

Race to the Top or Race to the Bottom ?
Competing for Investment Proposals in Special Economic Zones (SEZs):
Evidence from Indian States, 1998–2010

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Abstract: Post 1991 economic reforms, India relaxed investment regulation norms allowing states to form their own investment policy frameworks. Withdrawal of controls exercised by central government in approving investments in Special Economic Zones (SEZs) and Export Oriented Units (EOUs) has unleashed fierce competition among states to attract investments which generate jobs and boost local economy. Using spatial econometric estimations on panel data on 30 states in India during 1998–2010 period (13 years), we indeed find that the approval of SEZs and EOUs investment proposals in one state are positively correlated with approval of SEZs and EOUs investment proposals elsewhere (i.e. potential hosts are more likely to approval SEZ and EOU investment proposals when their competitors have done so). These results are not only robust to dropping special category states from the sample, but also to alternative weighting scheme and controlling for endogeneity. Our findings have key policy implications in terms of costs associated with undue competition. The race to attract investments is potentially having socially undesirable consequences in the areas of land acquisitions, environmental regulations, and labour standards.

Keywords: Investments, Special Economic Zones, Spatial econometrics, India (F21; R58; O53).

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“The current promotion of SEZs is unjust and would act as a trigger for massive social unrest, which may even take the form of armed struggle.”¹

- Vishwanath Pratap Singh, former Prime Minister of India

“SEZs are here to stay”²

- Dr. Manmohan Singh, current Prime Minister of India

1. Introduction

One of the key features of globalization is that it induces competition among countries to attract investments (Simmons and Zachary 2004, Stiglitz 2002). Studies in the past have shown that this phenomenon is not only restricted to developed countries alone, but is also proliferating among developing countries. Markusen and Nesse (2006) points out that competition to attract investments is spreading more rapidly even within developing countries like India where fiscal, political and administrative aspects are decentralized to subnational governments. Kanta (2011), Schneider (2004) and Venkatesan (2000) cite examples of large tax and other fiscal incentives the states within India offer to attract investments. In this study, we examine whether states in India compete for investment proposals in Special Economic Zones (SEZs henceforth) and Export Oriented Units (EOUs hereafter). A SEZ is a special geographic region within a state that has distinct economic laws from a country’s generally applicable laws, with an objective to increase economic growth and boost employment through increased domestic and foreign investment³. An EOU is the same as an SEZ but with a specific objective to boost the country’s export earnings⁴. Post 1991 economic reforms, India relaxed investment regulation norms allowing states to form their own investment policy frameworks, thus eliminating the role of

¹ www.frontline.in/fl2320/stories/20061020004900600.htm

² www.financialexpress.com/fe_full_story.php?content_id=158810

³ For more on SEZs in India, see: www.sezindia.nic.in

⁴ For more on SEZs in India, see: www.eouindia.gov.in

central government in investment policy making (Kohli 2004). Withdrawal of controls exercised by central government in approving investments in SEZs and EOUs therefore unleashed fierce competition among states to attract investments which generate jobs and boost local economy. This is well reflected in rapid increase in approval of SEZs across large number of states in India. Post SEZ Act 2005, there has been dramatic surge in approval of both SEZs and EOUs across states in India. As on 2010, there are roughly about 174 SEZs and EOUs approved across 25 states in India⁵. Many argue that such competition among states for investments can be significantly beneficial to the labor in a country which is labor rich and capital poor (Bhagwati 2004). Critics of globalization have however expressed concerns over the negative effects of such competition in areas such as taxation, labor standards and environmental standards (Rodrik 1997, Stiglitz 2002). In this paper, we use spatial econometrics to specifically examine whether approval of SEZ and EOU investment proposals in one state are indeed influenced by investment proposal approvals elsewhere in India. We also examine if such competition among states within India is leading to socially undesirable consequences.

Spatial econometrics has been used in the literature to explore the extent of competition in tax, environmental standards, economic policy reforms, bilateral investment treaties, labor standards, among other areas. The first set of studies using spatial econometrics to examine tax competition, Davies, Egger and Egger (2003), Devereux, Lockwood, and Redoano (2008), Davies and Voget (2008), Overesche and Rinke (2008) and Klemm and van Parys (2009) find that developed countries do offer various tax cuts while competing for FDI. Extending spatial econometrics to competition in labor standards, Davies and Vadlamannati (2011) find strong evidence on the potential race to the bottom in aggregate labour standards, while Neumayer and de Soysa (2011) find support for race to the top with respect to women's labor rights. Spatial

⁵ See: www.sezindia.nic.in and www.eouindia.nic.in

econometrics is also used to examine the impact on environmental standards as a result of competition to attract investments. Cumberland (1981) long argued that such competition usually weakens environmental standards. Using spatial estimations, Markusen, Morey and Olewiler (1995), Fredriksson and Millimet (2002), Beron et al. (2003), Murdoch et al. (2003), Davies and Naughton (2006) and Perkins and Neumayer (2010) find evidence consistent with the race to the bottom in the adoption of environmental agreements and policies. Spatial econometric studies also measure the extent of diffusion of policy liberalization and investment treaties, where Pitlik (2007) and Gassebner, Gaston and Lamla (2011) find evidence of competition among countries to liberalize regulatory, monetary and trade policies, while Simmons and Elkins (2004) find that adoption of economic practices is highly clustered both temporally and spatially. Elkins, Guzman and Simmons (2004) also find that inter-country competition drives signing bilateral investment treaties⁶.

While most of these studies are cross-country analysis, to the best of our knowledge there is no evidence on within country competition to attract SEZ and EOU investments. Our paper attempts to fill this gap by specifically focusing on competition among Indian states to attract SEZ and EOU investments and discuss the potential fallout of such fierce competition. Using information on investment proposals approved in SEZs and EOUs in 30 Indian states during the period 1998–2009, we find that the approval of SEZ and EOU investment proposals in one state are positively correlated with the investment proposal approvals in other states. Furthermore, we find that industrial states (excluding special category states) compete for SEZ and EOU investment proposals more fiercely among themselves. Our results remain robust to alternative weighting scheme and controlling for endogeneity. We interpret these results as direct evidence

⁶ There are also other areas where spatial econometrics has been used to examine the diffusion in anti-trafficking government policies (Cho, Dreher and Neumayer 2011), inbound and outbound FDI (Blongien et al. 2007).

of interstate strategic interactions in SEZ investment policy. We find that investment policies are strategic complements, a key requirement for finding a ‘race to the bottom or top’ in attracting investments. Since there is a large noticeable anecdotal evidence reported in press, media and NGO reports on the side-effects (such as lapses in environmental regulations, labor standards and land acquisition policy) of such fierce competition among states to attract investments into SEZ, we consider this as an evidence of race to the bottom. The various controversial aspects regarding the establishment of SEZs as a result of intense inter-state competition has been met with stiff resistance by the locals (discussed in detail in section 2.1). It appears that the costs associated with competition for SEZ investments, at least in India, far outweigh the benefits.

The rest of the paper structured as follows. Section 2 illustrates why states in India compete for SEZ and EOU investment proposals and the potential fallout of such competition. Section 3 describes the data used and the spatial econometric methodology in detail. Section 4 discusses the results and section 5 concludes with discussion.

2. Competing for Investments in SEZs: Race to the Top or Race to the Bottom?

In 1991, as a part of economic reforms, India embarked upon series of significant policy changes to industrial policy thus ending the ‘license and permit raj’ which required industrial undertakings to obtain licenses from the central government of India for not only setting up their businesses but even for expansion of operations and increasing the production capacity (Aghion, Burgess, Redding and Zilibotti 2008). As India relaxed investment regulation norms, state governments were allowed to form their independent investment policy frameworks to attract big ticket investments. With the intention to attract high end technological investments and boost country’s export production, the central government of India started to focus on the policy of SEZs. The history of SEZs in India trace back to 1965 when the government set up Asia’s first

SEZ (then known as Export Processing Zone) in Kandla (Maharashtra state) to promote exports. Following Kandla's experience, seven more SEZs were set-up in the mid-1980s in various parts of India. However, setting up of SEZs, development and approval of investment proposals within SEZs were under the purview of the central government. Post economic reforms, the central government in mid-1990s through its policy of SEZs actively encouraged state governments in creating SEZs to attract export oriented local and foreign investments. Consequently, all previous eight EPZs were converted into SEZs. The state governments were then allowed to approve the investment units/proposals in SEZs and EOUs coming into their state. The real change in government's SEZ policy came during the 1998 National Democratic Alliance (NDA) government when the then Minister for Commerce visited some of the Chinese SEZs. Post-China visit, the minister acknowledged that if India aspires to attract large FDIs then India needs to overcome the shortcomings on the account of multiplicity of controls and clearances, developing world class infrastructure, simplifying the approval mechanisms and providing other fiscal incentives. This changed mindset of Indian government paving way for the first SEZ policy released by central government in 2000 under EXIM (Export-Import) policy thereby providing various forms of fiscal incentives. Following central government, some state governments have also enacted their own SEZ policies.

To ensure a stable and long term SEZ policy, the government of India legislated SEZ Act in 2005. As per the SEZ 2005 Act, the main objectives of the SEZs, in government's own words, are: (a) generation of additional economic activity, (b) promotion of exports of goods and services, (c) promotion of investment from domestic and foreign sources, (d) creation of employment opportunities, and (e) development of infrastructure facilities. The Act also emphasizes on simplified procedures for development, operation and maintenance of SEZs,

single window clearance not only for setting up for an SEZ but also to the investment proposals (i.e. units) to be set up within SEZs and simplified compliance procedural documentation on matters related to state government. As per the Act, the approval mechanism fully vests with the state governments. The developer of SEZ (who can also be a state-government or an agency of a state government or a private entity) upon submission of proposal to the state government receives clearance within 45 days from the date of receipt. This proposal is then forwarded to the Board of Approval (BOA) by the state government. The BOA consists of 19 members (including nominated representative members of state governments). Each zone (North, East, West and South zones) has their own committees to approve investment proposals forwarded by the respective state governments in their zones.

To further enhance export promotion, EOU scheme was initiated by the central government. An EOU can be set up with both local and/or foreign firm to manufacture good and render services with an aim to achieve net positive foreign exchange with five years of their establishment. The EOU units need to get the approval of respective SEZ development commissioner (who can also be a state government or an agency of a state government or a private entity approved by the central government). With two weeks of submitting the proposal, a letter of permission to start the EOU is delivered. It is noteworthy that prior to submitting the application to the SEZ development commissioner, the entrepreneur must get approvals from various state government agencies such as state electricity board, state water board, registration under state sales tax Act, state pollution control board and so on. Thus, a SEZ includes both SEZ units and EOU units producing goods and services mostly with the intention to provide export services.

Withdrawal of controls exercised by central government in approving investments in Special Economic Zones (SEZs) and Export Oriented Units (EOUs) has unleashed fierce competition among states to attract investments which generate jobs and boost the state's economy. Ahluwalia (2000) argues that post economic reforms period saw a marked decline in public investments in states which coincided with rapid increase in private investments. This led states which already possessed locational advantages such as huge markets, better infrastructural facilities, skilled labor force, and presence of large investor base in comparison to less well-endowed states started to attract more investments and benefit thereby (Kohli 2006, Ahluwalia 2000). This in turn put more pressure on less developed states and all states for that matter to increase their competitiveness in order to compete for investments. Secondly, Vadlamannati (2011) argues that post 1991 economic reforms, the political discourse in the country seems to be changing from caste (ethnicity) centric to development oriented discussion during the run-up towards elections. The state level politics have been dominated by state specific issues rather than national issues which put economic development of respective states in focus in front of potential electorate. Along with good governance, attracting investments and job creation became a key priority for many states governments in the post reforms period (Markusen and Nesse 2006). Moreover, the traditional economic growth theory predicts the importance of investments in attaining higher economic growth rates (Barro and Sala-i-Martin 2004). In fact stylized-theory in terms of the rewards of competing for investments such as 'Heckscher-Ohlin--Samuelson theory', 'Ricardo-Viner model' and 'ideology and inequality thesis' proposed by Dutta and Mitra (2006) suggest that workers and farmers in poor countries will gain from the process of liberalization whereas capital and domestic rent-seeking forces could lose. Since developing countries like India are labor rich and capital poor, their openness to investments is

expected to benefit the vast labor force, while hurting the domestic rent seeking capitalists⁷. Thus, workers and consumers could gain when goods become cheaper and access to better quality goods increases. In addition, attracting investments into the state provide significant benefits for the labor as new investments, particularly FDI, creates quality jobs that are associated with high wages and better working conditions than existing local firms. As large sections of middle class stand to gain, the median electorate will prefer those governments which support capital importation (Tondon 2012, Jakobsen and de Soysa 2006, Bhagwati 1999). Thus, state governments are forced to compete against each other for attracting investments which would not only generate jobs and boost their economies but also form huge political capital for the incumbent politicians.

Although the competition among states to attract investments may be mutually beneficial for both the state governments and the potential private and/or foreign investors, the overall welfare effects associated with such fierce competition is questionable given its potential redistributive consequences. Over the years, sceptics of liberalization have expressed many concerns over the impact of race among states to attract investments into SEZs. Many of them centre on the possibility of a race to the bottom in which state governments seek to attract investment proposals into SEZs and EOUs by removing policies that are viewed as unattractive to firms which can have serious potentially socially undesirable consequences. This worry has primarily been expressed in the arenas of land acquisition policies, environmental regulations, and labour standards. Several such examples have come to light in the recent years where the state government or one of the state government agencies have been caught flouting the rules and

⁷ See Kochanek (1996) for a detailed discussion on how some of the local Indian industrialists came together to form 'Bombay Club' to oppose the proposed economic reforms to open the Indian industry to external world.

regulations while approving investments into SEZs. We describe illustrative cases in some states to document these dynamics in detail in next section.

2.1. Illustrative Cases

Before empirically evaluating the hypotheses, we describe illustrative cases in some states to document the dynamics of inter-state competition to attract SEZ and EOU investment proposals and potential side-effects of such fierce competition in detail. Citizens Report Card on Special Economic Zones: CRC-SEZ (2010) argues that a high rate of approvals and establishment of SEZs in other states puts the state government *i* under pressure to approve investment proposals thus paying scant attention to the environmental and social effects. At the heart of the problem is three core issues namely, land acquisition, environmental regulations and labor standards, among others which are a direct result of undue competition among states to attract SEZ investments in particular.

The SEZs in India can be established anywhere, requiring the developers to procure land from property owners or from open market. However, due to complex nature of land dealings, uneven infrastructure development within states, and requirement of project site near to urban area made SEZ developers difficult to acquire large areas of land on their own. Therefore, the state in which SEZ is proposed to be set-up started to act as a facilitator for acquiring land on their behalf. In India, the Land Acquisition Act of 1894 is the legal basis for acquiring lands for the purpose of industrial and infrastructural development. Accordingly, the Land Acquisition Act of 1894 allows the government to acquire land for ‘public purposes’, while ambiguously defining the meaning of ‘public purpose.’⁸ This ambiguity allowed the successive governments to draw their own conclusions about the purpose for which land can be acquired by the state. With the

⁸ Subsequently, the Parliament of India passed two Land Acquisition (Amendment) Acts in 1962 and 1984 allowing state governments to acquire land for private firms for a public purpose and sale of land to private entities. Both amendments again failed to provide clarity on what ‘public purpose’ was meant to be.

intention to attract SEZs into the state at any cost, the ways and means adopted by the state governments to acquire the land proposed by SEZ developer led to bloody confrontation with the locals. For instance, in 2006, farmers' organizations resisted the development of Reliance Industries' SEZ in Raigad village in the state of Maharashtra against the proposed acquisition of farm land which is the mainstay of livelihood for the local farmers. As the agitation became violent and wide-spread, it attracted the support of various opposition political parties, farmer associations and other trade unions eventually halting the land acquisition process. Likewise, Videocon promoted SEZ at Aurangabad and Wagholi villages in Pune district, requiring over 2500 and 1000 hectares of land, Mahindra and Mahindra's SEZ at Karle in Pune district on roughly 10000 hectares and Bharat Forge's SEZ at Rajgurunagar village in Pune district requiring about 1000 hectares of land were postponed by the state government of Maharashtra in the wake of protests by various farmers and labour associations against unfair land compensation proposals (Gadgil 2007). Another dreadful instance being the 2008 SEZ in Kakinada district of Andhra Pradesh in which government bureaucrats deploying about 1000 policemen were involved in forceful eviction of farmers who were still in possession of the lands from the 8000 hectares land which was meant for acquisition by the government of Andhra Pradesh. Farmers and local community were unhappy about the proposed compensation and resisted against police forcing the officials and police to erect fences around the acquired land. Six months later, a division bench of the Andhra Pradesh High Court directed the state government not to take possession of lands forcibly except in accordance with law (Center for Education and Documentation 2009). In November 2006, farmers from the Jamnagar district in the state of Gujarat filed petition in the High Court of Gujarat and the Supreme Court of India against the Reliance Infrastructure SEZ to be set-up on 10000 hectares of agriculture land. The farmers

accuse the government of not only violating the Land Acquisition Act of 1894, but also acting against the public interest.

Similar such agitations were observed in other proposed SEZs across India, namely in Navi Mumbai in Maharashtra state in 2006, outskirts of Bangalore city in the state of Karnataka in 2007, in the state of Delhi in 2007, Gurgaon city in Haryana state in 2007, Jhajjar city in the state of Haryana in 2008, in the state of Pondicherry in 2008, in Dadri near Ghaziabad district in Uttar Pradesh state in 2009, in Ranihati area of Howrah district in West Bengal state in 2010, by various farmers and local community fearing unfair land acquisitions and loss of livelihood. Two agitations, in Orissa and West Bengal, against the development of SEZs are noteworthy. The agitation by local tribal villagers against the displacement policy and forceful land acquisition by state government of Orissa for South Korean firm POSCO in Kalinganagar district in Orissa turned violent resulting in police firing which led to loss of 13 lives in the village of Ambagodia. The movement resisting the proposed SEZ in Nandigram, in West Bengal state attracted lot of national and international media attention. Local farmers agitated against forcefully displacement by the state government, while the compensation for land acquisition was way below the market price. Mismanagement of the crisis by the local authorities led to clashes between the local farmers associations, village community, other political fronts on one hand and the state police and paramilitary forces on the other resulting in over 15 people being killed and wounded 70. Ironically, the Left front (led by Communist Party of India-Marxist) which actively supported the resistance movements against SEZs across the country pursued an aggressive policy of industrial investment promotion while in power in West Bengal state. The vociferous opposition to developing SEZs resulted in the formation of an All India Committee against SEZs and Forcible Acquisition of Land in 2008. The Committee, consisting of NGOs, social activists and some

trade unions, was formed with the intention to coordinate various anti-SEZ movements across the country.

In addition to problems confronting land acquisition, the approvals and establishment of SEZs are also said to have serious environmental implications in and around the area of project sites. Numerous case studies have shown how development of SEZs plug the ground water out and affect the surrounding environment, especially the high-yield crops, through soil, water and air pollution. In a field survey conducted in Polepally SEZ in the state of Andhra Pradesh, Rawat, Bhushan and Surepally (2011) find that pollution from SEZ is a major issue concerning inhabitants living in the vicinity of SEZ. Households are forced to consume mineral water due to high water pollution after the establishment of SEZ. The survey finds that even drinking water through hand pumps is contaminated by toxic minerals. Number of livestock deaths has been registered due to apparent water pollution widely attributed to the construction of the SEZ. In addition, the survey finds that a total of 1585 trees were cut in the course of SEZ construction. Similarly, Pande (2007) finds that water bodies taken over by the China Mambattu SEZ in Nellore district of Andhra Pradesh is being polluted resulting in loss of fishing activity which is a vital livelihood option for the tribal villagers. Similar such environmental adverse effects have been reported in Falta SEZ which is 55 kilometres from Kolkata city in West Bengal state. Ray (2009) reports that the toxic waste and water and air pollution from the firms located in the SEZ is causing tremendous damage to the surrounding villages' environment and the livelihoods of people. In Nainan village for instance, the periodic release of a red acidic effluent into the canals has resulted in gradual intoxication of groundwater killing fishing activity which is a major source of income for the villagers (Ray 2009). In addition, Ray (2009) notes that the land

acquisition for Falta SEZ resulted in decline in agriculture production and massive groundwater depletion.

Many argue that the environmental hazards from SEZs is a direct result of undue competition among states to attract and approve SEZs often by relaxing environmental standards or overlooking emission control regulations in order to reduce costs and lower profits associated with such regulations (Jenkins 2007, CRC-SEZ 2010). Variations in environmental clearance procedures across different states due to competition allow SEZs to bypass certain environmental norms and environmental impact assessments. In fact, SEZ and EOU units are exempted from environmental impact analysis as per the Environment Protection Act and can obtain the no objection letter required from the state Pollution Control Board (PCB) directly from the SEZ development commissioner (Bhatta 2007). For instance, the Directorate of Industrial Safety and Health (DISH) is not allowed for inspection in SEZs without the permission of the development commissioner in Maharashtra (CRC-SEZ 2010). The SEZs are also exempted from the mandatory environment clearance public hearings normally associated with big ticket investment proposals. Mundra SEZ in the state of Gujarat is often cited as an example where the Ministry of Environment exempted the SEZ from public hearing (CRC-SEZ 2010). Although the SEZ and EOU units are required to submit pollution standards compliance report, they are usually allowed to follow their own prescribed environmental standards (Bhatta 2007). Race to attract investments into SEZs also resulted in lapses in policy legislation of SEZs. The report presented by Comptroller Auditor General of India (CAG) in 2008 to Parliament of India covering 370 SEZ units highlights several such instances. Citing the case of 2002 SEZ Act of Gujarat, CAG report is critical about the state legislation granting powers to SEZ developers to develop and distribute water supply to SEZs. Illustrating the case of Mundra SEZ, the CAG report criticized

the SEZ policy of diverting water meant for severe drought prone areas from Sardar Sarovar dam (CAG 2008, p.142).

Other contentious issue is the labor standards. Davies and Vadlamannati (2011) find that the labour standards in one country are positively correlated with the labour standards elsewhere, suggesting a race to the bottom as nations compete for investment. Extending the same analogy to SEZs within India, labor rights are found to be an unimportant while approving SEZs. It is argued that development commissioner can declare a SEZ and EOU as ‘public utility’ under the Industrial Disputes Act 1948 which prohibits basic labor rights as prescribed by International Labor Organization (ILO) such as right to form union, right to strike and right to collective bargaining of wages, among others (Kumar 2007). For instance, SEZs in Andhra Pradesh offered concessions in minimum wages for 365 days work. Similar such story is reported from Madras SEZ in Tamil Nadu state (Suchitra 2005)⁹. Likewise, workers in Noida SEZ have been laid off while demanding the implementation of labor laws (CRC-SEZ 2010). Other potential effects of incentive competition are loss of tax revenue. There is a huge tax competition literature focusing on developed and developing countries find that tax competition is intense among countries to attract investments (see: Klemm and van Parys 2009, Devereux, Lockwood, and Redoano 2008, Davies and Voget 2008, Overesche and Rinke 2008, Wilson 2006). There is large anecdotal evidence in India that SEZ and EOU investment tax incentives have become increasingly common and increasingly large especially post SEZ Act 2005. The CAG, in its various reports, cites data showing how such exemptions are leading to loss for exchequer. For instance, the 2005 CAG audit report on Madhya Pradesh state find that Madhya Pradesh State Industrial Development Corporation (MPSID) allotted land for Indore SEZ for cheaper prices resulting in

⁹ For a detailed study on how labor is repressed and abused in some of the SEZs in India, see 2005 Appan Menon Memorial Award winning study, ‘Socio-economic Impact of the Proliferation of SEZs in India’ by Suchitra (2005).

loss of revenues to exchequer worth Rs. 22.58 crore (CAG audit report 2005). Likewise, the 2008 CAG audit report on Goa finds that the land allotted to seven SEZs by Goa Industrial Development Corporation (GIDC) for low prices led to a revenue loss of Rs. 102.64 crores (CAG audit report 2008). The CRC-SEZ (2010) finds that granting tax breaks under Value Added Tax and other exemptions like allotting land for throwaway price and weaving stamp duty, worth Rs 645.4 crore for Nokia Telecom SEZ resulted in a loss of Rs. 640 crore and Rs. 7.4 crore for the exchequer of Tamil Nadu state government and State Industrial Promotion Corporation of Tamil Nadu (SIPT). Furthermore, the Ministry of Finance report (2010) reveals a cumulative revenue loss of Rs. 175,487 crore from various tax holidays provided by different states in India to attract SEZ and EOU investments during the period 2004–2009, which constitutes about 7% of total central government revenue (MoF report 2010). In line with Zodrow and Mieszkowsky (1986), many in India argue that such fierce competition among states is proving to be inefficient and that the loss in revenue can compensate the lower government spending on provision of basic public goods such as education and health in a country with 37% of population living below US\$ 1.25 a day (CRC-SEZ 2010)¹⁰.

3. Data and Methods

The data we use is a panel data set across 30 Indian states during the period 1998–2009.

The estimation specification used in the analysis is as under:

3.1 Model Specification

¹⁰ The impact of SEZs is also felt on other areas such as livelihood of women and minorities which has been highlighted by the Indian Community Welfare Organization (ICWO). According to ICWO report, large numbers of Scheduled Caste and Scheduled Tribe families have been displaced due to development of SEZ in 2002 in the state of Tamil Nadu (All India Christian Council Press 2010). Furthermore, development of State Industries Promotion Corporation of Tamil Nadu (SIPCOT) SEZ in Thervoykandigai and Surapoondi villages in Tamil Nadu resulted in loss of livelihood of the landless agricultural laborers without any compensation after acquiring land worth 971 and 506 hectares respectively (All India Christian Council Press 2010).

The baseline specification estimates the investment proposals in SEZs and EOUs coming into state i in year t is a function of a set of exogenous variables Z_{it} :

$$IP^{SEZs+EOUs}_{it} = \phi_i + \beta Z_{it} + \omega_{it} \quad (1)$$

Where, ϕ_i is the state-specific dummy and ω_{it} is the error term. The control variables are drawn from the existing FDI literature and are described below. To this baseline specification, we introduce the SEZ and EOU investment proposals approved in other states in year t , a variable known in the literature as the spatial lag. Specifically, I estimate:

$$IP^{SEZs+EOUs}_{it} = \phi_i + \rho \sum_{j \neq i} \varpi_{jit} IP^{SEZs+EOUs}_{jt} + \beta Z_{it} + \omega_{it} \quad (2)$$

Where, $\sum_{j \neq i} \varpi_{jit} IP^{SEZs+EOUs}_{jt}$ is the spatial lag, i.e. the weighted average of SEZ and EOU

investment proposals approved in other states. For weights, following Davies and Vadlamannati

(2011), Vadlamannati (2011), we utilize $\varpi_{jit} = \frac{SGDP_{jt}}{\sum_{k \neq i} SGDP_{kt}}$. That is, the share that state i gives to

state j is equivalent to j 's share of the total GDP across states in India not including state i .¹¹ It is however noteworthy that the sum of the weights across the other states for state i observation will equal 1. This weighting scheme implicitly assumes that large states get higher weights. The rationale for using state-GDP as the weight is two-fold. First, one might anticipate that state i pay more attention to what is taking place in larger states rather than small ones. Second, when the goal of streamlining investment approval mechanism (investment policy) is to attract investments, this will depend on the elasticity of investments to a given state's approval mechanism. Thus, if state j (Maharashtra, which attracts large number of SEZ and EOU

¹¹ It is normal to "row standardize" the weights so that the sum of the weights adds up to one (see Plümer and Neumayer 2010).

proposals, see figure 1, and its GDP share in India's total GDP is about 16%) is already attractive to SEZ investments relative to state k , then investment proposal approvals in j 's (Maharashtra's) has a larger impact on the approval of investment proposals in state i than a comparable change in k . This in turn would make state i (Orissa) more responsive to j 's (Maharashtra's) investment policies than to that of k 's. This is precisely the difference that equation (2) captures by assigning greater weight to state j . In addition to that, FDI literature also shows that FDI is attracted to larger countries (see Blonigen 2005), this would imply a greater sensitivity on the part of state i to the investment policies of a large state in India. This apart, several papers in race to the bottom or cross-country competition literature have used GDP as a weight (Devereux, Lockwood, and Redoano, 2008, Madariaga and Poncet 2007, Pitlik 2007). Alternatively, we also make use of

industrialization of states using the following weighting scheme: $\omega_{ijt} = \frac{Industry_{jt}}{\sum_{k \neq i} Industry_{kt}}$ which is the share of industry's output in a state's total GDP reflecting how industrialized a state is. With this alternative weight, we expect that state i pays more attention to the changes taking place in investment policies of the industrial states rather than the less industrial states.

We include state fixed effects to control for unobserved state specific heterogeneity in the panel dataset and ω_{it} is the error term. We also include time trend to capture for the regulatory and other reforms measures taking place in each state. Time trend also captures factors which are not accounted in the models such as efficient gains through technological advancements or enhanced management skills which grow over time and can have positive correlation with investment proposals. As the dependent variable here is count of investment proposals in SEZs and EOUs, the preferred estimates are those from maximum likelihood zero-inflated negative binomial regressions method (Brandt et al. 2000 and King 1988) with heteroskedasticity

consistent robust standard errors (Beck and Katz 1995). It is noteworthy that our dependent count variable not only exhibits distribution that is strongly skewed to the right (with an accumulation of observations at zero) and display significant over dispersion (with the variance being greater than the mean, see descriptive statistics in Appendix 2), but also has excess zeros (zeros represent about 42% of our count data). Therefore, zero-inflated negative binomial is used which models excess zeros in addition to allowing for over dispersion (Lambert 1992, Greene 1994).

3.2 Data

We use annual data for 30 Indian states from 1998 to 2009. The list of states is in the appendix 1. For the dependent variable, we use the total number of investment proposals in SEZs and EOUs approved by state government i in financial year t . The state-wide and year-wise approvals data is obtained from the statistics book of Secretariat of Industrial Assistance (SIA hereafter), Department of Industrial Policy and Promotion (DIPP), Government of India. These data are published every month in aggregate form by each state in SIA's various monthly and annual statistical reports, Ministry of Commerce and Industry, New Delhi. As highlighted earlier, the SEZ and EOU proposals are approved by the state government which are then forwarded to Board of Approvals to the respective zones in which a particular state belongs. The Board of Approvals comprising of 19 members including representatives for that particular state government would sanction the final approval. It is noteworthy that as a first step, the proposal must be forwarded by the SEZ developer for the approval of state government. However, if the SEZ developer is state government itself, then the proposal is directly forwarded to the Board of Approvals. Figure 1 captures the details about the total SEZ and EOU investment proposals approved by each state during the period 1998–2009. As seen, Maharashtra, Andhra Pradesh,

Karnataka, Tamil Nadu and Gujarat are in forefront in approving investment proposals in SEZs and EOUs, while most of the Northeastern states lag behind. On an average roughly 13 SEZ and EOU proposals are approved per state during 1998–2009 with a deviation from mean of about 28 investment proposals.

The vector of control variables include other potential determinants attracting investment proposals in SEZs and EOUs in state i during year t which we obtain from the extant literature on FDI. We follow other studies on determinants of FDI: Blonigen et al. (2007), Blonigen (2003), Blonigen and Figlio (1998), Wheeler and Moody (1992), Coughlin et al. (1991) and other comprehensive evaluations of these early studies on FDI (Chakrabarti 2001). Dunning (1993) proposed that the location factor is the key to attract foreign investments into the country. We believe this would also be similar in the case of SEZs and EOUs. Some of the location specific factors include: market growth, economic development, institutions, infrastructure, availability of natural resources and government policies. Accordingly, our models control for the effects of income levels by including respective state per-capita GDP (logged) in Indian rupees 1993-94 constant prices obtained from the Reserve Bank of India's dataset, Mumbai (Nunnenkamp and Spatz 2002). Good infrastructure facilities increases productivity of investments and help attract more investments (Wheeler and Mody 1992, Asiedu and Lien 2004). Since there are various factors which contribute to the infrastructure development like roads, ports, telecommunications, power, railways and so on, it becomes quite difficult to capture the data for all these variables for any given state due to lack of data availability. We thus include relative electricity consumption state i in year t in kilowatts to all other states, thus capturing the relative infrastructural advantage a state has over other states. The main reason to consider this variable is that it captures not only the availability of the electricity but also the cost of the electricity. Likewise,

we also include a proxy for industrialization by including industry share in state's GDP as industrialized states tend to attract big ticket industrial investment projects. We also include a dummy coding the value 1 if a state has new industrial policy in place and 0 otherwise. The information on the new industrial policy is from DIPP website on states' industrial policies. Likewise, we also include another dummy capturing the presence of SEZ policy in a state for which the information was obtained from the website of SEZ, Ministry of Commerce and Industry, Government of India. Finally, following Basely and Burgess (2000), we also capture the count of years for Indian National Congress (INC hereafter) which is center-left in its ideology, Bharatiya Janata Party (BJP henceforth) - center-right, Left Front led by Communist Party of India-Marxist (CPI-M) – leftists, and regional parties which are considered as soft left, in power in state i in year t to control for the 'ideology hypothesis' discussed by Dutta and Mitra (2006). Accordingly, we expect that number of years the parties with center left ideology in power in a state to have a positive impact on number of investment proposals approved. More details on the definition and data sources are provided in appendix 3.

3.3 Endogeneity concerns

The problem with the spatial lag is that it is endogenous because if investment policy in state i depend on that in state j then the vice versa is also true. In order to address these endogeneity concerns, we utilize non-linear instrumental variable estimations. Following standard spatial econometric procedure, for the instruments we use $\sum_{j \neq i} \omega_{jit} Z_{jt}$ that is, the weighted average of the other states' economic variables namely, state per capita GDP (log), industry share of state GDP, state's industrial policy, SEZ policy, relative infrastructure and political variables. The intuition behind using these variables is twofold. First, economic and political factors are found to be very important in attracting investments into states. Second, for a

given state j , its economic exogenous variables directly impact its investment policies but are not dependent on those in state i . Therefore they are the suitable instruments as they are correlated with the endogenous variable but are themselves exogenous.

Employing two-stage instrumental variable estimations (2SLS–IV) for non-linear models such as zero-inflated negative binomial may be problematic and difficult to estimate directly. Therefore, we manually program instrumental variable regressions for zero-inflated negative binomial models. We first regress our endogenous variable – spatial lag (of SEZ and EOU approvals) – on the selected instrumental variables by using the pooled OLS models (which are the first stage regressions). We then predict the values of the endogenous variable and regress our dependent variable – SEZ and EOU investment proposals approved – using zero-inflated negative binomial estimations respectively (the second stage regressions). However, to check the validity of the instruments, the 2SLS–IV estimations with state fixed effects is employed.

The validity of the selected instruments depends on two conditions. First, instrument relevance, they must be correlated with the explanatory variable in question – otherwise they have no power. Connected to this, Bound, Jaeger and Baker (1995) suggest examining the F-statistic on the excluded instruments in the first-stage regression. The selected instrument would be relevant when the first stage regression model's F-statistic is above 10 (Staiger and Stock 1997). Second, the selected instrument variable should not vary systematically with the disturbance term in the second stage equation, i.e. $[\omega_{it} | IV_{it}] = 0$. Meaning, the instruments cannot have independent effects on the dependent variable. As for the exclusion restriction, it might not be possible be that the exogenous variables of state j directly impact the approval of investment proposals in state i . Nevertheless, F-statistic and Hansen J-test is employed (using

2SLS-IV) to check whether the selected instruments satisfy the relevance and exclusion criterion (results provided at the end of all the tables reporting regression estimations).

4. Empirical Results

4.1 Baseline Results

The table 1 presents the baseline results estimated using zero-inflated negative binomial regression estimations and table 2 focuses exclusively on instrumental variables estimations. Note that results in all the tables reports marginal effects at the mean of explanatory variables¹². The summary of data statistics are presented in appendix 2. Beginning with column 1 in table 1, which forms our preferred specification, as can be seen, we find a positive and significant spatial lag which is significantly different from zero at 1% level. In column 2, we drop the special category states and still find that the spatial lag term remains significantly different from zero at 1% level. However, it is noteworthy that the marginal effects in column 2 (where special category states are dropped) are higher compared to full sample estimations reported in column 1. This provides some preliminary evidence that the race to compete for SEZ and EOU investments is fierce among industrial states or higher income states. To interpret the marginal effects, a standard deviation increase in the investment proposal approvals of all other states would increase the approval of investment proposals in state i by roughly 0.11 (and by three proposals in industrial states in column 2). In the next two columns, the positive significant effects of spatial lag term remains robust when we include the lagged dependent variable (see column 3 and 4 in table 1). Again, the marginal effects reported for non-special category states in column 4 are higher compared to the full sample estimated in column 3.

In column 5 and 6, we replace the current weighting scheme (of state-GDP) with industry output share in state-GDP, a proxy for industrialization in states. We find in both columns that

¹² We use Stata 11.0's margins command to calculate marginal effects.

our spatial lag term weighted by industry share in state-GDP is positive and significantly different from zero at 1% level. The marginal effects once again show that they are much higher for non-special category states estimated in column 6 compared to that of full sample in column 5. Holding other covariates at their mean, a standard deviation increase in spatial lag is associated with roughly 0.25 proposals approved per state in full sample in column 5 (and almost seven proposals approved among industrial states in column 6). Likewise, when we include the lagged dependent variable, the spatial lag retains its positive sign and remains significantly different from zero at 1% levels in column 7 and 8 (see table 1). Since the spatial lag term is positive both samples and to the alternative weights, this can be interpreted as evidence of strategic complementarity. While strategic complements can theoretically result in a race to the bottom or the top, since the anecdotal evidence suggest huge costs associated with such competition, we interpret the results as evidence of a race to the bottom in attracting SEZ and EOU investments.

Before moving further, we focus on the extent of control variables reported in table 1. As expected, we find that income levels of the state, relative infrastructural facilities, states that have clear cur industrial policy framework and states ruled by INC party and allies tend to have more SEZ and EOU investment proposals approved. After controlling for state-specific fixed effects, however, other controls remain statistically insignificant. These results on controls remain mostly robust when estimating the models using IV estimations in table 2.

In table 2, we report the results based on zero-inflated negative binomial IV models. As seen from the first two columns in table 2, the positive significant effects of spatial lag term remains robust in the IV models (see column 1 and 2 in table 2). Note that in column 2, we included the lagged dependent variable and the spatial lag results still hold. The substantive

effects suggest that a standard deviation increase in spatial lag in IV models is associated with increase in SEZ and EOU investment proposals approved in state i by roughly 0.11 proposals. In column 3 and 4, we include the spatial lag with albeit with alternative weight, which is industrial share in state-GDP. We find the positive significant effects remain significantly different from zero at 1% level in both columns (see table 2). A one standard deviation increase in spatial lag is associated with roughly 0.36 investment proposal approvals in state i . As highlighted earlier, to examine the validity of the instruments, we estimate 2SLS-IV models that report the statistics which explore the strength of the instruments. As seen, the first-stage F-test, and Anderson canon LR statistics report the test statistic used to test the null hypothesis that the parameter estimate for the instrument in the first stage regression is equal to zero. Based on Staiger and Stock (1997) we treat F-statistics greater than 10 as being sufficiently strong. In table 2, we find in all the columns below, the F-statistics is always greater than 10 which is significantly different from zero at 1% level. Finally, the Hansen J-Statistic also shows that the null-hypothesis of exogeneity cannot be rejected at the conventional level of significance.

4.2 Checks on Robustness

We examine the robustness of our main findings in the following ways. First, we use an alternative weighting approach with distance from each state instead of state-GDP and industrial share in GDP under the presumption that a state closer to those states with higher approvals of SEZ and EOU investments are well placed to approve more proposals. We use the distance in kilometres from state i as the weighting scheme so that the distant states get smaller weights.

Hence, we use inverse distance, not distance, with weighting as follows: $\omega_{i,j,t} = \frac{1}{\sum_{k \neq i} \frac{1}{dist_{i,k,t}}}$. The

base line results basically remain unchanged although the magnitude of the results does vary

marginally. We still find that the approval of investment proposals in SEZs and EOUs in one state are positively correlated with approval of SEZs and EOUs investment proposals elsewhere weighted by distance. Second, in line with the argument of Kohli (2006), Alhuwalia (2000), Kanta (2011) that states which already possessed locational advantages prior to 1991 economic reforms period, such as huge markets, better infrastructural facilities, skilled labor force, and presence of large investor base in comparison to less well-endowed states benefited more in terms of attracting more private and foreign investments. We drop those states from the sample which are identified by Kohli (2006) as laggard states (including Northeastern states, which are remotely connected to Indian main land and are often recognized as special category states) and re-estimate the baseline models. We find that after dropping both Northeastern states recognized as special category states and the laggard states from the sample, the spatial lag retains positive sign and the marginal effect becomes even stronger. This finding lends support to the argument that competition is fiercer among those states which already enjoy prior locational advantages. Third, we estimate our zero-inflated IV models estimated manually with new IV-Poisson estimator which implements Generalized Method of Moments (GMM) estimator of Poisson regression. The key endogenous variables in IV-Poisson estimator are instrumented by selected excluded instruments. Note that the standard errors are bootstrapped with 100 replications. The results estimated using IV-poisson method shows the spatial lag is consistently positive and significantly different from zero at 1% level across both full sample and in a sample of non-special category states. The results of all of the robustness checks are not reported because of space considerations, but are available upon request. Alternatively, they can also be replicable using our STATA data and do files. Given the robust evidence on, we can safely accept the hypothesis of a strong inter-state competition to attract SEZ and EOU investment proposals.

Whether this intense competition has any socially undesirable consequences, as highlighted by anecdotal evidence in section 2.1, is a question worth probing.

5. Conclusion

This aim of this paper is to examine if states within India compete to attract investment proposals in SEZs and EOUs. We make use of the annual data on SEZ and EOU investment proposals approved in each state, as well as other key variables determining SEZ and EOU investment proposals, and utilize spatial econometrics approach to estimate the extent of interdependence among states within India. Using zero-inflated negative binomial regression estimates in a panel data spanning the period 1998–2010, we find a robustly positive and significant spatial lag which is consistent with strategic complements in SEZ investment proposals approvals. Our findings though do not imply that such competition prevails across all states in India. We find that such fierce competition is concentrated only among industrial states. These results remain robust to alternative weighting scheme, estimation techniques, sample size and controlling for possible endogeneity concerns.

Since SEZ and EOU investment proposals increased across states and over time, we interpret this as competition among states for private and foreign investments. However, the moot question remains as to whether the race among states to attract investments into SEZs and EOUs is good or potentially harmful? Vadlamannati (2011) argues that this sort of competition is largely driven by the desire of the state governments to not only generate job opportunities for the existing pool of labor and unemployed in their respective states but also to increase the incumbent's chances for re-election. The competition might also generate desired results especially in addressing problems associated with excessive bureaucratic controls, improving property rights protection, controlling corruption, creating quality institutions, strengthening

state-business relations and improvising investment friendly atmosphere in the states (Aghion, Burgess, Redding and Zilibotti 2008). But, concerns remain over the welfare effects associated with such fierce competition given its potential redistributive consequences. Apart from the notable side-effects of such race, it is also argued that only richer states benefit from such competition (Schneider 2004) – a point also supported by our empirical evidence. While some states might stand to gain from such competition, other states may well lose their potential tax base and even jobs to other states. Moreover, given all the incentives, the investment proposals will not contribute to overall development of the state if the proposals are not realized. Given the costs associated with competition for SEZ and EOU investments in India outweigh benefits we consider this as an evidence of race to the bottom.

Table 1: Baseline Results with Zero-Inflated Negative Binomial estimations

Dependent variable: Investment proposals approvals in SEZs and EOUs

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Full sample	Without special category states	Full sample	Without special category states	Full sample	Without special category states	Full sample	Without special category states
<i>Weighting scheme</i>	State GDP	State GDP	State GDP	State GDP	Industry share in GDP	Industry share in GDP	Industry share in GDP	Industry share in GDP
Lagged Dependent Variable			0.000 (0.72)	0.006 (0.81)			0.000 (0.43)	0.002 (0.32)
Spatial Lag	0.004*** (5.58)	0.117*** (5.93)	0.003*** (4.40)	0.087*** (4.55)	0.007*** (5.99)	0.253*** (6.40)	0.005*** (5.01)	0.211*** (5.39)
State Per-capita GDP (log)	0.168*** (2.76)	5.677*** (3.13)	0.050 (0.80)	1.080 (0.51)	0.116** (2.53)	4.926*** (2.88)	0.045 (0.86)	2.419 (1.20)
Industry Share in GDP	0.001 (0.39)	0.028 (0.37)	-0.001 (0.36)	-0.033 (0.50)	0.001 (0.57)	0.040 (0.55)	-0.000 (0.24)	-0.014 (0.20)
Relative Infrastructure	1.754 (1.38)	51.742 (1.33)	2.470** (2.08)	94.903** (2.36)	1.694* (1.73)	62.825* (1.67)	2.518** (2.42)	95.347** (2.33)
SEZ Policy Dummy	-0.024 (1.20)	-0.653 (1.04)	-0.019 (1.00)	-0.628 (1.07)	-0.023 (1.47)	-0.795 (1.31)	-0.019 (1.18)	-0.667 (1.04)
Industrial Policy Dummy	0.037** (2.37)	1.241*** (2.59)	0.037*** (2.81)	1.550*** (3.96)	0.028** (2.34)	1.160** (2.54)	0.030*** (2.63)	1.221*** (2.78)
INC ruling years	0.008** (2.56)	0.275*** (2.83)	0.007*** (2.64)	0.280*** (3.17)	0.006*** (2.64)	0.268*** (2.87)	0.006*** (2.72)	0.269*** (2.94)
BJP ruling years	0.001 (0.44)	0.054 (0.57)	0.002 (0.98)	0.074 (0.96)	0.001 (0.42)	0.046 (0.52)	0.002 (0.94)	0.086 (1.15)
Left Front ruling years	0.011** (2.23)	0.364** (2.38)	0.013** (2.31)	0.337* (1.68)	0.010*** (2.73)	0.414*** (2.85)	0.013*** (2.81)	0.509*** (2.92)
Regional Parties ruling years	0.002 (0.81)	0.032 (0.47)	0.001 (0.31)	-0.020 (0.33)	0.001 (0.87)	0.035 (0.55)	0.001 (0.38)	0.001 (0.03)
Time Trend	-0.007	-0.262*	0.004	0.142	-0.004	-0.195	0.004	0.054

	(1.48)	(1.96)	(0.80)	(0.77)	(1.09)	(1.56)	(0.86)	(0.32)
State Dummies	YES							
Number of States	30	30	30	30	23	23	23	23
Number of Observations	354	258	327	239	354	258	327	239

Notes: (a) Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

(b) Reports average marginal effects of all explanatory variables.

(c) Special Category States include Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland and Tripura.

Table 2: Zero-Inflated Negative Binomial IV Estimations

Dependent variable: Investment proposals approvals in SEZs and EOUs

Variables	(1)	(2)	(3)	(4)
<i>Weighting scheme</i>	State GDP	State GDP	Industry share in GDP	Industry share in GDP
Lagged Dependent Variable		0.000 (1.15)		0.000* (1.68)
Spatial Lag	0.004*** (5.18)	0.003*** (4.88)	0.013*** (6.04)	0.008*** (5.11)
State Per-capita GDP (log)	0.099* (1.80)	-0.088* (1.65)	0.178** (2.50)	-0.011 (0.16)
Industry Share in GDP	0.003 (1.15)	-0.000 (0.02)	-0.001 (0.38)	-0.003 (1.15)
Relative Infrastructure	0.098 (0.08)	2.003* (1.88)	1.918 (1.29)	3.381*** (2.79)
SEZ Policy Dummy	-0.031* (1.68)	-0.033** (2.05)	0.017 (0.73)	0.008 (0.42)
Industrial Policy Dummy	0.042*** (3.11)	0.055*** (5.62)	-0.014 (0.60)	0.012 (0.75)
INC ruling years	0.010*** (3.37)	0.011*** (4.04)	-0.002 (0.57)	0.001 (0.30)
BJP ruling years	0.002 (0.70)	0.003 (1.44)	0.005 (1.26)	0.004* (1.74)
Left Front ruling years	0.012** (2.45)	0.012** (2.21)	0.010 (1.55)	0.007 (0.95)
Regional Parties ruling years	0.002 (0.90)	-0.000 (0.29)	0.001 (0.27)	-0.001 (0.74)
Time Trend	-0.007 (1.53)	0.009* (1.78)	-0.008 (1.53)	0.005 (0.96)
State Dummies	YES	YES	YES	YES
Number of States	30	30	30	30
Number of Observations	354	258	327	239

Notes: (a) Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1**(b)** Reports average marginal effects of all explanatory variables.

Appendix

Appendix 1: States under study

Andhra Pradesh	Jammu & Kashmir	Orissa
Arunachal Pradesh	Jharkhand	Pondicherry
Assam	Karnataka	Punjab
Bihar	Kerala	Rajasthan
Chhattisgarh	Madhya Pradesh	Sikkim
Delhi	Maharashtra	Tamil Nadu
Goa	Manipur	Tripura
Gujarat	Meghalaya	Uttar Pradesh
Haryana	Mizoram	Uttaranchal
Himachal Pradesh	Nagaland	West Bengal

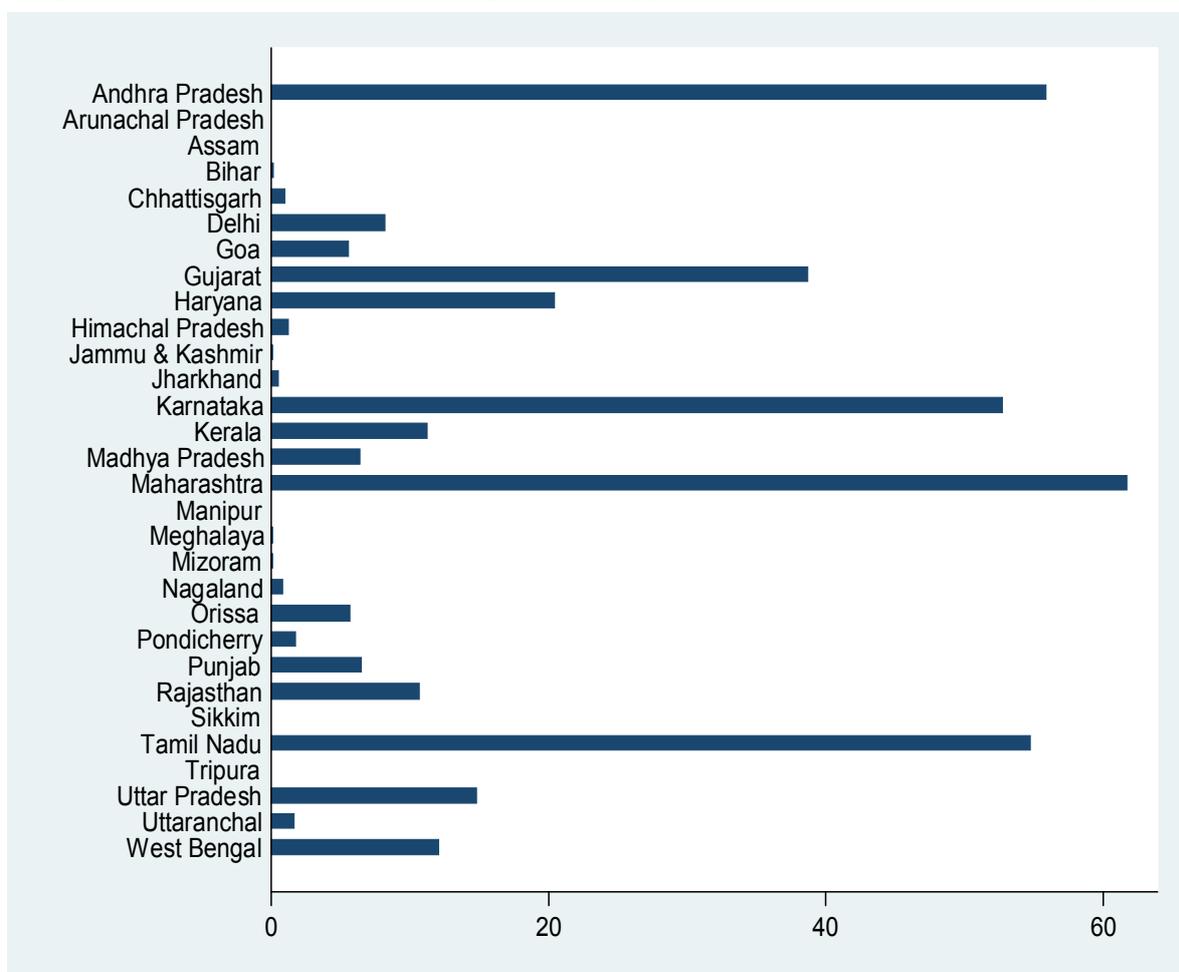
Appendix 2: Descriptive Statistics

Variables	Mean	Standard Deviation	Minimum	Maximum	Observations
SEZs and EOUs approvals	12.49	27.34	0.00	174.00	358
Spatial Lag (GDP weighted)	28.81	23.57	0.19	76.04	358
Spatial Lag (Industry GDP share weighted)	14.21	11.14	0.12	35.92	358
State Per-capita GDP (log)	6.13	0.44	4.90	7.42	387
Industry Share in GDP	19.59	12.76	1.55	67.16	390
Relative Infrastructure	0.03	0.02	0.00	0.12	390
SEZ Policy dummy	0.17	0.38	0.00	1.00	388
Industrial Policy dummy	0.73	0.44	0.00	1.00	388
INC ruling years	2.25	3.19	0.00	12.00	384
BJP ruling years	1.21	2.57	0.00	16.00	384
Left Front ruling years	1.45	5.54	0.00	34.00	384
Regional parties ruling years	4.08	7.18	0.00	32.00	384

Appendix 3: Data definitions and sources

Variables	Definitions and data sources
SEZ & EOU unit approvals	Investment units approved in SEZs and EOUs from each state in a financial year obtained from eouindia and SIA, New Delhi.
GDP (log)	State GDP in 1993-94 constant prices (Indian Rupees) from Reserve Bank of India
Per-capita GDP (log)	State Per-capita GDP in 1993-94 constant prices (Indian Rupees) from Reserve Bank of India, Mumbai
Industry share in GDP	Share of industry in State GDP from Reserve Bank of India, Mumbai
Infrastructure (log)	Electricity Consumption in kwh by state obtained from Indiastat.com
SEZ policy dummy	Dummy coding value 1 if a state has SEZ policy and 0 otherwise. Information obtained from sezindia.org
Industrial policy dummy	Dummy coding value 1 if a state has New Industrial policy and 0 otherwise. Information obtained from SIA, New Delhi.
Political Parties in power	Own construction based on the information published by Election Commission of India
Spatial lag	Own construction as described in section 3.1

Figure 1: SEZ and EOU investment proposals approved in states during 1998–2009 period



References

- Aghion, Philippe, Robin Burgess, Stephen J. Redding and Fabrizio Zilibotti (2008) The Unequal Effects of Liberalization: Evidence from Dismantling the License Raj in India, *American Economic Review*, 98(4), 1397-1412.
- Ahluwalia, M.S. (2000) Economic Performance of States in the Post-Reforms Period, *Economic and Political Weekly*, 1637-1648.
- Asiedu, Elizabeth and Donald Lien (2004) Capital Controls and Foreign Direct Investment, *World Development*, 32(3), 479-490.
- Barro, R., and X Sala-i-Martin (2004) *Economic Growth*, Cambridge, MA: MIT Press.
- Basely, Timothy and Robin Burgess (2000) Land Reform, Poverty Reduction and Growth: Evidence from India, *Quarterly Journal of Economics*, 115(2), 389-430.
- Beck, Nathaniel and Jonathan N. Katz, (1995) What To Do (and Not To Do) with Time-Series Cross-Section Data, *American Political Science Review*, 89(3), 634-647.
- Beron, Kurt J., James C. Murdoch, and Wim P. M. Vijverberg (2003) Why Cooperate? Public Goods, Economic Power, and the Montreal Protocol, *Review of Economics and Statistics*, 85(2), 286-297.
- Bhagwati, Jagdish (2004) *In Defense of Globalization*, Princeton: Princeton University.
- Bhagwati, Jagdish (1999) Globalization: Who Gains, Who Loses?, in: Siebert Horst (ed.), *Globalization and Labor*, Tübingen: Mohr Siebeck.
- Bhatta, Ramachandra (2007) Karnataka: SEZs and the Environment, *Economic and Political Weekly*, 38(20), 17-23.
- Blonigen, Bruce A., Ronald B. Davies, Glen R. Waddell and Helen Naughton (2007) FDI in Space: Spatial Autoregressive Lags in Foreign Direct Investment, *European Economic Review*, 51, 1303-1325.
- Blonigen, Bruce A. (2005) A Review of the Empirical Literature on FDI Determinants, *Atlantic Economic Journal*, 33, 383-403.
- Blonigen, Bruce A., and David N. Figlio (1998) Voting for Protection: Does Direct Foreign Investment Influence Legislator Behavior? *American Economic Review*, 88(4), 1002-14.
- Bound, J., D. Jaeger, and R. Baker (1995) Problems with Instrumental Variables Estimation when the Correlation between the Instruments and the Endogenous Explanatory Variable is Weak, *Journal of the American Statistical Association*, 90, 443-450.

Brandt, Patrick T., John T Williams, Benjamin O. Fordham and Brian Pollins (2000) Dynamic Models for Persistent Event Count Time Series, *American Journal of Political Science*, 44(4), 823-43.

Chakrabarti, Avik (2001) The Determinants of Foreign Direct Investment: Sensitivity Analyses of Cross-Country Regressions, *Kyklos*, 54(1), 89-113.

Cho, Seo-Young, Axel Dreher and Eric Neumayer (2011) The Spread of Anti-Trafficking Policies – Evidence from a New Index, Cege Discussion Paper Series No. 119, Georg-August-University of Goettingen, Germany.

Citizens Report Card on Special Economic Zones: CRC-SEZ (2010) Five Years of SEZ Act: A Citizen Report Card of SEZ, Intellectual Resources: New Delhi.

Comptroller Auditor General (2008) CAG Reports on SEZs, Comptroller Auditor General: New Delhi.

Coughlin, Cletus C., Joseph V. Terza, and Vachira Arromdee (1991) State Characteristics and Location of Foreign Direct Investment within the United States, *Review of Economics and Statistics*, 73(4), 675-83.

Davies, Ronald B. and Krishna Chaitanya Vadlamannati (2011) A Race to the Bottom in Labor Standards? An Empirical Investigation, working paper, University of Heidelberg: Germany.

Davies Ronald B. and Johannes Voget (2008) Tax Competition in an Expanding European Union, Working paper 0830, Oxford University Centre for Business Taxation.

Davies Ronald B. and Helen T. Naughton (2006) Cooperation in Environmental Policy: A Spatial Approach, Working paper 2006-18, University of Oregon.

Davies Ronald B., Hartmut Egger and Peter Egger (2003) Tax Competition for International Producers and the Mode of Foreign Market Entry, Working paper 2006-19, University of Oregon.

Devereux, Michael P., Ben Lockwood and Michela Redoano (2008) Do Countries Compete over Corporate Tax Rates? *Journal of Public Economics*, 92(5-6), 1210-1235.

Dunning H. John (1993) *Multinational Enterprises and the Global Economy*, Wokingham, England: Addison-Wesley.

Dutt, Pushan and Devashish Mitra (2006) Labor versus Capital in Trade Policy: The Role of Ideology and Inequality, *Journal of International Economics*, 69(2), 310-320.

Fredriksson, Per G., and Daniel L. Millimet (2002) Strategic Interaction and the Determination of Environmental Policy across US States, *Journal of Urban Economics*, 51, 101-122.

Gadgil, Makarand (2007) SEZ on the back foot in Maharashtra, accessed from: <http://www.rediff.com/money/2007/nov/21sez1.htm>

Gassebner, Martin, Noel Gaston and Micheal Lamla (2011) The Inverse Domino Effect: Are Economic Reforms Contagious? *International Economic Review*, 52(1) 183-200.

Greene, W. H. (1994) Accounting for Excess Zeros and Sample Selection in Poisson and Negative Binomial Regression Models, Technical report.

Jakobsen, Jo and Indra de Soysa (2006) Do Foreign Investors punish Democracy? Theory and Empirics, 1984-2001, *Kyklos*, 55(3), 383-410.

Jenkins, Rob (2007) The Politics of India's Special Economic Zones, unpublished manuscript, Hunter College: New York.

Kanta, Murali (2011) Economic Liberalization, Electoral Coalitions and Private Investment in India, paper presented in Politics of FDI Conference, Niehaus Center for Globalization and Governance, September 23-24.

King, Gary (1988) Statistical Models for Political Science Event Counts: Bias in Conventional Procedures and Evidence for the Exponential Poisson Regression Model, *American Journal of Political Science*, 32(3), 838-863.

Klemm, Alexander and Stefan van Parys (2009) Empirical Evidence on the Effects of Tax Incentives, Working Paper WP/09/136, IMF: Washington DC.

Kochanek, Stanley A. (1996) Liberalization and Business Lobbying in India, *Journal of Commonwealth and Comparative Politics*, 34(3), 155-173.

Kohli, Atul (2006) Politics of Economic Growth in India, 1980-2005, parts I and II, *Economic and Political Weekly*, 1361-1370.

Kohli, Atul (2004) State-Directed Development: Political Power and Industrialization in the Global Periphery. Cambridge: Cambridge University Press

Kumar, Arun (2007) SEZs: One More Anti-Bharat Act, *Mainstream*, April, 27-May 3, 11-18

Lambert, D. (1992) Zero-Inflated Poisson Regression Models with an Application to Defects in Manufacturing, *Technometrics*, 34, 1-14.

Madariaga, Nicole and Sandra Poncet (2007) FDI in Chinese Cities: Spillovers and Impact on Growth, *World Economy*, 30, 837-862.

Markusen, Ann and Kate Nesse (2006) Institutional and Political Determinants of Incentive Competition: Reassessing Causes, Outcomes, Remedies, in Ann Markusen (ed.) *Reining in the*

Competition for Capital: International Perspectives, Kalamazoo, MI: W. E. Upjohn Institute for Employment Research.

Markusen, James R., Edward R. Morey and Nancy Olewiler (1995) Competition in Regional Environmental Policies when Plant Locations are Endogenous, *Journal of Public Economics*, 56(1), 55-77.

Murdoch, James C., Todd Sandler, and Wim P. M. Vijverberg (2003) The Participation Decisions versus the Level of Participation in an Environmental Treaty: A Spatial Probit Analysis, *Journal of Public Economics*, 87, 337-362.

Neumayer, Eric and De Soysa, Indra (2011) Globalization and the Empowerment of Women: An Analysis of Spatial Dependence via Trade and FDI, *World development*, 39(7), 1065-1074.

Nunnenkamp, Peter and Julius Spatz (2002) Determinants of FDI in Developing Countries: Has Globalization Changed the Rules of the Game? *Transnational Corporations*, 11(1), 1-34.

Overesch, Michael and Johannes Rincke (2008) Tax Competition in Europe 1980-2007 – Evidence from Dynamic Panel Data Estimation, Working Paper.

Pande, Sandeep (2007) Special Exploitation Zones of Andhra, Accessed from: http://www.thesouthasian.org/archives/2007/special_exploitation_zones_of.html

Perkins, Richard and Neumayer, Eric (2011) Does the ‘California effect’ Operate Across Borders?: Trading and Investing-up in Automobile Emission Standards, *Journal of European Public Policy*.

Pitlik, Hans (2007) A Race to Liberalization? Diffusion of Economic Policy Reform among OECD-Economies, *Public Choice*, 132, 159–178.

Plümper, Thomas and Neumayer, Eric (2010) Model Specification in the Analysis of Spatial Dependence, *European Journal of Political Research*, 49(3), 418-442

Ray, Partho Sarathi (2009) Falta - First SEZ in India, Accessed from: <http://marxistupdate.blogspot.com/2010/01/falta-first-sez-in-india.html>

Rawat, Bhushan and Surepally (2011) The impact of special economic zones in India: A case study of Polepally SEZ, Survey report from International Land Coalition: Rome.

Rodrik, Dani (1997) Has Globalization Gone Too Far? Washington, DC: Institute for International Economics.

Schneider, Aaron (2004) Accountability and Capacity in Developing Country Federalism: Empowered States, Competitive Federalism, *Forum for Development Studies*, 31(1), 33-56.

- Simmons, BA, Elkins Z, Guzman A. (2006) Competing for Capital: The Diffusion of Bilateral Investment Treaties, 1960-2000, *International Organization*, 60(4), 811-846.
- Simmons, BA, Elkins Z. (2004) The Globalization of Liberalization: Policy Diffusion in the International Political Economy, *American Political Science Review*, 98(1), 171-189.
- Staiger, D., and J.H. Stock (1997) Instrumental Variables Regression with Weak Instruments, *Econometrica*, 65, 557-586.
- Stiglitz, Joseph E (2002) *Globalization and Its Discontents*, London: W.W. Norton.
- Suchitra M. (2005) *The Socio-economic Impacts of the Proliferation of SEZs in India*, unpublished manuscript, The Quest Features & Footage: Kozhikode.
- Vadlamannati, Krishna Chaitanya (2011) *A Race to Compete for Investments Among Indian State? An Empirical Investigation*, working paper, University of Heidelberg: Germany.
- Venkatesan, R. (2000) *Study on Policy Competition among States in India for Attracting Direct Investment*. New Delhi, India: National Council of Applied Economic Research.
- Wheeler, David, and Ashoka Mody (1992) International Investment Location Decisions: The Case of U.S. Firms, *Journal of International Economics*, 33(1-2), 57-76.
- Zodrow, George. R. and Peter Mieszkowski (1986) Pigou, Tiebout, Property Taxation, and the Underprovision of Local Public Goods, *Journal of Urban Economics*, 19, 356-370.