Land Acquisition and Sectoral Composition: Evidence from India*

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Abstract

For many governments of emerging economies, compulsory land acquisition is an increasingly integral part of industrial policy. In these countries, private land acquisition involves high negotiation costs due to fragmented land ownership; compulsory land acquisition shifts this burden from the private investor to the government. In theory, this tool might be the most efficient to stimulate industrialisation; in practice, we see most economies in transition being led by services-led growth. To understand this apparent paradox, this paper investigates the impact of an increase in land acquisition costs on sectoral composition in non-agriculture, based on the empirical regularity that manufacturing requires more land than services. I exploit an unexpected reform that placed restrictions on compulsory land acquisition for Special Economic Zones (SEZs) in India. I leverage ex-ante variation across Indian states in compulsory acquisition policy for SEZs in a difference-in-differences design to obtain causal estimates. A virtue of my setting is that I can analyse intention and actual entry separately. I find that this increase in land acquisition costs changes the composition of the non-agricultural sector, with the share of manufacturing decreasing by more than 30 percent, both in terms of intentions as well as actual entry. This paper will furthermore analyze whether SEZs after the reform are different in terms of productivity and employment, to provide a full picture on how a reduction in government intervention on the land market hinders industrialisation.

JEL classification: L16, O14, Q15

Keywords: Land Reform, Industry Mix, Structural Change, India.

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I. INTRODUCTION

Since ancient Egypt, compulsory land acquisition – also known as eminent domain or land expropriation – has been an oft-used tool to stimulate economic activity (Roudart and Mazoyer, 2016). In the past, authorities used compulsory acquistion to create larger plots for *agricultural* use, such as the enclosure movement in 16th century Britain. This is mirrorred in present-day transition economies, where land provision is increasingly adopted as an integral part of *industrial* policy (Lindsay et al., 2017).[1] These are not small-scale interventions: for example, in China, five percent of all arable land was acquired by the government to be converted to non-agriculture between 1998 and 2004 (Kahn, 2006). One rationale for such government intervention arises in land markets where land ownership is highly fragmented, which is a regular characteristic of countries in the developing world (Deininger, 2003). Government intervention here serves to prevent the hold-out problem and the corresponding underinvestment. Especially for projects that require a large plot of land, the private land acquisition process involves sequentially acquiring land. Then, individual landowners, knowing that their parcel is required to complete the assembly, could "hold out" for prices beyond their opportunity costs. This implies private investors face substantial negotiation costs, and might potentially be dissuaded from investing in the first place (Miceli and Sirmans, 2007). In this scenario, compulsory acquisition is an efficient tool for emerging economies in order to stimulate industrialisation and development (Sarkar, 2007). However, reality departs from this theoretical rationale in two ways. First, not all countries employing compulsory acquisition have a appropriate regulatory framework in place that protects those who are dispossessed; this results in substantial long-term welfare losses for those subject to forced displacement (Cernea and Mathur, 2007). Moreover, despite many of these industrial policies aiming to incentivize manufacturing growth and thereby structural transformation, most currently developing countries are characterized by services-led growth (Fan et al., 2023). This raises questions on the potential of

[1] According to Land Matrix (2023), a global initiative aimed at creating a cohesive dataset about large-scale land acquisitions, land deals to facilitate non-agricultural activity more than quintupled in the last twenty years, amounting to 464,265.74 square kilometres, which is almost equivalent to Spain's total land area. It should be noted that also the *share* of land deals for non-agriculture purposes in the total amount of these contracts has increased over these two decades. Another substantial share of large-scale land acquisition is intended for large-scale agriculture, following the observation that larger farms are generally more productive (as in e.g. Adamopoulos and Restuccia (2014)). This is beyond the scope of this paper.

compulsory acquisition in fostering industrialization and engendering manufacturing growth.

This paper provides novel evidence of the impact of land acquisition costs on sectoral composition in the context of an industrial policy. To do so, I exploit an unexpected reform that placed restrictions on compulsory land acquisition for Special Economic Zones (SEZs) in India. A virtue of my study is that I separate the transition from agriculture to non-agriculture into manufacturing and services. Understanding the composition of non-agriculture has direct policy relevance: per Rodrik (2015), evolving into a service economy without a sustained industrialization experience is detrimental to long-run growth, as the capital stock in the economy is insufficient. I argue that fragmented ownership, and the government's ability to intervene, contribute to this atypical structural transformation as manufacturing and services use land in different intensity. According to Batista e Silva et al. (2014), services need on average 6.7 times less land than industry to produce one monetary unit of gross value added in the Netherlands and Spain. This finding is not exclusive to advanced economies: Duranton et al. (2016) showed that the main source of misallocation in manufacturing is land, while for services it is labour. In short, private investment in services is less fraught by land market distortions than that in manufacturing.

This notion implies that cutting back compulsory land acquisition could hinder industrialization in countries with high land fragmentation. I aim to identify this effect in the context of Indian SEZs. Introduced with the explicit goal of fostering industrial growth, India's 2005 SEZ Act provided a multitude of financial and regulatory benefits to firms located in a SEZ (Central Government of India, 2005).[2] The Indian SEZ experience is notably different from similar policies in other countries. First of all, it explicitly allowed also private developers to create a SEZ. Second, the policy was relatively popular: within three years after the law was introduced, more than 500 SEZs in a variety of sectoral specializations in manufacturing and services were approved. Finally, since these SEZs are relatively large, and India is characterized by high land fragmentation, nine out of 39 State Governments committed to expropriating land for both public and private developers (Levien, 2012). Thus, the State Governments shielded SEZ developers, and any firms locating in the SEZ, from the normally high negotiation costs involved in private land acquisition. These features make the Indian SEZ experience an ideal case study, as I can directly relate *government*

[2] Firms were not only exempt from sales taxes and import duties, they also profited from automatic approval of FDI up to 100% and single-window clearance, which dramatically lowered the administrative burden of operating a business.

land acquisition to *private* economic activity.

I exploit an unexpected reform in 2007 that increases land acquisition costs for SEZ developers. In that year, a large protest against a SEZ in West Bengal was violently shut down by the state police, with fourteen farmers being killed and more than a hundred missing. In response, the Central Government announced that from then on, *forced* land acquisition was prohibited in all states, and that landlosers must be compensated properly in terms of rehabilitation and resettlement (SEZ Board of Approval, 2007). Importantly, SEZs that were already approved were exempt from this policy; only new developers were exposed to this dramatic increase in land acquisition costs. Furthermore, this exposure is concentrated in those states that used to expropriate land for SEZ developers. I exploit this regional heterogeneity in the ex-ante propensity for expropriation as a measure of exposure to the reform in a difference-in-differences framework.

Based on Hopenhayn (1992) and Melitz (2003), I predict that the reform reduced the share of manufacturing proposals in those states that introduced compulsory acquisition policies for SEZs, as the entry barrier increased relatively more for manufacturing in these states. However, the increased entry barrier also has a selection effect, suggesting that new entrants are on average of higher productivity or quality. This implies that separating the entry decision and firm performance are important. To that end, I have constructed a dataset of the universe of official SEZ proposals between 2006-2022, allowing me to track SEZ development over time. I scraped the Minutes from all SEZ Board of Approval meetings, and used text analysis to compile this dataset. I have information for 1,439 proposals on their specific location at the village level, their size in hectares and the sector in which they will operate. This dataset allows me to separately analyse the effect on private firm intentions, or the proposed, and the actual sectoral composition. I then match this novel village-level dataset with the SHRUG dataset, using their rich open source data to track economic development and sectoral composition at the village-level (Asher et al., 2021).[3]

The first analysis investigates the effect of the reform on the proposed sectoral composition: I show that the proposed share of manufacturing SEZs in states that committed to compulsory acquisition is thirteen percentage points lower, and that of services is twelve percentage points higher. This reduction in intentions to enter for manufacturing translates into fewer manufacturing

[3] Technically, this data is not at the village level. To account for the many boundary changes in India, **?** have created a *shrid*, which is a location identifier that is consistent across 1991-2021. If a village does not experience any boundary changes, the shrid is at the village-level; otherwise it includes multiple villages.

SEZs that become operational: in terms of actual sectoral composition, the share of manufacturing SEZs is fifteen percentage points lower. My results show that a reduction in compulsory acquisition reduces industrialisation and increases investment in services under the industrial policy of Special Economic Zones.

My paper contributes to the literature in three distinct ways. First, it is the first to analyze the impact of compulsory acquisition on industrial policy. Moreover, I leverage a natural experiment to obtain causal estimates for this impact. I complement existing research on compulsory land acquisition, which mainly involves careful documentation of the negative welfare effects of those who are expropriated, as in e.g. Cernea and Mathur (2007); Gironde and Senties Portilla (2016), the regulatory process governments engaged in compulsory acquisition should adhere to (Keith et al., 2009; Lindsay et al., 2017), or explore in which settings compulsory acquisition, if compensation is fair, could foster economic development in general (Miceli and Sirmans, 2007; Sarkar, 2007; Ghatak and Mookherjee, 2014). The closest related paper to my study, Blakeslee et al. (2021), analysed Industrial Areas in Karnataka, in which the State Government not only acquires the land but also converts the land to industrial use, positively affect firm entry and employment in both these areas and the surrounding villages. They argued that this mainly demonstrates the burden of strict land zoning laws that hinder land use conversion, and that the act of providing industrial land at market rates is an effective enough place-based policy for emerging economies. This important result can however not distinguish between the barriers to land acquisition and the barrier to land use conversion; my paper can inform on the degree to which access to land is the main constraint private firms face.

The second contribution is to enrich existing evidence on the impact of land barriers on firm performance by analysing how they affect firm entry. There is extensive evidence that land market frictions, such as fragmented ownership and weak property rights, have a negative effect on agricultural productivity and output (e.g.Adamopoulos and Restuccia (2014); Britos et al. (2022); Foster and Rosenzweig (2022)), manufacturing output and employment (Duranton et al., 2016; Pal et al., 2022; Sood, 2022), but not on services output and employment (Mehta, 2022). A virtue of my study is that I not only investigate its effect on actual sectoral composition, as in Mehta (2022), but that my unique dataset allows me to understand how *entry* into manufacturing and services is affected differently by land market frictions. This complementary finding adds a new dimension in which manufacturing and services behave differently in frictional land markets.

Third, my paper contributes to the literature on the effects of SEZs in India, providing a novel explanation to appraise their relatively mediocre success. SEZs are one of the most popular development strategies; in 2006, there were 3,500 SEZs across 130 countries (Frick et al., 2019). They are also economically important: estimates suggest that SEZs were responsible for more than 20 percent of all exports and employed more than 60 million people in the mid-2000s. In the case of India however, there is at most mixed evidence on economic activity (Hyun and Ravi, 2018; Görg and Mulyukova, 2022), and no effect on development outcomes such as education and infrastructure (Aggarwal, 2007; Alkon, 2018). Those papers that found negative effects on economic developments have rationalized this through the strict regulatory environment and the potential for corruption by local politicians (e.g. Levien (2012). This paper proposes a complementary explanation, showing that the intensity of compulsory acquisition, and thereby the opportunity of private firms to avoid the land acquisition process, influences the sectoral composition and potentially performance of these SEZs.

Finally, its discussion of sectoral composition naturally relates to a set of papers describing India's growth puzzle and India's atypical structural transformation, characterised by services-led growth with a still-growing manufacturing sector.[4] Competing explanations for this phenomenon include costly skill accumulation (Chari et al., 2016), informality of the workforce (Djidonou and Foster-McGregor, 2022), or a combination of productivity shocks and income effects (Fan et al., 2023). This paper asserts that land market imperfections, due to their differing impact on manufacturing and services, might contribute to differences in factor reallocation from agriculture to these respective sectors and thereby influence structural transformation.

The next section contains the literature review. Section II discusses the related literature in more detail and highlights the contributions of this paper. In Section III, the institutional environment for SEZs, their tenuous relationship with land and the protest and subsequent policy changes will be elaborated upon. Section IV discusses the data and the empirical methodology and Section V contains the results. Finally, section VI will provide a conclusion and suggestions for future research.

[4] As noted in Fan et al. (2023), this pattern of structural transformation is not unique to India, as the combination of growth in services with limited industrialization is observed in other developing countries.

II. Literature Review

As outlined above, this paper contributes to multiple strands of literature, which will be elaborated on below.

I. Compulsory acquisition

Large-scale land acquisition by the government has been a documented practice at least since 3000 BC, with records on the expropriation of villages to create large public estates in the Old Kingdom of Egypt (Roudart and Mazoyer, 2016). For as long, it has been a tenuous and delicate strategy, with dispute on the tradeoff between investments for public purpose and the consequence of dispossession. With the increased interest for governments to accelerate development and increased value of land since the agricultural price surge in 2007-8, this topic has become increasingly fraught with tension (Keith et al., 2009). This tension in turn has spurred an economic literature that mainly focuses on documenting the consequences of compulsory acquisition for those dispossessed. Often based on detailed case studies, this research highlights the long-term negative welfare effects on citizens whose land is expropriated (Cernea and Mathur, 2007). Moreover, Gironde and Senties Portilla (2016) showed that this not just affects the landowners: in a case study of seven villages in Cambodia and Laos, the livelihood of those who were partially or not expropriated from changed markedly, as the new plants brought about market and urban developments. The investment lead to improved infrastructure and thereby access to nearby villages, but also dramatically reduced job security and left families unable to live off farming alone. Understanding how and who should be compensated, especially in contexts with weak property rights and tenure security, remains a complicated but important issue (Lindsay et al., 2017).

It is however not just equity considerations that drive concerns with compulsory acquisition; it can affect economic efficiency as well. One concern is that the use value of the land when used for industry exceeds its current market value (Pal et al., 2022). Especially in settings with high land fragmentation, government intervention improve efficiency as it avoids the hold out problem (Miceli and Sirmans, 2007). In dealing with a large number of landowners, the buying process would almost surely become sequentially, meaning that those landowners that are approached later have higher bargaining power than those approached initially. A speculative seller will then "hold out" in anticipation of a higher price (Sarkar, 2007). If the investor anticipates this delay, he

might not even be willing to undertake the project in the first place. Kitchens (2014) investigated the prevalence of the speculative hold out problem under eminent domain in Tennessee, US, in the 1930s, finding that those that held out and went to court obtained on average about five percent higher compensations. Finally, Ghatak and Mookherjee (2014) argued that not compensating the farmers that do not own but work on the land that is acquired means that the landowner does not internalize the farmers' losses upon sale of said land. They showed that in fact farmers need to be overcompensated to curb the owner's socially excessive incentive to sell.

There is however little research on what the implications of compulsory acquisition, especially for industrial policy, are on industrialisation. The closest paper to this one is Blakeslee et al. (2021), who studied the impact of land-zoning laws on economic activity in the context of the Industrial Areas policy in Karnataka. These areas are contiguous pieces of land acquired and converted to industrial land use by the State Government, after which the land is sold or leased to companies at market rates. The State Government also provides infrastructure and utilities, but unlike many other place-based policies no other financial incentives are provided. They found that the program increased firm creation and employment both in the Industrial Area and its surrounding villages, suggesting that the land constraint is potentially binding for local economic activity. My paper differs from the work of Blakeslee et al. (2021) in two aspects. First, the firms locating to the Industrial Areas do not only avoid land-zoning laws, they also do not face any other land barriers as the State Government expropriated the land. It is therefore not necessarily clear to what degree the strict land zoning regulation is the only constraint that binds firms. In my setting, I exploit a policy shock that only affects the costs of compulsory, and thereby land, acquisition. Furthermore, I can explicitly disentangle the barriers surrounding land acquisition costs from those associated with land use conversion, as these occur at different stages in the SEZ development process. Second, I investigate the impact on different sectors separately, as land barriers affect sectors with different land requirements heterogeneously.

II. Impact of land market frictions on economic outcomes

My paper also relates to the literature that describes the impact of land market imperfections, such as land fragmentation or weak property rights, on economic outcomes. As discussed before, these imperfections are used to theoretically and in practice justify compulsory acquisition. The bulk of evidence on this relationship is for the agricultural sector, showing that land barriers

are an important factor in explaining the agricultural productivity gap between developed and developing countries (Adamopoulos and Restuccia, 2014). First, it has been shown that land imperfections hinders farms from achieving their optimal scale (Britos et al., 2022). Furthermore, the inefficiently small plot sizes generate underutilization of labour or disguised employment: in the case of India, Foster and Rosenzweig (2022) showed that if all farms were at optimal size, output per worker would increase by 68% while reducing the total agricultural labour force by 16%. Finally, Kitamura (2022) showed how land market frictions and credit frictions interact: using a large land redistribution policy in Japan, he found that increased access to land and increases credit access through higher collateral. This incentivizes farmers to invest more in production technologies, thereby increasing agricultural productivity.

More recently, the effect of land market frictions on the manufacturing sector has been investigated. Duranton et al. (2016) established that in India, land misallocation is the main driver for output misallocation in manufacturing. This has been corroborrated more formally by Sood (2022), who found that manufacturing firms in regions with higher land fragmentation acquire additional land slowly over time rather than buying a sufficiently large plot before starting production. These manufacturing firms are 22 percent smaller than their counterparts in regions with more concentrated land ownership; this lack of expansion equates to a reduction in lifetime producer profits of 6.5%. Pal et al. (2022) developed a model that shows that stricter land ceilings, which cap the amount of land a landowner can hold, reduce both capital investment and industrial output.

The only other study – that I am aware of – that describes the impact of land market frictions on both manufacturing and services is Mehta (2022). In his paper, he investigated whether firms perform worse in states with more land fragmentation, finding that only manufacturing firms have significantly lower output and employment in such states. Furthermore, the effect size is higher for states that also exhibit more land disputes or an ill-functioning land rental market, suggesting that it is differences in land requirements that drive this phenomenon. A virtue of my study is that I can not only investigate the impact of the policy environment on firm-level outcomes, but that I can analyse entry directly. Understanding how land policy affects selection is of the utmost importance to contextualize the findings that already-established firms perform worse.

III. Impact of SEZs in developing countries

Third, my paper contributes to the stream of literature on the (socio-)economic impact of place-based policies in general and SEZs in India specifically. Research on spatial policies initially focused on developed countries due to data availability, showing mixed effects (e.g. Greenstone et al. (2010), Brachert et al. (2019) and Criscuolo et al. (2022)). Koster et al. (2019) pointed out the the impact of place-based interventions might well play out differently in developing countries, as these are generally focused on well-performing firms or areas. This reduces the chance that the local benefits such agglomeration effects are dwarfed by firm and job displacement in surrounding areas. In their paper, they found large increases in firm productivity and local wages in industrial parks in Shenzen, China. Partly because of this success, SEZs have become one of the more prominent development strategies (Frick et al., 2019).

However, the Indian SEZ experience has generally been less impressive: Görg and Mulyukova (2022) showed, based on PROWESS data, how the productivity of firms in close proximity of SEZs is actually negatively affected. He showed that this effect is most pronounced for state-owned SEZs. In his paper, Alkon (2018) investigated the oft-made claim that SEZs not only bring economic but also developmental benefits, such as improvements in human capital or infrastructure, finding no effect. This is complementary to Aggarwal (2007), who finds that SEZs create jobs but have limited impact on human development. Finally, Hyun and Ravi (2018) used night light data to show that SEZs boosted economic activity. They further provided evidence that SEZs draws workers out of informality, such that the formal sector grew in size and productivity. My paper is complementary to this existing literature by considering land as an input in the production function, and attempting to catalogue the opportunity costs of these SEZs.

IV. India's atypical structural transformation

Finally, since my paper discusses reallocation within non-manufacturing in India, it naturally relates to a set of papers exploring India's atypical structural transformation. In general, structural transformation relates to factor reallocation across the three broad sectors: agriculture, manufacturing and services (McMillan and Rodrik, 2011; Herrendorf et al., 2014). This phenomenon differs significantly from India's factor reallocation in the last decades, which is characterised

by services-led growth with a still-growing manufacturing sector.[5] Chari et al. (2016) advocated that this is not the result of limited labour mobility, instead highlighting costly skill accumulation as an explanation. Relatedly, Djidonou and Foster-McGregor (2022) contended that the relative underperformance of the manufacturing sector in India is driven by informality, as labour reallocates from agriculture to the informal sector. According to Dehejia and Panagariya (2014), the growth puzzle can partly be explained by intersectoral linkages: they showed that the large growth in services in India is partly generated by the growth in manufacturing, which created a stronger internal market for services. Finally, Fan et al. (2023) analysed the growth of services in India, stating that the development process led to a productivity increase in services, and the growth was reinforced by increased demand due to income effects. My paper is the first to assert that compulsory acquisition, due to their differing impact on manufacturing and services, might contribute to differences in factor reallocation from agriculture to these respective sectors and thereby influence structural transformation.

III. India: Land and SEZs

I. The Indian SEZ Act

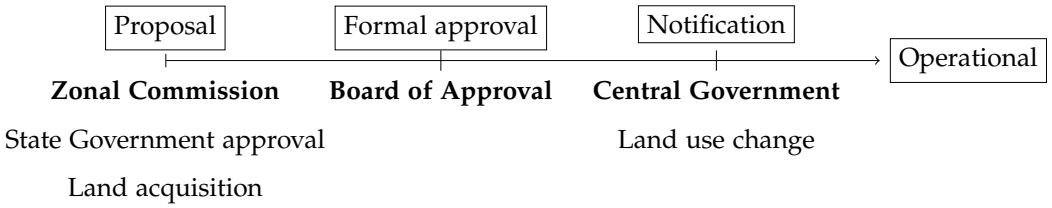
Starting with industrial estates and townships from the late forties to establishing the first ever Export Processing Zone (EPZ) in 1965, the Indian Central Government was in some sense ahead of the curve when it came to implementing place-based policies (Levien, 2012). The objective for these EPZs was to manufacture commodities for export to obtain foreign exchange, in exchange for tax breaks and smoother trade procedures. In 2000, inspired by the success of Chinese SEZs in the Guangdong province, the Export-Import policy was established, as a precursor to the SEZ Act (Hyun and Ravi, 2018). The pre-existing EPZs were converted to SEZs, could process imports duty-free and did not need any license to import. At the same time, the focus shifted from exports to general processing, as evidenced by SEZ developments inland instead of close to the port. Several states, including "economically backward" states, introduced specific SEZ legislation. Nevertheless, it was not until after the ratification of the 2005 Special Economic Zone Act that the popularity and prevalence of SEZs materialized Tewari (2020). Established with the goal of

[5] As noted in Fan et al. (2023), this pattern of structural transformation is not unique to India, as the combination of growth in services with limited industrialization is observed in other developing countries.

increasing employment and thereby economic growth, the Indian Act differs from most other SEZ endeavours by allowing both public and private developers to set up a SEZ (Central Government of India, 2005).[6] Firms locating inside an SEZ can profit from duty-free imports, single window clearance and 15-year income tax benefits.[7] They can also set up a joint venture with up to 100% FDI with automatic approval, instead of the 49% threshold.

The development of an SEZ proceeds through three stages. First, the developer submits a proposal to the State Government of the proposed location and the SEZ Board of Approval (BoA). The BoA meets between four and 25 times a year to judge whether proposals are of sufficient quality. In general there are three elements to this judgement: the State Government must approve the proposal; the plan for the SEZ must meet the requirements and, importantly, the developer should own the land.[8] If the developer (be it private or public) does not own the land, only in-principle approval can be granted; if there are multiple unfulfilled requirements the proposal is deferred. In the latter two cases, the proposal can be resubmitted to the BoA to be discussed again later. After the formal approval is received, the SEZ moves to the notification stage, which involves the Central Government changing the land use designation on the SEZ plot to industrial land. The Government does so if it believes that the SEZ will bring about economic development and will be for the greater good (Central Government of India, 2005). Then, the developer can start building on the land and eventually start operating, which is the final phase of SEZ development. The developer also sets up a SEZ Board of Approval, which then can decide which firms to allow into the SEZ. The schematic development of a SEZ is given in Figure 1 below:

Figure 1: *Schematic overview of the development stages of a SEZ*



This process immediately showcases the direct effect of SEZs on the local economy, which is

[6] Another notable difference is the minimal size requirement, which varies across industries and is lower than in for example China (Hyun and Ravi, 2018).

[7] The latter is only for units operating before 30 June 2020.

[8] Alternatively, the developer must have a twenty-year lease on the land.

the developer and other firms locating in the SEZ. Moreover, following Dehejia and Panagariya (2014), the SEZ might have an indirect effect on regional economic outcomes, through either agglomeration benefits or these intersectoral linkages. The potential spillovers are sizeable, as the uptake was high: within three years after the law was instated, more than 500 SEZs in a variety of sectoral specializations in manufacturing and services were approved. In total, as of 29 October 2022, the Board of Approval has considered 1,429 proposals, of which more than 800 were approved.

II. Land in SEZs

In India, the barriers to land acquisition are ubiquitous. First, there is a lack of accurate and up-to-date land records, and thereby insecure property rights (Prabhakar et al., 2020). Moreover, land ownership in India is extremely fragmented, with an average parcel size one hundred times smaller than in the U.S. – 2.9 acres versus 234 acres (Sood, 2022). Finally, it has been estimated that land in India is governed by more than 1,000 laws, some of which are contradictory in nature (Wahi, 2020). All aforementioned factors highlight that acquiring land in India is a time-consuming and costly land acquisition process. Anecdotal evidence furthermore suggests that state investment in land is a prerequisite for many private developers, in line with the fear of the Central Government (Levien, 2012).

To circumvent this lack of incentive, the State Governments were incentivized to expropriate land for private developers, often before their proposal was to be discussed in the Board of Approval meetings. Specifically, they used the colonial Land Acquisition Act (LAA, 1894), which allowed the government to forcibly acquire land for "public purposes" (Singhi, 2020). In 1984, this law was amended to allow the state to acquire land also on behalf of private investors While the SEZ Act does not explicitly mention the LAA as a tool to facilitate private SEZs, both anecdotal evidence and state-specific SEZ policies and acts suggest this strategy, and other land acquisition strategies, was used in abundance. Eleven states have published either a state-specific SEZ policy or state-specific rules; the other states adhere to the national SEZ Act. Of these 11, nine states – Chandigarh, Gujarat, Haryana, Karnataka, Punjab, Maharashtra, Madhya Pradesh, Tamil Nadu and West Bengal – have declared that the government would provide the necessary land. The first six states name the Land Acquistion Act as the appropriate method to do so. Upon completing the compulsory land acquisition, the State Governments would transfer this land at a lower cost

to developers (Levien, 2012). Thus, the State Governments shielded private developers, and any firms locating in the SEZ, from the normally high transaction costs.

III. Protests and land acquisition reforms

To understand the effect of land transaction costs on sectoral composition, I exploit an unexpected policy change to land acquisition for SEZs. After the 2005 SEZ Act, the West Bengal Industrial Development Corporation and the Salim Group, a private firm, proposed to set up a chemical SEZ in Nandigram, close to Haldia port.[9] This proposal was accompanied by a notification of land acquisition for 4,047 hectares of land, directly affecting 29 villages and more than 100,000 people in Nandigram (Patra, 2019). When the land acquisition program started in January 2007, farmers and other locals began to barricade the area in protest. On March 14, 2007, the West Bengal State Government decided to intervene, by sending 3,000 police officers to suppress the 5,000 villagers participating in the protest. In the ensuing violence, 14 farmers were killed and more than a hundred farmers went, and remained, missing (Levien, 2012). Moreover, there were extensive reports of acts of sexual violence by the police officers.

This protest, and its violent ending, not just changed the trajectory for Nandigram but also for the rest of India. First, the SEZ at Nandigram was cancelled; the West Bengal Industrial Development Corporation announced it would move the SEZ to Nayachar, an empty strip of land also close to Haldia. Second, the West Bengal State Government would eventually lose the next election due to their involvement in repressing the protest (Patra, 2019). Finally, and most relevant for this paper, the Central Government revisited the SEZ policy. After three months, during which the BoA meetings were suspended, the Central Government announced that effective immediately, *forced* land acquisition was prohibited and landlosers must be compensated properly (SEZ Board of Approval, 2007). It furthermore promised to revise the rules on land acquisition and resettlement and rehabilitation more formally by passing new acts.[10] A first step was the National Policy on

[9] Haldia is one of India's major ports, increasingly taking over traffic from Kolkata as Haldia is more easily accessible for ships.

[10] The process eventually culminated in two new bills, introduced in Lok Sabha (Lower House) on 6 December 2007. The Resettlement and Rehabilitation Bill was a formalization of the existing National Policy, while the Land Acquisition (Amendment) Bill most notably redefines "public purpose" beyond strategic or military provisions and infrastructure investments. Specifically, the provision of land for any other project under the umbrella of public purchases is limited to thirty percent of the total area of land necessary, and conditional on the other seventy percent having been legally

Rehabilitation and Resettlement in October 2007, which advocates for land-for-land compensation, and preference to the landlosers for employment.

The restriction on forced land acquisition should have increased land transaction costs: even if the government would still undertake the negotiations with the numerous landowners, the higher costs of resettlement and rehabilitation would be borne by the developers.[11] This increase would be most markedly felt, or at least more present, in the states explicitly committed to aiding SEZ developers in land acquisition. As mentioned before, these states are Chandigarh, Gujarat, Haryana, Karnataka, Punjab, Madhya Pradesh, Tamil Nadu and West Bengal. Furthermore, the impact of this could be exacerbated by credit frictions: despite the lenient allowances for FDI for SEZs, the foreign capital flow was "disappointing", with most of the SEZ financing coming from internal accruals and domestic bank loans (Levien, 2012).

IV. Data and Methodology

This section first provides an overview of the data that is used in answering this question, and then discusses the empirical strategy used to obtain causal estimates.

I. Data

I.i. SEZ data

The main dataset is a unique dataset on Indian SEZ proposals. My principal data source is the BoA Meeting Minutes, which are scanned documents publicly available from SEZ India (2022b). After collecting the meeting minutes, I used text analysis to extract information about all SEZ proposals. The constructed dataset contains information on the SEZ developer, the proposed location, the size in hectares, the sector in which they plan to operate and the decision of the Board, including, if applicable, the reason for deferral. I complement this data with similarly collected data from the corresponding meeting agendas of the BoA, which provide, for a subset of firms around the shock,

acquired by the developer (Ministry of Rural Development, 2007). The Land Acquisition (Amendment) Bill was passed in Lok Sabha on 25 February 2009, but both bills lapsed with the dissolution of the parliament on 1 June 2009. It wasn't until 2011 when both bills were introduced in the combined Land Acquisition, Resettlement and Rehabilition Bill in 2011. The Right to Fair Compensation and Transparency in Land Acquisition Resettlement and Rehabilitation Act was finally passed on 27 September 2013, coming into effect on 1 January 2014 (Ministry of Law and Justice, 2013).

[11] This is for example explicitly mentioned in the SEZ policy of Uttar Pradesh (2008).

information on initial proposal dates, state government approval and land possession (SEZ India, 2022a). I also collected data on whether the SEZ developer is a public or private entity and the exact location at the village level.[12] Furthermore, for those SEZs that were notified in 2014, the Ministry of Commerce and Industry published information on the share of vacant land in each zone (SEZ India, 2014). Finally, the Export Promotion Council for EOUs and SEZs published a list of all firms, including the date on which they started operating, in SEZs that were operational in 2021 (Export Promotion Council for EOUs and SEZs, 2022).

Table 1 shows the difference-in-means before and after the protest and the ensuing policy reform. The raw data suggests that there is both an intensive and extensive margin response after the shock to land transaction costs. First, the difference in log size is -0.576, which implies SEZ developers reduce the size of SEZs by 45 percent. There is no significant change in ownership, with almost 90 percent of SEZs being set up by private developers. Moving to the sectoral composition of SEZ proposals, we see that the share of utilities SEZs, which includes refineries and renewable energy, remains unchanged. However, the share of manufacturing decreases by nine percentage points and the share of services SEZ proposals increases by 8.8 percentage points. In Table 2, I decompose the changes in manufacturing and services proposals into their respective industries. This shows, besides a reallocation across manufacturing and services, a change within manufacturing. Specifically, the share of proposed SEZs operating in food processing increases, while the decrease in manufacturing proposals overall seems to be driven by manufacture of apparal, manufacture of textile and multi-product SEZs. For services, it seems that the increase is driven by an increase in IT/ITES, which already comprised almost half of all proposals, and an increase in supporting transport activities, which includes mainly (air)port-based zones that facilitate handling and warehousing activities.

I.ii. Administrative data

To measure sectoral composition at the local level, I use the Economic Census (EC, 1990-2013), which is a complete count of all economic units (both agricultural and non-agricultural) in the country except for crop production, plantation and production solely for direct consumption and

[12] To find out which SEZs were developed by public entities, I extracted a list of all state Industrial Development Corporations from the website of Council of State Industrial Development and Investment Corporations of India (COSIDICI), supplemented with ownership data from SEZ India (2014).

Table 1: *Proposed SEZs discussed before and after the reform*

Variable	Pre		Post		Difference	
	Mean	Std. Dev.	Mean	Std. Dev.	Coefficient	Std. Dev.
Log Area	4.255	(1.777)	3.679	(1.661)	-0.576***	(0.091)
Ownership	0.873	(0.333)	0.894	(0.308)	0.021	(0.017)
Power	0.020	(0.140)	0.020	(0.140)	-0.000	(0.007)
Manufacturing	0.350	(0.477)	0.263	(0.441)	-0.087***	(0.024)
Services	0.630	(0.483)	0.717	(0.451)	0.087***	(0.025)
Observations	653	653	802	802	1,455	1,455

Log area is the logarithm of the proposed SEZ size in hectares. *Ownership* is a dummy that equals 1 if the developer is a private entity, and 0 if the developer is a central or state government body. The next three variables describe the sectoral composition of the proposal. *Power* is a dummy that equals 1 if the proposed SEZ specializes in power, including (facilitating) oil and gas refineries and renewable energy. *Manufacturing* and *Services* equal to 1 if the sector of the proposed SEZ falls in the manufacturing or services category.

takes place once every seven to eight years. The EC contains information for each village-industry combination on hired and non-hired employment, the number of active firms, the share of firms using power and the share of public firms. One important note is that villages in India are subject to border changes over time. To provide consistent comparisons, I use the Socioeconomic High-resolution Rural-Urban Geographic Data Platform for India (SHRUG) (Asher et al., 2021). The unit of aggregation in the SHRUG is a shrid; this is a location-based identifier that contains at least one village or town. India has around 607,000 villages and towns, and these are collapsed into around 590,000 unique shrids, that facilitate tracking over time.

The second novel dataset is the scraped Agricultural Census (AC, 1995-2015), which provides me with the exact plot size distribution, crop types and irrigation in India's subdistricts. A subdistrict is the third administrative boundary level in India; India consists of more than 6,000 subdistricts. This dataset is publicly available, but one needs to download the data separately for each subdistrict-year combination. I therefore scraped the Agriculture Census website and compiled the dataset. I then use the detailed plot size distribution data to calculate land concentration at the subdistrict, district and state level, which serves as a proxy for land transaction costs. I use the Gini coefficient, Sen's social welfare function and the percentile ratio of the top and bottom ten

Table 2: *Industry affiliation of SEZs discussed before and after the reform*

Industry	Pre		Post		Difference	
	Mean	Std. Dev.	Mean	Std. Dev.	Coefficient	Std. Dev.
Manufacturing						
Food processing	0.014	(0.117)	0.027	(0.163)	0.014*	(0.008)
Manufacture of apparel	0.017	(0.129)	0.005	(0.070)	-0.012**	(0.005)
Manufacture of chemicals	0.035	(0.185)	0.021	(0.144)	-0.014	(0.009)
Manufacture of footwear and leather	0.015	(0.123)	0.007	(0.086)	-0.008	(0.006)
Manufacture of metals	0.015	(0.123)	0.021	(0.144)	0.006	(0.007)
Manufacture of non-metallic mineral products	0.009	(0.096)	0.012	(0.111)	0.003	(0.006)
Manufacture of other transport equipment	0.003	(0.055)	0.009	(0.093)	0.006	(0.004)
Manufacture of paper	0.002	(0.039)	0.001	(0.035)	-0.000	(0.002)
Manufacture of textile	0.048	(0.213)	0.030	(0.170)	-0.018*	(0.010)
Manufacture of vehicles	0.012	(0.110)	0.005	(0.070)	-0.007	(0.005)
Manufacturing of machinery	0.009	(0.096)	0.005	(0.070)	-0.004	(0.004)
Multi-product/nec	0.167	(0.374)	0.116	(0.320)	-0.051***	(0.018)
Petroleum and refineries	0.003	(0.055)	0.004	(0.061)	0.001	(0.003)
Services						
Education	0.000	(0.000)	0.001	(0.035)	0.001	(0.001)
IT/ITES	0.498	(0.500)	0.515	(0.500)	0.017	(0.026)
Other business activities	0.026	(0.160)	0.039	(0.193)	0.013	(0.009)
Research and Development	0.075	(0.264)	0.094	(0.291)	0.018	(0.015)
Supporting transport activities	0.031	(0.173)	0.067	(0.251)	0.037***	(0.012)
Utilities						
Oil and gas	0.000	(0.000)	0.001	(0.035)	0.001	(0.001)
Power generation	0.020	(0.140)	0.019	(0.136)	-0.001	(0.007)
Observations	653	653	802	802	1,455	1,455

This table contains all proposals for which a sector was declared; 9 proposals had sectors "to be indicated" and were thusly excluded. The industry is coded using text analysis on the proposed sector, based on the NIC98, the Indian industrial classification system. The category *multi-product/nec* contains multi-product SEZs, made up of multiple manufacturing sectors, and gems/jewellery. Furthermore, *Other business activities* describes financial SEZs, strategy SEZs, tourism SEZs and multi-services SEZs. Finally, *Supporting transport activities* are (air)port-based zones that facilitate handling and warehousing activities.

percent.

Table 3 displays the change in location choice for proposed SEZs before and after the reform. The first characteristic, whether the state in question has either introduced SEZ policy or SEZ rules in which they state explicitly that the State Government should provide the land to SEZ developers, is significantly less sought-after after the reform. This is in line with what one would expect, as the relative attractiveness of these states has decreased when compulsory acquisition was restricted. The Primary Census Abstract provides me with pre-reform levels of population and labour force in each subdistrict; it seems that after the reform, smaller subdistricts are more attractive. This is reaffirmed by the observed decrease in subdistrict-level manufacturing and services employment in 1998. Finally, there is no significant change in the weighted Gini coefficient on land, meaning that before and after the protest, the SEZ location choice does not depend differently on subdistrict land concentration.

Table 3: *Location choices of SEZs discussed before and after the reform*

Variable	Pre		Post		Difference	
	Mean	Std. Dev.	Mean	Std. Dev.	Coefficient	Std. Dev.
State has CA policy	0.692	(0.462)	0.633	(0.482)	-0.059**	(0.025)
Log tehsil population	13.028	(1.258)	12.882	(1.340)	-0.146**	(0.074)
Log labour force (2001)	12.066	(1.208)	11.940	(1.257)	-0.126*	(0.070)
Log manufacturing employment (1998)	9.320	(1.742)	9.120	(1.833)	-0.200**	(0.101)
Log services employment (1998)	10.087	(1.694)	9.902	(1.732)	-0.186*	(0.097)
Weighted Gini coefficient	0.752	(0.558)	0.763	(0.748)	0.011	(0.040)
Observations	653	653	802	802	1,455	1,455

State has CA policy is a dummy equal to 1 if the state in question has either introduced SEZ policy or SEZ rules in which they state explicitly that the State Government should provide the land to SEZ developers. *Population* and *Labour force* at the subdistrict level, in logs, are obtained from the 2001 Primary Census Abstract. The logarithm of total *manufacturing employment* and *services employment*, also at the subdistrict level, are collected from the Economic Census 1998. Finally, the *Weighted Gini coefficient* is a measure of land concentration at the subdistrict level. This variable is constructed using data from the 2000 Agricultural Census, which provides the complete plot size distribution across eight size categories.

I.iii. Other data

To control for local economic activity before the development of an SEZ, and analyze how this pattern has changed following this establishment, I follow Hyun and Ravi (2018) and employ the DMSP-OLS dataset (1994-2013), which provides annual measures of night time luminosity at the pixel level. Finally, to control for local agricultural productivity, and perhaps shed some light on the opportunity costs of transforming farmland into an SEZ, I use a pixel-level agricultural gross primary productivity dataset (2001-2019) developed by Gangopadhyay et al. (2022).

II. Empirical methodology

The empirical strategy builds on the stationary model of entry, exit and firm dynamics in Hopenhayn (1992) and later Melitz (2003). In this model, firms are faced with uncertainty about their productivity. Upon paying an entry cost, firms learn their productivity and decide whether to enter the market. It can be shown that the marginal entrant is the one for which the present discounted profits, as a function of their productivity, equals the entry costs. This means that an increase in entry costs acts as a higher barrier to entry, protecting incumbents and increasing selection (Hopenhayn, 1992).

The reform that placed restrictions on compulsory land acquisition corresponds to an increase in entry costs, especially in those nine states that committed to compulsory acquisition for SEZs. Importantly, I posit that this increase is higher for manufacturing than for services SEZs. As mentioned before, services need on average 6.7 times less land than industry to produce one monetary unit of gross value added in the Netherlands and Spain (Batista e Silva et al., 2014). Table 4 shows that in my sample of SEZ proposals, the manufacturing SEZs are on average 12 times larger than services SEZs. Besides a difference in land intensity, there is limited albeit convincing evidence that manufacturing firms are especially impacted by land market frictions. Sood (2022) analysed how manufacturing firms resort to a land-biting strategy, in which firms first acquire a small plot of land and slowly expand their plot over the years. Furthermore, Duranton et al. (2016) estimated that the biggest source of misallocation for manufacturing firms was land, while the biggest source for services firms was labour. If manufacturing firms are relatively more constrained by land than services firms, the increase in entry costs after the reform will be relatively higher for manufacturing firms, such that there will be relatively fewer manufacturing SEZ proposals.

At the same time, the higher entry barrier implies that the marginal entrant requires a higher discounted profit; the average new entrant should therefore be of higher productivity than before. Suggestive evidence of this pattern is provided in Table 5, which provides an overview of the SEZ development trajectory before and after the reform. In total, 734 proposed SEZs obtained formal approval, but the share of proposals obtaining formal approval is significantly higher after the reform. This might reflect a change in quality of SEZ proposals discussed after the reform in general, which would correspond to the aforementioned theory, but might also indicate a change in the strategy of the Board of Approval. In a future analysis, I plan to use an RD in time to separate these two margins of adjustment. Table 5 furthermore shows that there is no significant change in the share of notifications for SEZs before and after the reform, although the number increases slightly, ending up with 484 notifications in total. There is no signicant change in the average time between formal approval and notification. Finally, there is no significant change in the share of SEZs that become operational before and after the reform.

Table 4: *Land area statistics by sector*

	Mean (sd)
Services	65.00
	(203.8)
Manufacturing	884.2
	(2216.7)
Total	302.7
	(1261.3)

In short, I formulate the following hypotheses. First, the share of manufacturing proposals decreases after the reform relative to services proposals in those states with compulsory acquisition policies, reflecting how the entry costs have increased more for manufacturing industries. I predict that this reduction, especially right after the protest, persists in the following development stages. However, over time, the new manufacturing SEZ entrants will be of higher productivity, reflected in the quality of their proposals. For now, I measure quality by speed through which the SEZ proposal moves through the development process. However, it might also be that the selection

Table 5: *Development trajectory for SEZs discussed before and after the reform*

Variable	Pre		Post		Difference	
	Mean	Std. Dev.	Mean	Std. Dev.	Coefficient	Std. Dev.
Formal Approval	0.532	(0.499)	0.750	(0.433)	0.219***	(0.028)
Notification	0.413	(0.493)	0.436	(0.496)	0.023	(0.029)
Days until notification	394.240	(391.916)	401.634	(502.697)	7.394	(41.484)
Operational	0.242	(0.429)	0.211	(0.408)	-0.032	(0.025)
Observations	549	549	589	589	1,138	1,138

This table compares the development trajectory for SEZs where the first proposal was discussed before to those whose first proposal was discussed after the reform. *Formal Approval* is a dummy that equals 1 if the proposal - at some point - is approved by the Board of Approvals. *Notification* equals 1 if the SEZ is notified by the Central Government and *Time to notification* is the number of days between a SEZ obtaining formal approval and being notified. Finally, *Operational* equals 1 if at least one firm in the SEZ is operational.

effect in this process is dwarfed by the reduction in manufacturing proposals. To understand the impact on economic outcomes, I aim to extend this with SEZ-level characteristics upon operation, such as employment, number of firms in SEZ and exports.

To analyse these hypotheses, I use a difference-in-differences estimation strategy. Specifically, I compare the change in manufacturing SEZ proposals in states with compulsory acquisition policy after the reform to the states in which such policy was not adopted. This results in the following regression equation:

$$Y_{irst} = \beta Post_t \cdot LA_s + X_{rs}\gamma + \alpha_s + \alpha_t + \epsilon_{irst}, \tag{1}$$

where Y_{irst} refers to any outcome, sector choice or area, of SEZ developer i in region r in state s discussed at t. $Post_t$ is a dummy designating whether the proposal i was discussed before or after the protest and LA_s equals 1 if the state s ex ante committed to facilitating the land for SEZ developers. I furthermore control for variables that influence the location choice of SEZ developers in X_{rs}, including subdistrict-level population and labour force in 2001, manufacturing and services employment in 1998 and the weighted Gini coefficient that measures land concentration. I add year fixed effects α_t and state or subdistrict fixed effects α_r. To ensure proper identification, I cluster the standard errors at the meeting level, as I do not have a smooth time variable but bunching of proposals, and to account for the fact that the number of proposals discussed per meeting varies

dramatically over time. Alternatively, one could argue that the standard errors should be clustered at the treatment level, which would be states in my setting, but there are fewer than thirty states that ever see an SEZ so this strategy is unavailable. Instead, I can cluster on the subdistrict-level or on the proposal level. All results are robust to these clustering strategies.

In what follows, I will parametrically test the null-hypothesis that $\beta = 0$ for three outcome variables: log SEZ size, the probability of a proposal being for a manufacturing SEZ and the respective probability for services. If $\beta > 0$, this implies that after the protest, the outcome variable is relatively larger in states that employed compulsory acquisition policies for SEZs.

The main threat to identification is unobservable heterogeneity. The unexpected nature of the protest an thereby policy change that I exploit helps subside concerns of reverse causality, but it might still be possible that entry decisions for manufacturing and services SEZs were on a different trend before the reform. As shown before, including subdistrict-specific variables that control for location choice are instrumental here. Figure 2 plots, for both manufacturing and services, the coefficient per quarter relative to the baseline meeting just before the protest. This regression includes controls and state fixed effects, and the standard errors are clustered at the date level. The figure shows that the pretrends are not significantly different for manufacturing and services SEZs. In the DiD design, I can control for time-varying unobservables that impact the entry decision for manufacturing and SEZs differently; the 2008 crisis had for example a large impact on the Indian economy, especially on manufacturing. One might also worry that the treatment and control group, those being states that introduced compulsory acquisition policies and those that did not, are not comparable even with controls. Figure 3 shows the variation I leverage to obtain identification, where the states in pink are those that committed to these policies and those in purple did not.

The remaining concern is that there are unobservables that are correlated with the treatment variable. To reduce the potential impact of this issue, I plan to include trends of the controls to show how general development influences the estimation result and to analyze the tendency to protest against SEZs before and after the reform.

V. Results – preliminary

In this section, I provide evidence that the policy shock changed the proposed and sectoral composition of SEZs.

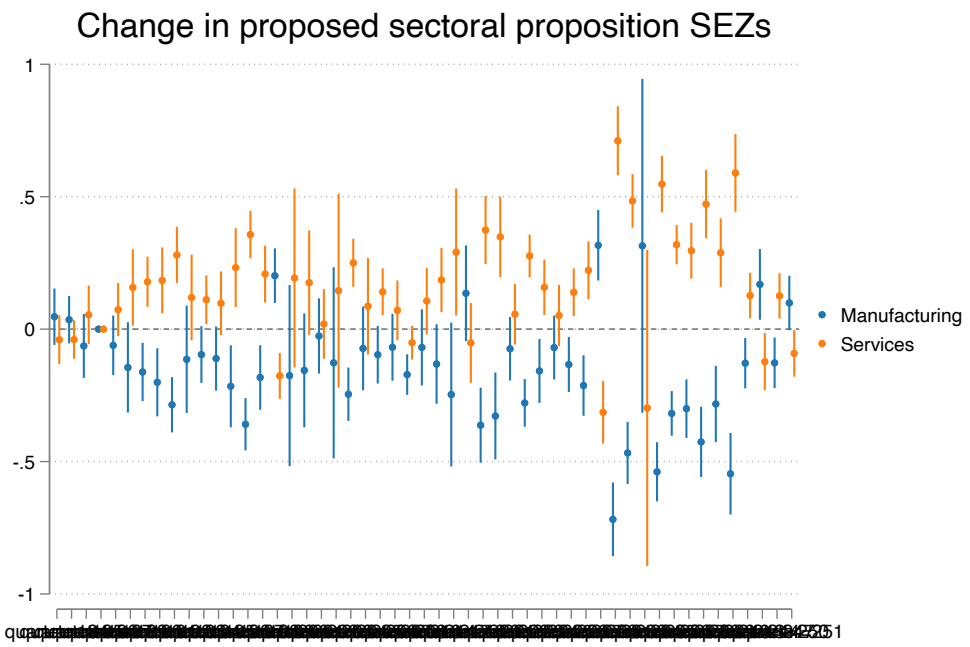


Figure 2: *Change in proposed sectoral composition SEZs*

Table 6 shows the results of estimating Equation 1 for the universe of SEZ proposals. The first three columns show the results for this equation with Manufacturing as the outcome variable, where Manufacturing is a dummy that equals one if the SEZ proposal was for a sector within manufacturing. In column (1), we see that the reduction in manufacturing SEZ proposals after the protest is present only in states that explicitly committed to compulsory acquisition for SEZs. Column (2) adds year fixed effects, and in the third column subdistrict fixed effects are used in lieu of state fixed effects and subdistrict-level controls. Including subdistrict fixed effects, to account for time-invariant characteristics that might influence the SEZ location choice, does not dramatically change the coefficient. It should be noted that the number of observations declines somewhat with the addition of subdistrict fixed effects, as a few SEZs do not have subdistrict-level location information. The preferred baseline specification in the third column shows that the probability of a SEZ proposal being in manufacturing is 13.4 percentage point lower after the reform in those states that use compulsory acquisition for SEZs. This translates to a decrease of almost one third, as the baseline average is 35 pecent. The last three columns show that the share of services SEZs (or rather, the probability that an SEZ is in the services sector) increases by 12.3 to 14.6 percentage

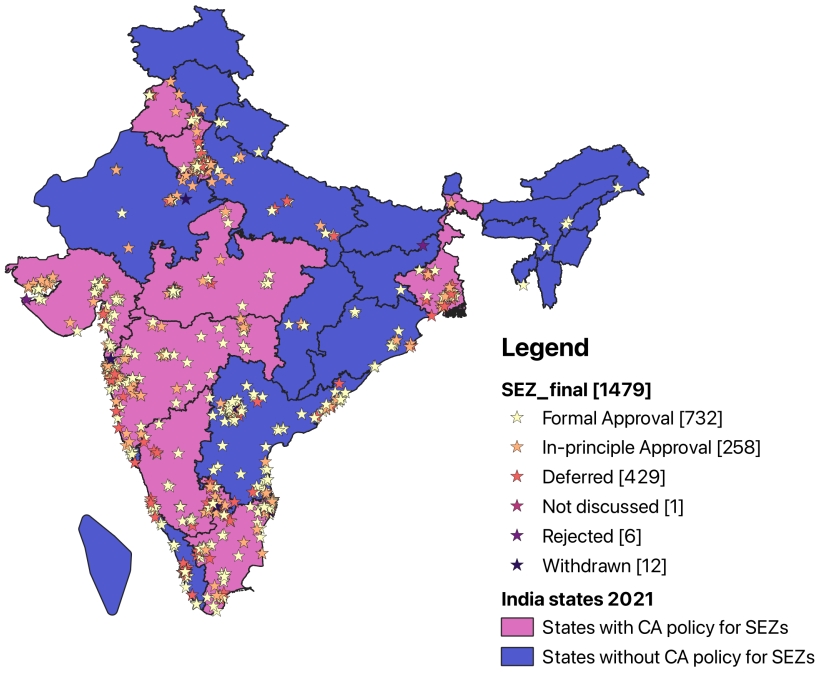


Figure 3: *SEZ proposals and states' propensity to expropriation for SEZs*

points depending on the specification, from a baseline average of 62.9 percent.

Moving to the next step in the SEZ development process, Table 7 displays the results of estimating Equation 1 for those SEZs that moved to Formal Approval. Again, the effect of the protest seems to be fully driven by changes in entry in states that mediated land acquisition. The preferred specification for Manufacturing in column (3) indicates that the likelihood of an approved SEZ being in manufacturing decreases by 15.1 percentage point in states that carried out compulsory acquisition for SEZs. The last three columns show that this is almost fully mirrored by the effect on services entry, with the share of services increasing by 13.5 percentage points in states with higher land acquisition intensity.

Third, Table 8 displays the results of estimating Equation 1 for those SEZs that were eventually notified, meaning that the Central Government also approved of the SEZ and the land use was officially changed to industrial or commercial. Again, the effect of the protest seems to be fully driven by changes in entry in states that mediated land acquisition. The preferred specification for Manufacturing in column (3) indicates that the likelihood of a notified SEZ being in manufacturing

Table 6: *Change in proposed SEZ composition*

	Manufacturing			Services		
PostProtest=1	-0.0418			0.0423		
	(0.0430)			(0.0429)		
PostProtest=1	-0.127**	-0.136**	-0.134**	0.136**	0.146**	0.123***
× State with CA=1	(0.0571)	(0.0601)	(0.0553)	(0.0563)	(0.0589)	(0.0459)
Location controls	Yes	Yes	No	Yes	Yes	No
State FE	Yes	Yes	No	Yes	Yes	No
Year FE	No	Yes	Yes	No	Yes	Yes
Subdistrict FE	No	No	Yes	No	No	Yes
Observations	1014	1014	1278	1014	1014	1278
R-squared	0.228	0.237	0.562	0.252	0.260	0.580

The dependent variable is a dummy that equals one if the proposed SEZ is for *Manufacturing* or *Services*, respectively. *PostProtest* is a dummy that takes the value 1 if the meeting in which the proposal is discussed happens after 17 March 2007. The controls include measures of subdistrict-level population and labour force variables from the 2001 Primary Census Abstract, and data on manufacturing and services employment, also at the subdistrict level, from the Economic Census 1998. Finally, the regressions control for local land concentration using data from the 2000 Agricultural Census, which provides the plot size distribution across eight size categories in a subdistrict. Standard errors, clustered at the meeting level, are in parentheses.

$*p < 0.1, **p < 0.05, ***p < 0.01$.

decreases by 15.3 percentage point in states that carried out compulsory acquisition for SEZs. The last three columns show that this is almost fully mirrored by the effect on services entry, with the share of services increasing by 15.4 percentage points in states with higher land acquisition intensity.

The final stage of development is the SEZ becoming operational, meaning that the SEZ contains at least one operating firm. Repeating the analysis above, but now restricting the observations to those SEZs that became operational, Table 9 shows that again, there is a decrease in the share of manufacturing SEZs in states with compulsory acquisition policies after the protest. The coefficient

Table 7: *Change in approved SEZ composition*

	Manufacturing			Services		
PostProtest=1	0.0574			-0.0540		
	(0.0620)			(0.0616)		
PostProtest=1	-0.195**	-0.196**	-0.151***	0.190**	0.190**	0.135***
× State with CA=1	(0.0818)	(0.0841)	(0.0522)	(0.0813)	(0.0837)	(0.0478)
Location controls	Yes	Yes	No	Yes	Yes	No
State FE	Yes	Yes	No	Yes	Yes	No
Year FE	No	Yes	Yes	No	Yes	Yes
Subdistrict FE	No	No	Yes	No	No	Yes
Observations	516	515	564	516	515	564
R-squared	0.270	0.280	0.516	0.295	0.305	0.511

Observations are restricted to those that eventually were granted formal approval. The dependent variable is a dummy that equals one if the approved SEZ is for *Manufacturing* or *Services*, respectively.*PostProtest* is a dummy that takes the value 1 if the meeting in which the proposal is discussed happens after 17 March 2007. The controls include measures of subdistrict-level population and labour force variables from the 2001 Primary Census Abstract, and data on manufacturing and services employment, also at the subdistrict level, from the Economic Census 1998. Finally, the regressions control for local land concentration using data from the 2000 Agricultural Census, which provides the plot size distribution across eight size categories in a subdistrict. Standard errors, clustered at the meeting level, are in parentheses.

$*p < 0.1, **p < 0.05, ***p < 0.01$.

is still similar in size across all three specifications, especially for those where manufacturing is the dependent variable, but the results are only marginally significant. It should be noted that, even though both pre- and post-reform the share of SEZs becoming operational is similar, the total sample is relatively small compared to the SEZs reaching earlier stages. It might thus be that the analysis is underpowered. On the other hand, it might be that the difference pre- and post-reform is just not that unlikely. In that case, especially since this result is not fully robust to different clustering strategies, the relatively higher entry barrier for manufacturing might have translated into fewer attempts at entry, but those who entered after the reform were of higher quality or potential, such that the actual sectoral composition of SEZs is not dramatically different after the

Table 8: *Change in notified SEZ composition*

	Manufacturing			Services		
PostProtest=1	0.0317			-0.0264		
	(0.0737)			(0.0727)		
PostProtest=1	-0.182*	-0.196**	-0.153**	0.150	0.161*	0.154**
× State with CA=1	(0.0948)	(0.0980)	(0.0716)	(0.0943)	(0.0962)	(0.0754)
Location controls	Yes	Yes	No	Yes	Yes	No
State FE	Yes	Yes	No	Yes	Yes	No
Year FE	No	Yes	Yes	No	Yes	Yes
Subdistrict FE	No	No	Yes	No	No	Yes
Observations	335	333	347	335	333	347
R-squared	0.327	0.344	0.504	0.341	0.358	0.483

Observations are restricted to those that eventually were notified. The dependent variable is a dummy that equals one if the approved SEZ is for *Manufacturing* or *Services*, respectively.*PostProtest* is a dummy that takes the value 1 if the meeting in which the proposal is discussed happens after 17 March 2007. The controls include measures of subdistrict-level population and labour force variables from the 2001 Primary Census Abstract, and data on manufacturing and services employment, also at the subdistrict level, from the Economic Census 1998. Finally, the regressions control for local land concentration using data from the 2000 Agricultural Census, which provides the plot size distribution across eight size categories in a subdistrict. Standard errors, clustered at the meeting level, are in parentheses.

$*p < 0.1, **p < 0.05, ***p < 0.01$.

reform.

VI. Conclusion

Compulsory land acquisition by the government, also known as expropriation or use of eminent domain, has been a long-standing practice for governments across the world and levels of development. In the last few decades, we observe an increasing number of transition economies utilizing compulsory acquisition as an integral part of industrial policy. The rationale for this is that the land markets are sufficiently imperfect that prohibitively high land transaction costs dissuade private investment. In that setting, it might be efficient for the government to leverage eminent

Table 9: *Change in operational SEZ composition*

	Manufacturing			Services		
PostProtest=1	0.0335			-0.0314		
	(0.107)			(0.105)		
PostProtest=1	-0.126	-0.179	-0.151*	0.0839	0.135	0.219**
× State with CA=1	(0.130)	(0.129)	(0.0886)	(0.126)	(0.122)	(0.0940)
Location controls	Yes	Yes	No	Yes	Yes	No
State FE	Yes	Yes	No	Yes	Yes	No
Year FE	No	Yes	Yes	No	Yes	Yes
Subdistrict FE	No	No	Yes	No	No	Yes
Observations	180	177	181	180	177	181
R-squared	0.298	0.331	0.608	0.341	0.384	0.616

Observations are restricted to those that eventually became operational. The dependent variable is a dummy that equals one if the approved SEZ is for *Manufacturing* or *Services*, respectively.*PostProtest* is a dummy that takes the value 1 if the meeting in which the proposal is discussed happens after 17 March 2007. The controls include measures of subdistrict-level population and labour force variables from the 2001 Primary Census Abstract, and data on manufacturing and services employment, also at the subdistrict level, from the Economic Census 1998. Finally, the regressions control for local land concentration using data from the 2000 Agricultural Census, which provides the plot size distribution across eight size categories in a subdistrict. Standard errors, clustered at the meeting level, are in parentheses.
$*p < 0.1, **p < 0.05, ***p < 0.01$.

domain to stimulate economic activity.

This paper is the first to provide quasi-experimental evidence on the impact of compulsory acquisition, or rather, a restriction in compulsory land acquisition, on industrialisation. Based on the fact that manufacturing requires vastly more land than services, I separate the factor reallocation from agriculture to non-agriculture into manufacturing and services to investigate how compulsory acquisition affects structural transformation.

I exploit an unexpected reform in 2007 that placed restrictions on compulsory land acquisition for Special Economic Zones (SEZs) in India. In that year, a large protest against a SEZ in West Bengal was violently shut down by state police, with fourteen farmers being killed and more than

a hundred missing. In response, the Central Government announced that from then on, *forced* land acquisition was prohibited, and that landlosers must be compensated properly in terms of rehabilitation and resettlement (SEZ Board of Approval, 2007). Importantly, SEZs that were already approved were exempt from this policy; only new developers were exposed to this dramatic increase in land acquisition costs.

I obtain causal estimates by comparing states that officially committed to compulsory acquisition for SEZs to those that did not have such policies. The idea is that the former State Governments shielded private developers, and any firms locating in the SEZ, from the normally high transaction costs due to India's imperfect land markets. This allows me to directly relate *government* land acquisition to *private* economic activity.

Based on the stationary version of the Hopenhayn (1992) model, I predict that the reform reduced the share of manufacturing proposals in those states that introduced compulsory acquisition policies for SEZs, as the entry barrier increased relatively more for manufacturing these states. However, the increased entry barrier also has a selection effect, suggesting that new entrants are on average of higher productivity or quality. This implies that separating the entry decision and ultimate productivity are important. My hand-collected dataset on SEZ proposals, complemented with information on operation and firm activity, is uniquely suited for this exercise. In the results, I show that the increase in land acquisition costs results in a decrease in the share of proposals for manufacturing by thirteen percentage points, while the corresponding share for services increases by twelve percentage points. This effect size is consistent across all stages of SEZ development, although the results are less robust for operational SEZs.

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