_{od}$	0.655***	0.655***	0.655***		0.248	0.248	
	(0.235)	(0.235)	(0.235)		(0.230)	(0.230)	
$Time_{od}$	0.0541***	0.0541***	0.0541***		0.0382**	0.0382**	
	(0.0161)	(0.0161)	(0.0161)		(0.0179)	(0.0179)	
$Currency_{od}$	-0.338***	-0.338***	-0.338***		-0.315**	-0.315**	
	(0.106)	(0.106)	(0.106)		(0.124)	(0.124)	
$Religion_{od}$	0.103	0.103	0.103		-0.187	-0.187	
	(0.134)	(0.134)	(0.134)		(0.165)	(0.165)	
WTO_o	1.573***	1.573***	1.573***		1.486***	1.486***	
	(0.140)	(0.140)	(0.140)		(0.159)	(0.159)	
WTO_d	0.802***	0.802***	0.802***		1.078**	1.078**	
	(0.247)	(0.247)	(0.247)		(0.455)	(0.455)	
FTA_{od}	0.167*	0.167*	0.167*		0.236*	0.236*	
	(0.101)	(0.101)	(0.101)		(0.130)	(0.130)	
Observations	21,659	1,191,245	1,191,245	250,470	3,508,758	3,508,758	491,670

Robust standard errors clustered by country pair in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Columns 2-7 include sector fixed effects. Columns 4 and 7 include country pair fixed effects. Columns 5-7 include function fixed effects.

Table 5: Projects Only During 2010-2014

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Country level	*All sectors; sector level*			*Manf. sectors; function level*		
EPZ_d	0.256**	0.256**	0.0521		0.456***	0.0792	
	(0.108)	(0.108)	(0.122)		(0.119)	(0.128)	
EPZ_d*$MANF_s$			0.467***	0.466***			
			(0.0935)	(0.0930)			
EPZ_d*$MANF_f$						0.710***	0.711***
						(0.0776)	(0.0775)
GDP_o	1.474***	1.474***	1.474***		1.570***	1.570***	
	(0.0444)	(0.0444)	(0.0444)		(0.0512)	(0.0512)	
Pop_o	-0.571***	-0.571***	-0.571***		-0.608***	-0.608***	
	(0.0427)	(0.0427)	(0.0427)		(0.0511)	(0.0511)	
GDP_d	0.696***	0.696***	0.696***		0.720***	0.720***	
	(0.0379)	(0.0379)	(0.0379)		(0.0460)	(0.0460)	
Pop_d	0.0575	0.0575	0.0575		0.121**	0.121**	
	(0.0476)	(0.0476)	(0.0476)		(0.0526)	(0.0526)	
$Dist_{od}$	-0.562***	-0.562***	-0.562***		-0.521***	-0.521***	
	(0.0699)	(0.0699)	(0.0699)		(0.0825)	(0.0825)	
$Contig_{od}$	-0.226*	-0.226*	-0.226*		-0.0346	-0.0346	
	(0.128)	(0.128)	(0.128)		(0.133)	(0.133)	
$Lang_{od}$	0.632***	0.632***	0.632***		0.133	0.133	
	(0.110)	(0.110)	(0.110)		(0.120)	(0.120)	
$Colony_{od}$	0.716***	0.716***	0.716***		0.314	0.314	
	(0.251)	(0.251)	(0.251)		(0.246)	(0.246)	
$Time_{od}$	0.0379**	0.0379**	0.0379**		0.0263	0.0263	
	(0.0149)	(0.0149)	(0.0149)		(0.0174)	(0.0174)	
$Currency_{od}$	-0.337***	-0.337***	-0.337***		-0.302**	-0.302**	
	(0.112)	(0.112)	(0.112)		(0.129)	(0.129)	
$Religion_{od}$	0.180	0.180	0.180		-0.0104	-0.0104	
	(0.139)	(0.139)	(0.139)		(0.169)	(0.169)	
WTO_o	1.746***	1.746***	1.746***		1.632***	1.632***	
	(0.157)	(0.157)	(0.157)		(0.197)	(0.197)	
WTO_d	0.759**	0.759**	0.759**		1.495*	1.495*	
	(0.368)	(0.368)	(0.368)		(0.763)	(0.763)	
FTA_{od}	0.147	0.147	0.147		0.243*	0.243*	
	(0.107)	(0.107)	(0.107)		(0.131)	(0.131)	
Observations	21,659	1,191,245	1,191,245	199,870	3,508,758	3,508,758	376,974

Robust standard errors clustered by country pair in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Columns 2-7 include sector fixed effects. Columns 4 and 7 include country pair fixed effects. Columns 5-7 include function fixed effects.

Table 6: Developing recipient countries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Country level	*All sectors; sector level*			*Manf. sectors; function level*		
EPZ_d	0.155	0.155	-0.183		0.452***	0.217	
	(0.124)	(0.124)	(0.139)		(0.133)	(0.153)	
EPZ_d*$MANF_s$			0.833***	0.829***			
			(0.144)	(0.144)			
EPZ_d*$MANF_f$						0.367***	0.363***
						(0.129)	(0.129)
GDP_o	1.448***	1.448***	1.448***		1.599***	1.599***	
	(0.0512)	(0.0512)	(0.0512)		(0.0601)	(0.0601)	
Pop_o	-0.541***	-0.541***	-0.541***		-0.620***	-0.620***	
	(0.0444)	(0.0444)	(0.0444)		(0.0537)	(0.0537)	
GDP_d	0.538***	0.538***	0.538***		0.588***	0.588***	
	(0.0515)	(0.0515)	(0.0515)		(0.0570)	(0.0570)	
Pop_d	0.372***	0.372***	0.372***		0.393***	0.393***	
	(0.0632)	(0.0632)	(0.0632)		(0.0602)	(0.0602)	
$Dist_{od}$	-0.789***	-0.789***	-0.789***		-0.760***	-0.760***	
	(0.109)	(0.109)	(0.109)		(0.124)	(0.124)	
$Contig_{od}$	-0.362*	-0.362*	-0.362*		-0.367*	-0.367*	
	(0.212)	(0.212)	(0.212)		(0.201)	(0.201)	
$Lang_{od}$	0.366***	0.366***	0.366***		-0.0571	-0.0571	
	(0.136)	(0.136)	(0.136)		(0.193)	(0.193)	
$Colony_{od}$	0.601***	0.601***	0.601***		0.310	0.310	
	(0.223)	(0.223)	(0.223)		(0.237)	(0.237)	
$Time_{od}$	0.0451*	0.0451*	0.0451*		0.0195	0.0195	
	(0.0239)	(0.0239)	(0.0239)		(0.0245)	(0.0245)	
$Currency_{od}$	0.375	0.375	0.375		0.402	0.402	
	(0.347)	(0.347)	(0.347)		(0.333)	(0.333)	
$Religion_{od}$	0.590***	0.590***	0.590***		0.0250	0.0250	
	(0.152)	(0.152)	(0.152)		(0.215)	(0.215)	
WTO_o	1.739***	1.739***	1.739***		1.549***	1.549***	
	(0.194)	(0.194)	(0.194)		(0.239)	(0.239)	
WTO_d	0.519**	0.519**	0.519**		0.692	0.692	
	(0.257)	(0.257)	(0.257)		(0.451)	(0.451)	
FTA_{od}	0.453***	0.453***	0.453***		0.569***	0.569***	
	(0.103)	(0.103)	(0.103)		(0.157)	(0.157)	
Observations	14,320	787,600	787,600	138,930	2,319,840	2,319,840	257,094

Robust standard errors clustered by country pair in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Columns 2-7 include sector fixed effects. Columns 4 and 7 include country pair fixed effects. Columns 5-7 include function fixed effects.

Table 7: Alternative Measure of SEZ

	(1)	(2)
$SEZ_d * MANF_f$	0.137***	
	(0.0198)	
$SEZ1_d * MANF_f$		0.7238***
		(0.1388)
$SEZ2_d * MANF_f$		1.0778***
		(0.0878)
$SEZ3_d * MANF_f$		0.3043**
		(0.1253)
$SEZ4_d * MANF_f$		0.5742***
		(0.0812)
Observations	476,280	476,280

Robust standard errors clustered by country pair in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All specifications include country pair, sector, and function fixed effects.

Table 8: Other Incentives

Incentive Measure:	(1) Customs Duties	(2) Earnings repatriation	(3) Export	(4) Income	(5) Property Tax	(6) Sales Tax	(7) Subs. Utilities	(8) VAT	(9) Subs. Land	(10) Expedited Visa	(11) Other
Incent_d*MANF_f	0.631***	0.499***	0.532***	0.468***	0.409***	0.454***	0.554***	0.461***	0.353***	0.376***	0.363***
	(0.0796)	(0.0951)	(0.0805)	(0.0867)	(0.0830)	(0.0756)	(0.0933)	(0.0791)	(0.109)	(0.0846)	(0.0969)
Observations	364,662	364,662	364,662	364,662	364,662	364,662	364,662	364,662	364,662	364,662	364,662
Incent_d*MANF_f	0.428***	0.292***	0.297***	0.337***	0.363***	0.191**	0.259**	0.274***	0.395***	0.140*	0.364***
	(0.0915)	(0.0884)	(0.0831)	(0.0770)	(0.0710)	(0.0849)	(0.103)	(0.0772)	(0.0832)	(0.0839)	(0.0761)
EPZ_d*MANF_f	0.372***	0.546***	0.449***	0.516***	0.578***	0.522***	0.512***	0.506***	0.618***	0.561***	0.602***
	(0.0928)	(0.0751)	(0.0851)	(0.0779)	(0.0731)	(0.0925)	(0.0856)	(0.0821)	(0.0711)	(0.0801)	(0.0741)
Observations	364,662	364,662	364,662	364,662	364,662	364,662	364,662	364,662	364,662	364,662	364,662

Robust standard errors clustered by country pair in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All specifications include country pair, sector, and function fixed effects.

Table 9: Sector-specific characteristics

	(1)	(2)	(3)	(4)
EPZ_d*$MANF_f$	0.550***	0.576***	0.608***	0.610***
	(0.0678)	(0.0655)	(0.0722)	(0.0722)
EPZ_d*$Open_s$	0.0621			
	(0.0430)			
$Open_s$* $MANF_f$	-0.439***			
	(0.0282)			
EPZ_d*$Open_s$* $MANF_f$	0.112***			
	(0.0408)			
EPZ_d*$Contract_s$		-0.0774		
		(0.127)		
$Contract_s$*$MANF_f$		-1.143***		
		(0.103)		
EPZ_d*$Contract_s$*$MANF_f$		0.232*		
		(0.133)		
EPZ_d*$LabInt_s$			-0.161**	-0.107
			(0.0807)	(0.0753)
$LabInt_s$*$MANF_f$			-0.480***	-0.992***
			(0.0559)	(0.0648)
EPZ_d*$LabInt_s$*$MANF_f$			0.288***	0.344***
			(0.0713)	(0.0846)
Observations	472,368	472,368	447,900	419,616

Robust standard errors clustered by country pair in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All specifications include country pair, sector, and function fixed effects.

Table 10: Country-specific characteristics: RCA and Geography

	(1)	(2)	(3)	(4)
$EPZ_d * MANF_f$	0.792***	0.800***	0.853***	0.866***
	(0.0752)	(0.0673)	(0.0937)	(0.0830)
RCA_{os}	0.401***			
	(0.0241)			
RCA_{ds}	0.138***			
	(0.0271)			
$EPZ_d * RCA_{os}$	0.00955			
	(0.0393)			
$EPZ_d * RCA_{ds}$	-0.0729*			
	(0.0384)			
$RCA_{os} * MANF_f$	0.158***			
	(0.0351)			
$RCA_{ds} * MANF_f$	0.238***			
	(0.0384)			
$EPZ_d * RCA_{os} * MANF_f$	-0.152***			
	(0.0482)			
$EPZ_d * RCA_{ds} * MANF_f$	-0.160***			
	(0.0514)			
$Dist_{od} * MANF_f$		-0.216***		-0.200***
		(0.0397)		(0.0460)
$EPZ_d * Dist_{od} * MANF_f$		-0.0880		-0.0961
		(0.0677)		(0.0754)
$MktP_d * MANF_f$			0.340***	0.124
			(0.0921)	(0.100)
$EPZ_d * MktP_d * MANF_f$			-0.0448	-0.0587
			(0.186)	(0.205)
Observations	437,976	491,670	491,670	491,670

Robust standard errors clustered by country pair in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All specifications include country pair, sector, and function fixed effects.

Table 11: Country-specific characteristics: Regions and Governance

	(1)	(2)	(3)	(4)	(5)
Govern Measure		Business	Invest.	Property	Trade
EPZ_d*MANF_f	0.669***	0.458***	0.611***	0.282***	0.318***
	(0.0809)	(0.0801)	(0.0725)	(0.0752)	(0.0912)
Gov_o*MANF_f		0.000685	0.00896**	0.0102***	0.0140**
		(0.00696)	(0.00427)	(0.00326)	(0.00603)
Gov_d*MANF_f		-0.0152***	-0.00960***	-0.0334***	-0.0418***
		(0.00379)	(0.00290)	(0.00261)	(0.00554)
$EPZ_d*Gov_o*MANF_f$		-0.00219	-0.0208***	-0.00937**	-0.0159**
		(0.00830)	(0.00553)	(0.00390)	(0.00669)
$EPZ_d*Gov_d*MANF_f$		-0.00562	0.0101**	0.0214***	0.0329***
		(0.00517)	(0.00413)	(0.00337)	(0.00624)
$EPZ_d*MANF_f*Africa_d$	-0.167*				
	(0.101)				
$EPZ_d*MANF_f*America_d$	-0.157				
	(0.104)				
$EPZ_d*MANF_f*Europe_d$	-0.0331				
	(0.251)				
Observations	491,670	457,812	457,812	457,812	457,812

Robust standard errors clustered by country pair in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All specifications include country pair, sector, and function fixed effects.

Table 12: Intensive choices

	(1)	(2)	(3)	(4)	(5)
Dep. Var.	Invest.	Jobs	Inv/Proj	Jobs/Proj	Jobs/Inv
EPZ_d*MANF_f	0.690***	0.954***	0.404***	0.524***	0.836**
	(0.109)	(0.109)	(0.125)	(0.0602)	(0.381)
Observations	491,670	491,670	18,125	18,125	18,120

Robust standard errors clustered by country pair in parentheses. *** p<0.01, ** p<0.05, * p<0.1. All specifications include country pair, sector, and function fixed effects.

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