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Abstract

We use data from the universe of 3,000 ongoing formal real estate projects in Mumbai to show that 30% of the projects and around 50% of the built-up space is under litigation. On average, construction takes around 8.5 years to complete. This paper investigates the causal relationship between litigation and completion time of real estate projects in Mumbai. Even after controlling for experience of the developers and project size, we find that litigated projects take 20% longer to complete. We address potential endogeneity concerns using an instrument — the neighbourhood's propensity to sue, and find that litigation increases time taken for completion a project by 58%. This has direct implication for housing affordability; house prices in Mumbai can go up by one-third due to litigation.

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- Work in progress -

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1 Introduction

India is urbanising, putting increasing pressure on urban land and an impetus to convert land from agriculture to non-agriculture use. According to United-Nations (2018), India will see the largest increase of all countries in urban population by 2050. Efficient functioning of urban land markets will be critical to ensure decent quality of living. The incremental urban population in India is being accommodated through redevelopment within cities and expansion around city peripheries (Angel et al. 2010, Angel et al. 2012, Angel et al. 2011, Chandrasekhar and Sharma 2015, Shirgaokar 2016). Both processes depend on availability of adequate land and rules governing land use and development. It is well known that formal urban land markets have remained unresponsive to housing needs in India (Bertaud and Brueckner 2005, Brueckner and Sridhar 2012, Annez et al. 2010, Bertaud 2014). This has led to a rise in informal housing or slums (Bertaud 2014). Around 17% of India's urban population lives in slums.

Indian cities are known to have some of the most stringent urban land regulations, which affect housing supply elasticity. This has been well documented in the academic and policy literature (Vishwanath et al. 2013, Ellis and Roberts 2015) and empirical studies have assessed its impact on various outcomes including supply (Sridhar 2010, Bertaud and Brueckner 2005, Brueckner and Sridhar 2012). Unresponsiveness can also arise due to delays in completing real estate projects. Delays in the sector have been documented in developed countries. Gyourko et al. (2008) conducted a survey of municipal officials across the United States and found that regulatory delays added about six months and construction took an additional two months. Studies focusing on the United States have documented the effect of delays in reducing elasticities and increasing house prices (see Paciorek 2013, Bahadir and Mykhaylova 2014). Mayer and Somerville (2000) find that regulations which lead to further delays as compared to those that lead to additional financial burden (such as impact fees) reduce housing starts and increase prices. While there is sufficient literature in the United

States and other developed countries, there has been no study that looks at construction delays in cities in developing countries where most urban growth is going to happen. Our paper fills this lacuna.

A useful measure to understand the magnitude of supply-side frictions is the regulatory tax (Glaeser et al. 2005, Brooks and Lutz 2016, Cheshire and Hilber 2008) [1]. The regulatory tax measures the difference between house prices and the marginal cost to produce additional built-up space. Cheshire and Hilber (2008) estimate the regulatory tax rate (that is, the regulatory tax relative to the marginal cost for producing additional built-up space) for offices in London to be close to 4. Regulatory tax rate for Manhattan using estimates in the Glaeser et al. (2005) study is around 1.07. For Mumbai, IDFC Institute (2016) estimates the regulatory tax rate to be between 3.5 and 4. The regulatory tax is a black box and can be affected due to various reasons (Glaeser et al. 2005, Cheshire and Hilber 2008). According to Glaeser et al. (2005 p. 334), the regulatory tax along with supply restrictions could arise due to "legal bills, lobbying fees, the carry costs of invested capital during long delays, or any of the myriad other expenses associated with navigating the city's regulatory maze". Glaeser et al. (2005) finds a correlation between the regulatory tax and delays in the permission process. An important motivation for this paper was to examine the burden of regulatory tax caused due to litigation and the resultant delays in completion of real estate projects in Mumbai. There has been no academic literature to our knowledge that looks at the impact of litigation on the real estate market.

As per the World Bank's Ease of Doing Business Rankings India ranks fifth from the bottom for time required for enforcing contracts [2]. The slow pace of the courts in India has

[1] Many papers look at the impact of regulations on urban housing supply. For an overview of this literature see Glaeser and Gyourko (2018), and Gyourko and Molloy (2015)

[2] As per the rankings it takes 1445 days to enforce a contract in India. Bangladesh takes 1442 days and Guatemala take 1402 days for the same. Link: https://www.doingbusiness.org/en/data/exploretopics/enforcing-contracts

led to cases pending for several years. As per the National Judiciary Data Grid of India, which is maintained by the Government of India, there are 27.6 million pending cases in the Indian Court System. [3] 53.2% and 24.4% of these cases have been pending for more than two years and five years respectively. A Daksh (2016) survey of around 9,000 litigants conducted in 2016 found that 66% of all civil cases were land and property disputes.

We investigate the nature of delays in real estate construction in Mumbai, which is under the jurisdiction of the Municipal Corporation of Greater Mumbai (MCGM).[4] Specifically, we examine whether projects under litigation have longer completion times. This paper uses data from three sources: The Real Estate Regulatory Authority of Maharashtra, the MCGM, and the Bombay High Court.

The Real Estate Regulatory Authority (RERA) was created to certify projects and provide detailed information to potential buyers. The Act that set up this authority mandates that all projects on a plot size larger than 500 sqm or having more than 8 apartments register with the regulatory authority. The public data from this Authority includes the names of developers, their previous projects, details regarding the projects such as project size, and estimated completion times.

Since the data provides proposed completion times self-reported by developers, there could be a possibility that the completion times are overstated in order to avoid facing penalties for not adhering to the declared completion date. To check this, we cross- reference projects against data with the MCGM to see if projects are actually completed by the self-reported proposed completion dates. We make use of this data to see whether projects under litigation take longer completion times. We cross reference litigation case data from RERA's database against cases in Bombay High Court database to find information about

[3] Data on 19th September 2018. http://njdg.ecourts.gov.in/
[4] The MCGM governs the area under the districts of Mumbai City and Mumbai Suburban.

the plaintiffs, respondents, and the nature of the disputes. We use these cases to understand the underlying reasons for litigations.[5]

Our baseline model uses OLS to estimate the effect of litigation on estimated project times. We control for other factors that could affect completion times such as size of the project, previous experience of developers, type of project, ward dummies, whether a project is under slum rehabilitation and whether it is new or a redevelopment. One key concern in this analysis is potential reverse causality arising because homebuyers sue project developers when there is delay in completion. We are able to address this issue as these cases go to the consumer redressal courts and we are able to identify these cases and drop such projects from the dataset.[6] A second concern is the possibility of omitted variables that are correlated with both litigation and time delays and could bias OLS coefficient estimates of the litigation dummy. For instance, unclear property titles and too many subdivisions could affect both the likelihood of litigation (due to disputes in ownership) and time to completion (due to time taken in assembling different land parcels). Developers with political connections may be able to complete projects in shorter periods but may be more vulnerable to litigation. We address this potential problem using an instrumental variable approach.

Our main strategy to address the identification challenges mentioned above is to use an instrument, which measures the "neighbourhood propensity to sue". It measures the mean of projects under litigation in neighbourhoods leaving out the project in question. The leave-out measure is highly predictive of litigation for the project under consideration. Such jack-knifed instrumental variable estimates have been used in empirical research on incarceration and its effects on recidivism as well as employment outcomes in Aizer and Doyle Jr (2015), Dobbie et al. (2018), Bhuller et al. (2019) and Galasso and Schankerman

[5]We track around 225 cases being heard in the Bombay High Court – the highest court in the state of Maharashtra, from the RERA database. However, not all of them have case files available. Hence, our analysis for understanding the nature of litigations is qualitative in nature

[6]There are consumer courts at district, state and national level.

(2014), and for estimating the impact of democracy on economic growth in Acemoglu et al. (2019).

The logic for litigation in the neighbourhood predicting litigation to a project is as follows. First, it may be the case that residents in certain neighbourhoods are more organised or there is a strong presence of NGOs who will litigate on behalf of residents to oppose malpractices by developers or petition the government. Second, specific location characteristics could increase likelihood of litigation. For instance, development in areas close to forests, mangroves or the coastline could see higher chances of litigation. Literature in the urban studies field provides some evidence of both these situations arising (Zérah 2009, Zérah 2007a, Zérah 2007b). We will be able to control for location using ward fixed effects. Third, if frequent subdivision of land in certain neighbourhoods result in fragmented ownership, and those possessing land have unclear property titles, the possibility for disputes over land ownership in these areas will increase.

While on average projects have very lengthy completion times, likely caused due to lags in getting necessary approvals and permits from various authorities, projects under litigation take even longer to complete on average. Our baseline OLS results show that for all of Mumbai, projects under litigation have around 19.9% longer estimated completion times compared to projects without litigation and have 19.6% longer estimated completion times after controlling for use and ward fixed effects. Our 2SLS estimates show that projects with litigation take nearly 58% longer to complete when using the full set of controls.

We conduct robustness checks. For instance, using a limited dataset of 110 completed projects and actual completion times from the MCGM database, we find that projects with litigation have 47% longer completion times. This is much closer to our 2SLS results. We also conduct the hazards ratio test to take care of censoring of the data.

This paper comprises eight sections including the introduction. Section 2 provides background regarding regulations and litigation in land and real estate markets in Mumbai. Section 3 describes the data. Section 4 describes the model to be estimated, introduces the instrument and section 5 presents results. Section 6 discusses the robustness checks. In section 7 we estimate the cost escalation due to litigation. Section 8 concludes.

2 Background

In this section, we set the institutional context with respect to land and real estate markets in urban Maharashtra and Mumbai.

2.1 Real Estate in Maharashtra and Mumbai

The state of Maharashtra is 45% urban, and has the largest urban population by state in the country. Its capital city – Mumbai – has a population of 12.4 million as per the last census published in 2011.

The availability of adequate and affordable housing in large cities has been a major challenge. Supply-side frictions in the formal housing market largely arise from stringent regulations governing how much can be built as well as complicated processes and delays in getting necessary approvals from planning authorities. This may result in high housing prices and a significant share of the cities' populations living in slums. In Mumbai, 42% of households live in slums.

In 2016, the state government of Maharashtra created RERA in response to home buyer complaints about cost and uncertainty in building completion times. All projects in Maharashtra on a plot size larger than 500 sqm or having more than 8 apartments must register with the regulatory authority. All new and ongoing projects in the city had to registered by a set deadline. Developers failing to do so were penalised. The authority has made this database of registered projects publicly available. As on December 2017, 14,462 projects across the state were registered with the Authority. Appendix 1 shows the district-wise distribution of projects registered under RERA and Figure 1 depicts the distribution of projects across districts.

2.2 Permission process for real estate projects

Within Mumbai, land ownership is public or private and the tenure type is either freehold or leasehold.[7] District collectors are the custodian of all state land, and conversion of land from agriculture to non-agricultural uses requires their prior approval. For Mumbai, the Development Plan classifies land areas according to planned uses such as residential use, commercial use, or industrial use. Development Control Regulations govern the building form and specify areas to be reserved for open spaces, recreational spaces, allowable Floor Area Ratio (FAR),[8] setbacks and so forth. Development Control Regulations also specify granting additional FAR or Transferable Development Rights in exchange for slum redevelopment, construction of schools, hospitals, public parking, and maintaining heritage buildings. Additional FAR can also be purchased on payment of premium. Any development on land within the jurisdiction of MCGM must adhere to the zoning and regulations. If land use of the proposed development does not conform to the zoning, the developer has to apply to the planning authority for a change in land use.

The process of development requires getting approvals and No Objection Certificates from different departments within MCGM as well as other regulatory authorities, as the

[7]Freehold refers to ownership whereas leasehold refers to the tenure system where land is taken on lease from the owners.

[8] FAR is more commonly known as Floor Space Index (FSI) in India.

case may be. Approvals are granted at different stages beginning with an "Intimation of Disapproval" granted after approving building layout plans and ending with an "Occupancy Certificate" after the building is complete and the authority is satisfied with all conditions and regulations being met.

2.3 Litigation of projects

When disputes arise at any stage of the projects and they are taken to the courts, it may create further delays in completion because of a stay on construction granted by the court or because developers may be unable to proceed for other reasons until the dispute is resolved. A high incidence of litigation in real estate projects may, therefore, be a cause for concern. In Maharashtra, of the ongoing projects registered with RERA, 16% are under litigation. The litigated projects comprise 31.2% of the total built-up area of RERA registered projects and 19.1% of the total land area of RERA registered projects in the state. The share of litigated projects varies considerably across districts. Figure 2 shows the share of total projects under litigation and share of total built-up area under litigation for all districts and the state. Most notably, the largest urban districts of Mumbai City, Mumbai Suburban, and Thane have the highest share of projects and built up area under litigation. The districts of Mumbai City and Mumbai Suburban together make up the city of Mumbai and are governed by the MCGM.

The disputes are heard at different levels of court. A project can have one or more cases in the court. In all, the total number of cases for projects in Mumbai is 2,836 in different courts. Table 1 provides the breakdown of cases in the Supreme Court — the apex court of India — cases in the High Court of Bombay — the highest court for the state of Maharashtra — and cases in lower courts and other tribunals and quasi-judicial bodies.

A majority of cases (57%) are in lower courts and tribunals, followed by the High Court.

The average pendency of cases in the Bombay High Court in 2016 was around 3.5 years (Daksh 2016). Only 1% of all cases are or have been heard in the Supreme Court.

3 Data

3.1 Data sources

RERA has made available data on all ongoing real estate projects in Maharashtra registered with it. This data includes the names of developers, their previous projects, details regarding the projects such as project size, amenities provided, and estimated completion date.[9] The dataset provides information on approvals granted by the relevant authorities, whether the project is currently or has been under litigation and details of legal cases.

The dataset does not provide start dates of projects. All projects require an "Intimation of Disapproval" that authorise the start of the work and enumerate various conditions that need to be satisfied.[10] We consider the date of granting this permission to be the start date of the project. This data is provided in the certificate or letters issued by the relevant planning authorities. The time taken from this start date to the completion date reported by developers is taken as the total duration of the project. A possibility of overstating the completion date may arise if developers feel that they would attract a penalty or criticism for not completing the project within the stipulated date of completion. However, there is a natural check for this action, given that projects having very long completion times will have lower markets values. Nevertheless, in order to correct for the possibility of overestimation, for projects that should already be completed based on the reported completion date, we

[9]Real estate project developers are given the option to revise their proposed completion times. The RERA data therefore reports "proposed completion time" for all projects and "revised proposed completion time" if the completion time initially reported is revised. For the analysis, we make use of revised completion time except for projects that did not revise completion times. For such projects, we use proposed completion times.

[10]In case of Slum Rehabilitation projects, this is known as an "Intimation of Approval".

cross-verify against a database of permissions granted from the MCGM to check whether they have indeed been completed in the stipulated time.

For details regarding litigation, we cross-referenced the case numbers provided by developers against the public database maintained by the Bombay High Court. This database provides information regarding the petitioners, plaintiffs, respondents, and orders passed. The database also provides details of the disputes for some of these cases.

3.2 Data sample

At the time of data collection, RERA provided information on 3040 projects combined for the Mumbai suburban and Mumbai city districts. We exclude duplicate projects from this dataset to get a sample size of 2,953. Of these projects, 82 had cases in the consumer court and therefore were excluded to eliminate potential reverse causality. Of the remaining 2,871 projects, we were able to get the start dates from the Intimation of Disapproval for 2,457 projects. For 36 out of the 2,457 projects there are no details on whether the building is new or redeveloped and another 8 projects do not have details on built up area. Further, we were able to geocode locations for 2,425 projects.

3.3 Descriptive statistics

Table 2 provides summary statistics for all variables of interest. The mean duration for completing real estate projects is 8.44 years. The average built-up area of projects is 8842 square meters. In 27% of projects, the developers have past experience, 33% of projects are redevelopment projects, and 18% of projects are being built under the Slum Rehabilitation Scheme or are slums converted to formal residential buildings.

Figure 3 shows the frequency distribution of number of projects and difference between start dates and end dates in terms of number of days. The distribution is right-skewed since the duration (or difference between start and end dates) for completing for a large proportion of projects lies to the left of the mean duration. The skewness in the distribution justifies the use of natural log transformation of the duration for the analysis.

Variations in project duration could be affected by whether or not a project is under litigation, the size of project and the developer's experience. Table 3 presents difference between start and end dates by litigation status, experience status, and project size. Mean duration is higher for projects with litigation and for projects where developer does not have previous experience.

4 Model specification

4.1 Baseline

Our estimation strategy involves regressing the natural log of estimated time for projects on a dummy variable for litigation along with three types of controls. First, the total completion time of a project will be affected by different project-level characteristics such as size, type of use, whether projects are new as opposed to redevelopments of existing buildings, and whether projects are under slum rehabilitation. We capture these characteristics in a vector of project-specific variables. Second, completion times could be affected by whether or not developers have had past experience in construction. This is because experience developers know the system and would be better at maneuvering the rules and requirements needed to construct real estate projects. Therefore, we control for developer experience. Finally, given that there may be variation across the ward offices in the city in terms of the speed and efficiency of granting necessary permits, we capture the variation by using ward dummies. The main variable of interest is the total estimated completion time of real estate projects. We estimate the baseline regression with the following equation:

$$lnEstT_i = \alpha + \hat{\beta}_1 L_i + \hat{\beta}_2 Exp_i + \hat{\beta}_3 lnSize_i + \hat{\beta}_4 SRA_i + \hat{\beta}_5 ReDev_i + \hat{\beta}_U se_i + \hat{\epsilon}_i \tag{1}$$

Where $estT_i$ is the time taken in days from the start date to estimated end date of the project, L_i is the main explanatory dummy variable for litigation, and Exp_i, $lnSize_i$, SRA_i,and $ReDev_i$ is the set of control variables for developer experience, project size, SRA dummy, and redevelopment dummy respectively. α is the constant term and e_i is the error term. We also control for use of the project by having Use_i dummy. The types of uses are residential, industrial, commercial, and mixed use. The positive β_1 would indicate that projects with litigation take longer to complete than projects without litigation.

Despite using controls, there could still be unobservable factors that are correlated with both litigation and time delays and could bias OLS coefficient estimates of the litigation dummy. For instance, unclear property titles and too many subdivisions could affect both the likelihood of litigation (due to disputes in ownership) and time to completion (due to time taken in assembling land parcels). Developers with political connections may be able to complete projects in shorter periods but may be more vulnerable to litigation. We address this potential problem using an instrumental variable approach.

4.2 Instrument

Our main strategy to address potential omitted variable bias is to use an instrument Z, which measures the "propensity to sue" in the neighbourhood for each project i. neighbourhood m is determined by a radius r around the project.

$$Z_(m(i)r) = \frac{1}{N_m(i) - 1} \sum_{k \neq i}^{N_(m(i))-1} L_k \tag{2}$$

The instrument Z is a leave-out average. Here, $Nm(i)r$ is the total number of under construction projects in neighbourhood m. k indexes the projects that have a litigation in the m neighbourhood without including project i. L_k is equal to 1. Thus $Z_(m(i)r)$ gives us the ratio of projects under litigation in the neighbourhood around project i. This captures the extent of communities and residents litigating against projects coming up in the neighbourhood.

This is not a perfect instrument. If litigation for a particular property is correlated with unobservables determining construction delays (which are included in the error term), then the instrument may also be correlated with the error term if there is a common tendency for neighbourhood properties to experience delays.

To determine a neighbourhood, we created radii of specific distances around each geocoded project in the dataset. We estimate the leave-out average within each such neighbourhood. Figure 4 depicts the geocoded projects with litigated and non litigated projects shown in different colours. In appendix 2 we look at the validity of the instrument for r ranging from 100 meters to 400 meters with a 50 meters increase. The first stage runs are carried out with the same controls. In second stage the instrumented litigation is positive and significant in the neighbourhood of 200, 250 and 350 meters, with an effective F statistic of 24, 18 and 11 respectively. For the rest of the paper we make use of the propensity to sue with a radius of 250 meters.

4.3 Some evidence on existence of neighbourhood-level variation in litigation

The cases pertaining to real estate development in the various courts belong to a range of categories such as disputes in land ownership, plot boundaries, quality of construction, and challenging permissions given for development by development authorities. Petitioners include not just private aggrieved parties but also volunteer organizations and groups. The latter commonly make use of Public Interest Litigation (PIL). These were first introduced in the 1970s so that citizen-activists, who suffer no personal damage, can approach higher courts in the interest of safeguarding fundamental and human rights of the public at large. Well organised groups have used PILs to oppose a range of activities that they deem will have detrimental outcomes for the environment or their neighbourhood (Dupont and Ramanathan 2008, Zérah 2007a). A study found that more than one-third of residential welfare groups interviewed in Mumbai were open to the idea of filing PILs in court to get their desired outcomes Zérah (2009). Thus, projects in neighbourhoods where residents have been able to overcome the collective action problem are more likely to be litigated against. Two cases help illustrate this.

In Federation of Churchgate Residents & Ors vs Municipal Corporation of Greater Mumbai & Ors (PIL number 54 of 2012 in the Bombay High Court), the petitioners challenged the permission and exemption from height restrictions that were granted by the Municipal Corporation to a developer for redeveloping a property in a precinct where heritage regulations as well as coastal zone regulations applied. In Normandie Cooperative Housing Society Limited & Ors vs State of Maharashtra (PIL number 48 of 2016), petitioners opposed the redevelopment of a property on several grounds such as that the redevelopment would violate the sanctity of the heritage precinct, the building was not a cessed property as claimed by respondents, the transfer of tenancy rights was invalid, and its location with respect to abutment to the street was misrepresented in order to be able to build a taller building than allowed by regulations. It was submitted that the petitioners were public-spirited individuals, and not private aggrieved parties, concerned with protecting the sanctity of heritage precincts in the city.

4.4 Tests for instrument validity

In this section we test whether the instrument meets the condition of randomness and exclusion restriction.

Meeting the condition of randomness requires that the projects' locations are not correlated with neighbourhood propensity to sue. In general, we know that developers do not randomise the location of their projects. Decisions are based on factors like land values, availability of land, and so forth. Hence, we take a narrower view of randomness to mean that construction of a project is not correlated with the neighbourhoods propensity to sue. If developers were aware that certain neighbourhoods have high incidences of litigation, they would be unwilling to construct projects in such neighbourhoods and randomness would be violated. To test for randomness, we use the dummy variable for developer experience. Assuming that developers with prior experience have better information about litigation in neighbourhoods compared to developers having no prior experience, we would see developers with experience building in neighbourhoods with low propensity to sue and vice versa. A t-test on the difference in mean neighbourhood propensity to sue shows that we cannot reject the hypothesis that there is no difference between developers with experience and developers without experience (see Table 4). In other words, we cannot claim that developers with experience build in neighbourhoods with low propensity to sue compared to developers without experience.

A different way to check randomness is to examine whether is a difference in the developer experience and sizes of projects across neighbourhoods with low, medium, and high propensity to sue (see Aizer and Doyle Jr 2015). Following Aizer and Doyle Jr, we define these categories based on the bottom, middle, and top tercile of the distribution of neighbourhood propensity to sue. We see that mean values of project size, and developer experience are very similar across these categories (see Table 4). FAR seems to vary across the categories, which could be a concern as it could violate the exclusion restriction.

Inferring the 2SLS estimates as measuring the casual impact of litigation on delays requires satisfying the exclusion restriction. If there is a direct effect of the instrument on the dependent variable or if the instrument and dependent variables are correlated with the same factor, the exclusion restriction is violated. In our case, it may be possible that communities in denser neighbourhoods are suing developers to stop real estate projects and communities are litigating against projects that have a higher capital to land ratio i.e. FAR. Both these examples could violate the exclusion restriction; it is more difficult to build in denser neighbourhoods and it is more time consuming to build taller buildings, both resulting in higher completion times. We look at first stage results to test both these cases: (a) do denser areas have a higher coefficient value of propensity to sue on litigation than less dense areas, and (b) does controlling for FAR lead to a fall in coefficient estimates of propensity to sue on litigation.

In appendix 3 we see that denser areas of Mumbai have a *smaller* coefficient of propensity to sue on litigation than less dense areas.[11] The coefficient of propensity to sue is 0.178 in less dense areas and 0.113 in dense areas. While density of the neighbourhood does impact the coefficient of propensity to sue, less dense areas have a bigger coefficient. It may be the case that they have lower density as they litigate more. The FAR measures how much built up space the developer can build on land. The higher the FAR the more the developer can build on the same parcel of land.[12] Appendix 3 column 6 looks at the impact on the first stage when one incorporates FAR. After controlling for FAR the coefficient of propensity to sue hardly changes as compared to column (5). Thus, variation in FAR is not driving

[11]We categories dense areas by looking at ward level population densities. Mumbai has 24 wards. We made use of densities for these wards to categories dense and less dense wards. 53 % of our geocoded projects are in dense wards and 47% are in less dense wards.

[12]It is important to note here that total built up space measures the size of the real estate projects where as FAR measures density.

propensity to sue.

5 Results

This section presents the main findings from our analysis to test for the relationship between litigation and time delays. To equation (1) we also add ward dummies, reported in column (3). Column (4) and (5) report the 2SLS results using the geocoded projects for neighbourhood with radius 250 meters.

Table 5 presents the regression results. For the first three columns, we see a positive and significant effect of litigation on the time to completion. Column 1 shows that time taken for completion is 19.9% longer for projects with litigation as compared to projects without litigation. In column 2 we show that adding use categories as dummies doesn't change the value of the litigation coefficient appreciably. The results with ward dummies are reported in column (3). We find that coefficient values change marginally to 18.5% from column (2). Columns (4) and (5) show the 2SLS results. According to the 2SLS results litigated projects take 58% longer to complete, much higher than the OLS estimates.[13] The fact that the coefficient for litigation in the 2SLS is so much larger than that in the OLS implies that omitted variables in the OLS discussed previously are creating a downward bias, that is, they are negatively correlated with estimated completion times but positively correlated with likelihood to litigation. One possibility consistent with our discussions with developers, bureaucrats and public interest groups is that developer experience helps developers both to construct buildings quickly and to manage the politics of the system (possibly with bribes and knowing the "right" people) but "working the system" also opens the developers to litigation and regulation through the court system. Indeed, this type of countervailing force was precisely the goal of the Public Interest Litigation system. See Glaeser and Shleifer

[13] Even when we run the same specification as column 2 but only for observations we could geocode the coefficient for litigation falls marginally from 0.196 to 0.194. Hence the loss of observations does not affect the results.

(2003) and Mahoney(2012) for models with tradeoffs between regulation and litigation.

We find a negative and significant effect of developer experience, on completion time (that is, projects, where developers have past experience have shorter completion times) and also for redevelopment projects. Size of the project is positive and significantly associated with completion time.

6 Robustness Checks

6.1 Actual completions

A potential problem in correctly estimating the impact of litigation arises due to reliance on estimated completion times that are self-reported by developers rather than actual completion time. As per the Real Estate Regulatory Act, the developer is to be penalised if she fails to meet the stipulated completion time. Thus, developers have an incentive to over-report their completion time. This is not a problem if all developers over-report or if over-reporting is random with respect to our variables of interest such as whether a project is litigated. Nevertheless, we can check whether our result is robust using a smaller, secondary dataset.

We explored another dataset with MCGM, which provides Occupancy Certificates – the last approval needed by developers in order to hand over the homes to buyers. We cross-referenced projects in the RERA dataset that had reported completion date prior to 2018 against this MCGM Occupancy Certificate database to check whether they have actually been completed. We found 110 such projects in the MCGM database. These are non slum projects since the approval authority for slum projects is not the local government (MCGM) but a different authority.

We estimate the baseline model again with a modified main dependent variable. The dependent variable is the log time taken in days from the start date to the date of issue of the occupancy certificate given by MCGM (i.e. end date of the project). Table 6 shows the coefficient estimations for the set of 110 completed and verified projects. 19% of these projects had litigation. The reported results show that litigated projects took around 46-47% longer to complete compared to projects without litigation. These results are closer to the 2SLS results in Table 5. This result is significant at 1%. Column (4) shows the 2SLS results using the neighbourhood propensity to sue instrument. Although based on a small sample the time to completion results are between our OLS and IV results. We will use this conservative "in-between" figure when we calculate costs of delay in terms of indian ruppees (INR) in section 7 below.

6.2 Hazard Ratios

To deal with the issue that our dependent variable is calculated based on estimated completion dates and not actual completion dates, a different way to frame the question is to examine what factors are likely to influence the chance of an event occurring, where the "event" we are interested in is completion of the project. The event in consideration or the variable of interest, "Completion", is coded as 1 if the estimated completion date of the project was before the current date (taken as March 5, 2018) and 0 if the estimated completion date is later than the current date. The assumption is that if the completion date is before the current date then the event has occurred, that is, the project has been completed and if the completion date is in the future then the event has not occurred, that is, it is not completed. We consider survival to failure, where "failure" is completing the building. Table 7 shows the Hazard Ratios and table 8 shows the results of the Cox regression. The model satisfies tests for proportional hazards.

A hazard ratio of less than 1 indicates that increases in the variable make the event (completion) less likely and so increase the time to completion. Thus in Table 7, as expected, litigation significantly reduces the probability of completion.

6.3 Time Under Construction

Since completion times are estimated and not actual, we consider the duration for which the project has been under construction from the time that it started until the date at which the data was acquired from RERA. Thus, the main variable of interest is not estimated completion time but time under construction. The explanatory variables are the same as used in the earlier regressions. Table 9 presents the regression results.

$Logdiffstartdatedaterecd$ is the dependent variable and is the natural log of the time under construction from start dates to date of getting the data. In the OLS as well as the 2SLS runs, we see a positive and significant effect of litigation on the dependent variable. For Mumbai, time under construction is 26% longer for projects with litigation as compared to projects without litigation. Thus, the coefficient estimates for litigation are robust to this modified specification of the model.

6.4 Time left for completion since start of RERA

A possible bias in the data could arise due to the absence of projects that were already completed at the time of registration with RERA. In other words, our dataset does not have information regarding projects that began at the same time as the projects registered under RERA but were already complete and therefore not registered under RERA. For instance, there are high chances that many of the projects that started in, say, 2005 were completed by the time RERA was set up. Because they had already been completed, they did not have to register with RERA and as a result, we have no data about the characteristics of these projects and cannot use them for our analysis. The only projects that started in 2005 whose information we have are the ones that had not been completed by 2017. On the other hand, the registered projects form the universe of projects that were ongoing at the time when RERA was set up, irrespective of their start date and that met the criteria for mandatory registration as per the RERA regulation.[14] If we observe a process in equilibrium there is no bias to the snapshot but as a robustness check instead of considering the total time from the start date to the end date, we consider the time taken from the date by which all new and ongoing projects had to be registered with RERA (which was July 31, 2017) till the estimated completion time. Table 10 presents the regression results.

The OLS results show that even with the modified dependent variable, the coefficient for litigation continues to be positive and significant at 1%. On average for Mumbai, projects with litigation take 13% longer to complete (from the last date of registering with RERA) than projects that do not have litigation. The 2SLS estimates are larger and suggest a 34% increase in time to complete, albeit the latter are not statistically significant.

7 The Cost of Litigation

Delays on account of litigation can have significant implications for cost escalations in projects and hence increase the burden of regulatory tax. To estimate the extent of cost escalations, we consider the effect of litigation on two types of cost viz. construction cost and land cost. We got estimates for construction cost for a basic affordable housing project of different heights (or number of floors). Using the average building height in our dataset, which is 17 floors, and average plot area that can be built upon (usually 67% of the total plot as 33% has to be left empty in setbacks etc), we arrive at total built-up area and hence the total construction cost for the average real estate project in the dataset. This cost does not vary depending upon the location of the project. Next, we got the land cost for one area each in downtown, western suburb, and eastern suburb of Mumbai using the Mumbai real estate ready reckoner for 2019. The total land cost is this land cost per sq meter times the average plot area of a project in our dataset.

[14] To recall, only projects which are larger than 500 square meters or having more than 8 apartments have to register with RERA

We interviewed with real estate developers in Mumbai to get the borrowing cost for construction and land. For construction, the cost of borrowing ranges between 16% and 18%. Since regulations prohibit Indian banks from lending for land, developers have to borrow through other sources at much higher interests rates, which range from 22% to 30%. On average, a project without litigation takes around 2838 days or 7.7 years to complete (see Table 3). Using OLS estimate from the regression on the completed projects as the coefficient value, litigation increases completion time to 11.3 years whereas if we consider 2SLS esimate of the coefficient from the regression with the full RERA dataset, litigation increases completion time to 12.2 years. Taking land and construction cost, respective borrowing rates, and expected delays, we estimate the increase in cost escalation for a project with litigation.

Taking OLS estimates, if we consider the lower bound of the borrowing rates (16% for construction and 22% for land) litigation could increase cost by 27-28%.[15] The increase in regulatory tax rate is in the range of 27-28% due to litigation. Taking 2SLS estimates the increase in costs due to litigation ranges from 33-35%. [16] The increase in regulatory tax rate is in the range of 32-33% due to litigation.

8 Conclusion

The rapid expansion of slums (informal, unapproved housing often disconnected from city infrastructure) in Indian cities is the result of a mismatch between expanding urban job markets and a moribund housing market that is expensive and inelastic. One important cause of expense and delay is litigation. This paper makes a significant contribution in providing an empirical understanding of the impact of litigation on completion times of projects using

[15]For projects located in downtown, western suburbs and eastern suburbs of Mumbai, litigation could increase cost by 27.8%, 26.7% and 26.1% respectively. The differences in impact arises due to land costs differing across locations

[16]For projects located in downtown, western suburbs and eastern suburbs of Mumbai, litigation could increase cost by 34.6, 33.3% and 32.7% respectively.

a unique dataset of ongoing real estate projects in Mumbai.

The PIL system which was designed as a countervailing force to a political system dominated by insiders has given outsiders a voice in urban development. Voice, however, especially when combined with a very slow moving court system has been accompanied by veto power. The accumulation of veto players slows decision making and raises costs (Olson 2008, Tsebelis 2002, Heller 2010).

Using a variety of approaches we estimate that litigation increases the time to complete very significantly, by 46% using our preferred estimate. The increase in time to completion is equivalent to an increase in costs of at least 27%. Our conclusion is that the PIL system combined with slow courts has had the unintended consequence of significantly slowing down urban development and pushing more people into slums.

Policy solutions must focus on tackling the two-pronged problem of high incidence of litigation and high pendancy rates in the judiciary. The former require reforms pertaining to land titling and reducing complexity in regulations. The latter require to be addressed through measures that improve the efficacy of an overburdened court system.

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Tables

Table 1: Type of court and number of cases for Mumbai

Court Type	**Mumbai City**	**Mumbai Suburban**	**Grand Total**
High Court	275	914	1,189 (42)
Lower courts and others	335	1,289	1,624 (57)
Supreme Court	15	8	23 (1)
Grand Total of cases	**625**	**2,211**	**2,836**
Number of projects	**198**	**586**	**784**

Note: Figures in parentheses denote % share of total cases.
Source: Authors' own based on data with the RERA

Table 2: Summary Statistics

Variable	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
Time (Days)	2,457	3,080.74	1,826.75	163.00	18,332.00
log Time	2,457	7.88	0.54	5.0938	9.8164
Litigation (Dummy)	2,871	0.27	0.45	0	1
Developer Experience (Dummy)	2,871	0.27	0.45	0	1
Redevelopment Project (Dummy)	2,510	0.33	0.47	0	1
Slum Projects	2,871	0.18	0.38	0	1
Builtup (in SqMts)	2,871	8,841.83	19,490.74	0	622,011
log_built-up	2,862	8.45	1.03	5.13	13.34

Table 3: Mean duration by litigation, experience, and project size

Variable	Obs	Mean	Std. Dev.	Min	Max
By litigation:					
Litigation	684	3710.762	1987.505	819	18332
No Litigation	1,773	2837.682	1700.071	163	15183
By experience:					
Experience	682	2785.455	1622.374	370	11632
No Experience	1,775	3194.193	1887.618	163	18332
By project size:					
100-1000	75	2925.587	2199.251	842	11935
1000-2500	654	2496.625	1659.571	610	11339
2500-5000	652	2964.089	1763.466	163	15183
5000-10000	545	3317.448	1850.643	871	14513
10000-25000	357	3660.445	1693.036	679	13203
25000-50000	110	3878.264	2067.872	893	18332
>50000	56	3954.768	1722.81	936	8256

Note: Sizes are included in the lower bound of the class intervals but not in the upper bound.

Table 4: Tests for instrument validity

a) Statistical tests on difference in neighbourhood propensity to sue

Variable	Developers with experience	Developers without experience	Difference	t-statistic
Mean neighbourhood propensity to sue	0.272	0.259	-0.013	0.355

b) Instrument versus experience and size of buildings

	Low	Medium	High
Z: Share of neighbourhood properties that are litigated	0	0.23	0.65
Project size	8.5	8.3	8.6
FAR	4.6	4.1	5.3
Developer experience	0.26	0.27	0.29

Table 5: Regression results: Litigation and log of difference between start and end dates

Variables	(1) OLS	(2) OLS	(3) OLS	(4) 2SLS	(5) 2SLS
Litigation Dummy	0.199***	0.196***	0.185***	0.579**	0.582**
	(0.0228)	(0.0228)	(0.0248)	(0.252)	(0.253)
Developer Experience	-0.152***	-0.141***	-0.112***	-0.148***	-0.138***
	(0.0223)	(0.0222)	(0.0238)	(0.0267)	(0.0268)
Log Built-up	0.124***	0.124***	0.122***	0.0885***	0.0877***
	(0.0112)	(0.0111)	(0.0120)	(0.0297)	(0.0300)
Redevelopment	-0.233***	-0.219***	-0.232***	-0.200***	-0.188***
	(0.0233)	(0.0233)	(0.0251)	(0.0320)	(0.0314)
Slum Projects	-0.0246	-0.0233	-0.0145	-0.0409	-0.0379
	(0.0263)	(0.0261)	(0.0281)	(0.0304)	(0.0302)
Constant	6.908***	7.192***	7.820***	7.086***	7.345***
	(0.0961)	(0.104)	(0.230)	(0.187)	(0.179)
Ward Dummy			Yes		
Use Dummy		Yes	Yes		Yes
Observations	2,413	2,413	2,079	2,079	2,079
R-squared	0.179	0.199	0.227	0.087	0.102
Mean time (Days)	3804	3804	3804	3065	3065
Mean log Time	7.9	7.9	7.9	7.9	7.9

Note: Robust standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$
For 36 out of the 2,457 projects there are no details on whether the building is new or redeveloped and another 8 projects do not have details on built up area. Hence, number of observations is 2,413. The dependent variable is the log time taken in days from the start date to estimated end date of the project. Column (3) reports results for the same specification as column (2) with ward dummy. Column (4) and (5) reports results after instrumenting litigation by Propensity to sue in neighbourhoods within the radius of 250 meters. Of the 2413 projects, 334 have not been mapped and hence no information on distances and wards are available for them.

Table 6: Litigation and log of difference between start and end dates for completed projects

VARIABLES	(1) OLS	(2) OLS	(3) OLS	(4) 2SLS
Litigation Dummy	0.572***	0.467***	0.462***	0.0643
	(0.110)	(0.109)	(0.108)	(0.516)
Developer Experience (Dummy)		-0.108	-0.0602	-0.0903
		(0.0886)	(0.0880)	(0.116)
Redevelopment		-0.363***	-0.335***	-0.408***
		(0.0882)	(0.0889)	(0.109)
Log Built-up		0.118**	0.0951*	0.137*
		(0.0528)	(0.0515)	(0.0711)
Constant	7.270***	6.545***	7.181***	6.932***
	(0.0551)	(0.412)	(0.500)	(0.629)
Use Dummy			Yes	Yes
Observations	110	110	110	98
R-squared	0.168	0.326	0.369	0.307
Mean time (Days)	1868.93	1868.93	1868.93	1874
Mean log Time	7.382	7.382	7.382	7.372

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
The dependent variable is the log time taken in days from the start date to the date of issue of the occupancy certificate given by MCGM. Dummy for SRA is not applicable as these are projects approved by MCGM.

Table 7: Hazard Ratios (95 % CI for each outcome)

VARIABLES	All Mumbai	Mumbai City	Mumbai Suburban
Litigation	0.603 (0.378 to 0.962)	1.255 (0.350 to 4.510)	0.566 (0.340 to 0.942)
Developer Experience	2.266 (1.537 to 3.341)	1.705 (0.409 to 7.112)	2.259 (1.510 to 3.380)
Log built-up	0.516 (0.420 to 0.634)	0.601 (0.372 to 0.970)	0.484 (0.383 to 0.612)
Redevelopment	1.11 (0.749 to 1.644)	0.901 (0.208 to 3.903)	1.114 (0.735 to 1.688)
Slum Projects	0	0	0
Industrial	0	0	0
Mixed	0.598 (0.222 to 1.611)	0.223 (0.018 to 2.706)	0.723 (0.250 to 2.09)
Residential	1.274 (0.557 to 0.291)	0.442 (0.069 to 2.810)	1.577 (0.647 to 3.844)

Table 8: Cox results

VARIABLES	Time under construction
Litigation Dummy	-0.505**
	(0.238)
Developer Experience	0.818***
	(0.198)
Log Built-up	-0.662***
	(0.105)
Redevelopment	0.104
	(0.200)
Slum Projects	-41.00***
	(0.178)
Use Dummy	Yes
Observations	2,413

Robust standard errors in parentheses
*** p¡0.01, ** p¡0.05, * p¡0.1

Table 9: Litigation and log of difference between start date and date of receiving data

VARIABLES	(1) OLS	(2) 2SLS
Litigation Dummy	0.259***	0.767*
	(0.0362)	(0.392)
Developer Experience	-0.0899***	-0.0969**
	(0.0343)	(0.0407)
Log Built-up	0.0332*	-0.0125
	(0.0175)	(0.0463)
Redevelopment	-0.382***	-0.328***
	(0.0362)	(0.0481)
Slum Projects	-0.179***	-0.199***
	(0.0442)	(0.0499)
Constant	7.710***	7.888***
	(0.155)	(0.271)
Use Dummy	Yes	Yes
Observations	2,413	2,079
R-squared	0.106	0.030

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
The dependent variable is the log time taken in days from the start date to the date of receiving data (December 2017).

Table 10: litigation and log of difference between RERA date and estimated completion date

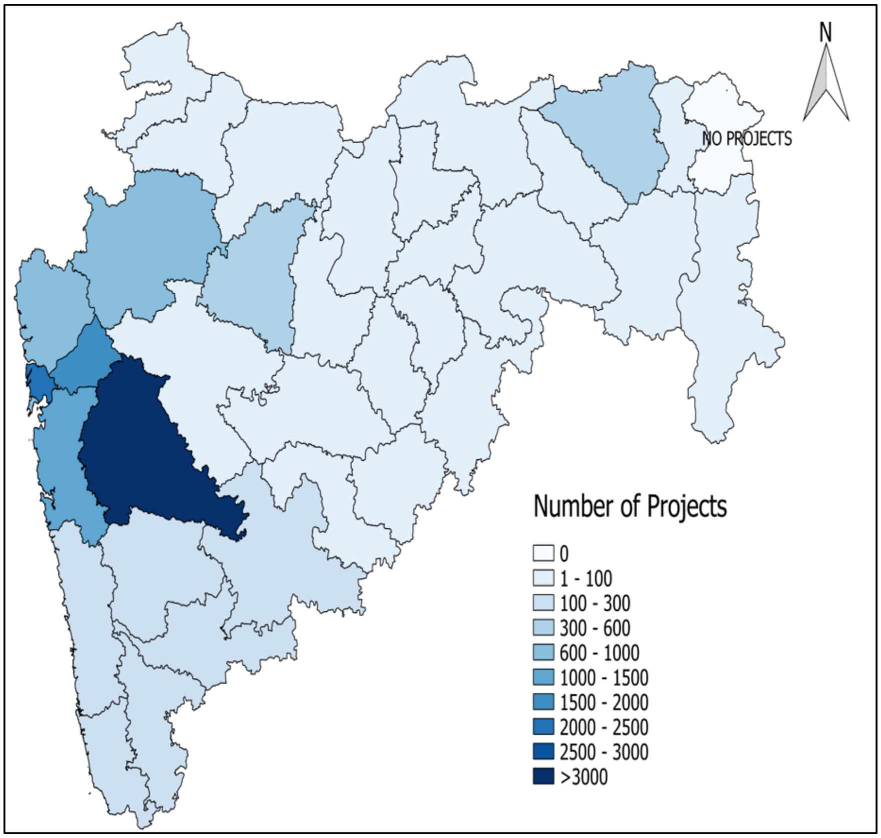
VARIABLES	(1) OLS	(2) 2SLS
Litigation	0.127***	0.340
	(0.0318)	(0.354)
Developer Experience	-0.186***	-0.155***
	(0.0319)	(0.0372)
Log built-up	0.242***	0.223***
	(0.0147)	(0.0407)
Redevelopment	0.133***	0.133***
	(0.0316)	(0.0435)
Slum Projects	0.239***	0.212***
	(0.0369)	(0.0402)
Constant	4.505***	4.680***
	(0.138)	(0.235)
Observations	2,501	2,152
Use Dummy	Yes	Yes
R-squared	0.167	0.142

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Note: The dependent variable is the log time taken in days from the date of registering with RERA to estimated end date of the project.

Figures

Figure 1: Distribution of Projects in Maharashtra

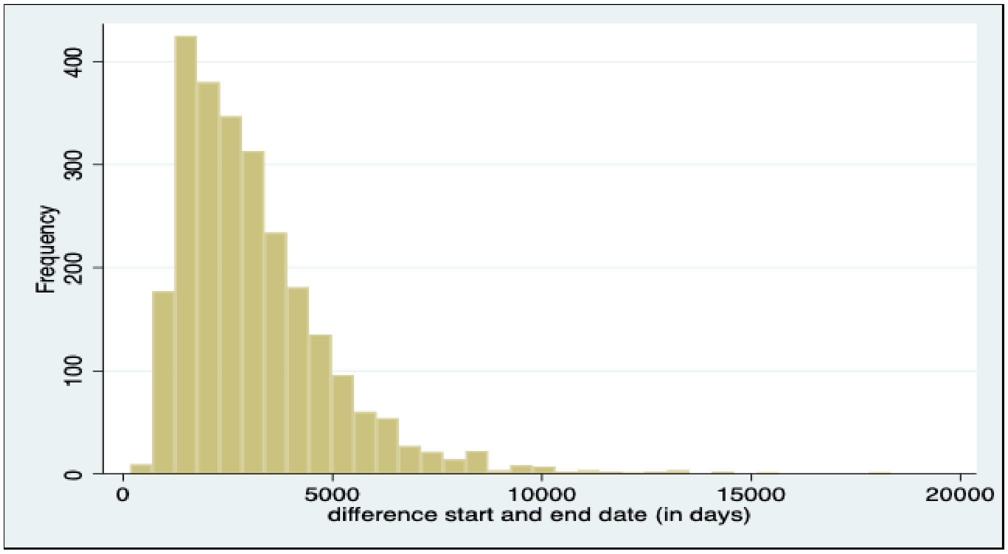


Source: Authors' own based on RERA data in December 2017.

Figure 2: Distribution of Projects in Maharashtra

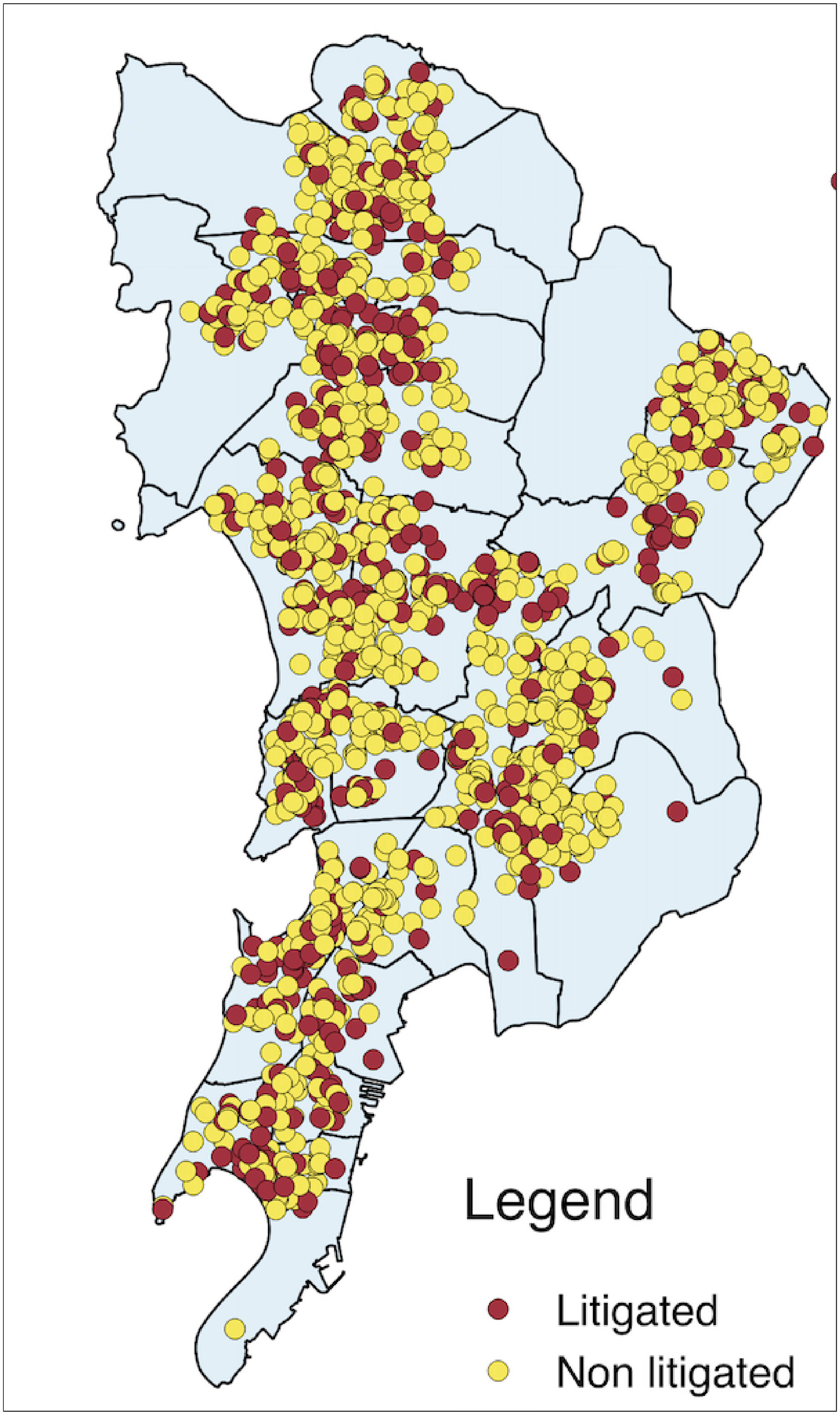
Note: districts with no projects under litigation are not shown. State average is the percent of projects and built up in litigation for the state of Maharashtra. Size of the bubble is representative the number of projects in the districts
Source: Authors' own based on data with the RERA.

Figure 3: Frequency distribution time between start and end dates



Source: Authors' own based on data with the RERA.

Figure 4: Litigated and non litigated projects in Mumbai geocoded



Source: Authors' own.

Appendix 1.

Districts in Maharashtra	Projects count	Share of projects (percent)	Percent Projects litigated	Percent Built up litigated	Percent Area litigated
Pune	3863	26.7	14.5	27.8	23.4
Mumbai Suburban	2385	16.5	29	43.9	34.7
Thane	1981	13.7	25.6	36	22.6
Raigarh	1412	9.8	9.3	23.4	13.9
Palghar	960	6.6	7.3	13.1	10.5
Nashik	718	5	5.7	15.9	12.8
Mumbai City	655	4.5	32.8	57.6	52.8
Nagpur	429	3	8.6	21.2	9
Aurangabad	327	2.3	4	6.8	6.6
Satara	300	2.1	5.3	3.1	1.8
Ratnagiri	300	2.1	3.3	2.8	4.4
Kolhapur	216	1.5	6.5	9.2	7
Sindhudurg	150	1	2.7	3.7	1
Solapur	141	1	1.4	11.2	2.9
Sangli	130	0.9	2.3	8.3	8.9
Amravati	100	0.7	0	0	0
Ahmednagar	94	0.6	0	0	0
Jalgaon	60	0.4	0	0	0
Chandrapur	48	0.3	2.1	0.6	0.3
Nanded	26	0.2	0	0	0
Wardha	24	0.2	0	0	0
Jalna	23	0.2	4.3	2.4	1.4
Yavatmal	22	0.2	9.1	13.3	31.1
Akola	15	0.1	13.3	5.5	4.9
Dhule	14	0.1	0	0	0
Bhandara	13	0.1	7.7	2.5	1.9
Osmanabad	10	0.1	0	0	0
Parbhani	10	0.1	0	0	0
Buldana	9	0.1	0	0	0
Latur	9	0.1	0	0	0
Nandurbar	6	0	0	0	0
Washim	4	0	0	0	0
beed	3	0	0	0	0
Hingoli	2	0	0	0	0
Konkan	2	0	0	0	0
Gadchiroli	1	0	0	0	0
Grand Total	14,462	100	16.06	31.2	19.1

Appendix 2: Sensitivity of instrument to different neighbourhood radii

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
First Stage							
Dependent Var.: litigation							
Propensity to sue	0.155***	0.151***	0.157***	0.146***	0.128***	0.135***	0.1211***
	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)
Radius in Meters	100	150	200	250	300	350	400
Second Stage							
Dependent Var.: time of construction							
litigation (Instrumented)	-0.01	0.33	0.410*	0.582**	0.43	0.647**	0.50
	(0.22)	(0.21)	(0.21)	(0.25)	(0.30)	(0.33)	(0.38)
Developer Experience	-0.116***	-0.129***	-0.132***	-0.138***	-0.133***	-0.141***	-0.135***
	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Redevelopment	-0.232***	-0.207***	-0.201***	-0.188***	-0.199***	-0.183***	-0.194***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)
Slum Projects	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04	-0.04
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Log Built-up	0.153***	0.115***	0.107***	0.0877***	0.105***	0.0805**	0.0965**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)
Constant	7.019***	7.207***	7.251***	7.345***	7.260***	7.381***	7.302***
	(0.16)	(0.17)	(0.16)	(0.18)	(0.20)	(0.22)	(0.24)
Use Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Radius in Meters	100	150	200	250	300	350	400
Observations	2079	2079	2079	2079	2079	2079	2079
R-squared	0.17	0.19	0.17	0.10	0.17	0.07	0.14
Effective F test	22.47	23.66	23.91	17.73	11.61	11.13	7.42

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
For 36 out of the 2,457 projects there are no details on whether the building is new or redeveloped and another 8 projects do not have details on built up area. Of the 2413 projects, 334 have not been mapped and hence no information on distances is available for them. The dependent variable is the log time taken in days from the start date to estimated end date of the project. The first stage have the same controls as the second stage.

Appendix 3. - Testing for exclusion restriction

	(1)	(2)	(3)	(4)	(5)	(6)
First Stage	Litigation Instrumented					
	Not Dense Areas		Dense Areas		All Mumbai	
Propensity to Sue	0.178***	0.175***	0.113**	0.112**	0.148***	0.146***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.03)	(0.03)
Developer Experience	0.0575*	0.0561*	0.02	0.02	0.0356*	0.0364*
	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)
Redevelopment	-0.0923***	-0.0903***	-0.0520*	-0.0541*	-0.0709***	-0.0713***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)
Slum Projects	0.01	0.02	0.004	0.004	0.004	0.010
	(0.041)	(0.042)	(0.038)	(0.038)	(0.028)	(0.028)
Log Built-up	0.0835***	0.0681***	0.120***	0.111***	0.104***	0.0930***
	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
FAR		0.00488*		0.00392*		0.00404**
		(0.003)		(0.002)		(0.002)
Constant	-0.478***	-0.373**	-0.728***	-0.671***	-0.620***	-0.547***
	(0.13)	(0.15)	(0.12)	(0.12)	(0.09)	(0.09)
Radius in Meters	250	250	250	250	250	250
Observations	974	973	1,105	1,105	2,079	2,078

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

QUALITY

INDEPENDENCE

IMPACT

BROOKINGS INDIA