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PLACE-BASED POLICIES AND STRUCTURAL CHANGE: EVIDENCE FROM INDIA'S SPECIAL ECONOMIC ZONES

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Place-based policies and structural change: Evidence from India's Special Economic Zones*

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Abstract

This paper quantifies the local economic impact of 147 Special Economic Zones (SEZs) that were established in India between 2005-2013. Combining census data on the universe of Indian firms with georeferenced data on SEZs, we find that SEZs increased manufacturing and service employment with little indication for spatial relocation. This employment gain was paralleled by a decline in local agricultural employment suggesting structural change. Female workers experienced weaker employment gains and we find no indication for systematic improvements in local public good provision. Employment gains are remarkably similar across privately and publicly run zones and zones with different industry denomination.

Key words: Special Economic Zones, economic development, place-based policy, spillovers, structural change

JEL: O23, O53, R12, R58

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1 Introduction

An increasing number of developing countries relies on Special Economic Zones (SEZs) as a policy tool to foster economic development. Over the past two decades, the total number of SEZs worldwide more than quintupled to a total of more than 5,000 zones - the vast majority of which are located in developing economies (UNCTAD, 2019). While their specific design can differ, SEZs have in common that they are set up in a clearly defined area where physically present firms have access to lower tax and tariff rates or more efficient bureaucratic procedures (World Bank, 2008). Their establishment can thus be understood as a place-based policy.

The literature on place-based policies has primarily studied policy implications in developed economies (e.g. Neumark and Simpson, 2015; Criscuolo et al., 2019; Grant, 2020) while evidence on the effects of SEZs in the developing world is still scarce (e.g. Duranton and Venables, 2018).[1] This leaves an important blank spot as experiences with place-based policies in developed countries can hardly be transferred to less developed economies for various reasons. First, developing countries are characterized by significantly lower institutional quality than their developed country counterparts, which may limit the efficiency of local transfer programs and place-based policies (Becker et al., 2013; Farole and Moberg, 2014). Moreover, formal firms operating in developing countries often face substantially higher tax and bureaucratic burdens than firms in developed countries (Gordon and Li, 2009). Place-based policies that reduce administrative burdens and grant tax exemptions might hence create steeper location incentives. Finally, SEZs in developing countries also differ in purpose and structure from SEZs in the developed world. Among others, they often target exporting firms – by offering tariff exemptions for input goods – a feature that is hardly prevalent in developed economies.

The aim of this paper is to advance our understanding of the economic and spatial effects of SEZs in developing countries. Testing ground is the establishment of 147 SEZs in India between 2005-2013. The zones were founded after the Indian government passed the 'Special Economic Zones Act' in 2005, which provided a uniform legal framework for developing and doing business in SEZs and regulated that firms within SEZs benefit from long-term tax and tariff exemptions. India was ranked as one of the least business-friendly countries in the *Ease of Doing Business Index* (World Bank, 2005) at the time and the SEZ Act was initiated to improve this situation and create new economic activity. Our empirical analysis builds on hand-collected data on Indian SEZs for the period 1998-2013. We identify the exact location of all SEZs and the date when they went into operation. The SEZ data are matched to rich administrative information on the population of firms in India which are linked to their hosting municipalities. Methodologically, we identify the effects of SEZs on local employment in a difference-in-differences framework that com-

[1] Other papers on place-based policies in developed countries include Gobillon et al., 2012; Busso et al., 2013; Kline and Moretti, 2014; Ehrlich and Seidel, 2018.

pares changes in the economic outcomes in municipalities where SEZs were established with municipalities in the same region without SEZs. To allow for a granular picture, we define 5km-distance bins around the SEZ. This enables us to determine the spatial gradient of the SEZ effect without parametric restrictions. The main identification concern of this approach is that SEZs are not randomly allocated in space, but that their location systematically correlates with the economic trajectories before SEZ establishment. We address this concern in placebo tests, which document that economic development did not systematically differ between SEZ-hosting municipalities, their neighbors and municipalities in further distance prior to SEZ establishment.

The estimates point to a sizable effect of SEZ establishments on local economic activity: On average, non-agricultural (that is, manufacturing and service) employment in SEZ-hosting municipalities increased by 47 percentage points (*pp*) more than in the reference locations - defined as the set of municipalities in a distance bin of 20-25km from the SEZ.[2] The sizable relative effect translates into a moderate absolute employment gain as Indian municipalities tend to be small administrative units: Evaluated at the sample mean, municipal employment increased, on average, by 1.475 non-agricultural workers per SEZ municipality.[3] Our findings indicate that the policy did not only foster economic activity within the boundaries of the SEZ but also contributed to local economic development more broadly: There are strong spatial spillovers on neighboring locations up to a distance of 10km. In the first distance bin around SEZs (< 5km), non-agricultural employment growth is 21*pp* higher than in the reference location after SEZ establishment; in the second distance bin (5-10km), it is 16*pp* higher. For municipalities 10-50km away from SEZs, we find no significant difference in employment trajectories relative to the reference locations. In additional analyses, we show that a non-negligible part of the observed employment response relates to the foundation of new firms, many of which are small and characterized by a low degree of formality. In particular in areas surrounding SEZs, employment gains are dominated by smaller entities.

Our results further suggest that the observed employment increase largely reflects the creation of genuinely new non-agricultural employment rather than relocation of manufacturing and service jobs in space. Importantly, we provide evidence that this development was paralleled by a decline in agricultural employment, in particular by marginally employed workers (with 183 workdays or less per year). This suggests that the SEZ-policy has contributed to structural change by inducing workers to relocate from agricultural work to more productive jobs in the manufacturing and service sector.[4] This finding connects well with previous research that has emphasized the importance of sectoral shifts from agriculture to more productive industries as a key driver of economic development

[2]Note that the particular choice of the reference category is immaterial for our results.

[3]Note that not necessarily all of this new employment is created by firms within SEZs; part of it may relate to increased economic activity of firms located in the same municipality but outside the SEZ.

[4]50-60% of Indian workers are employed in agriculture, but the sector contributes only 18% to GDP. Managing a peaceful transition from an agrarian-based to an industrial and service economy is widely considered to be one of countries' main challenges (Sud, 2014).

(McMillan et al., 2011; Eichengreen and Gupta, 2011; Gollin et al., 2014).

Proponents of SEZs have also argued that SEZs serve broader social goals. Our data allow us to test for some common presumptions. First, we separately study the impact of SEZs on female and male employment. Women are a particularly vulnerable group in the Indian labor market and gender discrimination is a prevalent and long-standing phenomenon. Unemployment rates among women are also significantly larger than among men (Klasen and Pieters, 2015; Srivastava and Srivastava, 2015). Many proponents of SEZ policies expected gains from SEZs to be biased towards female workers and predicted that new employment would mainly be sourced from the unused female workforce (World Bank, 2011; Bacchetta et al., 2009; Rama, 2003).[5] According to our evidence, these previous experiences do not carry over to the Indian case. We find that SEZ-induced increases in non-agricultural employment are largely centered around men. Female employment numbers increase, but the observed shift in female manufacturing and service employment is substantially smaller than for male workers. In additional analyses, we, moreover, assess whether SEZs improve the provision of local public goods that may serve local communities and residents in a broad sense. The SEZ Act defined the expansion of local infrastructure as an explicit policy goal, envisioning that SEZ developers might invest in infrastructure such street and electricity networks or waterways that could be co-used by local residents (Alkon, 2018; Vijayabaskar, 2010). We find little indication for such effects in our data.[6]

Finally, we add to the literature by assessing whether SEZ *characteristics* shape zones' local economic effect. Existing papers largely treat SEZs as homogeneous entities. This is at odds with real-world policy settings. Special economic zones in India (similar to SEZs in other countries) differ in key characteristics, the most important ones being that zones can be run by private or public developers; and that they differ in their industry denomination, ranging from IT, to engineering and multi-product SEZs. Theoretically, SEZ-effects may well differ by zone type, as sketched in our study. Empirically, we find that total employment gains are remarkably homogeneous across different types of SEZs - but that the structure of the employment response can markedly differ.

Beyond the referenced literature so far, our study relates in particular to research on regional economic effects of place-based policies. Most existing work is set in developed countries (Neumark and Simpson, 2015) and findings on the effectiveness of these zones in fostering regional employment and economic activity tend to be mixed (Neumark and Kolko, 2010; Gobillon et al., 2012; Busso et al., 2013; Ehrlich and Seidel, 2018). Evidence on SEZs in less developed countries is still scarce. For China, Wang (2013) and Lu et al. (2019) document that SEZs led to higher investments, employment and wages in SEZ-hosting communities, with limited spillover effects to surrounding areas. We are not aware of evidence for other less developed economies. Our paper is the first to comprehensively assess the regional economic effects of SEZs in India based on detailed administrative data

[5]These expectations, in part, derived from past experiences. Liberalizations in trade policies have led to a rise in the female labor share in many countries (Ozler, 2000; Bussmann, 2009).

[6]These findings are consistent with previous results based on more aggregate data by Alkon (2018).

on spatial economic activity.[7] Previous empirical work on the economic consequences of regional and local public policies in India, among others, studies state-level tax incentives (Chaurey, 2017) and rural road construction programs (Asher and Novosad, 2020). Many aspects highlighted in our work have, to the best of our knowledge, not been assessed by prior literature, including the role of SEZs in driving structural change and the social effects of SEZs. We further add more specifically to the literature on structural change and economic growth (Kline and Moretti, 2014; McMillan et al., 2011; Gollin et al., 2014; Laitner, 2000). For India, Eichengreen and Gupta (2011) identify the sectoral shift from agriculture to services as a key driver of economic growth. In this regard, Blakeslee et al. (2022) study the effects of a land-rezoning program in Karnataka on local sectoral shifts. Previous work in other developing countries has mostly focused on the role of trade liberalization and international integration in the process of structural change, see e.g. Uy et al. (2013) for Korea and McCaig and Pavcnik (2013) for Vietnam.

The remainder of the paper is organized as follows. Section 2 describes the institutional background. In Section 3, we present the construction of our data set and the empirical methodology. Section 4 summarizes our main findings and Section 5 concludes.

2 Institutional background

In the 1960s, India became one of the first countries to establish export-processing zones (EPZ) which were later relabeled as SEZs in the early 2000s. But for long, SEZs were rare in the country. Between the 1960s and the 1990s, only seven SEZs were established by the central government. This changed drastically when the Indian government implemented the Special Economic Zones Act in 2005, allowing for private investments in SEZs and a much more flexible environment than the precedent EPZ framework in which all zones were owned and managed exclusively by the central government.[8] Until 2020, the number of operational SEZs, i.e. zones with at least one active company, increased markedly to 240 of which more than 90% were established under the SEZ Act (see Figure 1).[9]

The main goals of the SEZ Act were to (i) generate additional economic activity, (ii) promote exports of goods and services, (iii) promote investment from domestic and foreign sources, (iv) create employment opportunities, and (v) develop local infrastructure facilities (SEZ Act, 2005).[10] To achieve these goals, the SEZ Act provided a uniform legal framework for developing and doing business in these specially designated areas. Firms in

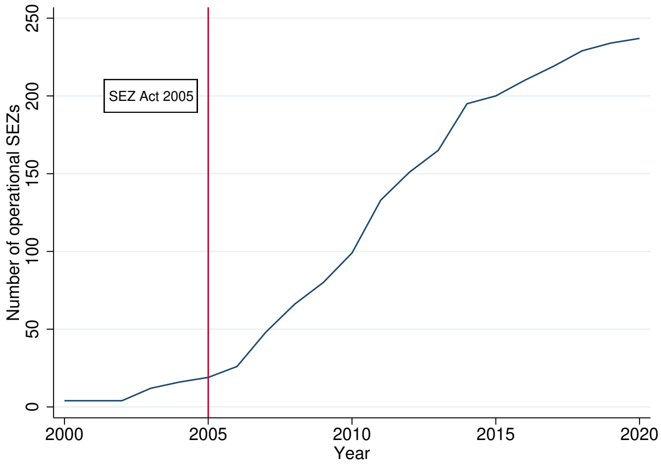
[7] Prior work on SEZs in India takes a descriptive perspective (Mukherjee et al., 2016) or relies on broad proxies for economic activity (Hyun and Ravi, 2018). A recent paper by Görg and Mulyukova (2022) uses a sample of Indian firms to study the effect of SEZs on exporting behavior and factor productivity.

[8] The EPZs were developed by the central government without any formal legislative framework. Further, India's economy was highly regulated and poorly integrated into the global economy, which impeded foreign investments into most parts of the economy (Mukherjee et al., 2016; Aghion et al., 2008).

[9] The remaining SEZs were established prior to the enactment of the SEZ Act (as EPZs).

[10] In the early 2000s, India was one of the least business-friendly economies according to the World Bank's *Ease of Doing Business Index* (World Bank, 2005).

Figure 1: Operational SEZs in India

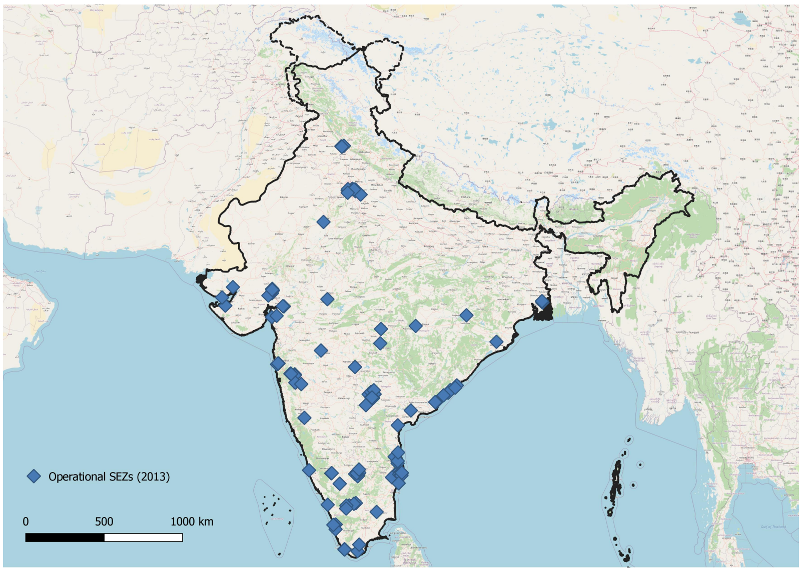


Notes: This figure plots the cumulative sum of operational SEZs in India by year. SEZs are defined as being operational as soon as one firm commenced with its production. The individual SEZ data are obtained from the Indian Ministry of Commerce and Industry. The date of operationalization is sourced from newspaper articles and administrative records.

SEZs, moreover, enjoy various administrative and fiscal benefits. On the administrative side, there is so-called "single window" clearance, that is all approvals are issued by a single authority. Businesses in SEZs, moreover, receive a 100% income tax exemption on export income for the first 5 years of operation, which reduces to a 50% exemption for the following 5 years. Thereafter, the tax benefit of 50% is granted to reinvested profits for a final period of 5 years. SEZ business units are, furthermore, exempted from sales and service taxes. Exemption from the Minimum Alternate Tax (MAT), a minimum tax on profits of 18.5%, was granted until 2012. SEZ units also benefit from duty free imports and domestic procurement of goods and services. Note that SEZs are treated as being outside of the domestic tariff area (DTA), so that goods that are produced in the SEZ and sold into the DTA are considered as imports to the Indian market. In consequence, companies in the DTA have to pay import tariffs if they purchase goods from a SEZ company. In turn, goods and services supplied by DTA companies to SEZ units are considered as exports from the DTA, which are exempted from any taxes and tariffs. Hence, only the flow of goods from DTA into SEZs is untaxed and zero tariffs apply, but not vice versa. SEZ applications are assessed by the Central Board of Approval. The main criteria for an approval by the board is that SEZ developers are in the rightful possession of sufficiently large parcels of land.[11] After the formal approval by the board, the proposal to develop the SEZ is recommended for notification to the Ministry of Industry and Commerce, which officially notifies the designated area as an SEZ area.

[11] The minimum land requirements depends on the industry denomination of the SEZ, namely whether the SEZ is a multi-product or a sector-specific SEZ. A multi-product zone during our sample period required a minimum contiguous area of 10 square kilometers, sector-specific zones such as IT zones required only 0.1 square kilometers.

Figure 2: Geographical distribution of operational SEZs



Notes: This figure plots the location of all SEZs in India that were established under the SEZ Act 2005 and became operational until 2013. Any maps included herein are without prejudice to the status or sovereignty over any territory, the delimitation of international frontiers and boundaries.

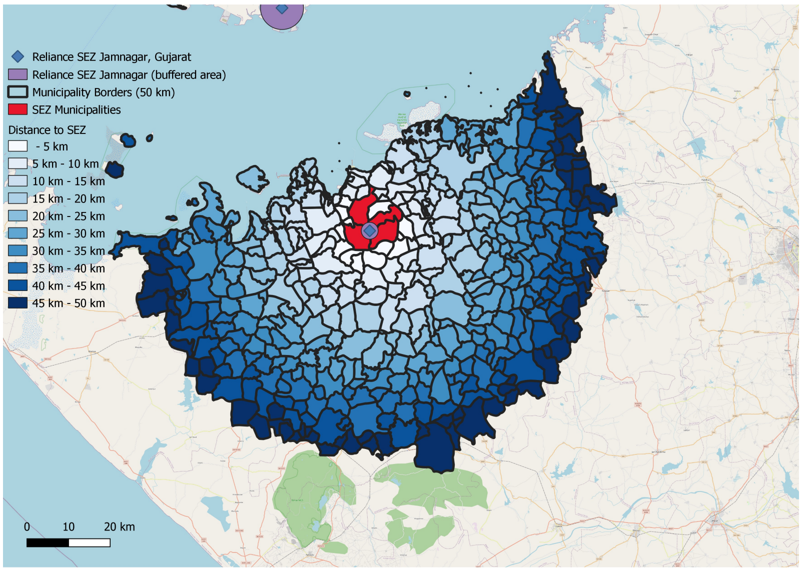
3 Data and empirical methodology

3.1 Data

Data on SEZs. We compiled information on all 147 Indian SEZs that were established under the SEZ Act and became operational until 2013 from various sources. Data on the name of the SEZ, whether the SEZ was privately or publicly developed, its location, size, industry type and date of notification are readily available from the Ministry of Commerce and Industry.[12] A key variable for our empirical analysis, the start of operation of a SEZ, was not directly accessible, however, and had to be hand-collected from newspaper articles, official statistics by the Ministry of Commerce and Industry as well as from minutes of the Central Board of Approval. We define the date of operationalization as the earliest date available, where we find at least one firm in the SEZ that went into operation. 77% of the SEZs we are considering (2005-2013) were developed by private companies, 23% by public bodies. In terms of industry denomination, 57% were IT zones, followed by engineering (12%), pharmaceutical (9%) and multi-product zones (9%). The average SEZ covers 1.76 square kilometers, but the size varies systematically by industry denomination. IT-zones, on average, cover 0.25 square kilometers, multi-product SEZs 14.02 square kilometers (see

[12] The precision of the location information varies by SEZ depending on the information provided by the Ministry of Commerce and Industry. We georeference each SEZ at the municipality-level or, if available, even to its exact location. We verify our strategy by comparing our SEZ coordinates with a sub-sample of officially georeferenced SEZ that is accessible at the development commissioner's website of Visakhapatnam SEZ. The individual information on each SEZ can be accessed from the SEZ website of the Ministry of Commerce and Industry: http://sezindia.nic.in/index.php.

Figure 3: Mapping municipalities into distance bins around SEZs



Notes: This figure illustrates the procedure of mapping municipalities into distance bins using the"Reliance SEZ" in Jamnagar (Gujarat) as an example.

Appendix A for details). According to Figure 2, the majority of SEZs are located close to India's biggest urban agglomerations such as Delhi, Mumbai, Hyderabad, and Bangalore and Chennai or in coastal areas close to ports. In the analysis to come, we will assess whether zone characteristics shape SEZs' impact on the local economy.

Link to municipal data. Using GIS techniques, we spatially join the georeferenced SEZ data with the India Village-Level Geospatial Socio-Economic Data Set (Meiyappan et al., 2018), which provides the administrative boundaries of every municipality in India based on the Population Census of 2001.[13] To identify SEZ-hosting municipalities and municipalities in close proximity to SEZs, we approximate the area of the SEZ based on the geo-coordinates and information on SEZ size (which by the SEZ Act is required to be contiguous (SEZ Act, 2005)). As information on precise SEZ boundaries is unavailable, SEZs are assumed to be shaped as circles. Based on the total area approved, we calculate the radius of the zone and consider all municipalities that fall within this radius as SEZ-hosting municipalities. Figure 3 illustrates the procedure for the Reliance SEZ in Jamnagar, where the red-colored polygons correspond to municipalities, whose administrative borders intersect with the SEZ-area. We consider these municipalities as municipalities that contain a SEZ. For most SEZs, the precise assumption on the shape of the zone does not impact which municipalities are coded as SEZ-hosting since the vast majority of zones is hosted by a single municipality. The blue-shaded polygons illustrate neighboring municipalities, classified by their distance to their closest SEZ ("Reliance SEZ" in the example above). The light blue color indicates municipalities which are within a 5km distance to their closest SEZ; darker blue colors indicate municipalities in a distance of 5-10km, 10-15km

[13]We use *municipality* as a collective term for villages and towns in India.

etc. to the closest SEZ (up to 50km). We draw on this classification in our empirical identification strategy below.[14]

Economic and Population Census. We complement these data with information from the *Economic Census* and the *Population Census*. The *Economic Census* is a complete enumeration of all non-agricultural (i.e. manufacturing and service) firms in India including the informal sector. We can draw on three repeated cross-sections of data for the years 1998, 2005 and 2013. We link municipalities across the three Economic Census waves by using the time-consistent municipality identifiers provided by the Socioeconomic High-resolution Rural-Urban Geographic Platform for India (Asher et al., 2021, SHRUG). For every non-agricultural firm in India, the Economic Census contains information on employment (total and separate by gender), firms' industry code and its host municipality. We disregard public administration employment and employment in international organizations. The Economic Census for 2013 lists 58.5 million firms employing 131.3 million workers. We collapse each Economic Census round to the municipality level and calculate the municipalities' number of firms, total employment, employment by gender and by industry as well as employment for small and large firms.[15] In the following analysis, we tab firms as small if they employ less than 10 workers. The rationale behind this distinction is that firms with less than 10 workers are often labelled as 'informal' as they are subject to a lighter regulatory burden under Indian law. For example, they do not need to register with official statistics, are exempted from social security taxes and subject to light bureaucratic procedures (Amirapu and Gechter, 2020; Mehrotra, 2019).

We further complement the data with three waves of the *Population Census* containing a repeated cross-section of data for the years 1991, 2001 and 2011. The data contain information on the total population, literacy and infrastructure facilities such as number of schools, road access or electricity for every municipality in India. Most importantly, the Population Census contains information on persons working as cultivators or agricultural laborers, which are not covered by the Economic Census.

Descriptive statistics. The final sample comprises 47,886 municipalities with a total population of 243 million people according to the latest Population Census in 2011. As summarized in Table 1, the average municipality has 643 non-agricultural employees and

[14] Figure A1 in Appendix A illustrates the workflow implemented in the open-source software QGIS to arrive at the final municipality sample.

[15] We use the concordance tables provided by the Ministry of Statistics and Programme Implementation to harmonize industry codes across time. While the Economic Census of 2013 uses the National Industry Classification (NIC) of 2008, the Economic Censuses of 2005 and 1998 use the NIC codes of 2004 and 1987, respectively. We match the three-digit NIC-04 Codes to three-digit NIC-08 codes and aggregate them to one digit NIC-08 codes for our analysis. In cases of industry splits across industries, we assign the industry code, that has a higher employment share according to the Economic Census of 2013. Hence, one caveat is that the harmonization of industry codes is not entirely time consistent. However, most of the industry splits between NIC-04 and NIC-08 are within the same one-digit industry. Hence, only splits across different one-digit industries might bias the results.

Table 1: Descriptive statistics: Municipality sample

	Mean	*SD*	*Median*	*N*	*Source*
Non-agricultural Employment					
- total	642.8	23,991	42	136,848	EC
- male	516.1	20,295	31	136,848	EC
- female	126.7	4,188	9	136,848	EC
- large	221.6	10,208	0	136,848	EC
- small	421.2	14,306	37	136,848	EC
Agricultural Employment					
- total	555.9	4,600	296	130,366	PC
- male	353.7	2686	190	130,366	PC
- female	202.2	1953	90	130,366	PC
- main	460.4	1,657	239	130,366	PC
- marginal	126.9	593	42	130,366	PC
Firms					
- total	215.8	6,312	23	136,848	EC
- male	174.2	5,402	16	136,848	EC
- female	21.47	570.9	1	136,848	EC
- large	5.630	237.6	0	136,848	EC
- small	210.1	6,100	23	136,848	EC
Other					
- Population	4,621.8	119,846	1,013	130,366	PC
- Literacy	0.543	0.163	0.562	130,366	PC
- Schools	4.207	82.08	1	130,366	PC
- Paved road	0.803	0.398	1	130,366	PC
- Electrity	0.777	0.416	1	130,366	PC

Notes: Small and large firms are classified according to the 10-worker rule. Marginal workers (as opposed to main workers) work less than 183 days a year. Information on main and marginal workers is only available for the years 2001 and 2011. *Literacy* states the literacy rate, which is calculated as the share of literate population relative to the total population. *Schools* refers to the total number of schools in a municipality. *Paved road* is a dummy variable that equals 1 if a municipality is accessible via paved road. *Electricity* is a dummy variable that equals 1 if there is some form of electricity. EC = Economic Census (1998, 2005, 2013), PC = Population Census (1991, 2001, 2011). The sample consists of all municipalities which are observed at least two consecutive rounds in the EC.

4,452 residents.[16] The non-agricultural employment distribution features a median of 42 and is highly right-skewed. Employment is, moreover, male-dominated. Only 20% of the workers observed in our data are female. Small (informal) firms with less than 10 workers account for about two thirds of total employment.

3.2 Empirical approach

To identify the economic impact of SEZs across space, we implement a difference-in-differences-style analysis. The unit of observation is municipality i at time t. We observe information on municipal employment and firm counts at three points in time: $t \in \{1998, 2005, 2013\}$. The main analysis compares municipal employment changes between the pre-treatment year 2005 and the post-treatment year 2013 between municipalities that host an SEZ and municipalities in the same region without SEZ. The data include all neighboring municipalities to SEZs in a distance up to 50km and we compare the development of employment/firm counts across municipalities in 5km-distance bins around the SEZ (neighbors with a distance of <5km, 5-10km, 10-15km,...). This avoids parametric assumptions on the spatial gradient of the SEZ effect.

The main threat to our empirical identification strategy is that SEZs are not randomly

[16] While the Economic Census was conducted in the years 1998, 2005 and 2013, the Population Census was conducted in 1991, 2001 and 2011. We match the Population Census of 1991 to the Economic Census of 1998. The Population census of 2001 is matched to the Economic Census of 2005 and the latest Population Census of 2011 is matched to the Economic Census of 2013.

allocated in space. If SEZ developers systematically place SEZs in areas whose outcome trends differ from other municipalities, difference-in-differences estimates are biased. The underlying identifying assumption is that, in the absence of the SEZ establishment, trends in outcomes would have been the same in SEZ-hosting and neighboring municipalities, irrespective of the distance to the SEZ. To assess the validity of this assumption, we run placebo regressions which compare the development of employment and firm counts in the *pre-treatment period* (1998-2005). As presented below, there is no indication of differences in economic development across these municipalities prior to treatment, which corroborates the common-trend assumption.

The main analysis relies on a model of the following form:

$$ln(y_{it}) = c + \sum_{d=0, d\neq 5}^{10} \beta_d D_{[d_i=d]} \times \gamma_{2013} + \gamma_{2013} + \alpha_i + \epsilon_{it}, \quad (1)$$

where y_{it} stands for the number of workers and the number of firms, respectively, in municipality i in year $t \in \{2005, 2013\}$. $D_{[d_i=d]}$ indicates whether a municipality is in distance bin d to an operational SEZ in 2013. $d_i = 0$ indicates SEZ-hosting municipalities, $d_i = 1$ SEZ-neighboring municipalities within a 5km-distance to the SEZ, $d_i = 2$ municipalities in a 5-10km distance etc. up to 50km ($d_i = 10$ for municipalities in a 45-50km distance). Distance bin $d = 5$ (distance of 20-25km) is omitted and serves as the reference category. We interact the distance dummy with a post-reform dummy γ_{2013} and include municipality fixed effects, α_i, to control for time-invariant heterogeneity across municipalities; γ_{2013} absorbs the trend in the dependent variable across municipalities in the reference category. ϵ_{it} is the error term. β_d captures differences in outcomes in municipalities in distance bin d relative to municipalities in the reference category.

In the base specification, standard errors account for clustering at the district level. In additional specifications, we account for clustering at the level of "closest SEZ groups" comprising all municipalities whose d_i is determined by the same SEZ and apply Conley (1999) standard errors. Also note that - while SEZs were implemented in a staggered design - our data include only two points in time. In the first sample year (2005), none of the SEZs were in operation, implying that we rely on a 'classic' difference-in-differences design with one pre- and one post-treatment period. In consequence, we do not have to assume homogeneous treatment effects for our estimator to be unbiased (DeChaisemartin and d'Haultfoeuille, 2020; Goodman-Bacon, 2021).

4 Results

In this section, we present evidence that SEZs increase local manufacturing and service employment (Section 4.1) and foster structural change (Sections 4.2 and 4.3). Further analyses in Sections 4.4 and 4.5 shed light on the anatomy of the employment response and Section 4.6 assesses whether effects differ across different types of SEZs.

4.1 Baseline estimates

In the baseline model, we estimate Eq. (1) using the log of municipalities' manufacturing and service employment as the dependent variable. As described in Section 3, municipalities in India are small administrative units, implying that our data offer a fine-grained picture of the spatial distribution of non-agricultural employment in India and how it changed over time. Exceptions are the biggest cities in the country, which are regarded as one municipality by official statistics. In the base analysis, we hence drop large municipalities with more than 500,000 inhabitants from the sample. In robustness checks, we employ alternative threshold values.

The results are shown in panel (a) of Figure 4. The figure plots the coefficients $\hat{\beta}_d$ and 95%-confidence intervals for all distance bins. We find a sharp difference in the employment trends of SEZ-hosting municipalities and reference locations between 2005 (the year of the SEZ Act) and 2013. SEZ-hosting municipalities and direct neighbors significantly gained employment relative to municipalities in further distance to the SEZ, suggesting that SEZs had a strong impact on local economic activity. Panel (b) of Figure 4 presents the results of a *placebo* test which tracks municipalities' employment trends (relative to the reference locations) prior to SEZ establishment between 1998 and 2005.[17] All estimated coefficients turn out to be close to zero and statistically insignificant which supports the common-trend assumption. The stark difference in employment trends only emerged after SEZ establishment.[18] Quantitatively, the point estimates in panel (a) suggest that employment in SEZ-hosting municipalities increased by 47pp ($= (e^{0.383} - 1) \times 100$) relative to the reference municipalities. Employment in municipalities in the <5km distance bin and the 5-10km distance bin increased by 21pp and 16pp indicating substantial positive spillovers to adjacent regions. For more distant municipalities, the estimates for β_d turn out to be small and statistically insignificant, suggesting that employment trends between municipalities in further distance to the SEZ did not differ systematically.

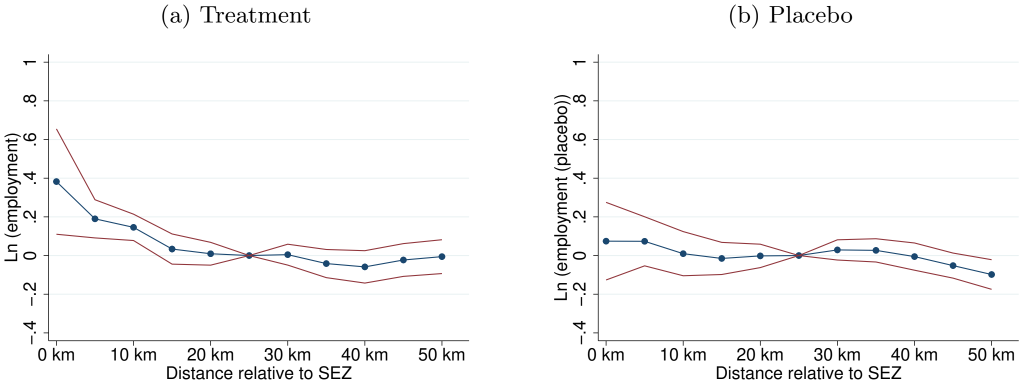
The magnitude of the estimated employment response is fairly large, but not implausible given the relatively small size of our sample jurisdictions. The average SEZ municipality in the sample hosts only 3,139 non-agricultural employees prior to treatment. Evaluated at the sample mean (of treated municipalities prior to treatment), our estimates suggest that manufacturing and service employment in SEZ-hosting municipalities increased on average by 1,475 workers in response to SEZ-establishment.[19]

[17] The placebo test reruns Eq. (1), but uses 2005 as the treatment year. Hence, for the placebo study γ_{2013} is replaced by γ_{2005}. Municipalities' treatment status corresponds to treatment, i.e. SEZ establishment in distance d, between 2005 and 2013.

[18] Figure A6 in Appendix B shows that our results are robust to using alternative distance bin classifications. Furthermore, alternative standard error clustering ("closest SEZ group" and Conley (1999)) do not change the results as depicted in Figure A8 in Appendix B.

[19] Re-estimating the base specification in a sample of large municipalities yields tiny coefficient estimates, in turn (Figure A3 in Appendix B).

Figure 4: SEZ effect on non-agricultural employment



Notes: The dots indicate the estimates for $\hat{\beta}_d$ as estimated according to Eq. (1). Each subscript d refers to a distance on the horizontal axis, e.g. the coefficient at 0km refers to $d = 0$. Panel (a) depicts results for the original specification. Panel (b) depicts results of the placebo specification (i.e. we interchange γ_{2013} with γ_{2005}). Red lines indicate 95% confidence intervals. Standard errors are clustered at the district level. Regressions include municipality and year fixed effects. Municipalities with more than 500,000 inhabitants are excluded. Employment data are drawn from the Economic Census for 1998, 2005 and 2013.

Figure 5, furthermore, shows that manufacturing and service employment increased in about equal proportion.[20] Table A6 in Appendix B documents that extensive margin responses - i.e. new business entries - significantly contribute to the observed employment response: After SEZ-establishment, the number of non-agricultural businesses increased by 35*pp* in SEZ-municipalities relative to the set of reference municipalities. The results are robust to altering assumptions on the correlation structure of the errors (see Figure A8) and on the definition of the size of bins that model SEZ-surrounding regions (see Figure A6).

4.2 Job relocation or genuinely new employment?

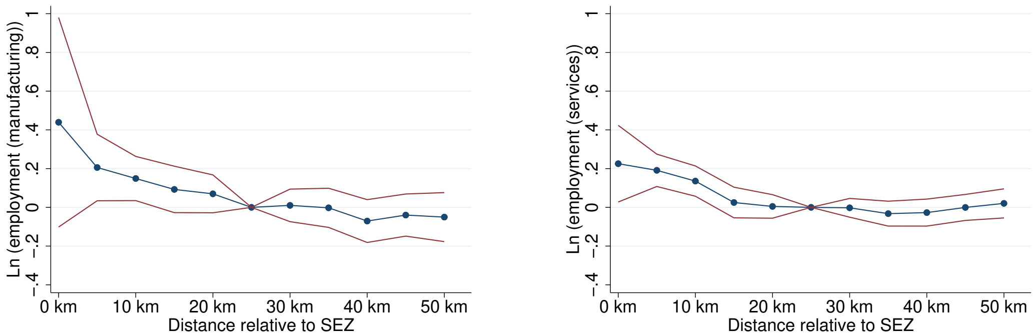
From a welfare perspective, it is important to understand if manufacturing and service jobs are simply relocated to SEZ areas or whether SEZ establishment creates genuinely new non-agricultural jobs. In the former case, the policy is a beggar-thy-neighbor instrument and does not add to aggregate economic development. If, in turn, genuinely new manufacturing and service jobs are created, the zones can contribute to structural change and to improving the population's living conditions.

To shed light on these questions, we first assess whether SEZs trigger job relocation in space (Kline and Moretti, 2014; Criscuolo et al., 2019; Ehrlich and Seidel, 2018). Prior evidence suggests that relocation - if present at all - is a local phenomenon and limited to small geographic areas (Neumark and Simpson, 2015). Our baseline estimates show a stark picture in the sense that employment growth differs strongly between SEZ-hosting

[20] Note that this reflects an average effect. For example, we will show below that manufacturing employment increased strongly in areas where multi-product SEZs were established, while showing no or even a negative response with the establishment of SEZs in other industries (see Section 4.6).

Figure 5: Manufacturing and service employment

(a) Employment in manufacturing (b) Employment in services



Notes: The dots indicate the estimates for $\hat{\beta}_d$'s as estimated according to Eq. (1). Each d refers to a distance on the horizontal axis e.g. the coefficient at 0km refers to $d = 0$. Panel (a) depicts results for manufacturing employment and panel (b) for employment in the service sector. Service employment refers to non-agricultural employment that is not part of the manufacturing sector. Red lines indicate 95% confidence intervals. The standard errors are clustered at the district level. Regressions include municipality and year fixed effects. Municipalities with more than 500,000 inhabitants are excluded. All panels are based on Economic Census for the years 2005-2013.

municipalities and their neighbors in distance circles up to 10km, while there is no significant difference between the employment growth of municipalities in further distance from the SEZ (10-50km). For this pattern to be consistent with relocation of economic activity, relocation costs must be invariant in space, i.e. additional employment must have been sourced from municipalities in distance radii of 10-50km at about equal rates, irrespective of their precise distance to the SEZ. This is at odds with existing empirical evidence, which shows a rather stable inverse relation between geographic distance and relocation costs (Bodemann and Axhausen, 2012; Rossi and Dej, 2020). Note that extending the distance radius to 200km from SEZs does not change this pattern (see Figure A7 in Appendix B).

As a further test, we explore whether the additional employment in SEZ municipalities and their direct neighboring jurisdictions in a distance band of up to 10km systematically correlates with employment changes in municipalities in further distance. If the strong relative employment increase in SEZ-hosting municipalities and their direct neighbors in less than 10km distance reflects employment relocation, we expect that larger employment increases in SEZ municipalities and surroundings are associated with stronger employment declines in jurisdictions in further distance (> 10km). We run a regression model of the following form:

$$ln(y_{i,t}) = \beta_0 + \beta_1 ln(y_{SEZ_{i,t}}) + \alpha_i + \gamma_t + \epsilon_{it}, \qquad (2)$$

where the variable definition corresponds to Eq. (1). The sample is restricted to municipalities in a distance of more than 10km to their closest SEZ. $y_{SEZ_{i,t}}$ depicts aggregate non-agricultural employment in SEZ-municipalities and its neighbors up to 10km that are within 50km distance of municipality i.

Table 2: SEZ employment gain and municipalities in further distance

	Distance to SEZ							
	10-15km	15-20km	20-25km	25-30km	30-35km	35-40km	40-45km	45-50km
Employment ($\leq$ 10km)	**-0.021**	**-0.031**	**-0.023**	**-0.027**	**-0.000**	**0.057**	**0.009**	**0.019**
	(0.047)	(0.039)	(0.048)	(0.029)	(0.046)	(0.038)	(0.043)	(0.046)
Firms ($\leq$ 10km)	**0.008**	**-0.039**	**-0.039**	**-0.030**	**-0.009**	**0.034**	**-0.015**	**-0.011**
	(0.055)	(0.039)	(0.038)	(0.030)	(0.044)	(0.036)	(0.042)	(0.041)
Observations	6,940	7,864	9,070	10,556	11,656	12,334	13,054	13,534
District fixed effects	✓	✓	✓	✓	✓	✓	✓	✓
Year fixed effects	✓	✓	✓	✓	✓	✓	✓	✓

Notes: Regression results from Eq. (2). The uper panel depicts the effects of employment within a 10km radius around a SEZ on employment in municipalities in further distance bins. The lower panel reruns this specification using the number of firms as dependent variable. Standard errors are clustered at the district level. Years included: 2005 and 2013. *** p<0.01, ** p<0.05, * p<0.1.

The estimates for β_1 are reported in the upper panel of Table 2. The columns reflect specifications for neighboring municipalities in different distance bins (specification (1) comprises municipalities in a distance between 10-15km from a SEZ; specification (2) municipalities in a distance between 15-20km etc.). Throughout all specifications the β_1-estimate turns out small and statistically insignificant, corroborating the notion that the observed baseline findings reflect a genuine increase in local non-agricultural economic activity rather than relocation of economic activity in space. Similar results emerge if we model $y_{i,t}$ as the log of municipal firm count (see lower panel of Table 2).[21]

In Appendix C, we show in a back-of-the-envelope calculation that, even if we take the negative (and statistically insignificant) coefficient estimates for some distance bins as depicted in Table 2 at face value, the estimates suggest that only around 1% of the observed employment gain in SEZs and neighboring jurisdictions up to 10km relates to relocation from municipalities in further distance. While similar to the existing literature (Ehrlich and Seidel, 2018; Criscuolo et al., 2019), the evidence presented in this subsection is only suggestive in nature, but it points to genuine increases in aggregate economic activity through SEZ establishment.

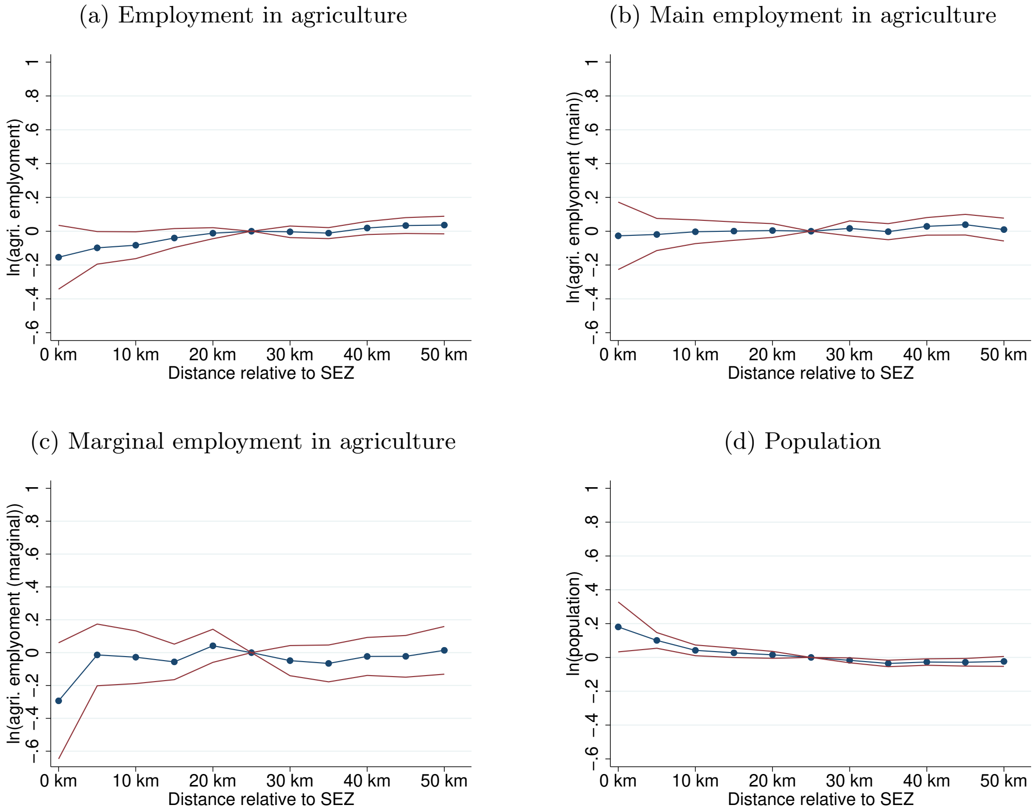
4.3 Structural change and migration

If genuinely new jobs were created, then a natural follow-up question is who took up these jobs? We explore two channels: structural change and regional migration.

India is characterized by a large agricultural sector that accommodates about half of the working population, mostly in low-productivity jobs and in marginal employment relationships (International Labour Organization, 2013). Managing the transition from

[21] Note that the number of municipalities per bin increases mechanically with distance to SEZ. Thus, the number of sourcing municipalities becomes larger relative to the number of potentially receiving municipalities (municipalities in <10km from an SEZ). Nevertheless, relocation would still imply that the estimated coefficients β_d decline in distance d.

Figure 6: Sources for local employment growth



Notes: The dots indicate the estimates for $\hat{\beta}_d$'s as estimated according to Eq. (1). Each d refers to a distance on the horizontal axis e.g. the coefficient at 0km refers to $d = 0$. Panel (a) depicts results for the agricultural employment. Panels (b) and (c) depict results for main- and marginal agricultural employment. Panel (d) depicts results for the total municipal population. Red lines indicate 95% confidence intervals. The standard errors are clustered at the district level. Regressions include municipality and year fixed effects. Municipalities with more than 500,000 inhabitants are excluded. All panels are based on the Population Census for the years 2001-2011.

an agricultural economy to economic structures that are dominated by manufacturing and service work is widely believed to be one of the country's top challenges (Binswanger-Mkhize, 2013), but at the same time a promising avenue for higher-paid jobs and economic growth (McMillan et al., 2011; Eichengreen and Gupta, 2011; Gollin et al., 2014).

We test whether SEZs contributed to this transition. Specifically, we ask whether the documented increase in local non-agricultural employment in SEZ-areas is paralleled by a decline in agricultural employment. Based on the population census, we assign agricultural employment to municipalities following the procedure outlined in Section 3 and then rerun our baseline model in Eq. (1) using the log of the number of agricultural workers as the dependent variable. Panel (a) of Figure 6 indicates that the number of workers in the primary sector declined in SEZ municipalities after SEZ establishment. Quantitatively, the drop amounts to 12.8*pp* and just fails to gain statistical significance at conventional significance levels (p-value of 0.11).

We can go one step further and split up the overall reduction of agricultural jobs into main and marginal employment. As shown in panels (b) and (c) of Figure 6, SEZs have in particular led to a reduction in marginal agricultural employment - i.e. workers that are employed for less than 183 days per year. Quantitatively, their number declined by 25*pp* in SEZ-municipalities (p-value of 0.103) relative to municipalities in the reference category, whereas the point estimates for the response of the number of main agricultural workers is close to zero. Although we cannot follow individual workers across space and jobs, our results provide novel evidence that the SEZ-policy has caused a transition from agricultural to manufacturing and service employment.

Turning to the second channel, workers may be sourced from outside the SEZ-municipality. While we have shown above that there is little evidence for net job relocation over a distance of 50km, it is possible that SEZ-municipalities experienced higher population growth due to more and better paying jobs. The pronounced population growth in India provided an ideal environment for such an effect. In our sample, the population increased from 209M to 243M between 2001 and 2011. Panel (d) of Figure 6 shows that population growth in SEZ areas was systematically higher than in control jurisdictions and there is indication of SEZ-induced population gains in neighboring areas.[22]

A third potential channel that we cannot exploit due to data limitations would be commuting from neighboring locations to SEZ areas. Commuting is rather uncommon in India as public transport networks are not well developed and services tend to be infrequent. Census data for 2011 suggests that only around 18% of the Indian workforce travels more than 10km to work.[23] We therefore regard structural change and regional migration as the more important explanations.

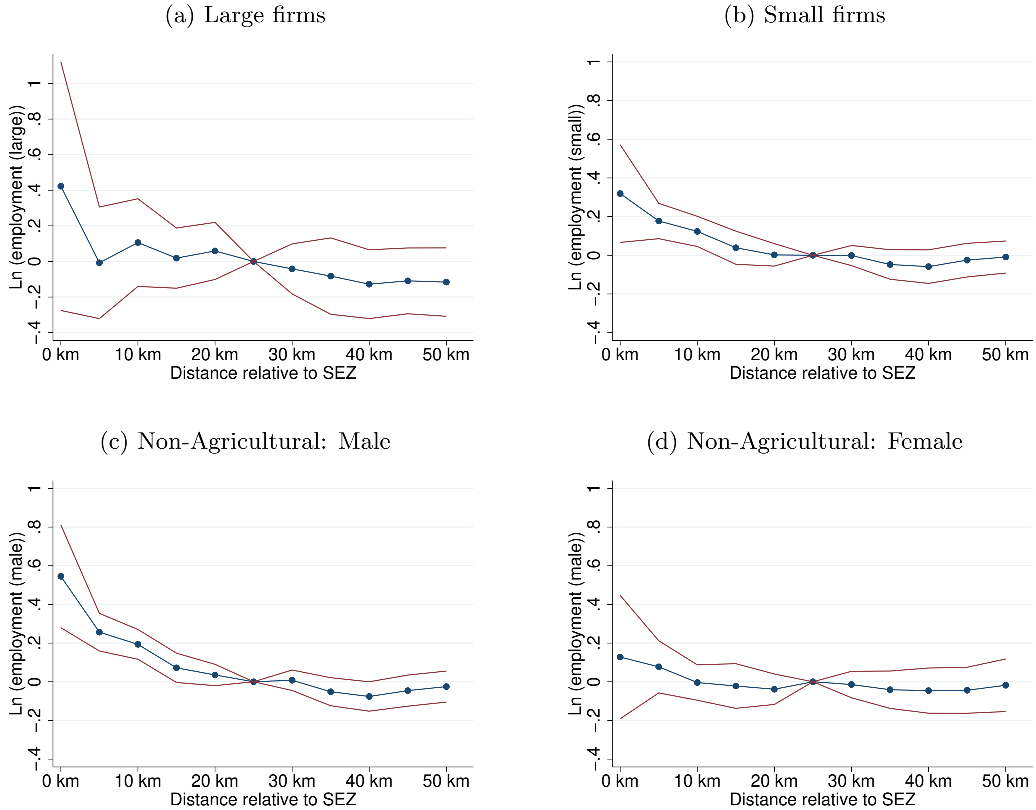
4.4 Employment effects by firm size

Our data also allow us to examine whether it is large or small firms that create the new employment. While some elements of the SEZ policy mainly target large firms, others - e.g. the corporate tax holidays provided - are equally attractive for smaller entities. The latter firms may also find it attractive to co-locate in or close to SEZs if they are connected to other (exporting) firms through input-output-links. Understanding whether it is small or large entities that create the new employment is important for a number of reasons: First, prior evidence shows that firm size strongly correlates with worker productivity and workers' wages (Idson and Oi, 1999; Oi and Idson, 1999) - this said, note that productivity in the manufacturing and service sector tend to be higher than in agriculture, even in smaller entities, especially if the comparison is with marginal agricultural work. Second,

[22] In principle, the difference in population trends might also reflect differences in fertility rates (e.g. triggered by higher income opportunities in SEZ areas). Given the rather short sample frame, we consider this explanation to be of second-order importance. Also note that our main results remain largely unchanged when we include municipal population as a control variable (see Figure A9 in Appendix B for details), dampening the quantitative importance of migration responses in explaining the additional job take-up.

[23] Own calculation based on the Population Census 2011.

Figure 7: SEZ effect on employment by firm size and gender



Notes: The dots indicate the estimates for $\hat{\beta}_d$'s as estimated according to Eq. (1). Each d refers to a distance on the horizontal axis e.g. the coefficient at 0km refers to $d = 0$. Panels (a)-(b) depict the effect of SEZ establishment on employment in large and small firms respectively. Panel (c)-(d) depict the effect on non-agricultural employment by gender. Red lines indicate 95% confidence intervals. The standard errors are clustered at the district level. Regressions include municipality and year fixed effects. Municipalities with more than 500,000 inhabitants are excluded. All panels are based on the Economic Census for the years 2005-2013.

small firms are more likely to be informal. In India, firms with less than 10 workers are, by official statistics, tabbed as 'informal' (Mehrotra, 2019; NCEUS, 2009). Informality can offer benefits to firms, but likely lowers job-related amenities for workers. There are, finally, also fiscal implications. The tax and tariff cuts of SEZs imply direct revenue losses for governments, that may partly be compensated by revenue collections from SEZ-induced new activity, but the latter revenue gains are arguably smaller if the employment is created by small firms, which are exempt from certain insurance and social security tax payments and, in general, show weaker tax compliance behavior than larger entities (LaPorta and Shleifer, 2014; McCaig and Pavcnik, 2021).

Panels (a) and (b) of Figure 7 report employment responses separately for small (less than 10 workers) and large firms (more than 10 workers). The point estimates indicate that employment gains are driven by both large and small businesses. Quantitatively, large firms increased their employment by 53*pp*, small firms by 38*pp* after SEZs became operational. Note that the estimate for larger firms is not significantly different from zero at conventional significance levels though - potentially reflecting that the number of large firms per municipality tends to be rather small (see Table 1). Taking the point estimate at face value, back-of-the-envelope estimates suggest that, within SEZ municipalities, approximately two thirds of the employment gain relate to employment expansion by large firms and one third to employment in small firms. This relation reverses when we determine the aggregate effects within 10km radii around SEZs.[24] While our findings thus suggest that a significant fraction of the observed employment increase in SEZ areas relates to small manufacturing and service entities, these jobs are arguably still often an improvement compared to (subsistence) farming, especially if it is marginal agricultural work.

4.5 Broader social consequences: Effects on female employment and public good provision

Proponents of SEZ policies have also formulated that SEZs serve broader social goals. One main presumption is that additional SEZ-employment is sourced from the unused female workforce and that women are the main beneficiaries of SEZ policies (e.g. Bacchetta et al., 2009; Rama, 2003; Brussevich and Dabla-Norris, 2020).[25] This is an important policy feature as female workers are a particularly vulnerable group in the Indian labor market - unemployment rates among women tend to be high and discrimination is a long-standing phenomenon (Klasen and Pieters, 2015; Srivastava and Srivastava, 2015).

In panels (c) and (d) of Figure 7, we present estimates for the impact of SEZs on male and female employment outside the agricultural sector. The evidence clearly conveys that employment gains are largely centered around men. Male non-agricultural employment in SEZ-hosting jurisdictions increased by $72pp$ relative to the reference location; in neighboring jurisdictions up to a distance of 5km and between 5-10km by $29pp$ and $21pp$, respectively. For female employment, SEZ effects, in turn, tend to be small and do not statistically differ from zero. This may reflect that many of the SEZs specialized in industries that are dominated by male and/or high-skilled workers (57% of SEZs are IT zones, for

[24] The fraction of the employment gain created by large firms in SEZ-hosting municipalities can be calculated by evaluating the estimated effects at the pre-treatment average employment (either small- or large firm) in SEZ-hosting municipalities and the number of municipalities. To retrieve the share of employment gain by large firms in SEZ municipalities, one can calculate $(0.53 \times 1,793)/(0.53 \times 1,793 + 0.38 \times 1,346) = 0.65$, where $1,793$ and $1,346$ are the number of workers employed by large and small firms, respectively, in SEZ municipalities prior to treatments. Applying this procedure to distance rings 0-5km and 5-10km respectively yields that in the 10km radii, 40% of the employment gain is realized in large firms. See also Table A4. Appendix B, furthermore, shows that, at the extensive margin, it is in particular small firms that enter the market, especially in areas outside SEZs; moreover, note that pre-reform trends in the employment of large-firm and small-firm in SEZ municipalities is comparable to that of surrounding neighboring jurisdictions in the same 50km-circle.

[25] Such hopes were spurred by the feminization of labor in export oriented industries in many less developed counties (Ozler, 2000; Bussmann, 2009).

which both applies).[26] Higher labor demand in these industries may therefore create only few employment opportunities for women, in particular if they are low-skilled agricultural workers (Dhanaraj and Mahambare, 2019).

SEZs may, moreover, also benefit communities in a broader sense if SEZ developers invested in public goods, e.g. streets or electricity infrastructure, that can be co-used by local residents or if they submitted local revenues and donations that allowed communities to improve local infrastructure. The population census data allow us to shed some light on local public good provision: we observe the number of schools in municipality i at time t and whether municipality i at time t had access to any kind of electricity or to a paved road, respectively. Re-estimating Eq. 1 with these different dependent variables does not point to any SEZ-induced improvements in electricity and road access. The number of schools slightly increased in treated municipalities after SEZ establishment (relative to municipalities in further distance). This positive effect vanishes, however, when we normalize the number of schools on population size (see Figure 8).[27]

4.6 Heterogeneity in zone characteristics

One striking feature of the small existing literature on evidence on the spatial effects of SEZs is that studies largely assume SEZs to be homogeneous entities (e.g. Wang, 2013; Lu et al., 2019). That is at odds with real-world settings (World Bank, 2008). Zones in India differ in two key dimensions: First, there is heterogeneity in zones' main industry denomination. There are IT, pharma, engineering, apparel or manufacturing zones (the latter are tabbed 'multiproduct zones'). Zones further differ in whether they are developed and run by a private or a public body. In this section, we assess how these characteristics shape the impact of SEZs on local economic activity.

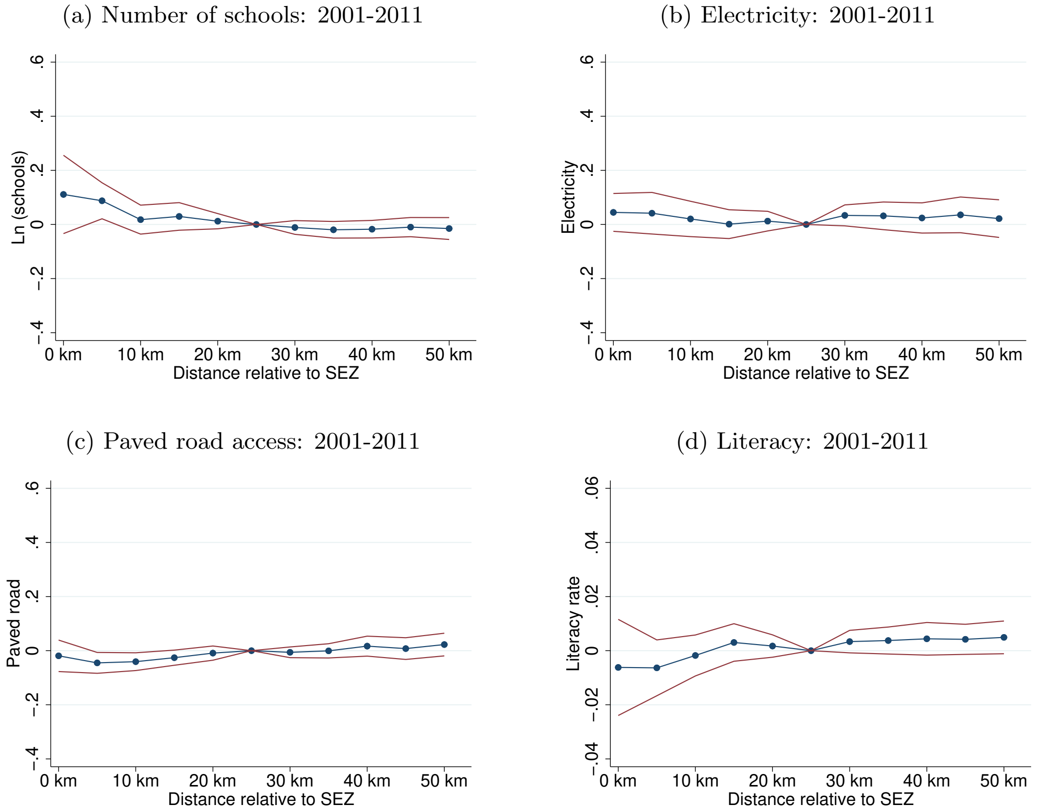
Public vs. private SEZs. As depicted in panel (a) of Figure 9, more than two thirds of the zones that went into operation during our sample period were developed and run by a private developer. While privately developed zones do not systematically differ from their publicly developed counterparts in terms of area size (see panel (b)), they tend to be located in larger and more prosperous areas (as determined by host municipalities' employment and nightlight intensity, see panels (c) and (d)).[28] This is consistent with public developers putting a stronger emphasis on creating new employment

[26] On average there are 1.2 female workers in IT per municipality, which is around 20% of total IT employment and 1.7% of total female employment. For manufacturing employment female workers account for 30% of total manufacturing employment and 49% of total female employment. Further, as depicted in Figure A10 there is no indication for distance-specific differences in female employment prior to the establishment of SEZ.

[27] Public good provision may, theoretically, improve literacy rates - either through improved public schooling or through selection of better educated workers towards SEZ areas. Empirically, we find no indication of improvements along these lines (see Figure 8d), which is consistent with the observed null effect on infrastructure provision.

[28] Consistent GDP data are, unfortunately, not available at the level of Indian municipalities. Henderson et al. (2012) show that nightlights are a reasonable proxy of economic development and income growth at subnational levels.

Figure 8: SEZ effect on local infrastructure



Notes: The dots indicate the estimates for $\hat{\beta}_d$ as estimated according to Eq. (1). Each d refers to a distance on the horizontal axis e.g. the coefficient at 0km refers to $d = 0$. Panel (a) depicts results for the number of schools. Panel (b) depicts results for electricity access. Panel (c) depicts results for paved road access. Panel (d) depicts the results for the literacy rate. Red lines indicate 95% confidence intervals. The standard errors are clustered at the district level. Regressions include municipality and year fixed effects. Municipalities with more than 500,000 inhabitants are excluded. All panels are based on Population Census for the years 2001-2011. Hence, only municipalities that are within 50km of SEZs that became operational until 2011 are included.

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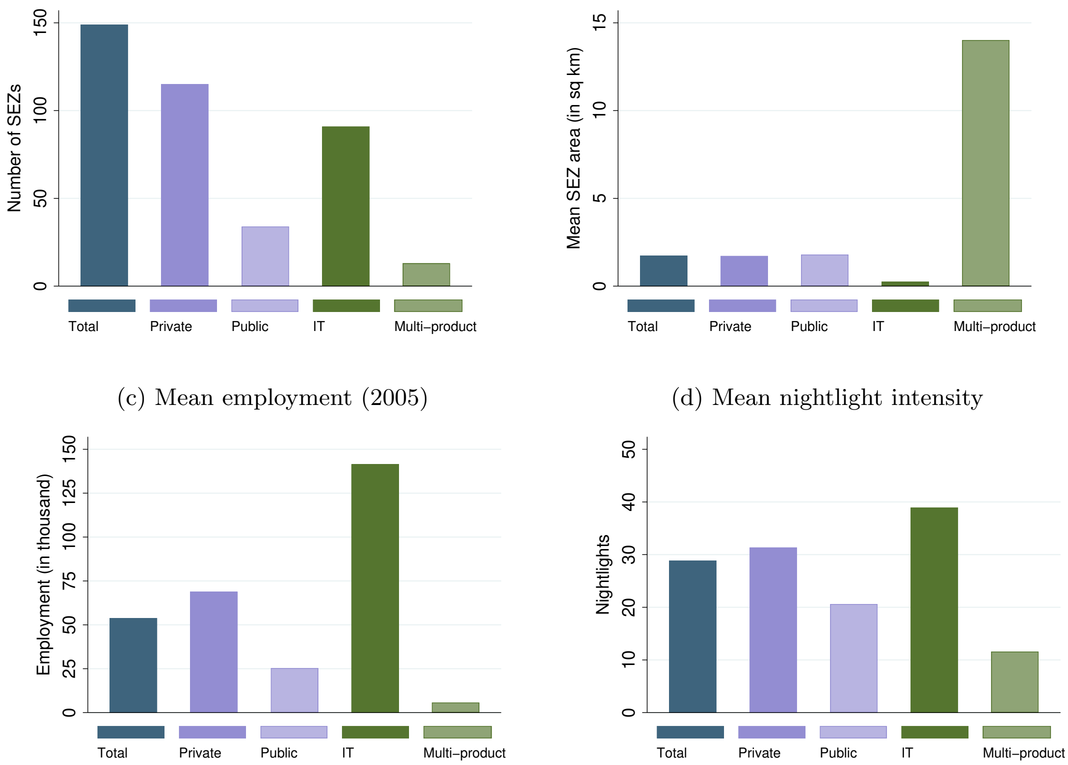
in less prosperous regions compared to private developers, who primarily seek to maximize profits (see also Appendix A for further discussion).

There are also reasons to believe that the local employment impact of public and private SEZs may differ. On the one hand, public bodies have less incentives to run projects efficiently (see e.g. Megginson and Netter, 2001) and the optimal size of publicly developed zones may therefore, ceteris paribus, be smaller than the optimal size of private zones. On the other hand, public zones may exert stronger local employment effects as public developers plausibly pursue employment goals when designing SEZs, while private developers first and foremost aim for profit maximization. To test for effect heterogeneity

Figure 9: SEZ (municipalities) characteristics



(a) Number of SEZs

(b) Mean SEZ area

(c) Mean employment (2005)

(d) Mean nightlight intensity

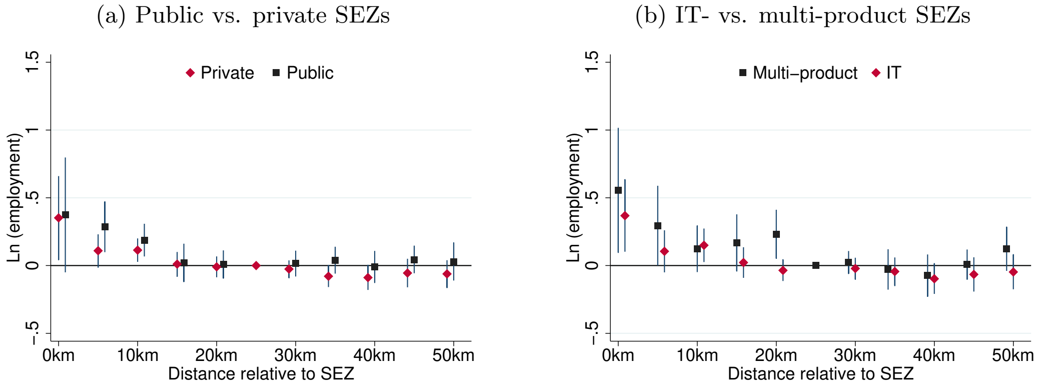
Notes: Graphical illustration of SEZs and hosting municipalities by industry type. Authors' own calculations based on SEZ information from the Ministry of Industry and Commerce, the Economic Census and DMSP-OLS Nighttime Lights Time Series provided by the National Oceanic and Atmosphere Administration (NOAA).

along these lines, we estimate a model of the following form:

$$ln(y_{it}) = c + \sum_{d=0,d\neq 5}^{10} \beta_d D_{[d_i=d]} \times \gamma_{2013} + \sum_{d=0,d\neq 5}^{10} \theta_d D_{[d_i=d]} \times \gamma_{2013} \times priv.developer_i$$
$$+ \gamma_{2013} \times priv.developer_i + \gamma_{2013} + \alpha_i + \epsilon_{it}, \quad (3)$$

where the variable definitions correspond to Eq. (1) and $priv.developer_i$ is a dummy variable indicating that the closest SEZ to municipality i is developed by a private developer. One challenge when estimating Eq. (3) is that SEZs do not only differ in their status of being developed by a private or public body, but also in their industry denomination. If the industry denomination correlates systematically with private and public development status and with SEZs' local employment impact, estimates of θ_d may be confounded. Descriptive statistics indeed suggest that the fraction of IT zones is, for example, larger among private than among public SEZs (see Table A2 in the appendix). We draw on *(coarsened) exact matching* (CEM) to address this concern (Iacus et al., 2012; Blackwell et al., 2009). In the base analysis, we match observations according to the industry class of the closest SEZ located in distance d_i from municipality i to balance differences in industry

Figure 10: Employment effects by zone type (CEM)



Notes: The plotted coefficients are estimated according to Eq. (3) (panel (a)) and Eq. (5) (panel(b)). In panel (a) (panel (b)) black squares depict the effects of public (Multi-product) SEZs on employment in the respective distance bins ($\hat{\beta}_d$). Red diamonds show the effects for private (IT) SEZs ($\hat{\beta}_d + \hat{\theta}_d$). Each d refers to a distance on the horizontal axis, e.g. the coefficient at 0km refers to $d = 0$. Black lines indicate 95%-confidence intervals. Standard errors are clustered at the district level. Regressions include municipality and year fixed effects. Observations are re-weighted using coarsened exact matching over designated industry (ownership-type) and with *private* (IT) as the treatment category. Municipalities with more than 500,000 inhabitants are excluded. For the purpose of giving a comprehensive picture of the full set of SEZ location choices the IT-sample includes all municipalities. Employment data based on Economic Census for the years 2005-2013.

denomination across SEZs developed and run by private and public entities.

Panel (a) of Figure 10 plots the effects of SEZs on local employment conditional on industry denomination and separately for public and private SEZs (β_d and $\beta_d + \theta_d$ in Eq. (3)). It is evident that the effects do not differ systematically between publicly and privately developed SEZs. In Appendix B, we report additional results where we reestimate Eq. (3), first, without matching and, second, conditional on SEZ's industry denomination *and* SEZ size (precisely the area size of the SEZ relative to the area of the municipality itself).[29] In all of these specifications, we find that SEZs developed by private and public developers exert similar local employment effects, hence reinforcing our baseline findings.

Sector-specific effects. The impact of SEZs on local economic activity may also hinge on SEZs' industry denomination. Industry denomination might determine zone location: Our data suggests that IT-zones tend to be hosted by systematically larger jurisdictions than multi-product zones (see Figure 9). This is intuitive since IT-firms demand high-skilled labor, which can be found predominantly in big cities.[30] Furthermore, the minimum area size requirement for IT-zones is substantially smaller than for other zone types, facilitating the establishment of IT-SEZs in areas where land is costly. Multi-product SEZs are, in turn, observed to be located in smaller municipalities at the coast,

[29] The size variable is coarsened based on the default autocut algorithm as described in Blackwell et al. (2009).

[30] For the purpose of giving comprehensive picture of the full set of location choices of SEZs, we include municipalities of more than 500,000 inhabitants when studying heterogeneous effects across industries since a significant share of IT-SEZs is located in large cities. However, there are no substantially different effects when excluding the biggest cities as in the baseline

reflecting their need for proximity to physical infrastructure such as ports for exporting manufactured goods.[31]

Analogously to the prior subsection, we assess whether the employment impact of SEZs systematically differs with the SEZ's industry denomination. Naturally, the size and structure of local employment effects may differ across SEZs with different industry denomination. In the base analysis, we distinguish between highly prevalent IT zones and multi-product zones. In additional analyses presented in the Appendix, we also depict results for other industry types (for details, see Figure A5 in the appendix). We again apply CEM to control for other zone characteristics that may shape the local employment impact. In the models presented in panel (b) of Figure 10, we account for development by a public and private developer (in Table A7 in Appendix B additionally for zone size). The results suggest that the impact on total non-agricultural employment is broadly comparable across IT and multi-product zones. The structure of the employment effect differs across SEZs, however. Multi-product zones, for example, induce pronounced increases in local manufacturing employment, a moderate rise in service work and a stark drop in (marginal) agricultural employment. The latter response is consistent with the low-skilled nature of work in the manufacturing sector, which can be accessed by low-skilled workers from the agricultural sector. Effects look different for IT zones: After their establishment, local service employment rises, but we find no effect on agricultural work, which is consistent with the high-skilled nature of IT-related employment that cannot readily be accessed by non-trained agricultural workers (see Table A9 and A10 in Appendix B).[32]

5 Conclusion

In recent decades, many developing countries established SEZs to foster local economic development. Their economic consequences have to date remained largely unexplored, however. This paper contributes to filling this gap. We study the economic effects of 147 SEZs established in India between 2005 and 2013 under the SEZ Act. The analysis relies on newly compiled data set merging rich administrative census information on local economic activity with hand-collected data on SEZ location and characteristics to show that the SEZ policy has stimulated quantitatively important employment growth in SEZ-hosting municipalities in the non-agricultural sectors. These positive effects are directly associated with a decline in agricultural employment, especially a decline in the number of marginally employed workers. The findings thus suggest that SEZs foster structural change and therefore contribute in an important way to economic development.

We establish various further novel insights into the workings of SEZ-policies in India: Our findings suggest that the SEZ-induced employment growth, to a significant extent,

[31] Figure A2 in Appendix A plots the location of SEZs in India by their designated industry. Table A3 depicts the descriptive statistics within the respective industry designation.

[32] The results point to some substitution effect with the manufacturing sector though: After the establishment of IT zones, manufacturing employment strongly drops in SEZ localities (see Table A10)

accrues in small firms with a low level of formality. We also shed light on some of the social consequences of SEZ establishment. Differentiating employment effects by gender reveals that employment gains are largely centered around men. Women who are regarded as a vulnerable group in the Indian labor market do not, to a significant extent, take up jobs in SEZ-industries. There is also no indication that SEZs improve local public good provision. Finally, we show that total effects of SEZ establishment on non-agricultural employment are strikingly homogeneous across different types of SEZs - while the structure of the employment response can differ.

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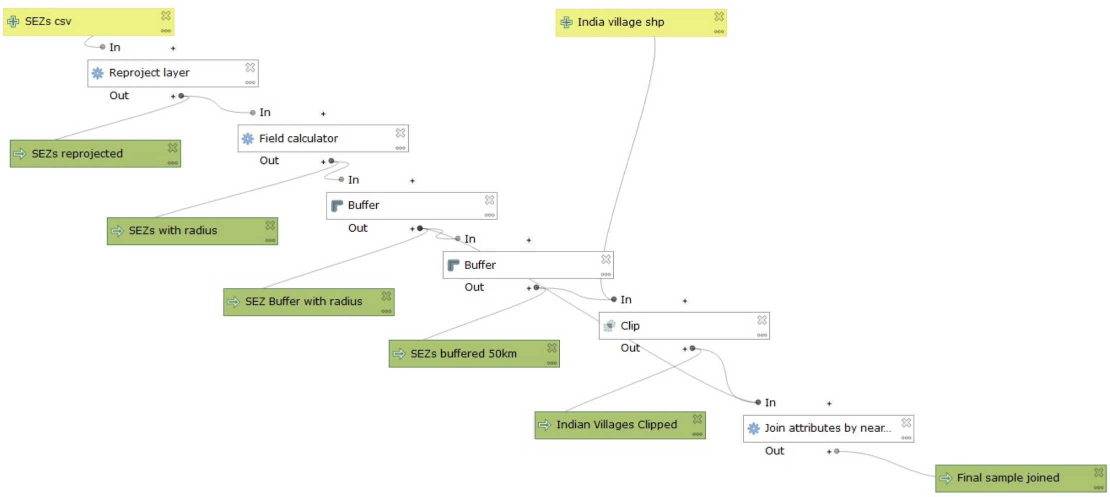
Appendix

A Data and methodology

This section complements Section 3 in the main paper. Figure A1 illustrates each individual step implemented in QGIS 3.10. to arrive at the municipality sample. Table A1 contains descriptive statistics of all SEZs in the sample. The maps in Figure A2 show the geographic distribution of different types of SEZs (IT, multi-product and public/private, respectively) across India. Table A2 tabulates SEZ characteristics differentiating by SEZ developer.

Figure A1: Automated workflow in QGIS 3.10 to obtain final municipality sample



Notes: Figure A1 illustrates each individual step implemented in QGIS to obtain our final estimation sample. The two inputs required are (1) the point coordinates of each SEZ that became operational between 2005-2013 and (2) the municipality shape file provided by Meiyappan et al. (2018). After projecting the input files into the same CRS, we use information on the total area approved to calculate the potential radius of each SEZ assuming it is shaped as a circle. Afterwards, we create a 50km buffer around the SEZ circles, clip all municipalities that fall within this radius and spatially merge all SEZs that are within 50km distance of each municipality.

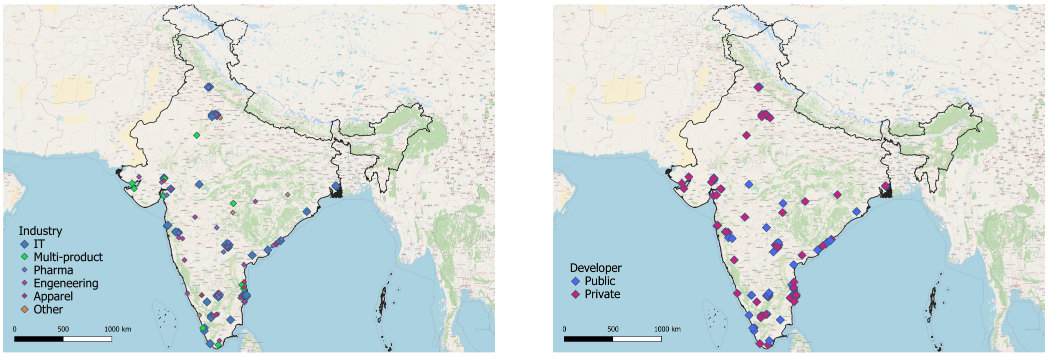
Table A1: Descriptive Statistics SEZ-level data

	Mean	*SD*	*Median*	*N*
- Year of notification	2007	1.17	2007	147
- Year of operation	2010	2.07	2010	147
- Developing time (in years)	2.67	1.76	3	147
- Area sq. km	1.76	7.40	0.27	147
- Private SEZ	0.77	0.42	1	147
- Public SEZ	0.23	0.42	1	147
- IT SEZ	0.57	0.50	1	147
- Multiproduct SEZ	0.09	0.29	1	147
- Pharma SEZ	0.09	0.29	0	147
- Engineering SEZ	0.12	0.32	0	147
- Apparel SEZ	0.05	0.23	0	147

Notes: Authors' own calculations based on sources described in the main text. Private implies that the SEZ was established by a private body. Year of operation denotes the year in which the SEZ initialized its operation.

Figure A2: Geographical Distribution of SEZ by industry and developer

(a) SEZs by industry (b) SEZs by developer



Notes: Panel (a) plots the location of all SEZs in India that were established under the SEZ Act 2005 and became operational until 2013 by their industry designation. Panel (b) plots the location of all SEZs in India that were established under the SEZ Act 2005 and became operational until 2013 by their type of developer. Any maps included herein are without prejudice to the status or sovereignty over any territory, the delimitation of international frontiers and boundaries.

Notes on location choice between public and private SEZs. The majority of public SEZs is developed by state-owned development corporations. Zooming in on their location choice it appears that within their state territory, SEZs are still located in upward regions. However, given the differences in general economic development between Indian states, these regions appear backward *relative* to regions, which attracted private developers. Therefore, the differences between public- and SEZ hosting municipalities observed in Figure 9 are not due to the central government targeting place-based policies at economically distressed areas in absolute terms but rather the absence of private SEZs in economically backward states. For example, the Madya Pradesh Industrial Development cooperation developed the only SEZ in the state and placed in their largest city Indore. The corresponding authority in the state of Odisha developed their only SEZ in Bubaneshwar, Odisha's capital city. While these cities constitute the economic hubs of their respective states, they are not comparable to cities like Delhi or Mumbai, in which surroundings many private SEZs were established.

Table A2: Descriptive Statistics SEZ-level data (private and public)

	Mean	*SD*	*Median*	*N*
Private SEZs				
- Year of notification	2007	1.098	2007	113
- Year of operation	2010	2.062	2010	113
- Developing time (in years)	2.504	1.696	2	113
- Area sq. km	1.752	8.204	0.200	113
- IT SEZ	0.646	0.480	1	113
- Multi-product SEZ	0.0708	0.258	0	113
- Pharma SEZ	0.0796	0.272	0	113
- Engineering SEZ	0.0796	0.272	0	113
Public SEZs				
- Year of notification	2007	1.354	2007	34
- Year of operation	2011	1.818	2011	34
- Developing time (in years)	3.235	1.860	3	34
- Area sq. km	1.800	3.686	0.552	34
- IT SEZ	0.324	0.475	0	34
- Multi-product SEZ	0.147	0.359	0	34
- Pharma SEZ	0.118	0.327	0	34
- Engineering SEZ	0.235	0.431	0	34

Notes: Authors' own calculations based on sources described in the main text. Private implies that the SEZ was established by a private body. Year of operation denotes the year in which the SEZ initialized its operation. Developing time denotes the time between notification and date the zone became operational.

Table A3: Descriptive Statistics SEZ-level data (Industry)

	Mean	*SD*	*Median*	*N*
IT SEZs				
- Year of notification	2007	0.920	2007	84
- Year of operation	2010	2.068	2010	84
- Developing time (in years)	2.655	1.807	3	84
- Area sq. km	0.245	0.297	0.146	84
- Private SEZ	0.869	0.339	1	84
Multi-product SEZs				
- Year of notification	2007	1.463	2007	13
- Year of operation	2010	1.826	2009	13
- Developing time (in years)	2.846	1.772	2	13
- Area sq. km	14.02	21.86	10.20	13
- Private SEZ	0.615	0.506	1	13
Pharma SEZs				
- Year of notification	2007	0.862	2007	13
- Year of operation	2010	2.267	2010	13
- Developing time (in years)	2.923	1.801	3	13
- Area sq. km	0.945	0.667	1.012	13
- Private SEZ	0.692	0.480	1	13
Engineering SEZs				
- Year of notification	2008	1.536	2008	17
- Year of operation	2010	1.661	2011	17
- Developing time (in years)	2.294	1.490	2	17
- Area sq. km	0.988	0.929	0.981	17
- Private SEZ	0.529	0.514	1	17
Apparel SEZs				
- Year of notification	2007	0.991	2007	8
- Year of operation	2009	2.669	2010	8
- Developing time (in years)	2.250	2.121	2	8
- Area sq. km	1.552	1.224	1.191	8
- Private SEZ	0.750	0.463	1	8

Notes: Authors' own calculations based on sources described in the main text. Descriptive statistics are calculated separately for each designated industry. Private implies that the SEZ was established by a private body. Year of operation denotes the year in which the SEZ initialized its operation. Developing time denotes the time between notification and date the zone became operational.

B Additional results

This part complements Section 4 by reporting the results of several extensions, placebo- and robustness tests.

Main Results. In the following we tabulate the point estimates which are plotted in the figures in Section 4.1. Table A4 reports the estimates for the different types of employment (figures 4 and 7). Table A5 reports the estimates for figures 6 and 5.

Table A4: SEZ effect on employment

Distance bins	(1) *Total*	(2) *Placebo*	(3) *Male*	(4) *Female*	(5) *Large*	(6) *Small*
0km	**0.383*** **	**0.074**	**0.545*** **	**0.128**	**0.423**	**0.319** **
	(0.138)	(0.102)	(0.135)	(0.161)	(0.353)	(0.128)
0-5km	**0.190*** **	**0.074**	**0.256 *** **	**0.077**	**-0.008**	**0.177*** **
	(0.050)	(0.064)	(0.049)	(0.068)	(0.159)	(0.046)
5-10km	**0.146*** **	**0.010**	**0.193*** **	**-0.004**	**0.106**	**0.124*** **
	(0.035)	(0.058)	(0.039)	(0.046)	(0.125)	(0.039)
10-15km	**0.034**	**-0.015**	**0.072* **	**-0.022**	**0.019**	**0.039**
	(0.040)	(0.042)	(0.038)	(0.059)	(0.086)	(0.043)
15-20km	**0.009**	**-0.002**	**0.035**	**-0.039**	**0.059**	**0.002**
	(0.030)	(0.031)	(0.028)	(0.040)	(0.081)	(0.029)
20-25km	-	-	-	-	-	-
25-30km	**0.005**	**0.029**	**0.008**	**-0.014**	**-0.042**	**-0.001**
	(0.027)	(0.026)	(0.027)	(0.035)	(0.071)	(0.026)
30-35km	**-0.041**	**0.027**	**-0.052**	**-0.041**	**-0.082**	**-0.048**
	(0.037)	(0.030)	(0.037)	(0.049)	(0.109)	(0.039)
35-40km	**-0.059**	**-0.005**	**-0.076** **	**-0.046**	**-0.128**	**-0.059**
	(0.042)	(0.036)	(0.038)	(0.059)	(0.098)	(0.044)
40-45km	**-0.023**	**-0.052**	**-0.046**	**-0.044**	**-0.109**	**-0.025**
	(0.043)	(0.033)	(0.041)	(0.060)	(0.094)	(0.044)
45-50km	**-0.006**	**-0.098** **	**-0.025**	**-0.018**	**-0.116**	**-0.009**
	(0.044)	(0.039)	(0.041)	(0.069)	(0.097)	(0.042)
Observations	93,026	84,772	92,282	78,322	16,726	92,922
R-squared	0.888	0.891	0.889	0.843	0.817	0.893
Municipality fixed effects	✓	✓	✓	✓	✓	✓
Year fixed effects	✓	✓	✓	✓	✓	✓

Notes: Regression results from Eq. (1) with different types of employment as the dependent variable. Column (1) reports the estimated effects on total employment (cf. Figure 4). Column (2) reports the placebo results. Columns (3)-(6) report employment results for males, females, large and small firms, respectively. Municipalities with more than 500,000 inhabitants are excluded. Employment data are drawn from the Economic Census for 1998, 2005 and 2013. Standard errors are clustered at the district level. *** p<0.01, ** p<0.05, * p<0.1.

Table A5: SEZ employment channels

Distance bins	(1) *Agr. Emp.*	(2) *Main Agr.*	(3) *Marginal Agr.*	(4) *Population*	(5) *Manuf.*	(6) *Services*
0km	**-0.154**	**-0.027**	**-0.293**	**0.240*****	**0.443**	**0.297****
	(0.095)	(0.101)	(0.179)	(0.087)	(0.274)	(0.131)
0-5km	**-0.098****	**-0.019**	**-0.014**	**0.138*****	**0.194****	**0.241*****
	(0.049)	(0.048)	(0.095)	(0.031)	(0.086)	(0.074)
5-10km	**-0.083****	**-0.003**	**-0.028**	**0.053*****	**0.151*****	**0.108***
	(0.040)	(0.035)	(0.081)	(0.018)	(0.058)	(0.060)
10-15km	**-0.040**	**0.001**	**-0.056**	**0.043****	**0.094**	**-0.000**
	(0.028)	(0.027)	(0.055)	(0.018)	(0.060)	(0.041)
15-20km	**-0.012**	**0.004**	**0.042**	**0.021***	**0.072**	**0.006**
	(0.017)	(0.021)	(0.051)	(0.012)	(0.049)	(0.036)
20-25km	-	-	-	-	-	-
25-30km	**-0.003**	**0.017**	**-0.049**	**-0.019****	**0.008**	**-0.028**
	(0.017)	(0.022)	(0.046)	(0.009)	(0.041)	(0.038)
30-35km	**-0.011**	**-0.003**	**-0.066**	**-0.043*****	**-0.003**	**-0.040**
	(0.016)	(0.024)	(0.057)	(0.011)	(0.051)	(0.041)
35-40km	**0.019**	**0.029**	**-0.023**	**-0.036*****	**-0.069**	**-0.079**
	(0.020)	(0.026)	(0.058)	(0.013)	(0.056)	(0.049)
40-45km	**0.034**	**0.039**	**-0.022**	**-0.041****	**-0.039**	**-0.020**
	(0.024)	(0.031)	(0.064)	(0.016)	(0.054)	(0.047)
45-50km	**0.036**	**0.010**	**0.014**	**-0.048****	**-0.049**	**-0.023**
	(0.026)	(0.034)	(0.073)	(0.022)	(0.063)	(0.052)
Observations	126,993	83,848	72,016	127,485	65,830	72,518
R-squared	0.921	0.901	0.704	0.973	0.838	0.850
Municipality fixed effects	✓	✓	✓	✓	✓	✓
Year fixed effects	✓	✓	✓	✓	✓	✓

Notes: Regression results from Eq. (1) with different types of employment as the dependent variable. Columns (1)-(4) report the estimated effects on agricultural employment (differentiated by main and marginal) and population (cf. Figure 6). Columns (5) and (6) report the results for manufacturing and services employment (cf. Figure 5). Municipalities with more than 500,000 inhabitants are excluded. Columns (1)-(4) draw on the Population Census for 2001-2011. Columns (5) and (6) draw on the Economic Census for 2005-2013. Standard errors are clustered at the district level. *** p<0.01, ** p<0.05, * p<0.1.

Firm entry. We rerun Eq. (1) using the log of the number of firms as the dependent variable. Table A6 reports the estimated effects of SEZs on firm count - total , differentiated by gender of the owner as well as firm size. Firm numbers increased significantly in SEZ-hosting municipalities and neighboring jurisdictions in close distance to SEZs, as can be seen from column (1). Extensive margin responses hence significantly contribute to the observed shift in economic activity. Taken at face value, the employment response is stronger than the response in firm numbers (47*pp* vs. 35*pp*). There are two potential explanations: First, the extensive margin may - while being an important contributing factor - not fully explain the observed employment increase; some existing firms may also raise their employment at the intensive margin. Second, the firms that are newly founded in and close to SEZs in response to SEZ establishment may have a larger average size than existing firms prior to SEZ establishment.

Table A6: SEZ effect on firm count

Distance bins	(1) *Total*	(2) *Placebo*	(3) *Male*	(4) *Female*	(5) *Large*	(6) *Small*
0km	**0.300****	**-0.054**	**0.407*****	**0.161**	**0.114**	**0.321****
	(0.120)	(0.102)	(0.120)	(0.147)	(0.212)	(0.124)
0-5km	**0.208*****	**0.052**	**0.266*****	**0.144**	**-0.138**	**0.214*****
	(0.046)	(0.064)	(0.058)	(0.094)	(0.100)	(0.047)
5-10km	**0.144*****	**-0.003**	**0.181*****	**0.093**	**-0.058**	**0.147*****
	(0.036)	(0.062)	(0.046)	(0.079)	(0.122)	(0.038)
10-15km	**0.057**	**0.016**	**0.079**	**0.028**	**-0.155***	**0.060**
	(0.049)	(0.042)	(0.051)	(0.055)	(0.089)	(0.050)
15-20km	**-0.006**	**-0.006**	**0.034**	**-0.012**	**-0.028**	**-0.007**
	(0.027)	(0.028)	(0.031)	(0.045)	(0.059)	(0.028)
20-25km	–	–	–	–	–	–
25-30km	**-0.013**	**0.016**	**-0.006**	**-0.068**	**-0.118***	**-0.015**
	(0.027)	(0.028)	(0.035)	(0.042)	(0.061)	(0.027)
30-35km	**-0.062***	**0.030**	**-0.065**	**-0.047**	**-0.105**	**-0.065***
	(0.037)	(0.033)	(0.041)	(0.052)	(0.094)	(0.038)
35-40km	**-0.071***	**0.000**	**-0.080***	**-0.056**	**-0.153**	**-0.073***
	(0.039)	(0.035)	(0.045)	(0.055)	(0.093)	(0.040)
40-45km	**-0.032**	**-0.038**	**-0.039**	**-0.032**	**-0.129**	**-0.031**
	(0.038)	(0.030)	(0.046)	(0.060)	(0.083)	(0.039)
45-50km	**-0.013**	**-0.085****	**-0.020**	**-0.026**	**-0.191****	**-0.014**
	(0.038)	(0.037)	(0.044)	(0.065)	(0.091)	(0.038)
Observations	93,026	84,772	85,288	36,914	16,726	92,922
R-squared	0.901	0.899	0.878	0.832	0.837	0.900
Municipality fixed effects	✓	✓	✓	✓	✓	✓
Year fixed effects	✓	✓	✓	✓	✓	✓

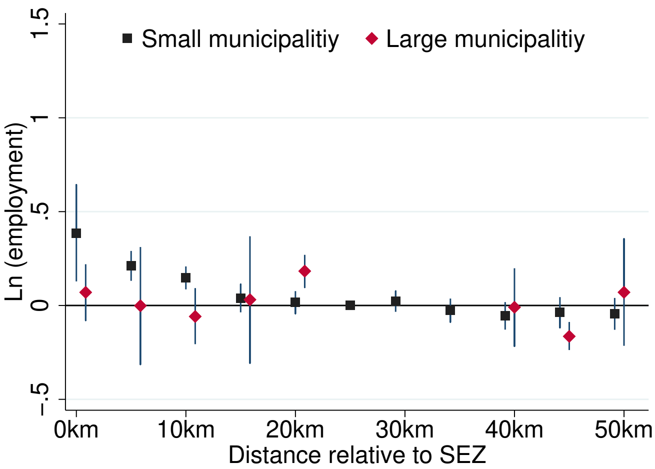
Notes: Regression results from Eq. (1) with the number of different types of firms as the dependent variable. Column (1) reports the estimated effects on total firm count. Column (2) reports the placebo results. Columns (3)-(6) report the results for male owned-, female owned-, large- and small firm count. Municipalities with more than 500,000 inhabitants are excluded. Employment data are drawn from the Economic Census for 1998, 2005 and 2013. Standard errors are clustered at the district level. *** p<0.01, ** p<0.05, * p<0.1.

SEZ effect by city size. To investigate the differential effect of SEZ-establishment on large ($> 500,000$ inhabitants) and small ($\leq 500,000$ inhabitants) municipalities, we estimate the following model:

$$\begin{aligned} ln(y_{it}) = c + \sum_{d=0,d\neq 5}^{10} \beta_d D_{[d_i=d]} \times \gamma_{2013} + \sum_{d=0,d\neq 5}^{10} \theta_d D_{[d_i=d]} \times \gamma_{2013} \times large_i \\ + \gamma_{2013} \times large_i + \gamma_{2013} + \alpha_i + \epsilon_{it}, \end{aligned} \tag{4}$$

where y_{it} is the dependent variable such as employment or the number of firms in municipality i in year t. $D_{[d_{it}=d]}$, γ_{2013},α_i and ϵ_{it} are defined as in Eq. (1). $large_i$ is a dummy variable indicating if municipality i had more than 500,000 inhabitants in 2001. Hence, β_d corresponds to the distance-specific SEZ-effect for both large and small municipalities and θ_d is the additional distance-specific effect for large municipalities. Figure A3 plots the results. Figure A4 shows that our baseline results are robust to applying different cutoff-values when dropping larger municipalities from the sample.

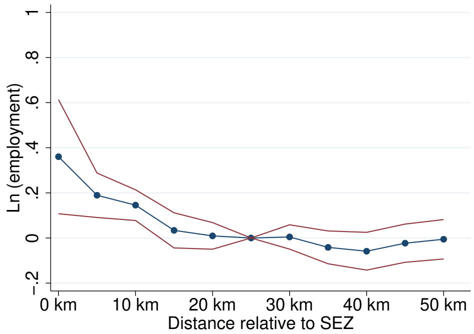
Figure A3: SEZ effect on employment by city size



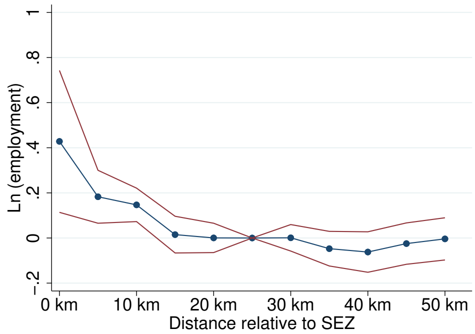
Notes: The plotted coefficients are estimated according to Eq. (4). Black squares depict the effects of SEZs on employment in small municipalities i.e. $\leq$ 500,000 ($\hat{\beta}_d$). Red diamonds show the effects for large municipalities i.e. $> 500,000$ ($\hat{\beta}_d + \hat{\theta}_d$). Each subscript d refers to a distance on the horizontal axis, e.g. the coefficient at 0km refers to $d = 0$. For some distance bins, there are no large municipalities, such that the point estimate is not identified. Black lines indicate 95%-confidence intervals. Standard errors are clustered at the district level. Regressions include municipality and year fixed effects. Employment data are drawn from the Economic Census for 2005-2013.

Figure A4: SEZ effect on employment by size cutoffs

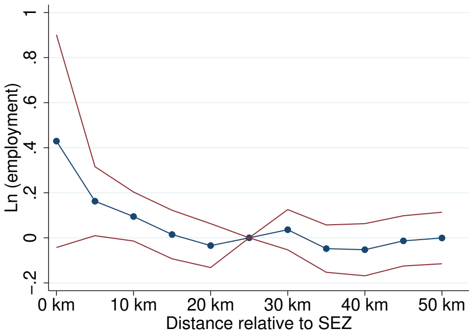
(a) Full sample



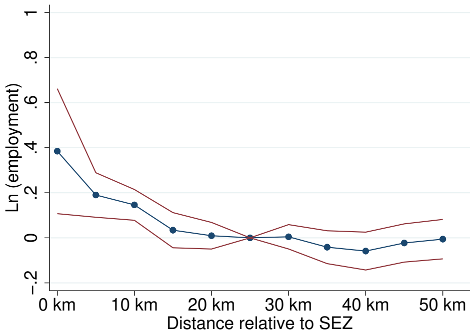
(b) Below Mean



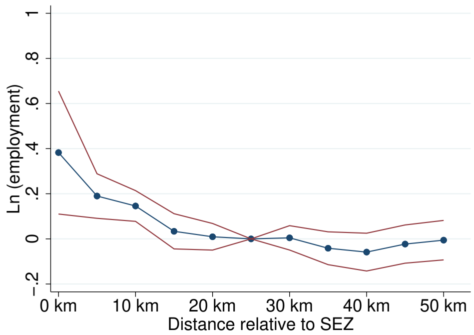
(c) Below Median



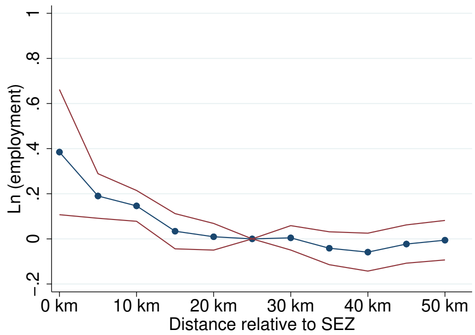
(d) Below 1 million



(e) Below 500,000



(f) Below 100,000



Notes: The dots refer to the coefficients $\hat{\beta}_d$ as estimated according to Eq. (1). Each subscript d refers to a distance on the horizontal axis, e.g. the coefficient at 0km refers to $d = 0$. Panel (a) repeats the baseline estimation for the full sample. The other panels report the results when excluding cities above varying inhabitants thresholds as per Population Census 2001. Mean population is 4,366. Median population is 1,083. Red lines indicate 95% confidence intervals. Standard errors are clustered at the district level. Regressions include municipality and year fixed effects. Employment data are drawn from the Economic Census for 2005-2013.

SEZ heterogeneity. In Figure A5 we plot the effects of SEZ with different industry designations on overall employment. Hereby we distinguish between municipalities within a 10km radius (panel (a)) and further than 10km (panel (b)) from the zones.

We further tabulate the results when applying CEM as discussed in subsection 4.6 which considers public vs. private SEZs and industry designation, respectively. The effects by developer are estimated according to Eq. (3). The estimation model for industry specific effects reads as follows:

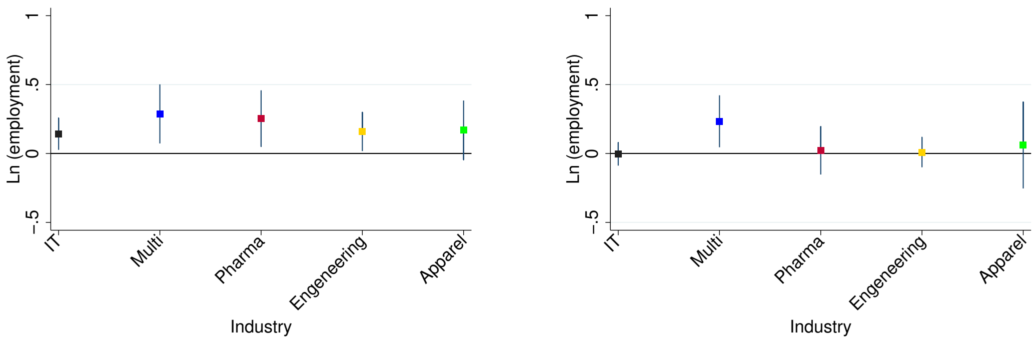
$$ln(y_{it}) = c + \sum_{d=0,d\neq5}^{10} \beta_d D_{[d_i=d]} \times \gamma_{2013} + \sum_{d=0,d\neq5}^{10} \theta_d D_{[d_i=d]} \times \gamma_{2013} \times industry_i \\ + \gamma_{2013} \times industry_i + \gamma_{2013} + \alpha_i + \epsilon_{it}, \tag{5}$$

where y_{it} is the dependent variable such as employment or the number of firms in municipality i in year t. $D_{[d_{it}=d]}$, γ_{2013}, α_i and ϵ_{it} are defined as in (1). $industry_i$ is a dummy variable indicating if the closest SEZ to municipality i is designated to the industry of interest. For example, if $industry_i = 1_{[SEZ_i=IT]}$, β_d corresponds to the distance-specific SEZ-effect for both IT and non-IT SEZs and θ_d is the additional distance-specific effect for IT-SEZs. Tables A7 and A8 contrast the effects of public vs. private SEZs and IT vs. manufacturing specific SEZs, respectively on overall employment. Table A10 report results for industry specific employment effects by industry designation of the SEZs. All results are reported for differing matching dimensions in the CEM approach.

Figure A5: SEZ effect by SEZ industry

(a) 0-10km (incl. SEZ municipalities):

(b) 10-20km:



Notes: The plotted coefficients refer to the $\hat{\beta}_d + \theta_d$ as estimated according to Eq. (5). Where the range of the bins equals 10km. Panel (a) depicts results for municipalities up to 10km away from their closest SEZ (incl. SEZ-municipalities). Panel (b) depicts results for municipalities that are 10-20km away from their closest SEZ. Straight lines indicate 95% confidence intervals. The standard errors are clustered at the district level. Regressions include municipality and year fixed effects. For the purpose of giving a comprehensive picture of the full set of SEZ location choices across industries the industry sample includes all municipalities. All panels are based on Economic Census for the years 2005-2013.

Table A7: SEZ effect by developer

	(1)	(2)	(3)	(4)	(5)	(6)
			Employment			
Matching	None		Industry		Industry & size	
Distance bins	*Private*	*Public*	*Private*	*Public*	Private	*Public*
0km	**0.261**	**0.563****	**0.352****	**0.374***	**0.332****	**0.406***
	(0.175)	(0.243)	(0.156)	(0.215)	(0.158)	(0.205)
0-5km	**0.109***	**0.359*****	**0.109***	**0.285*****	**0.103**	**0.282*****
	(0.061)	(0.077)	(0.061)	(0.094)	(0.062)	(0.092)
5-10km	**0.114****	**0.202*****	**0.114****	**0.188*****	**0.113****	**0.199*** ***
	(0.044)	(0.053)	(0.044)	(0.061)	(0.045)	(0.061)
10-15km	**0.011**	**0.070**	**0.011**	**0.022**	**0.009**	**0.015**
	(0.045)	(0.064)	(0.045)	(0.071)	(0.047)	(0.069)
15-20km	**-0.009**	**0.044**	**-0.009**	**0.010**	**-0.017**	**0.011**
	(0.039)	(0.048)	(0.039)	(0.052)	(0.042)	(0.051)
20-25km	–	–	–	–	–	–
25-30km	**-0.026**	**0.058**	**-0.026**	**0.015**	**-0.031**	**0.015**
	(0.032)	(0.050)	(0.032)	(0.048)	(0.032)	(0.048)
30-35km	**-0.079***	**0.025**	**-0.079***	**0.038**	**-0.076***	**0.042**
	(0.040)	(0.076)	(0.040)	(0.049)	(0.041)	(0.049)
35-40km	**-0.089***	**-0.006**	**-0.089***	**-0.009**	**-0.092***	**-0.006**
	(0.046)	(0.081)	(0.046)	(0.059)	(0.047)	(0.060)
40-45km	**-0.055**	**0.033**	**-0.055**	**0.043**	**-0.057**	**0.031**
	(0.053)	(0.059)	(0.053)	(0.051)	(0.055)	(0.052)
45-50km	**-0.061**	**0.090**	**-0.061**	**0.028**	**-0.067**	**0.036**
	(0.051)	(0.059)	(0.051)	(0.070)	(0.052)	(0.068)
Observations	93,080	93,080	93,054	93,054	92,042	92,042
R-squared	0.890	0.890	0.912	0.912	0.912	0.912
Municipality fixed effects	✓	✓	✓	✓	✓	✓
Year fixed effecs	✓	✓	✓	✓	✓	✓

Notes: Regression results from Eq. (3) contrasting the effects of public and private SEZs with total employment (columns (1)-(6)) as the dependent variable. Columns (1)-(2) report the results when no matching procedure is applied. Columns (3)-(4) report the results when municipalities are matched according to SEZ industry (cf. Figure 10). Columns (5)-(6) report the results when municipalities are matched according to SEZ industry and SEZ size relative to municipality size. Municipalities with more than 500,000 inhabitants are excluded. Employment data are drawn from the Economic Census for 2005-2013. Standard errors are clustered at the district level. *** p<0.01, ** p<0.05, * p<0.1.

Table A8: SEZ effect by SEZ industry

	(1)	(2)	(3)	(4)	(5)	(6)
	Employment					
Matching	None		Industry		Industry & size	
Distance bins	*Multi*	*IT*	*Multi*	*IT*	Multi	*IT*
0km	**0.692*** **	**0.368*** **	**0.556** **	**0.368*** **	**0.684* **	**0.368*** **
	(0.215)	(0.134)	(0.232)	(0.134)	(0.358)	(0.134)
0-5km	**0.370** **	**0.105**	**0.294** **	**0.105**	**0.247* **	**0.099**
	(0.143)	(0.078)	(0.149)	(0.078)	(0.129)	(0.081)
5-10km	**0.167* **	**0.150** **	**0.122**	**0.150** **	**0.075**	**0.150** **
	(0.087)	(0.062)	(0.086)	(0.062)	(0.094)	(0.062)
10-15km	**0.242* **	**0.022**	**0.169**	**0.022**	**0.088**	**0.017**
	(0.136)	(0.057)	(0.106)	(0.057)	(0.092)	(0.059)
15-20km	**0.225** **	**-0.035**	**0.232** **	**-0.035**	**0.134* **	**-0.035**
	(0.088)	(0.040)	(0.091)	(0.040)	(0.073)	(0.040)
20-25km	–	–	–	–	–	–
25-30km	**0.018**	**-0.022**	**0.024**	**-0.022**	**-0.024**	**-0.020**
	(0.048)	(0.040)	(0.042)	(0.040)	(0.042)	(0.040)
30-35km	**-0.001**	**-0.044**	**-0.029**	**-0.044**	**-0.017**	**-0.044**
	(0.066)	(0.052)	(0.075)	(0.052)	(0.070)	(0.052)
35-40km	**-0.025**	**-0.098* **	**-0.073**	**-0.098* **	**-0.126** **	**-0.098* **
	(0.065)	(0.056)	(0.078)	(0.056)	(0.062)	(0.056)
40-45km	**0.050**	**-0.065**	**0.009**	**-0.065**	**-0.057**	**-0.067**
	(0.061)	(0.064)	(0.055)	(0.064)	(0.070)	(0.064)
45-50km	**0.166** **	**-0.047**	**0.122**	**-0.047**	**0.078**	**-0.045**
	(0.077)	(0.064)	(0.081)	(0.064)	(0.076)	(0.064)
Observations	51,254	51,254	51,254	51,254	50,464	50,464
R-squared	0.886	0.886	0.886	0.886	0.886	0.886
Municipality fixed effects	✓	✓	✓	✓	✓	✓
Year fixed effecs	✓	✓	✓	✓	✓	✓

Notes: Regression results from Eq. (5) contrasting the effects of multi-product and IT SEZs with total employment (columns (1)-(6)) as the dependent variable. CEM is applied with IT being the treatment category. Columns (1)-(2) report the results when no matching procedure is applied. Columns (3)-(4) report the results when municipalities are matched according to SEZ developer (public or private) (cf. Figure 10). Columns (5)-(6) report the results when municipalities are matched according to SEZ developer and SEZ size relative to municipality size. For the purpose of giving a comprehensive picture of the full set of SEZ location choices across industries the industry sample includes all municipalities. Employment data are drawn from the Economic Census for 2005-2013. Standard errors are clustered at the district level. *** p<0.01, ** p<0.05, * p<0.1.

Table A9: SEZ effect on marginal agricultural employment by SEZ industry

	(1)	(2)	(3)	(4)	(5)	(6)
	Marginal Agricultural Employment					
Matching	None		Developer		Developer & size	
Distance rings	*Multi*	*IT*	*Multi*	*IT*	*Multi*	*IT*
0km	**-0.341**	**0.384**	**-0.674****	**0.384**	**-0.961****	**0.384**
	(0.478)	(0.326)	(0.287)	(0.326)	(0.412)	(0.326)
0.5km	**-0.038**	**-0.086**	**-0.076**	**-0.086**	**-0.204**	**-0.086**
	(0.143)	(0.155)	(0.145)	(0.155)	(0.143)	(0.155)
5-10km	**0.012**	**0.022**	**-0.004**	**0.022**	**-0.016**	**0.022**
	(0.146)	(0.135)	(0.174)	(0.135)	(0.116)	(0.135)
10-15km	**0.059**	**-0.080**	**0.090**	**-0.080**	**-0.053**	**-0.080**
	(0.137)	(0.077)	(0.115)	(0.077)	(0.096)	(0.077)
15-20km	**-0.019**	**0.054**	**-0.017**	**0.054**	**-0.199***	**0.053**
	(0.156)	(0.061)	(0.137)	(0.061)	(0.106)	(0.061)
20-25km	-	-	-	-	-	-
25-30km	**0.037**	**-0.060**	**-0.017**	**-0.060**	**-0.129**	**-0.061**
	(0.107)	(0.059)	(0.107)	(0.059)	(0.106)	(0.060)
30-35km	**0.079**	**-0.105**	**0.159**	**-0.105**	**0.045**	**-0.105**
	(0.131)	(0.074)	(0.134)	(0.074)	(0.128)	(0.074)
35-40km	**-0.041**	**0.064**	**-0.017**	**0.064**	**-0.162**	**0.065**
	(0.127)	(0.079)	(0.130)	(0.079)	(0.137)	(0.079)
40-45km	**0.011**	**-0.010**	**0.080**	**-0.010**	**-0.061**	**-0.009**
	(0.115)	(0.075)	(0.124)	(0.075)	(0.105)	(0.075)
45-50km	**0.007**	**0.027**	**0.041**	**0.027**	**-0.018**	**0.027**
	(0.123)	(0.094)	(0.092)	(0.094)	(0.090)	(0.094)
Observations	45,966	45,966	45,966	45,966	45,516	45,516
R-squared	0.718	0.718	0.719	0.719	0.719	0.719
Municipality fixed effects	✓	✓	✓	✓	✓	✓
Year fixed effects	✓	✓	✓	✓	✓	✓

Notes: Regression results from Eq. (5) contrasting the effects of multi-product and IT SEZs on marginal agricultural employment. CEM is applied with IT being the treatment category. Columns (1)-(2) report the results when no matching procedure is applied. Columns (3)-(4) report the results when municipalities are matched according to SEZ developer (public or private) (cf. Figure 10). Columns (5)-(6) report the results when municipalities are matched according to SEZ developer and SEZ size relative to municipality size. For the purpose of giving a comprehensive picture of the full set of SEZ location choices across industries the industry sample includes all municipalities. Employment data are drawn from the Population Census for 2001-2011. Standard errors are clustered at the district level. *** p<0.01, ** p<0.05, * p<0.1.

Table A10: SEZ effect on industry employment by SEZ industry

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Manufacturing employment						Service employment					
Matching	None		Developer		Developer & size		None		Developer		Developer & size	
Distance rings	*Multi*	*IT*	*Multi*	*IT*	*Multi*	*IT*	*Multi*	*IT*	*Multi*	*IT*	*Multi*	*IT*
0km	0.962***	-0.250	0.888	-0.250	0.949*	-0.250	0.354*	0.239*	0.219	0.239*	0.214	0.239*
	(0.377)	(0.199)	(0.546)	(0.199)	(0.608)	(0.199)	(0.196)	(0.175)	(0.249)	(0.175)	(0.259)	(0.175)
0-5km	0.317	0.074	0.211	0.074	0.127	0.057	0.376***	0.156**	0.337**	0.156**	0.324**	0.154**
	(0.208)	(0.163)	(0.218)	(0.163)	(0.216)	(0.164)	(0.136)	(0.065)	(0.144)	(0.065)	(0.134)	(0.068)
5-10km	0.120	0.166	0.010	0.166	-0.071	0.166	0.196*	0.152***	0.161	0.152***	0.158	0.152***
	(0.142)	(0.112)	(0.136)	(0.112)	(0.108)	(0.112)	(0.110)	(0.055)	(0.122)	(0.055)	(0.160)	(0.055)
10-15km	0.167*	0.078	0.090	0.078	-0.015	0.077	0.245*	0.023	0.193	0.023	0.157	0.020
	(0.100)	(0.105)	(0.092)	(0.105)	(0.058)	(0.105)	(0.144)	(0.054)	(0.132)	(0.054)	(0.123)	(0.055)
15-20km	0.394***	0.009	0.424***	0.009	0.065	0.009	0.167**	-0.033	0.174**	-0.033	0.156***	-0.033
	(0.122)	(0.080)	(0.153)	(0.080)	(0.117)	(0.080)	(0.078)	(0.043)	(0.081)	(0.043)	(0.051)	(0.043)
20-25km	–	–	–	–	–	–	–	–	–	–	–	–
25-30km	0.077	-0.028	0.074	-0.028	-0.025	-0.029	-0.060	-0.023	-0.062	-0.023	-0.099*	-0.021
	(0.066)	(0.068)	(0.072)	(0.068)	(0.089)	(0.068)	(0.059)	(0.040)	(0.058)	(0.040)	(0.057)	(0.040)
30-35km	-0.046	0.032	-0.049	0.032	-0.090	0.033	-0.052	-0.044	-0.076	-0.044	-0.031	-0.044
	(0.099)	(0.076)	(0.126)	(0.076)	(0.154)	(0.076)	(0.061)	(0.057)	(0.067)	(0.057)	(0.056)	(0.057)
35-40km	0.098	-0.065	0.089	-0.065	-0.003	-0.066	-0.028	-0.083	-0.073	-0.083	-0.109*	-0.084
	(0.114)	(0.072)	(0.118)	(0.072)	(0.129)	(0.072)	(0.065)	(0.053)	(0.067)	(0.053)	(0.059)	(0.053)
40-45km	0.001	-0.108	0.002	-0.108	-0.161	-0.110	-0.021	-0.032	-0.061	-0.032	-0.086	-0.033
	(0.129)	(0.087)	(0.128)	(0.087)	(0.134)	(0.087)	(0.073)	(0.051)	(0.064)	(0.051)	(0.072)	(0.051)
45-50km	0.077	-0.111	0.070	-0.111	-0.030	-0.108	0.156*	-0.005	0.115	-0.005	0.112	-0.001
	(0.097)	(0.102)	(0.110)	(0.102)	(0.110)	(0.102)	(0.090)	(0.057)	(0.084)	(0.057)	(0.086)	(0.057)
Observations	36,400	36,400	36,400	36,400	35,966	35,966	50,920	50,920	50,920	50,920	50,142	50,142
R-squared	0.832	0.832	0.832	0.832	0.833	0.833	0.897	0.897	0.897	0.897	0.898	0.898
Municipality fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year fixed effects	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

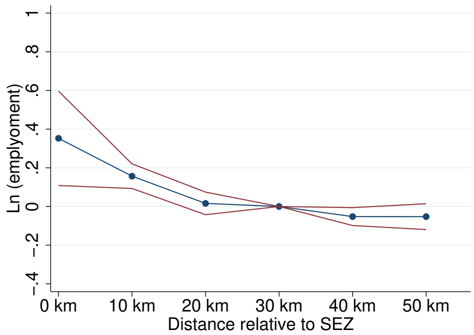
Notes: Regression results from Eq. (5) contrasting the effects of multi-product and IT SEZs with total manufacturing employment (columns (1)-(6)) and service employment (columns (7)-(12)) as the dependent variable. Service employment refers to non-agricultural employment that is not part of the manufacturing sector. CEM is applied with IT being the treatment category. Columns (1)-(2) and (7)-(8) report the results when no matching procedure is applied. Columns (3)-(4) and (9)-(10) report the results when municipalities are matched according to SEZ developer (public or private) (cf. Figure 10). Columns (5)-(6) and (11)-(12) report the results when municipalities are matched according to SEZ developer and SEZ size relative to municipality size. For the purpose of giving a comprehensive picture of the full set of SEZ location choices across industries the industry sample includes all municipalities. Employment data are drawn from the Economic Census for 2005-2013. Standard errors are clustered at the district level. *** p<0.01, ** p<0.05, * p<0.1.

Robustness. The following figures and tables check the robustness of the main results, derived in Section 4. Figure A6 plots our baseline results on total employment, when using alternative distance cutoffs for determining the size of the distance bins. While the classification of SEZ-municipalities remains the same (0km), we, in the left panel, increase the size of all other distance bins to 10km, which is indicated by the left panel in Figure A6. Municipalities between 20km and 30km serve as the reference group. While the coarser binning of municipalities leads to a less nuanced SEZ-Effect across space, the main results of positive employment effects up to 10km remains unchanged. In the right panel, we plot the results, when using smaller bins of 2.5km. Hence, the first distance bin outside SEZ-municipalities refers to municipalities up to 2.5km away. Here, we use municipalities between 22.5 and 25km as the reference group. Similar to the graph in the left panel, we can observe positive employment spillovers up to a distance of 10km, while the point estimates for municipalities beyond 10 km are close to zero and insignificant.

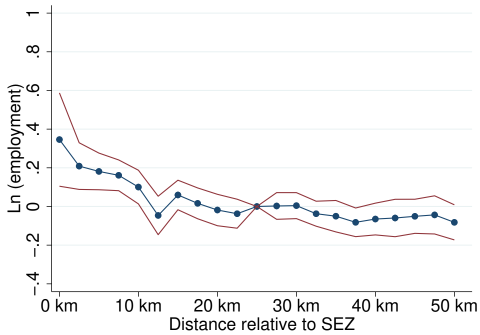
Figure A7 plots the results when extending our sample to 200km radii around SEZs. The result confirm our baseline findings in the sense that the strongly elevated employment trend, relative to the reference municipality, is only observable in SEZ municipalities in direct neighboring jurisdictions. The employment trend of other municipalities in a 200km radius of an SEZ does not significantly differ from that of the reference jurisdictions. Figure A8 shows that the baseline results for employment and firm count remain statistically significant when we cluster standard errors at the level of the closest SEZ and apply Conley (1999) standard errors, respectively.

Figure A6: SEZ effect on employment (10km and 2.5km distance bins)

(a) 10km distance bins



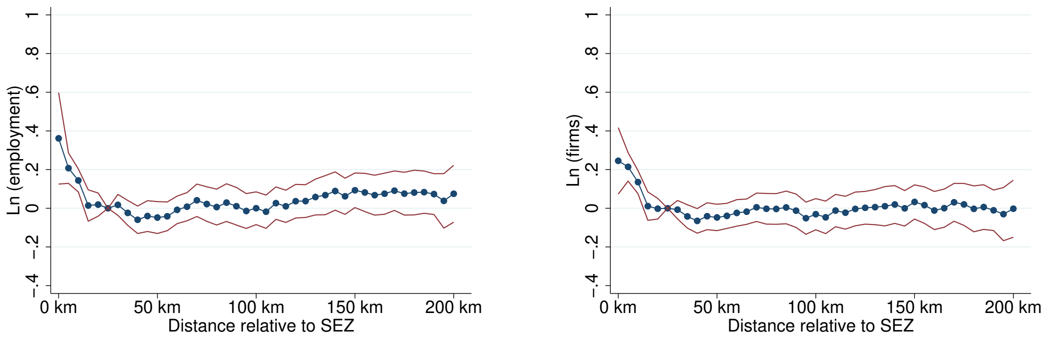
(b) 2.5km distance bins



Notes: The dots indicate the estimates for $\hat{\beta}_d$'s as estimated by Eq. (1). In this figure, distance bins are redefined as spreading 10km (panel (a)) and 2.5km (panel (b)). Red lines indicate 95% confidence intervals. The standard errors are clustered at the district level. Regressions include municipality and year fixed effects. Municipalities with more than 500,000 inhabitants are excluded. Employment data are drawn from the Economic Census for 2005 and 2013.

Figure A7: SEZ effect on employment and firms (200km radius)

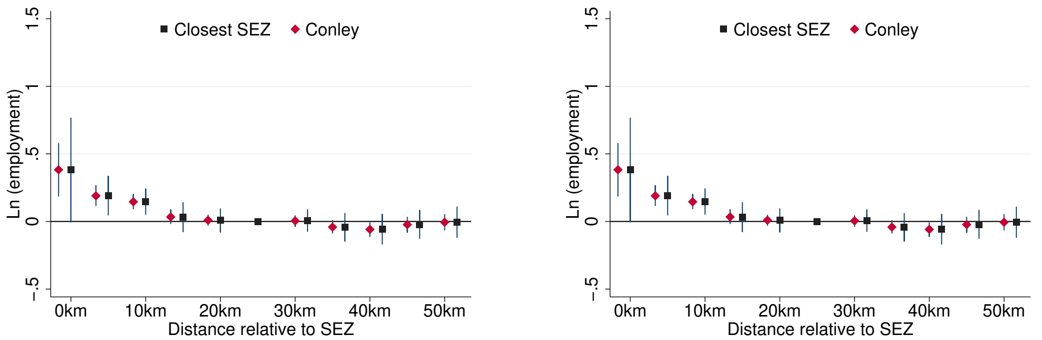
(a) Employment (b) Firms



Notes: The dots indicate the estimates for $\hat{\beta}_d$'s as estimated by Eq. (1). In this figure, the radius drawn around SEZs has been increased from 50km to 200km. Note that the coefficients up to 50km remain identical to the baseline. Red lines indicate 95% confidence intervals. The standard errors are clustered at the district level. Regressions include municipality and year fixed effects. Municipalities with more than 500,000 inhabitants are excluded. Employment data are drawn from the Economic Census for 2005 and 2013.

Figure A8: SEZ effect on employment and firm entry (SE clustered by closest SEZ and Conley)

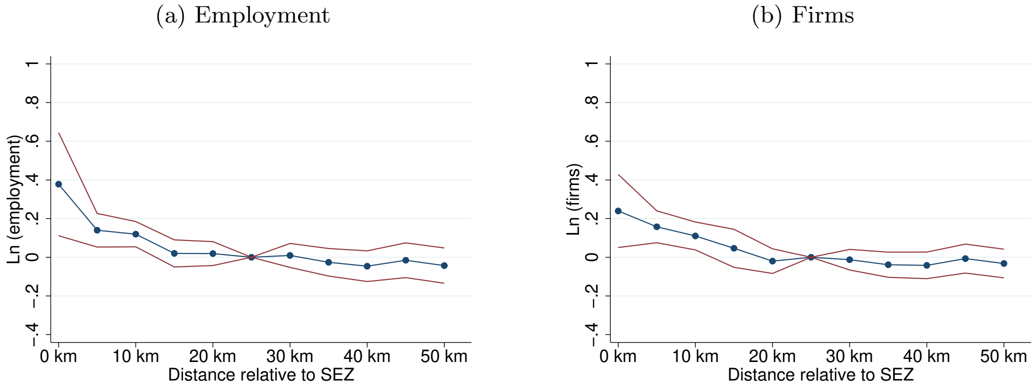
(a) Employment (b) Firms



Notes: The plotted coefficients refer to the $\hat{\beta}_d$'s as estimated by Eq. (1). Each d refers to a distance on the horizontal axis e.g. the coefficient at 0km refers to $d = 0$. Red diamonds show the effects for when using Conley standard errors with a distance cut-off at 30km. Black squares depict the results when clustering by closest SEZ. Panel (a) shows results for employment. Panel (b) shows results for firm entry. Red lines indicate 95% confidence intervals. Regressions include municipality and year fixed effects. Municipalities with more than 500,000 inhabitants are excluded. Employment data are drawn from the Economic Census for 2005 and 2013.

Finally, A9 reports results when including further controls from the Population Census in Eq. (1). We include municipal popuation, the *number of schools*, whether a municipality has access to a *paved road*, *power supply* and the *literacy rate* The information is taken from the Population Census (see Table 1). Note that we match the 2001 observations to the year 2005 and 2011 to 2013 respectively, which enables to use all SEZs, used in our baseline estimation. The results confirm our baseline results on employment and firm count, which were given by Figure 4 and tables A4 and A6 .

Figure A9: SEZ effect on employment and firm entry with controls from Population Census

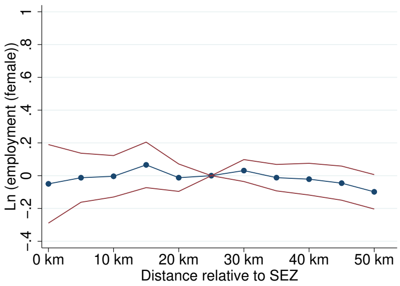


Notes: The dots indicate the estimates for $\hat{\beta}_d$ as estimated according to Eq. (1) with time-variant municipal characteristics (population, literacy rate, roads, electricity access) as additional control variables. Each d refers to a distance on the horizontal axis, e.g. the coefficient at 0km refers to $d = 0$. Panel (a) shows results for employment. Panel (b) shows results for firm count. Red lines indicate 95% confidence intervals. Standard errors are clustered at the district level. Regressions include municipality and year fixed effects. Municipalities with more than 500,000 inhabitants are excluded. Employment data are drawn from the Economic Census for 2005 and 2013.

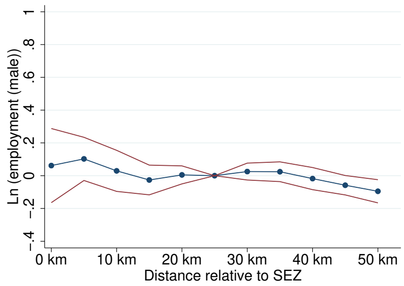
Placebo regressions. This part complements the heterogenity analysis of sections 4.4, 4.5 and 4.6 by reporting the results of placebo regressions. Figure A10 lends little supprt for differential pre-trends across the distance bins prior to SEZ establishment (1998-2005).

Figure A10: Placebo effects on employment: 1998-2005

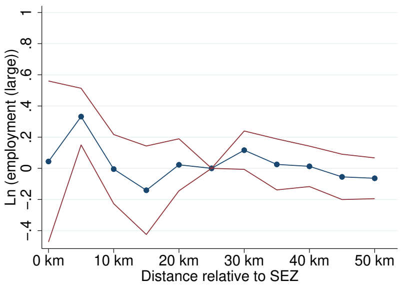
(a) Female Employment



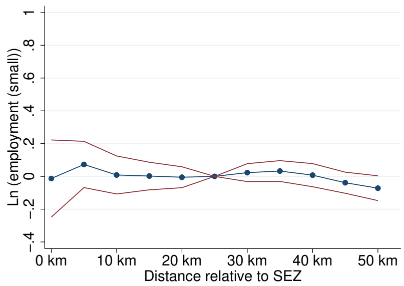
(b) Male Employment



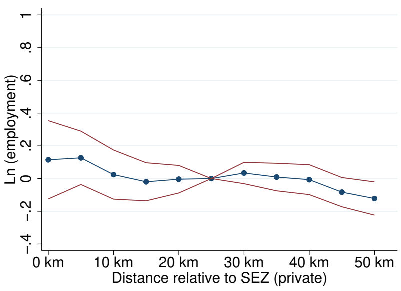
(c) Large firm employment



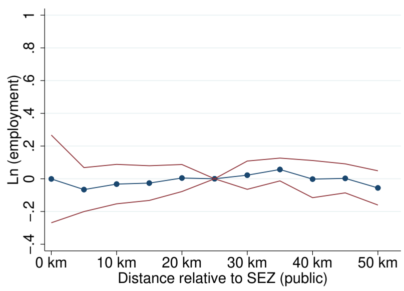
(d) Small firm employment



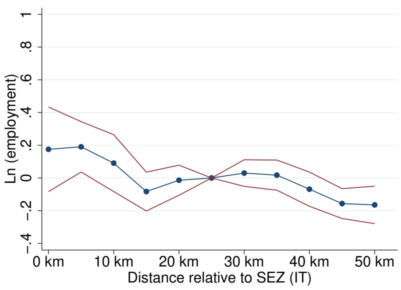
(e) Private SEZs



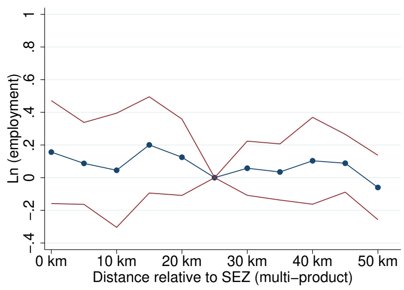
(f) Public SEZs



(g) IT SEZs



(h) Multi-product SEZs



Notes: The dots indicate the estimates for $\hat{\beta}_d$'s as estimated by Eq. (1). Each d refers to a distance on the horizontal axis e.g. the coefficient at 0km refers to $d = 0$. The panels refer to placebos of the corresponding analyses in Section 4. Red lines indicate 95% confidence intervals. The standard errors are clustered at the district level. Regressions include municipality and year fixed effects. Municipalities with more than 500,000 inhabitants are excluded. For the purpose of giving a comprehensive picture of the full set of SEZ location choices the IT-sample includes all municipalities. Employment data are drawn from the Economic Census for 2005 and 2013.

C Appendix on Relocation

This part complements Sections 4.1 and 4.2 by a back-of-the-envelope calculation.

In a first step, we ask how many jobs were established by SEZs in total within our sample frame. To answer this question, we draw on our baseline estimates in Figure 4. For small municipalities, the estimates suggest that employment increased by 47%, 21%, and 16%, respectively, in SEZ-municipalities and those in distance bins of 0-5km and 5-10km. Taking into consideration the average pre-treatment employment levels in SEZ-municipalities with less than 500,000 inhabitants (3,139) and the two closest distance bins (574 and 439, respectively) and the total number of such municipalities per distance bin (152; 1,264 and 2,390), the aggregate effect of SEZs on municipalities within a 10km radius amounts to 544,486 additional workers ($= 0.47 \times 3,139 \times 152 + 0.21 \times 574 \times 1,264 + 0.16 \times 439 \times 2,390$).

Within large municipalities the estimated average effect of SEZs on employment is much lower at 11% within SEZ-municipalities, 2% in municipalities distanced 0-5km and 8% in municipalities distanced 5-10km from SEZs (see Figure A3). Again, considering the average pre-treatment employment levels in SEZ-municipalities with more than 500,000 inhabitants (666,796) and the two closest distance bins (1,233,342 and 280,455, respectively) and the total number of such municipalities per distance bin (12; 4 and 7) the aggregate effect of SEZs on municipalities within a 10km radius amounts to 1,101,014 additional workers.

Thus, overall employment in 10km radii around SEZs increased by about 1,64 million, which implies an increase of about 9.5% relative to the pre-treatment year 2005. Note that official statistics quantify the increase of employment within SEZs at 1.14 million over our period of study 2005-2013. Taken at face value, this suggests that 2/3 of the estimated net employment increase accrues within-SEZs and 1/3 of it reflects spillovers on surrounding regions (including SEZ municipalities themselves).[33]

In a second step, we use a back-of-the envelope calculation to strengthen our argument in the main text that the observed estimates plausibly reflect the creation of new economic activity rather than job relocation in space. The results in Table 2 of the main text do not show any indication that the expansion of employment in SEZ areas correlates with employment paths in neighboring municipalities in further distance ($>$ 10km, which would serve as 'source jurisdictions' in case of job relocation). The point estimates are small and statistically insignificant.

For distance rings smaller than 30km, the coefficient estimates nevertheless turn our negative. To obtain a notion of the quantitative relevance of these point estimates, we take the estimated 9.5% employment increase within a 10km-radius (see above), and calculate the aggregate employment decrease across municipalities within 10-30km distance rings

[33] Figures accessible via the Indian Export Promotion council: https://www.epces.in/facts-and-figures.phphpgallery-6 . Last accessed: January 25th, 2022

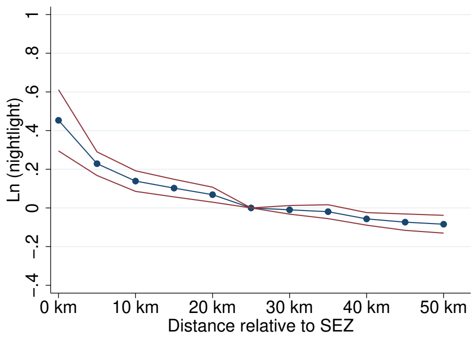
from SEZs as implied by the point estimates in the first row of Table 2. We again evaluate the estimated coefficients at the average pre-treatment employment (624; 370; 310 and 226) and account for the number of municipalities (4,178; 4,334; 4,788 and 5,524) for the 10-15km, 15-20km, 20-25km and 25-30km distance bin, respectively. The total job loss calculated for these jurisdictions is 16,524 jobs, which is thus minuscule relative to the aggregate employment gain in SEZ areas (1.64 million workers, see above).

D Alternative outcomes

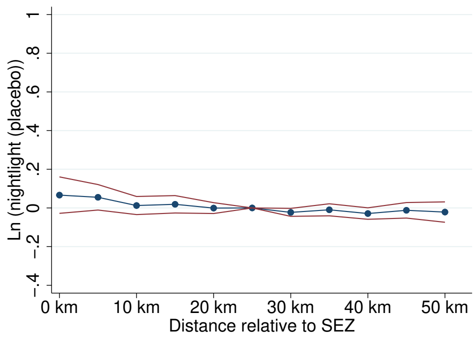
This section complements section 4. The effect of SEZ establishment (by industry) on nightlight intensity is plotted in A11 and shows effects that are qualitatively and quantitatively comparable to our baseline estimates.

Figure A11: SEZ effect on nightlights

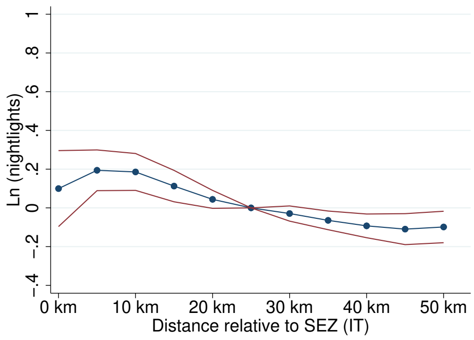
(a) Effect of SEZ Establishment: 2005-2013



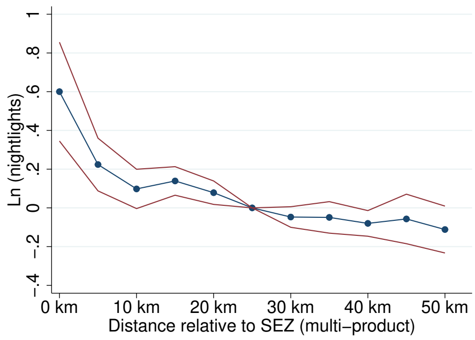
(b) Placebo: 1998-2005



(c) Effect of SEZ Establishment (IT)



(d) Effect of SEZ Establishment (multi-product)



Notes: The dots indicate the estimates for $\hat{\beta}_d$ as estimated according to Eq. (1). Each subscript d refers to a distance on the horizontal axis, e.g. the coefficient at 0km refers to $d = 0$. The dependant variable refers to the log of the mean nightlight intensity of a municipality. Panel (a) depicts results for the original specification. Panel (b) depicts results of the placebo specification (i.e. we interchange γ_{2013} with a dummy equal to 1 in year 2005). Panel (c) depicts results for IT-SEZs. Panel (d) depicts results for multi-product SEZs. Red lines indicate 95% confidence intervals. Standard errors are clustered at the district level. Regressions include municipality and year fixed effects. Municipalities with more than 500,000 inhabitants are excluded. Nightlights data are drawn from the DMSP-OLS Nighttime Lights Time Series provided by the NOAA.