Competing for Investment Proposals in Special Economic Zones (SEZs)? Evidence from Indian States, 1998–2009

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Abstract: After 1991 economic reforms, India relaxed investment regulation norms, allowing states to form their own investment policy frameworks. Withdrawal of controls exercised by the central government to approve investments in Special Economic Zones (SEZs) and Export Oriented Units (EOUs) has unleashed fierce competition among states to attract investment which generates jobs and boosts the local economy. Using spatial econometric estimations on panel data on 30 states in India during the 1998–2009 period (12 years), we find that the approval of SEZ and EOU investment proposals in one state are positively correlated with the approval of proposals elsewhere (i.e., potential hosts are more likely to approve SEZ and EOU investment proposals when their competitors have done so). These results are not only robust to alternative weighting schemes but also controlling for endogeneity. Our findings might suggest policy implications in terms of costs associated with undue competition. It is likely, due to differing initial conditions prevailing during the time of economic reforms, that in high-income industrial states the benefits from competition might outweighs the costs, while in low-income states the competition for investment might result in race to the bottom.

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

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1. Introduction

India, one of the fastest growing emerging economies, is home to some of the largest foreign investments (UNCTAD 2012). Bulk of the foreign investments started to flow in from the late-1990s onwards as the government of India reformed the existing foreign investment policy regime. One of the important reforms initiated by the government to attract investments was the new Special Economic Zone (SEZ henceforth) policy. The objective was not only to attract investments, but also generate export promotion though SEZs. The key component of SEZ policy was that the central government would provide a broad policy framework which would help create SEZs but the state governments were allowed to form their own SEZ policies which cater to the requirements of respective states. Many suspect that this created competition among states to attract investments into SEZs. Outside SEZs, Kanta (2011), Schneider (2004) and Venkatesan (2000) cite examples of large tax and other fiscal incentives which states within India offer to attract both private and foreign investment. Others argue that competition among states to attract investments might be a consequence of the marked variation in sub-national investment patterns in India after market reforms in the 1990s (Ahluwalia 2000). In this study, we examine whether states in India compete for investment proposals in SEZs and Export Oriented Units (EOUs hereafter). An SEZ is a special geographic region within a state that has distinct economic laws (such as state specific industrial policy) separate from a country's generally applicable laws, with the objective of increasing economic growth and boosting employment through increased domestic and foreign investment[1]. An EOU is the same as an SEZ but with the specific objective of boosting the country's export earnings[2]. After the 1991 economic reforms, India relaxed investment regulation norms, allowing states to form their own

[1] For more on SEZs in India, see: www.sezindia.nic.in
[2] For more on SEZs in India, see: www.eouindia.gov.in

investment policy frameworks and eliminating the role of the central government in investment policy making (Kohli 2004). It is however noteworthy that the broader tax policies (such as corporate tax) are still determined by the central government whereas the process of approvals, providing other incentives related to land, stamp duties, land registration, state sales tax and so on has been decentralized to the states. Withdrawal of controls exercised by the central government especially in approving investments in SEZs and EOUs is therefore expected to unleash fierce competition among states to attract investment, which generates jobs and boosts the local economy. This is reflected in the rapid increase in approval (in principle) of SEZs across a large number of states in India. After the SEZ Act of 2005, there has been dramatic surge in the approval of both SEZs and EOUs across states in India. In 2010, there were roughly 174 SEZs and EOUs approved across 25 states in India[3]. Many argue that such competition among states for investment can be significantly beneficial to the labor force 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, Khan 1997a, b, 2004, 2005 and 2008). However, the objective of this paper is to use spatial econometrics to examine whether the approval of SEZ and EOU investment proposals in one state are influenced by the approval of investment proposals elsewhere in India. In doing so, this chapter contributes to the main theme of the book - *human security*, defined as an effort to prioritize the security needs of the individual over those of the state. As discussed in the introductory chapter, the developmental policies put in place to generate double digit economic growth actually carry detrimental effects to growth targets. One such development policy which this chapter focuses is the new investment policy regime put in place to attract investments into SEZs and EOUs. Both SEZs and EOUs not only

[3] See: www.sezindia.nic.in and www.eouindia.nic.in

provide much needed investments and generate jobs but also account for indirect benefits such as transfer of advanced technology, managerial techniques and know-how, skill upgradation, and export diversification. Though the intention of the central government to decentralize the decision making process with respect to investment policy to states may be a bold step forward to address the existing inequities between the states and fix accountability to the states, this policy actually led to unintended consequences – fierce competition among states. The intense competition between states to attract investments in SEZs can actually exasperate, rather than countering, the regional inequality within the country. If indeed we find that states do compete for investments then naturally the most well off states might tend to benefit from such competition leaving behind the poorer and undeveloped states further behind.

Spatial econometrics has been used in the literature to explore the extent of competition in tax, environmental standards, economic policy reforms, bilateral investment treaties and labor standards, among others. 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 for a potential race to the bottom in aggregate labor standards, while Neumayer and de Soysa (2011) find support for a race to the top with respect to women's labor rights. In terms of the impact of competition for investment on environmental standards, Cumberland (1981) 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 (2011) find

evidence consistent with a 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 the signing of bilateral investment treaties[4].

While most of the aforementioned studies are cross-country analyses that explain competition that exists among countries in various arenas, the same kind of competition, we show in this paper, can also exists between states within a country. Using information on investment proposals approved in SEZs and EOUs in 30 Indian states during the 1998–2009 period (12 years), we empirically find that the approval of SEZ and EOU investment proposals in one state is positively correlated with proposal approvals in other states. Furthermore, we find that industrial states (excluding special category states[5] or low-income states) compete for SEZ and EOU investment proposals more fiercely among themselves. Our results remain robust to alternative weighting schemes and controlling for endogeneity. We interpret these results as direct evidence 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. However, it is difficult to know, with the data at hand,

[4] There are also other areas where spatial econometrics has been used to examine the diffusion of anti-trafficking government policies (Cho, Dreher and Neumayer 2011), inbound and outbound FDI (Blongien et al. 2007), diffusion of democracy (Elkink 2011), regime change (Brinks and Coppedge 2006), institutional changes (Jordana et al. 2011), corporate taxes (Jensen and Lindstadt 2012), social sector policies within Brazil (Sugiyama 2008).

[5] The main reason behind this categorization is the development of that particular state where there are many problems due to hilly terrains, international borders etc may witness difficulties in developing industries and the finances of the state are also less compared to other states. Therefore, the centre government provides monetary concessions and extra fiscal package to help these states attract large number of industrial units. Despite these initiatives, special category states tend to underperform not just in terms of industrial development, but also in overall socio-economic development (see: http://dipp.nic.in/English/Schemes/Category_states.aspx#MainContent).

as to whether the inter-state competition to attract investments into SEZs is leading to race to the bottom or not. But it is likely that in high-income industrial states, due to differing initial conditions states enjoyed when economic reforms were initiated in 1991-92 and the current level of development, the benefits from competition might outweigh the costs, while in low-income states the competition for investment proposals might result in race to the bottom.

The rest of the paper is structured as follows. Section 2 illustrates why and how states in India compete for SEZ and EOU investment proposals. Section 3 describes briefly about data used and the methodology applied (more details on this can be found in appendix 4) along with our main empirical findings. Section 4 provides the further discussion based on our findings and section 5 concludes the study.

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 a series of significant policy changes to industrial policy. This resulted in dismantling the 'license and permit raj' which required industrial undertakings to obtain licenses from the central government of India, not only for setting up their businesses, but also for expansion of operations and increasing production capacity (Aghion, Burgess, Redding and Zilibotti 2008). As India relaxed investment regulation norms, state governments were allowed to form independent investment policy frameworks to attract big ticket investment. With the intention of attracting high end technological investment and boosting the country's export production, the central government of India started to focus on the policy of SEZs. The history of SEZs in India can be traced back to 1965 when the government set up Asia's first SEZ (then known as Export Processing Zone) in Kandla region of Maharashtra state to promote exports. Following Kandla's experience, seven more SEZs were set-up in the mid-1980s in other parts of India. However, the setting up of

SEZs, as well as the development and approval of investment unit proposals within them remained under the purview of the central government. Since the economic reforms and the decentralization which followed, in the mid-1990's the central government actively encouraged state governments to create SEZs in order to attract export-oriented local and foreign investment. 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 the government's SEZ policy came during 1998 under the National Democratic Alliance (NDA) government, when the then Minister for Commerce visited some Chinese SEZs. After his visit, the minister acknowledged that if India aspires to attract large FDI, then it needed to overcome its shortcomings regarding the multiplicity of controls and clearances that existed, as well as developing world class infrastructure, simplifying the approval mechanisms, and providing other fiscal incentives. This changed mindset of the Indian government paved the way for the new SEZ policy released by the central government in 2000 under EXIM (Export-Import) policy, which provided various forms of fiscal incentives. Following the 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 the SEZ Act in 2005. As per the SEZ 2005 Act, the main objectives of the SEZs, in the 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 simplified procedures for development, operation and maintenance of SEZs, single window clearance to be set up within the SEZs, not only for setting them up but also for

investment proposals (i.e., units), and simplified compliance procedural documentation on matters related to state government. As per the Act, the approval mechanism is in full control of the state governments. Upon submission of a proposal to the state government, the developer of a SEZ (who can be a state government themselves, or an agency of a state government, as well as private entities) receives clearance within 45 days from the date of receipt from the state government. 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, South and West) has its own committees to approve investment proposals forwarded by the respective state governments in their zones.

To further enhance export promotion, the EOU scheme was initiated by the central government. An EOU can be set up with both local and/or foreign firms to manufacture goods and render services, with the aim of achieving net positive foreign exchange balance within five years of their establishment. The EOU units need to gain the approval of the respective SEZ development commissioner (who, again, can also be a state government, an agency of a state government, or a private entity approved by the central government). Within 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 gain approvals from various state government agencies such as the state electricity, water and pollution control boards, among others, as well as registering under the state sales tax act. Thus, an SEZ currently includes both SEZ units and EOU units producing goods and services, mostly with the intention to provide export services.

As mentioned already, we suspect that the withdrawal of controls exercised by the central government in approving investment in Special Economic Zones (SEZs) and Export Oriented

Units (EOUs) might have unleashed fierce competition among states. In connection to this, Ahluwalia (2000) argues that the post-reform period saw a marked decline in public investment in states which coincided with a rapid increase in private investment. This led states which already possessed location advantages such as huge markets, better infrastructural facilities, skilled labor forces, and the presence of a large investor base, to attract relatively more investment 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 investment. Secondly, Vadlamannati (2011) argues that since the 1991 economic reforms, the political discourse in the country seems to be changing from being caste (ethnicity) centric to development-oriented during the run-up towards elections. State-level politics has been dominated by state-specific issues, rather than national issues, which has made the economic development of respective states the focal point in front of a potential electorate. Along with good governance, attracting investment and job creation became a key priority for many state governments in the post-reform period (Markusen and Nesse 2006). Moreover, traditional economic growth theory predicts the importance of investment in attaining higher rates of economic growth (Barro and Sala-i-Martin 2004). In fact, stylized-theory in terms of the rewards of competing for investment, such as 'Heckscher-Ohlin--Samuelson theory', the 'Ricardo-Viner model' and the 'ideology and inequality thesis', proposed by Dutta and Mitra (2006), suggests that workers and farmers in poor countries will gain from the process of liberalization, whereas capital and domestic rent-seeking forces could lose out. Since developing countries like India are labor rich and capital poor, their openness to attract new investment is expected to benefit the vast labor force, while hurting domestic rent-seeking capitalists[6]. In addition, attracting

[6] See Kochanek (1996) for a detailed discussion on how a group of local Indian industrialists came together to form the 'Bombay Club', which opposes the proposed economic reforms which will further open Indian industries up to

investment into a state provides significant benefits for the labor force as new investment, particularly FDI, creates better quality jobs that are associated with higher wages and better working conditions compared to those offered by existing local firms. As labor is mobile across industries, this results in driving the wages up across the board (Pandya 2010). As sections of the middle class stand to gain, the median electorate will prefer those governments which support capital importation (Jakobsen and de Soysa 2006, Bhagwati 1999). However, it is also noteworthy that most of the labor employed in the SEZs is unskilled labor (i.e. with less education years) that also stands to gain from employment opportunities generated by such zones vis-à-vis the quality jobs which FDI tends to create. This is also one of the key reasons that might be forcing state governments to compete against each other to attract investment, which would not only generate jobs and boost their economies, but also form huge political capital for incumbent politicians. An important point noteworthy is that given the potential benefits for the incumbent government to attract SEZ and EOU investments, even if investment proposals do not flow in as a result of a state's provision of various incentives and deregulation, if the incumbent state government believes that it does, then this alone could result in inter-state competition to attract SEZ investments.

However, the conclusions of these highly abstract models which inter alia assume full employment, frictionless competition and equality in marginal costs and revenues in every sector, are open to question. Although the competition among states to attract investment may be mutually beneficial for both state governments and potential private and/or foreign investors, the overall welfare effects associated with such fierce competition are questionable given their

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the external world.

potential redistributive consequences.[7] Over the years, skeptics of liberalization have expressed many concerns over the impact of a race among states to attract investment into SEZs.[8] Many of them focus 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, but whose removal can have potentially serious, socially undesirable consequences. This worry has primarily been expressed in the arenas of land acquisition policy, environmental regulations, and labor standards. Several such examples have come to light in recent years where a state government or state government agency has been caught flouting the rules and regulations while approving investments into SEZs in the initial stages. But given the limitations of the empirical data at hand, it is hard to explain whether this inter-state competition to attract investments into SEZs is really leading to race to the bottom. Rather what the paper is supposed to examine is whether there is an empirical evidence of existence of inter-state competition to attract SEZ and EOU investment proposals. However, it is fully plausible that those states which inherited favorable initial conditions when economic reforms was introduced by the central governments in the early 1990s, some states which possessed location specific and other economic advantages such as huge markets, established infrastructure, human capital and active labor force were able to attract higher investment share compared to the less well-endowed states (see for example: Alhuwalia 2000, Kohli 2006). This in turn we suspect is also one of the main causes for fierce competition among less developed states to compete for investments. On the other hand, in high-income industrial states the benefits from inter-state competition outweighed

[7] Here, early work by Khan (1997a, b) is particularly notable. See also James and Khan (1997;1998) Even earlier than this, in the context of the choice of technology (including imported capital intensive technology), Khan (1982, 1985) and Khan and Thorbecke(1988, 1989) found empirical results within a Social Accounting Matrix framework, questioning conventional wisdom of the distributional aspects of investment and pointing to the need for a more nuanced analysis.

[8] For more recent results and an alternative theoretical model, see Gabriele and Khan (2010) on China.

the costs associated with such fierce competition. We return to this question in the subsequent sections following the empirical results (see section 4.3).

3. Data and Empirical Results

For our empirical analysis, we make use of the panel data covering 30 Indian states (see appendix 1) during the 1998–2009 period (12 years). The objective is to examine empirically if there is an inter-state competition to attract SEZ and EOU investments. We use spatial econometrics to quantify the inter-state competition during our study period. Accordingly, our dependent variable is the count of investment proposal of SEZs and EOUs approved in state *i* in year *t*. The state-wide yearly approvals data is obtained from the statistics book of Secretariat of Industrial Assistance (SIA hereafter), a division of the Indian government's Department of Industrial Policy and Promotion (DIPP hereafter). These data are published every month in aggregate format by each state in the SIA's various monthly and annual statistical reports. As highlighted earlier, the SEZ and EOU proposals are approved by the state government, which are then forwarded to the Board of Approvals for the respective zone to which a particular state belongs. Figure 1 captures the details of the total SEZ and EOU investment proposals approved by each state during the 1998–2009 period. As seen, Maharashtra, Andhra Pradesh, Karnataka, Tamil Nadu and Gujarat are the frontrunners in approving investment proposals in SEZs and EOUs, while most of the Northeastern states lag behind. On average, roughly 13 SEZ and EOU proposals were approved per state during 1998–2009, with a deviation from the mean of about 28 investment proposals. We then introduce SEZ and EOU investment proposals approved in other states in year *t* weighted by state GDP to capture the competition with other states, a variable known in the literature as the spatial lag. It is noteworthy that the detailed explanation is provided about how spatial lag variable is constructed, the weighting scheme and the rationale

behind the weights in the appendix 4. Figure 2 captures the extent to which states react to competition in approving investment proposals elsewhere. In total, 18 out of 30 states do tend to react to the competitive pressures captured by spatial lag (red line). The blue line captures the total number of SEZ and EOU proposals approved by each state on yearly basis. It is interesting to note that all those 18 states are industrial states falling in the high income category group. It is also noteworthy that most of these 18 states had the initial advantage of strong infrastructure, higher market share (in term of GDP), higher levels of income and skilled labor force when the economic reforms began in the early 1990s.

With respect to control variables, all our models include state per-capita GDP in Indian rupees in 1999-2000 constant prices, relative electricity consumption state *i* in year *t* in kilowatts to all other states capturing the relative infrastructural advantage a state has over other states, a dummy for state specific industrial policy, another dummy variable capturing the presence of SEZ policy in a state, count of years either the Indian National Congress (INC hereafter), which is center-left in ideology, Bharatiya Janata Party (BJP henceforth) - center-right, Left Front led by the Communist Party of India (Marxist) (CPI-M) – leftists, and regional parties which are considered as soft left, were in power in state *i* in year *t*. In all our regressions we include state fixed effects to control for unobserved state specific heterogeneity in the panel dataset and a time trend to capture the regulatory and other reform measures taking place in each state. We estimate the 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). The details on the definition and data sources are provided in appendix 2. Finally, spatial lag is endogenous and we address the endogeneity using non linear instrumental variable approach which is discussed in detail in appendix 4.

We present our main empirical results starting with Table 1 which is our baseline results, estimated using zero-inflated negative binomial regression estimations. Table 2 focuses exclusively on instrumental variable estimations. Note that the results in all tables report marginal effects at the mean of the explanatory variables[9]. A summary of the data statistics is presented in appendix 2. Beginning with column 1 of table 1, which forms our preferred specification, we find a positive and significant spatial lag which is significantly different from zero, at the 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 the 1% level. However, it is noteworthy that the marginal effects in column 2 (where special category states are dropped) are higher compared to the full sample (which includes all states) estimations reported in column 1. This provides some preliminary evidence of existence of inter-state competition to attract SEZ and EOU investments and this competition is fierce among industrial states. In the next two columns, as seen, the positive significant effect of the spatial lag term remains robust when we include the lagged dependent variable (see column 3 and 4 of 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 which all states are included.

In columns 5 and 6, we use alternative weight to construct spatial lag (using industry output as a share of state GDP, a proxy for industrialization in states). In both columns 5 and 6 (in table 1) we find that our spatial lag term with this new weight is positive and significantly different from zero, at the 1% level. The marginal effects once again show that they are much higher for industrial states compared, estimated in column 6, compared to that of the full sample in column 5. Likewise, when we include the lagged dependent variable, the spatial lag retains its positive sign and remains significantly different from zero, at the 1% level, in columns 7 and 8

[9] We use Stata 11.0's margins command to calculate marginal effects.

(see table 1). Since the spatial lag term remains positive in both samples (with all states included and only industrial states) and with the alternative weights, this can be interpreted as evidence of the presence of inter-state completion.

Before moving further, we focus on the extent of control variables reported in table 1. As expected, we find that the respective income level of a state, its relative infrastructural facilities, having clear cut industrial policy framework, and being ruled by the INC party and its allies all tend to have a positive effect on SEZ and EOU investment proposals approved. After controlling for state-specific fixed effects, however, other controls remain statistically insignificant.

In table 2, we report the results based on zero-inflated negative binomial instrumental variable (IV hereafter) models. As seen from the first two columns of the table 2, the positive significant effect of the spatial lag term remains robust in the IV models (see columns 1 and 2 in table 2). Note that in column 2, we included the lagged dependent variable and the spatial lag results still hold. In columns 3 and 4, we include the spatial lag, albeit with an alternative weight, industry's share of state GDP. We find the positive significant effects remain significantly different from zero, at the 1% level, in both columns (see table 2). It is also noteworthy that we perform range of other robustness checks which we discuss in the appendix 4.

4. Race to the top or Race to the Bottom?

Our findings clearly demonstrate that states in India do respond to competitive pressures emanating from their peers. Since SEZ and EOU investment proposals have increased across states and over time, one can interpret this, in light of a robustly positive and significant spatial lag, as competition among states to attract investment. However, the moot question remains whether the race among states to attract investment into SEZs and EOUs is beneficial or harmful. In other words, does it lead to race to the top or race to the bottom? An early pioneering paper by

Khan (1997c) for the regions in the Vietnamese case and Vadlamannati (2011) argues that this sort of competition among Indian states is largely driven by the desire of state governments to increase economic growth and generate job opportunities for the existing labor force and unemployed in their respective states. In the Indian case, as Vadlamannati (2011) points out, such competition might also driven by the desire to maximize the incumbent state government's chances of re-election. Competition, as suggested by Aghion, Burgess, Redding and Zilibotti (2008) might generate desired results in addressing problems associated with excessive bureaucratic controls, improving property rights protection, controlling corruption, creating quality institutions, strengthening state-business relations, and improvising investment conditions in states. Yet, concerns remain over the welfare effects associated with such fierce competition given its consequences on labor rights and the environment (Gabriele and Khan 2010, Khan 2004 a, b, Khan and Lu 2008). Although it is difficult to claim that the positive effects of spatial lag is an evidence in favour of race to the bottom or race to the top, it is reasonable to presume that the competition among states can produce either of the effects depending upon whether a state is high or a low income state. Schneider (2004) points out that the notable side-effects of race for investments is that only richer states benefit from such competition, 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 in the desperation to attract investments. In the case of India, it reasonable to assume that it is the high income or the industrial states which stand to benefit from such fierce competition and the low income states tend to lose out.

During the pre-economic reforms period, the central government was in-charge of approving investment proposals to the states. The objective of centralized control system was to

ensure that less developed states also benefit from the new investments and ensure equitable distribution of development across the states. When economic reforms were introduced in the 1990s, states which had initial advantage viz., large markets, better infrastructure, human capital, skilled labor force, and the presence of a large investor base, started to benefit more in comparison to less well-endowed states (Kanta 2011, Kohli 2004, 2006, Besley et al. 2007, Ahluwalia 2000). These changes resulted in putting less developed states under more pressure to increase their competitiveness in order to attract investments. While high income states started to compete for investments by increasing public expenditure on education, social welfare, building quality infrastructure and improving investment climate, the weak bargaining power of the low income states forced them to provide more incentives thus paying scant attention to the environmental and social effects. This doesn't mean to suggest that such problems are more absent in high income states. There are also some cases where high income states also faced this backlash. The magnitude of such cases in low income states is very high. Orissa is a one such example. At the heart of the problem are three core issues, namely land acquisition, environmental regulations and labor standards, which are a direct result of undue competition among states in order to attract SEZ investment in particular (Comptroller Auditor General's report 2008). It is also noteworthy that given all the incentives, investment proposals will not contribute to the overall development of the state if the proposals are not realized. The approval to realization ratio numbers computed by DIPP's reports for all the 30 Indian states show a huge gap in terms of approval of investment proposals and actual realization of those proposals[10]. Although all states witnessed this gap, the ratio of proposals to realizations is lowest among less developed states in India. Because the realizations being lower, it is plausible that low income states tend to approve as many investments proposals as possible in the hope that some of those

[10] See: http://dipp.nic.in/English/Publications/FDI_Statistics/FDI_Statistics.aspx

investments might actually be realized. It is therefore likely that inter-state competition to attract investments into SEZs might lead to different distributional effects across different states depending upon whether they have inherited a favorable initial conditions and the level of development.

5. Conclusion

We have examined whether states within India compete to attract investment proposals in SEZs and EOUs. We make use of annual data on SEZ and EOU investment proposals approved in each state, as well as other key variables determining SEZ and EOU investment proposals, utilizing a 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 across 30 Indian states during the 1998–2009 period, we find a robustly positive and significant spatial lag which is consistent with strategic complements in the approval of SEZ investment proposals. A straightforward interpretation is that the approval of SEZ and EOU investment proposals in one state are positively correlated with the approval of proposals elsewhere. That is, the potential hosts are more likely to approve SEZ and EOU investment proposals when their competitors have done so. These results are not only robust to alternative weighting schemes but also controlling for endogeneity. However, our findings do not imply that such competition prevails across all states in India. We find that such fierce competition is higher among the industrial states. Our findings do not explicitly explain whether this sort of competition is necessarily evidence in favor of race to the bottom. However, it is likely that in high-income and industrial states the benefits from competition might outweighs the costs, while in low-income states the competition for investment proposals might result in a race to the bottom. We leave it to future research, perhaps by usefully employing the comparative case study method, to

examine whether fierce competition among states is necessarily leading to race to the bottom, or otherwise.

The results of this study also suggest several potential policy considerations. First, the competition to attract SEZ and EOU investments among states stems from the fact that the SEZ policy is fraught with major problems. The SEZ policy remains unclear on several issues. For instance, frequent changes in the interpretation of provisions allow states to implement the policy at will. Likewise intense competition to attract investments also led to omission of provisions on appeal and dispute settlement mechanism, accountability safeguards, urban management, and land acquisition issues which has affected the implementation of the policy rather adversely. This highlights the need for coordination between central government and states involved in the implementation of the policy rather than leaving the implementation part to the states alone. There is also a need to fix greater accountability on the part of the states for the unintended consequences which certain SEZ approvals tend to generate. Second, the ability of a state to attract private or foreign investments through approving SEZ and EOU proposals is contingent on the other factors that attract investment such as domestic market size, infrastructure, and availability of resources. In particular, it is widely documented that firms respond to low entry barriers. As such, if an industrial state signs an investment agreement with private or foreign companies, thereby signalling its competence to attract new investments, our estimates indicate that this would force other states to respond by competing more fiercely in approving SEZ and EOU proposals to avoid losing investment. This suggests that it may be important to be mindful of such implications, particularly in low income states, when pursuing investment agreements or other policies that might lead to skewed distribution of investments in favour of few states.

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

Dependent variable: Investment proposals approvals in SEZs and EOUs

Variables	(1) Full sample	(2) Without special category states	(3) Full sample	(4) Without special category states	(5) Full sample	(6) Without special category states	(7) Full sample	(8) Without special category states
Weighting scheme	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	0.006			0.000	0.002
			(0.72)	(0.81)			(0.43)	(0.32)
Spatial Lag	0.004***	0.117***	0.003***	0.087***	0.007***	0.253***	0.005***	0.211***
	(5.58)	(5.93)	(4.40)	(4.55)	(5.99)	(6.40)	(5.01)	(5.39)
State Per-capita GDP (log)	0.168***	5.677***	0.050	1.080	0.116**	4.926***	0.045	2.419
	(2.76)	(3.13)	(0.80)	(0.51)	(2.53)	(2.88)	(0.86)	(1.20)
Industry Share in GDP	0.001	0.028	-0.001	-0.033	0.001	0.040	-0.000	-0.014
	(0.39)	(0.37)	(0.36)	(0.50)	(0.57)	(0.55)	(0.24)	(0.20)
Relative Infrastructure	1.754	51.742	2.470**	94.903**	1.694*	62.825*	2.518**	95.347**
	(1.38)	(1.33)	(2.08)	(2.36)	(1.73)	(1.67)	(2.42)	(2.33)
SEZ Policy Dummy	-0.024	-0.653	-0.019	-0.628	-0.023	-0.795	-0.019	-0.667
	(1.20)	(1.04)	(1.00)	(1.07)	(1.47)	(1.31)	(1.18)	(1.04)
Industrial Policy Dummy	0.037**	1.241***	0.037***	1.550***	0.028**	1.160**	0.030***	1.221***
	(2.37)	(2.59)	(2.81)	(3.96)	(2.34)	(2.54)	(2.63)	(2.78)
INC ruling years	0.008**	0.275***	0.007***	0.280***	0.006***	0.268***	0.006***	0.269***
	(2.56)	(2.83)	(2.64)	(3.17)	(2.64)	(2.87)	(2.72)	(2.94)
BJP ruling years	0.001	0.054	0.002	0.074	0.001	0.046	0.002	0.086
	(0.44)	(0.57)	(0.98)	(0.96)	(0.42)	(0.52)	(0.94)	(1.15)
Left Front ruling years	0.011**	0.364**	0.013**	0.337*	0.010***	0.414***	0.013***	0.509***
	(2.23)	(2.38)	(2.31)	(1.68)	(2.73)	(2.85)	(2.81)	(2.92)
Regional Parties ruling years	0.002	0.032	0.001	-0.020	0.001	0.035	0.001	0.001
	(0.81)	(0.47)	(0.31)	(0.33)	(0.87)	(0.55)	(0.38)	(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	YES	YES	YES	YES	YES	YES	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)**
Weighting scheme	**State-GDP**	**State-GDP**	**Industry share in GDP**	**Industry share in GDP**
Lagged Dependent Variable		0.000		0.000*
		(1.15)		(1.68)
Spatial Lag	0.004***	0.003***	0.013***	0.008***
	(5.18)	(4.88)	(6.04)	(5.11)
State Per-capita GDP (log)	0.099*	-0.088*	0.178**	-0.011
	(1.80)	(1.65)	(2.50)	(0.16)
Industry Share in GDP	0.003	-0.000	-0.001	-0.003
	(1.15)	(0.02)	(0.38)	(1.15)
Relative Infrastructure	0.098	2.003*	1.918	3.381***
	(0.08)	(1.88)	(1.29)	(2.79)
SEZ Policy Dummy	-0.031*	-0.033**	0.017	0.008
	(1.68)	(2.05)	(0.73)	(0.42)
Industrial Policy Dummy	0.042***	0.055***	-0.014	0.012
	(3.11)	(5.62)	(0.60)	(0.75)
INC ruling years	0.010***	0.011***	-0.002	0.001
	(3.37)	(4.04)	(0.57)	(0.30)
BJP ruling years	0.002	0.003	0.005	0.004*
	(0.70)	(1.44)	(1.26)	(1.74)
Left Front ruling years	0.012**	0.012**	0.010	0.007
	(2.45)	(2.21)	(1.55)	(0.95)
Regional Parties ruling years	0.002	-0.000	0.001	-0.001
	(0.90)	(0.29)	(0.27)	(0.74)
Time Trend	-0.007	0.009*	-0.008	0.005
	(1.53)	(1.78)	(1.53)	(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.

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

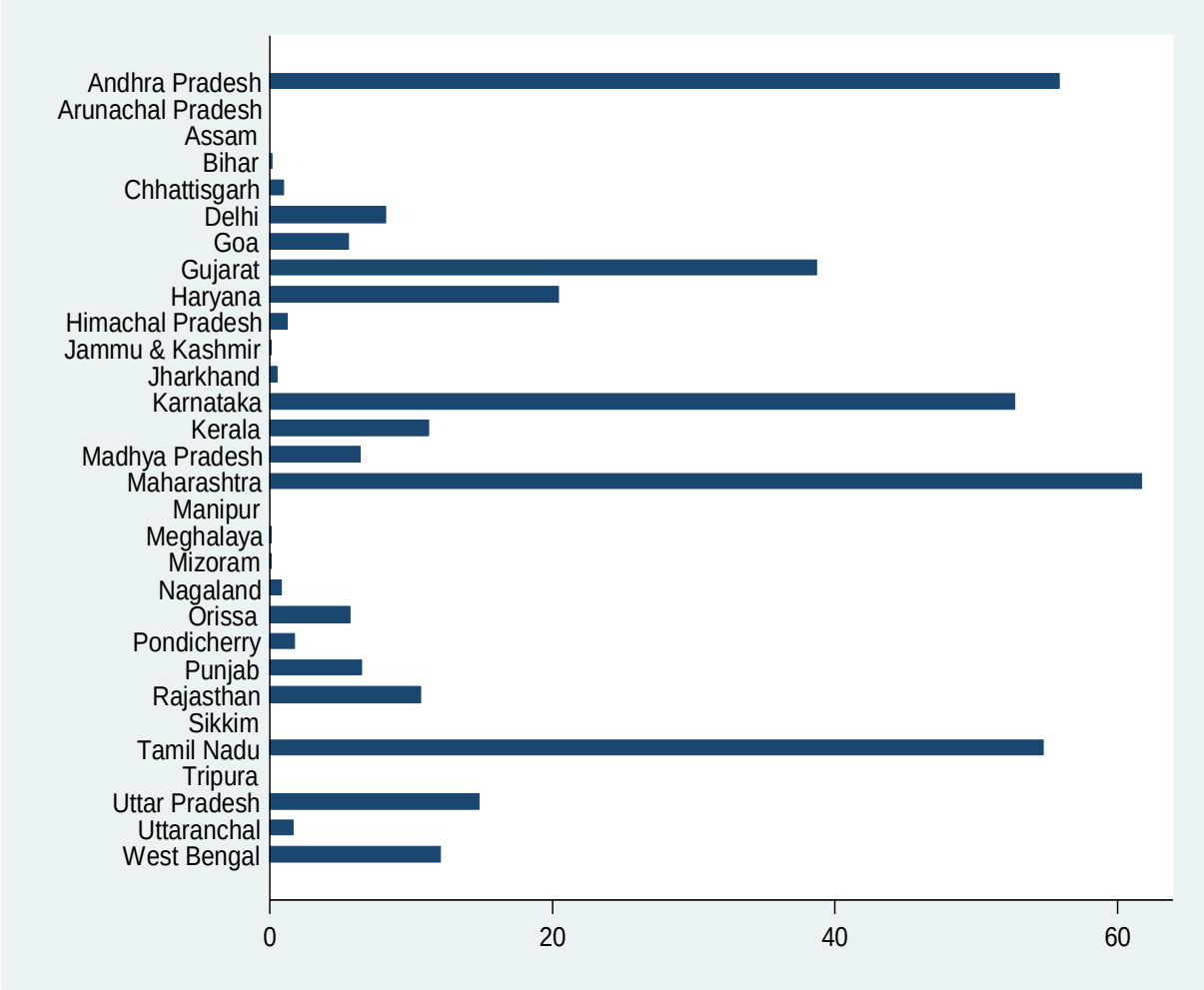
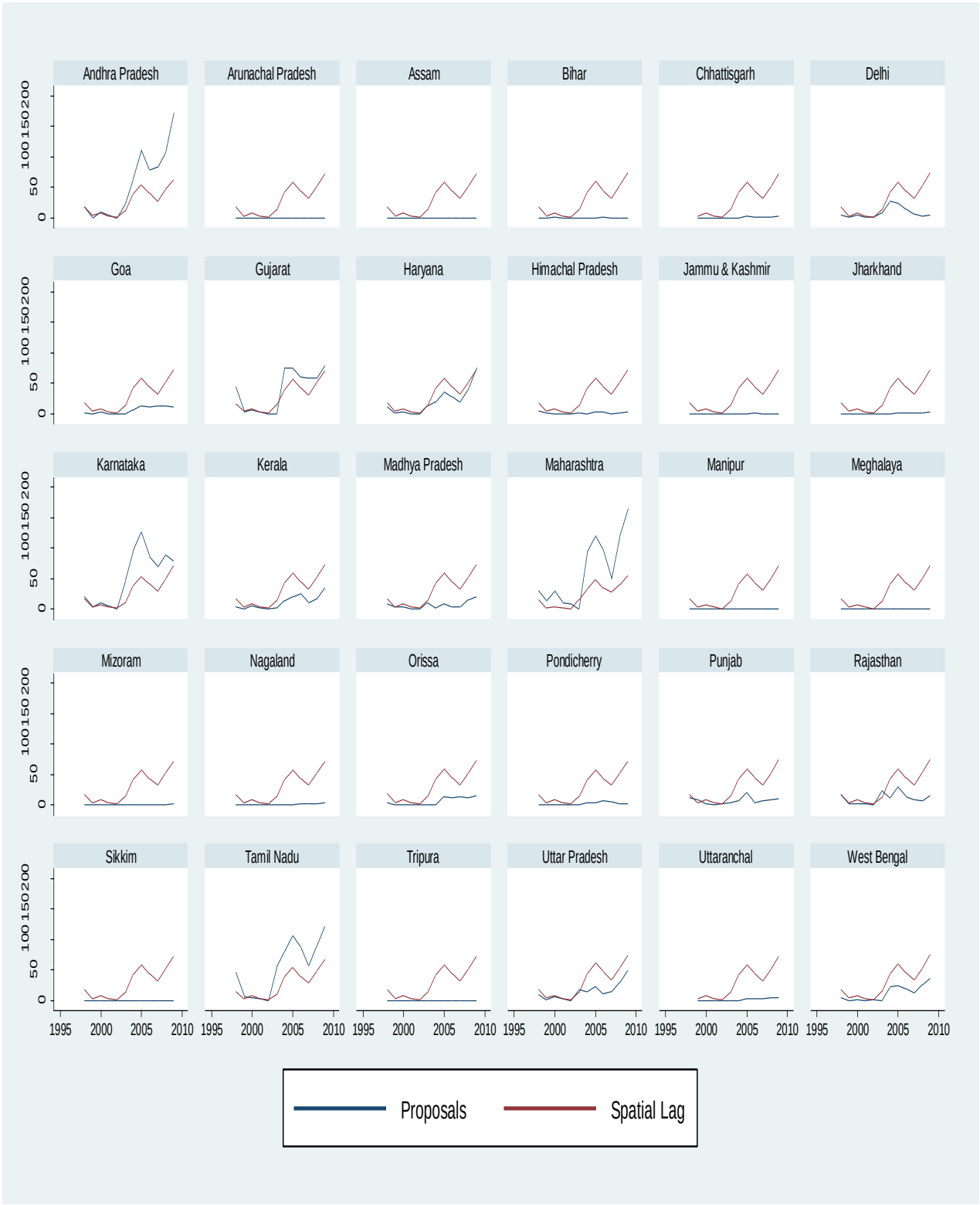


Figure 2: SEZ and EOU investment proposals and Spatial lag by States



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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: 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 khw 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

Appendix 3: 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 Font 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 4: Methodology used to construct Spatial lag variable

Construction of Spatial lag and addressing endogenity issues:

The estimation specification used in the analysis is as follows:

Model Specification

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} :

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

Where, ϕ_i is the state-specific dummy and ω_{i_t} is the error term. The control variables are drawn from the existing FDI literature and are described below. We now need to consider, crucially, the competition with other states. In order to do this, we introduce SEZ and EOU investment proposals approved in other states in year *t* to the baseline specifications, a variable known in the literature as the spatial lag. Specifically, we estimate:

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

Where, $\sum_{j \neq i} \varpi_{jit}\ IP^{SEZs+\ EOUs}$ 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) and Vadlamannati (2011), we utilize $\varpi_{ijt} = \frac{SGDP_{jt}}{\sum_{k \neq i} SGDP_{kt}}$. 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*. It is, however, noteworthy that the sum of the weights across the other states for the state *i*

observation will equal 1. This weighting scheme implicitly assumes that large states receive higher weights. The rationale for using state GDP as the weight is two-fold. First, one might anticipate that state *i* pays more attention to what is taking place in larger states rather than small ones. Following the cognitive psychological findings, this can be called a cognitive reference factor. Second, when the goal of streamlining investment approval mechanisms (investment policy) is to attract investments, this will depend on the elasticity of investment to a given state's approval mechanism. Thus, if state *j* (Maharashtra, which attracts a large number of SEZ and EOU proposals and has a share in India's total GDP of about 16%) is already attractive to SEZ investment relative to state *k* (Kerala), then approval of investment proposals in *j* (Maharashtra's) have a larger impact on the approval of investment proposals in state *i* (Haryana) than a comparable change in *k* (Kerala). This, in turn, would make state *i* (Haryana) more responsive to *j*'s (Maharashtra's) investment policies than to those of *k*. This is precisely the difference that equation (2) captures by assigning greater weight to state *j* (Maharashtra). In addition to this, the FDI literature also shows that FDI is attracted to larger countries (see Blonigen 2005), which would imply a greater sensitivity on the part of state *i* (Haryana) to the investment policies of a large state in India. This apart, several papers in the literature surrounding the race to the bottom or cross-country competition have used GDP as a weight (Devereux, Lockwood, and Redoano, 2008, Madariaga and Poncet 2007, Pitlik 2007). Alternatively, we also make use of the industrialization of states using the following weighting scheme: $\varpi_{ijt} = \frac{Industry_{jt}}{\sum_{k \neq i} Industry_{kt}}$ which is the share of total industry output in a state's GDP, reflecting how industrialized a state is. With

this alternative weight, we expect that state *i* pays more attention to the investment policies changes taking place in the industrial states compared to less industrial states[11].

We include state fixed effects to control for unobserved state specific heterogeneity in the panel dataset, with ω_{it} being the error term. We also include a time trend to capture the regulatory and other reform measures taking place in each state. The time trend also captures factors which are not accounted for in the models, such as efficiency gains through technological advancements or enhanced management skills, which grow over time and can, have a positive correlation with investment proposals[12]. As the dependent variable here is a count of investment proposals in SEZs and EOUs, the preferred estimates are those from the 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 displays 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).

[11] It is worth noting that we are examining the formation of SEZs immediately after (and during) a period where regulation by the central government has lessened, and all states are now not only forming new SEZs but are also increasing their numbers substantially during our study period as they move to a new equilibrium. What many spatial studies do is examine spatial lags in the cross-section only, assuming that there is some sort of steady-state equilibrium in place. Unfortunately, we do not have very many cross-sectional units, making this sort of analysis infeasible.

[12] Note that we do not include time dummies because our spatial lag measure, which changes slowly by time, is highly correlated by time dummies.

Details about Data

We use annual data for 30 Indian states from 1998 to 2009. 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 yearly approvals data is obtained from the statistics book of Secretariat of Industrial Assistance (SIA hereafter), a division of the Indian government's Department of Industrial Policy and Promotion (DIPP hereafter). These data are published every month in aggregate format by each state in the SIA's various monthly and annual statistical reports. As highlighted earlier, the SEZ and EOU proposals are approved by the state government, which are then forwarded to the Board of Approvals for the respective zone to which a particular state belongs. A Board of Approval, comprising of 19 members and 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 to the state government for approval. However, if the SEZ developer is a state government itself, then the proposal is directly forwarded to the Board of Approvals.

The vector of control variables includes 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 (Li 2009, Chakrabarti 2001). Accordingly, the location factor is the key to attract investments. 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 the per capita GDP (logged) of the respective states (in Indian rupees 1993-94 constant prices), obtained from the Reserve Bank of India's macroeconomic dataset. Good infrastructure facilities increase the productivity of investment and help attract more of it (Wheeler and Mody 1992, Asiedu and Lien 2004). Since there are various factors which contribute to 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. We thus include the 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 for considering this variable is that it not only captures the availability of electricity, but also its cost. Likewise, we also include a proxy for industrialization by including industry's share in a state's total 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 new industrial policy is from the DIPP's website on state 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. Finally, following Basely and Burgess (2000), we also capture the count of years either the Indian National Congress (INC hereafter), which is center-left in ideology, Bharatiya Janata Party (BJP henceforth) - center-right, Left Front led by the Communist Party of India (Marxist) (CPI-M) – leftists, and regional parties which are considered as soft left, were 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 a center-left ideology were in power in a state to have a positive impact on the number of investment proposals approved.

Endogeneity concerns

The problem with the spatial lag is that it is endogenous because if the investment policy of state *i* depends on that of state *j*, then the reverse 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 $\sum_{j \neq i} \varpi_{jit} Z_{jt}$ i.e., the weighted average of the other states' economic variables, namely state per capita GDP (log), industry's share of total state GDP, state 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 investment 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 hereafter) for non-linear models such as zero-inflated negative binomial may be problematic and the relevant parameters are difficult to estimate directly. Therefore, we manually program instrumental variable regressions for zero-inflated negative binomial models. We first regress our endogenous variable – the 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 (which is the second

stage regressions). However, to check the validity of the instruments, 2SLS–IV estimations with state fixed effects are employed.

The validity of the selected instruments depends on two conditions. First, *instrument relevance,* i.e., 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). We estimate the F-statistic by employing 2SLS-IV model. Second, the selected instrumental variable should not vary systematically with the disturbance term in the second stage equation, i.e., $[\omega_{it} \mid IV_{it}] = 0$. This means that the instruments cannot have independent effects on the dependent variable. As for the exclusion restriction, it is hard to argue that the exogenous variables of state *j* directly impact the approval of investment proposals in state *i*. Nevertheless, the 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 upon request).