Too Slow for the Urban March: Litigations and Real Estate Market in Mumbai, India

Abstract
According to a unique data set on around 3,000 ongoing real estate projects in Mumbai, 30% of the real estate 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 nature of the relationship between litigation and completion time of real estate projects in Mumbai. We find that litigated projects take 20-28% longer to complete. We control for use of the project, size, redevelopment projects, slum rehabilitation projects, use, and experience of developers. We also find that having number of litigations is associated with an increase in completion times. Within projects with litigation we find that projects with litigation only in upper courts take 7.2% lesser time to complete and projects with cases in both upper and lower courts have 6.57% longer completion times. Further, we carry out a qualitative examination of 220 cases in Bombay High Court to understand the nature of litigations in real estate in Mumbai.

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INTRODUCTION

India is urbanizing, putting increasing pressure on urban land and an impetus to convert land from agriculture to non-agriculture use. According to United Nations (2015), 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*. 2011a, Angel *et al.* 2011b, Chandrashekar and Sharma 2015, Shrigaonkar 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 Bruckner 2004, 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 with Mumbai having 42% of its population in slums.

Indian cities are known to have some of the most stringent urban land regulations, which affect housing supply elasticities. This has been well documented in the academic and policy literature (World Bank 2012, Ellis and Roberts 2016) and empirical studies have assessed its impact on various outcomes including supply (Sridhar 2010, Bertaud and Bruckner 2004, 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 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 2013). 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. The regulatory tax is a black box and can be affected due to various reasons (Cheshire and Hilber 2008, Glaeser *et al.* 2005). 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. This paper adds to the above literature by looking at the relationship between construction delays and litigation. There has been no academic literature to our knowledge that looks at the impact of litigation on the real estate market. The paper also adds to the literature on the real estate sector and developers in urban India (Ram and Needham 2016).

As per the World Bank's (2017) 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 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 survey (2016) 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 Local Government of Mumbai.[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 Municipal Corporation of Greater Mumbai (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 sq m or having more

[1] Many papers look at the impact of regulations on urban housing supply. For an overview of this literature see Glaesar 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.
[3] Data on 19th September 2018. http://njdg.ecourts.gov.in/
[4] The local government of Mumbai, the Municipal Corporation of Greater Mumbai (MCGM) governs the area under the districts of Mumbai City and Mumbai Suburban.

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. The dataset provides information on approvals granted by the relevant authorities, whether the project is currently or has been under litigation and details regarding the same.[5] In the dataset, nearly 30% of the projects are or have been under litigation at different stages. 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 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.

Further, we also undertake a qualitative study on the nature of litigations of around 225 cases being heard in the Bombay High Court – the highest court in the state of Maharashtra. We cross reference litigation case data from RERA's database against cases in Bombay High Court database to find information about the plaintiffs, respondents, and the nature of the disputes. We use these cases to understand the underlying reasons for litigations.

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 tend to take longer to complete. Our baseline results show that for all of Mumbai, projects under litigation have around 22% longer completion times compared to projects without litigation and have 21.8% longer completion times after controlling for use and ward fixed effects. For residential projects, completion times are 24% higher for litigated projects. Completion times are affected by the number of cases. We find that projects with litigation only in upper courts take 7.2% lesser time to complete compared to other projects without litigation. Our results also show that projects with cases in both upper and lower courts have 6.57% longer completion times.

This paper comprises eight sections including the introduction. Section 2 provides a background regarding regulations and litigations in land and real estate markets in Mumbai.

[5] This is available in documents made available on the website called "Intimation of Disapproval".

Section 3 describes the data. Section 4 describes the model to be estimated and section 5 presents results. Section 6 discusses the robustness checks. Section 7 is qualitative and describes the nature of litigation. Section 8 concludes.

BACKGROUND

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

i. Real Estate in Maharashtra and Mumbai

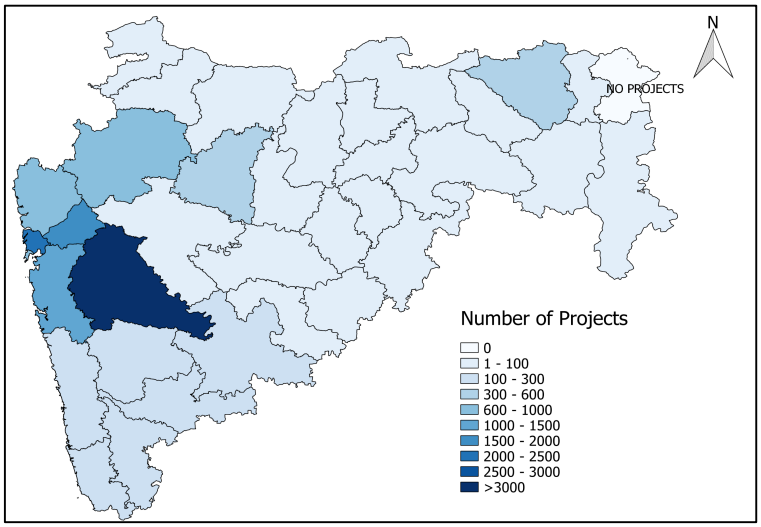
The state of Maharashtra is 45% urban, the largest urban population by state in the country. Its capital city – Mumbai – has a population of 12.4 million as per the last census in 2011. While population growth in Mumbai has stabilized in recent years, cities and towns around Mumbai are witnessing rapid growth. The population of Mumbai Metropolitan Region grew by 17% between 2001 and 2011 and most of the increase in population was in the district of Thane (which comprises the city of Thane), which accounted for around 42% of the total population in the region.

In 2016, the state government of Maharashtra created RERA in response to home buyer complaints about cost and uncertainty in building completion dates. The availability of adequate and affordable housing in the large cities has been a major challenge and resulted in a rise in slums. In Mumbai, 42% of the households live in slums. The housing problem has partly been attributed to prohibitively high land costs and regulatory hurdles that delay or even stall the completion of projects. In order to ensure timely delivery of projects, developers may sometimes resort to proceeding with construction without the necessary approvals in place. Thus, potential homebuyers faced considerable risks either in the form of not getting homes in time or the projects violating building regulations. It was felt that setting up of a regulatory authority would address some of these issues facing the sector.

All projects in Maharashtra on a plot size larger than 500 sq m or having more than 8 apartments must register with the regulatory authority. A deadline was provided for registering all ongoing and new projects in the city and developers that failed to register with the authority were penalized. 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 using a choropleth map.

Figure 1: Distribution of Projects in Maharashtra



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

ii. Permission process for real estate projects[6]

Within Mumbai, land ownership is public or private and the tenure type is either freehold or leasehold. 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 FSI, setbacks and so forth. Development Control Regulations also specify granting additional FSI or Transferrable Development Rights in exchange for slum redevelopment, construction of schools, hospitals, public parking, and maintaining heritage buildings. Additional FSI 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 case

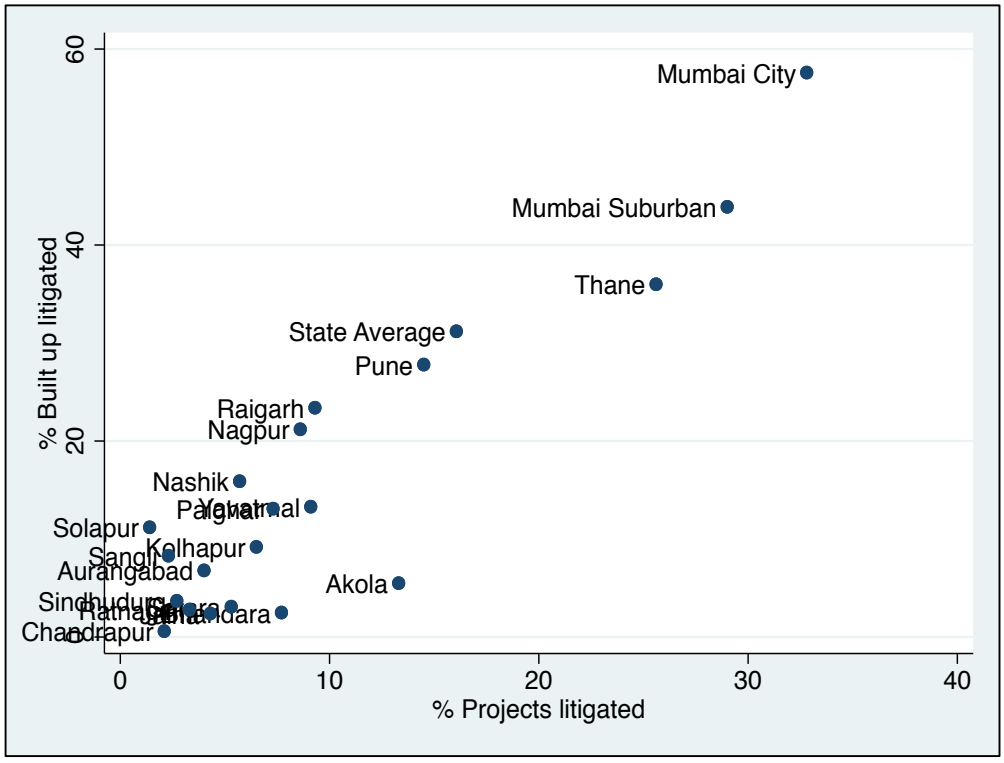
[6] The section is based on Pethe (2010).

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 about all conditions and regulations being met.

iii. 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 Maharashtra. There is considerable variation in the share of litigated projects 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 makes up the city of Mumbai which is under the MCGM.

Figure 2: Built up space and projects under Litigation in districts 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.
Source: Authors' own based on data with the RERA

The disputes are being 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 3,762 in different courts. Table 1 provides the break-down of cases in Supreme Court, the apex court of India, cases in 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 (58%) 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.

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

Number of cases			
Court Type	**Mumbai City**	**Mumbai Suburban**	**Grand Total**
High Court	296	1250	1546 (41)
Lower courts and Others	445	1741	2186 (58)
Supreme Court	15	15	30 (1)
Grand Total of cases	**756**	**3006**	**3762**
Number of projects	**211**	**655**	**866**

Note: Figures in parentheses denote % share of total cases

Source: Authors' own based on data with the RERA

DATA

i. Data sources

We use a unique dataset that has been made available and that presents an opportunity for research on real estate markets in Indian cities. RERA has provided data on all ongoing real estate projects in Maharashtra that have been 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.[7] The dataset provides information on approvals granted by the relevant authorities, whether the project is currently or has been under litigation and details regarding the same.

The dataset does not provide start dates of projects. All projects require an "Intimation of Disapproval" that authorize the start of the work and enumerate various conditions that need to be satisfied.[8] 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 time 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

[7] 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.

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

the possibility of overestimation, for projects that should already be completed based on the reported completion date, we 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. For cases that are in the lower courts, no details are available since the data from these courts cannot be obtained online.

ii. Descriptive statistics

Table 2 provides summary statistics for all variables of interest. These are presented for projects across both Mumbai city and Mumbai suburban districts for which there was data. The mean duration for completing real estate projects is 8.6 years. The average built-up area of projects is 9,274.56 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.

Table 2: Summary statistics

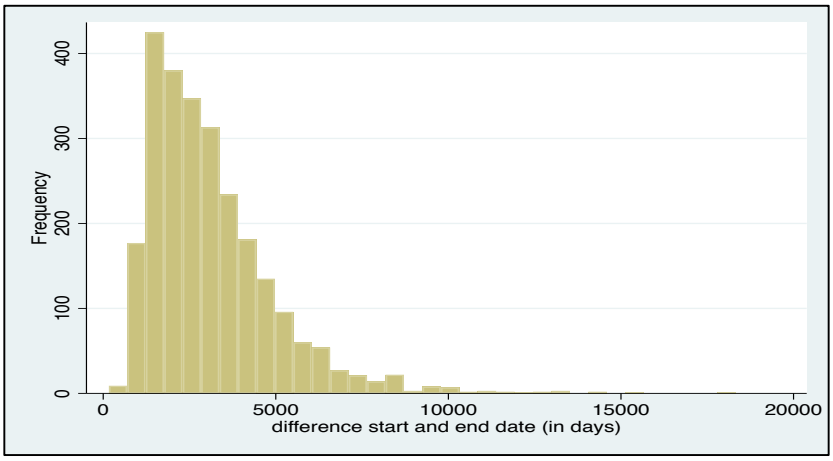
Variable	Obs	Mean	Std. Dev.	Min	Max
Mumbai city and Suburbs					
diff_time (days)	2,530	3126.83	1849.57	163	18332
log_diff_time	2,530	7.9	0.55	5.09	9.82
total_builtup_sqm	2,944	9274.56	20361.18	168.25	622011
log_total_builtup_sqm	2,944	8.47	1.04	5.13	13.34
litigation_dummy	2,953	0.29	0.46	0	1
experience_dummy	2,953	0.27	0.45	0	1
redevt_dummy	2,585	0.33	0.47	0	1
sra_dummy	2,953	0.18	0.39	0	1
Number of cases	2,953	1.227	6.165	0	168
Details of courts for litigated projects					
Only in Lower Court	866	0.351	0.477	0	1
Only in High or Supreme court	866	0.359	0.480	0	1
In lower and upper courts	866	0.285	0.451	0	1

In Mumbai, which is made up of the districts of Mumbai city and Mumbai Suburban, there are 866 projects with litigations. Of these 35.1% have cases in lower courts or others, 35.9% in

either High or Supreme courts (ie. Upper Courts)[9] and 28.5% projects have cases in both lower and Upper courts.

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 log transformations of the duration for the analysis.

Figure 3: Frequency distribution time between start and end dates



Source: Authors' own

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.

[9] We combine these courts since there were very few projects having cases in the Supreme Court.

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

Variable	Obs	Mean	Std. Dev.	Min	Max
By litigation:					
Litigation	757	3804.05	2003.47	819	18332
No Litigation	1,773	2837.68	1700.07	163	15183
By experience:					
Experience	705	2815.46	1622.03	370	11632
No Experience	1,825	3247.11	1917.21	163	18332
By project size:					
100-1000	77	2919.39	2174.86	842	11935
1000-2500	662	2520.31	1677.17	610	11339
2500-5000	662	2989.02	1774.33	163	15183
5000-10000	559	3351.95	1869.87	871	14513
10000-25000	377	3726.00	1742.64	679	13203
25000-50000	68	4184.71	1778.35	936	8598
>50000	8	2713.75	735.72	1622	3580

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

It is interesting to note that mean duration is higher for projects with litigation and projects and where developer does not have previous experience.

MODEL SPECIFICATION

Our estimation strategy involves regressing the log of difference in total estimated completion times on a dummy variable for litigation. To examine the relationship between incidence of litigation and time delays, we require 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 (since land assembly in newer projects would add to the completion time), 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. We therefore 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 having the following equation:

$$ln\ estT_i = \alpha + \beta_1 L_i + \beta_2 Exp_i + \beta_3 LogSize_i + \beta_4 SRA_i + \beta_5 ReDev_i + e_i \quad (1)$$

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 $Exp_i, LogSize_i, SRA_i, and\ ReDev_i$ is the set of control variables for developer experience, project size, SRA dummy and redevelopment dummy. α is the constant terms and e_i is the error term. The positive β_1 would indicate that projects with litigation take longer to complete than projects without litigation.
In the second specification, given in equation (2), we add a variable for the use of real estate.

$$ln\ estT_i = \alpha + \beta_1 L_i + \beta_2 Exp_i + \beta_3 LogSize_i + \beta_4 SRA_i + \beta_5 ReDev_i + \beta_6 Use_i + e_i \quad (2)$$

Equation (2) is the same as equation (1) with an additional variable – Use_i -- which is a use dummy. The types of uses are residential, industrial, commercial, and mixed use.

RESULTS

i. Baseline results

This section presents the main findings from our analysis to test for the relationship between litigation and time delays. We run 3 separate OLS regressions for all of Mumbai, Mumbai city district, and Mumbai suburban district for equations (1) and (2). To equation (2) we also add ward dummies, reported in column (7).

Table 4: Regression results – Litigation and log of difference between start and end dates

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All Mumbai	Mumbai City	Mumbai Suburban	All Mumbai	Mumbai City	Mumbai Suburban	All Mumbai
litigation_dummy	0.220***	0.282***	0.197***	0.218***	0.291***	0.192***	0.218***
	(0.0223)	(0.0501)	(0.0248)	(0.0221)	(0.0496)	(0.0246)	(0.0246)
experience_dummy	-0.154***	-0.200***	-0.141***	-0.144***	-0.191***	-0.130***	-0.126***
	(0.0219)	(0.0543)	(0.0239)	(0.0217)	(0.0537)	(0.0237)	(0.0241)
logbuilt-up	0.122***	0.0939***	0.127***	0.122***	0.0880***	0.128***	0.122***
	(0.0102)	(0.0217)	(0.0115)	(0.0101)	(0.0215)	(0.0114)	(0.0115)
redevt_dummy	-0.240***	-0.165***	-0.267***	-0.227***	-0.152***	-0.254***	-0.238***
	(0.0227)	(0.0493)	(0.0256)	(0.0226)	(0.0489)	(0.0254)	(0.0253)
sra_dummy	-0.0369	0.154**	-0.0636**	-0.0355	0.157**	-0.0613**	-0.0174
	(0.0264)	(0.0705)	(0.0285)	(0.0262)	(0.0698)	(0.0282)	(0.0292)
Industrial				0.263	0.817**	0.0773	0.203
				(0.190)	(0.389)	(0.220)	(0.220)
Mixed				-0.216***	-0.143	-0.228***	-0.252***
				(0.0546)	(0.161)	(0.0575)	(0.0612)
Residential				-0.319***	-0.261*	-0.334***	-0.334***
				(0.0515)	(0.155)	(0.0541)	(0.0579)
Constant	6.931***	7.174***	6.885***	7.209***	7.442***	7.168***	7.813***
	(0.0860)	(0.186)	(0.0971)	(0.0967)	(0.236)	(0.107)	(0.293)
Ward FE	No	No	No	No	No	No	Yes
Observations	2,486	505	1,981	2,486	505	1,981	1,975
R-squared	0.192	0.188	0.198	0.212	0.212	0.219	0.249
Mean log_diff_time	7.9	8	7.9	7.9	8	7.9	7.9

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 start date to estimated end date of the project

Table 4 presents the regression results. For first three columns, we see a positive and significant effect of litigation on the time to completion. For Mumbai, the coefficient estimate can be interpreted as time taken for completion being 22% longer for projects with litigation as compared to projects without litigation. For Mumbai City, projects with litigation take 28% longer completion time than projects without litigation. For Mumbai Suburban district, projects with litigation take 19.7% longer to be completed. From columns 4 to 6, we add use categories as dummies, with commercial use as the suppressed category. The fit of the model increases by 10% and the coefficient value of litigation dummy for All Mumbai and Mumbai Suburban falls marginally. The results with ward dummies are reported in column (7). We find that coefficient values and significance remain unchanged from column (4) while R-square increases.

We find 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. In case of SRA projects, the relationship is negative and significant for Mumbai and Mumbai Suburban and positive and significant for Mumbai City.

ii. Project uses

Table 5 shows impact of litigation across the different uses viz. residential, commercial, and mixed. We find that the coefficient value for residential projects is higher than for mixed use projects.

Table 5: Regression results – Litigation and log of difference between start and end dates for different uses

VARIABLES	(1)	(2)	(3)
	Residential	Commercial	Mixed
litigation_dummy	0.238***	0.147	0.174***
	(0.0260)	(0.0992)	(0.0466)
experience_dummy	-0.149***	-0.145	-0.130**
	(0.0248)	(0.113)	(0.0511)
logbuilt-up	0.123***	0.115**	0.107***
	(0.0115)	(0.0506)	(0.0233)
redevt_dummy	-0.226***	-0.328**	-0.215***
	(0.0259)	(0.140)	(0.0495)
sra_dummy	-0.0399	-0.0380	-0.00377
	(0.0310)	(0.124)	(0.0543)
Constant	6.870***	7.302***	7.113***
	(0.0976)	(0.423)	(0.198)
Observations	1,861	94	524
R-squared	0.201	0.143	0.156
Mean log_diff_time	7.9	8.2	8

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 start date to estimated end date of the project. We don't show the regression for industrial as it has only 10 observations.

iii. Differences in litigation

We extend our analysis to include variation in litigation characteristics. We can see from previous results that the existence of litigation increases completion times. It will also be crucial to see whether real estate projects with more cases take longer. The modified version of equation (2) is shown in equation (3).

$$ln\ estT_i = \alpha + \beta_1 L_i + \beta_2 Exp_i + \beta_3 LogSize_i + \beta_4 SRA_i + \beta_5 ReDev_i + \beta_6 Use_i + \beta_7 Num\_Case_i + e_i \quad (3)$$

Num_Case_i is the number of cases project *i* has. For projects that have litigation, cases are heard in different courts – Lower courts and others, High Court and Supreme Court, as shown Table 1.

It is important to note here that some projects have cases at multiple courts across different levels. We see whether the type of courts that cases are being heard in matter for completion times. We create three dummy variables to capture the differences. These are: dummy variable for projects having cases only in lower courts, dummy variable for projects having cases only in upper courts (that is, High Court and Supreme Court)[10], and dummy variable for projects having cases in both lower and upper courts. We run three versions of the court dummies for projects under litigation. We modify the equation (2) to drop the litigation dummy as shown in equation (4).

$$\ln estT_i = \alpha + \beta_1 Exp_i + \beta_2 LogSize_i + \beta_3 SRA_i + \beta_4 ReDev_i + \beta_5 CourtDummy_i + \beta_6 Use_i + e_i \qquad (4)$$

Column (1) in Table 6 reports coefficient estimates for the model specified in equation (3). If litigation dummy is included as an explanatory variable, the estimated coefficient for number of cases is not significant. Column (2) reports the coefficient estimates for the model without the litigation dummy. When excluding litigation dummy for all projects, we find that number of cases is significant. Column (3) reports result of a regression with different dummies for projects with number of cases from 1 to 10 and a dummy for projects with more than 10 cases. Figure 4 shows the coefficient plot for the dummy variables. Using this specification for number of cases, we find that higher number of cases are associated with an increase in completion times.

Columns (4), (5), and (6) report estimated coefficients for the model specified in equation (4). These regressions are only for projects under litigation. We find that projects with litigation only in upper courts take lesser completion times compared to other projects with litigation. Specifically, projects with cases only in the upper courts have 7% shorter completion times than projects with at least one case in the lower courts. We also find that projects with cases in both upper and lower courts have longer completion times by 6.57%. This is significant at only 10%.

[10] We combine these courts since there were very few projects having cases in the Supreme Court.

Table 6: Regression results – count of Litigation and different courts on timelines

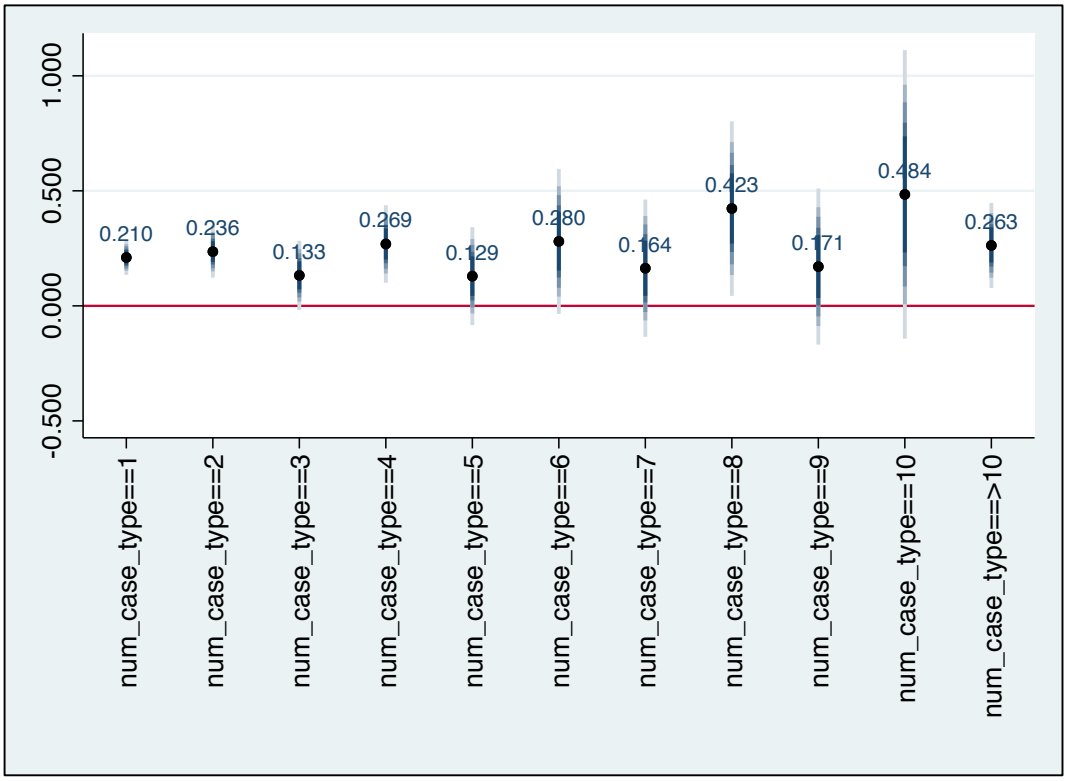
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES				Only Litigated Projects		
litigation_dummy	0.216***					
	(0.0229)					
experience_dummy	-0.145***	-0.143***	-0.146***	-0.131***	-0.132***	-0.127***
	(0.0218)	(0.0221)	(0.0218)	(0.0380)	(0.0379)	(0.0379)
logfsi	0.121***	0.141***	0.121***	0.0849***	0.0834***	0.0801***
	(0.0101)	(0.0100)	(0.0102)	(0.0153)	(0.0151)	(0.0153)
redevt_dummy	-0.227***	-0.243***	-0.227***	-0.195***	-0.199***	-0.196***
	(0.0226)	(0.0229)	(0.0227)	(0.0433)	(0.0432)	(0.0432)
sra_dummy	-0.0358	-0.0361	-0.0329	-0.0988**	-0.106**	-0.103**
	(0.0262)	(0.0267)	(0.0263)	(0.0417)	(0.0417)	(0.0417)
number_of_case	0.000433	0.00442***				
	(0.00155)	(0.00151)				
Num_case_1			0.210***			
			(0.0293)			
Num_case_2			0.236***			
			(0.0438)			
Num_case_3			0.133**			
			(0.0583)			
Num_case_4			0.269***			
			(0.0653)			
Num_case_5			0.129			
			(0.0826)			
Num_case_6			0.280**			
			(0.122)			
Num_case_7			0.164			
			(0.116)			
Num_case_8			0.423***			
			(0.147)			
Num_case_9			0.484**			
			(0.243)			
Num_case_10			0.171			
			(0.132)			
Num_case>10			0.263***			
			(0.0718)			
onlylowercourt				0.00881		
				(0.0364)		
onlyuppercourts					-0.0720**	
					(0.0360)	
lower_and_uppercourts						0.0657*
						(0.0385)
Constant	7.211***	7.123***	7.218***	7.692***	7.741***	7.723***
	(0.0970)	(0.0982)	(0.0985)	(0.154)	(0.153)	(0.152)
Use Dummy	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,486	2,486	2,486	747	747	747
R-squared	0.212	0.184	0.214	0.094	0.099	0.098

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 start date to estimated end date of the project

Figure 4: Number of cases and completion timelines



ROBUSTNESS CHECKS

i. 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 penalized if she fails to meet the stipulated completion time. Thus, developers have an incentive to overreport their completion time. This isn't a problem if all developers overreport or if overreporting 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 explore 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 100 such projects in the MCGM database. It is important to note here that

these are all non Slum Rehabilitation projects, since the approval authority for slum rehabilitation projects is not the local government but a different authority.

Table 7: Regression results – Litigation and log of difference between start and end dates for completed projects

VARIABLES	(1)	(2)	(3)
litigation_dummy	0.567***	0.412***	0.404***
	(0.137)	(0.131)	(0.128)
experience_dummy		-0.114	-0.0618
		(0.102)	(0.102)
logbuilt-up		0.130*	0.11
		(0.0673)	(0.0662)
redevt_dummy		-0.372***	-0.342***
			(0.103)
Mixed			-0.519**
			(0.247)
Residential			-0.526**
			(0.207)
Constant	7.271***	6.458***	7.076***
	(0.0580)	(0.532)	(0.574)
Observations	100	100	100
R-squared	0.150	0.317	0.362
Mean log_diff_completedtimechecked	7.4	7.4	7.4

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 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.

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 7 shows the coefficient estimations for the set of 100 completed and verified projects. 18% of these projects had litigation. The reported results show that litigated projects took around 40% longer to complete compared to projects without litigation. This result is significant at 1%. We realise that this dataset is limited and may not be a good, unbiased representation of the actual upcoming projects in the city. But this result serves to reaffirm the baseline results.

ii. Omitted Variable Bias using Oster (2017)

Our results show that if a project is under litigation it takes longer to complete. We have controlled for other factors that could confound the results. With controls, we find that litigation for all of Mumbai increases the time to completion by approximately 22%. Our results, however, could be biased due to omitted variables. Using Oster (2017) and Altonji *et al.* (2005) we assess how robust our results are to the potential impact of unobservables.

We ask two questions. How large would the effect of non-observables relative to observables have to be to drive the litigation coefficient to zero? And, what are the bounds on the litigation coefficient given assumptions about the relative strength of unobservables and the variance of the error in the (unknown) population regression equation? Oster (2017) shows how to answer these questions using movements in the coefficient of the treatment variable (in our case the litigation dummy) and movements in R-squared as controls are added to the regression equation. In addition, Oster (2017) guides our choices for what assumptions are reasonable to make about unknown factors.

In our baseline regression from Table 4, column 4 the coefficient on the litigation dummy is approximately .218. If we assume that if we included all the observables and unobservables in the regression then the value of R-squared, R_{max}, would be 1.3 actual $R^2_{cont.}$—an assumption which Oster (2017) shows is reasonable for most economics paper—-then we find that selection on unobservables would have to be more than three times as large as selections on observables, to drive the litigation coefficient to zero (delta (δ)=3.3). Oster (2017) suggests that δ=1 is a plausible high-bar for delta so a delta of 3.3 implies that the litigation coefficient is robust to very severe potential selection on unobservables. If we assume a significantly higher R_{max}= 2 R^2_{cont} we still find that δ=1.26, again in excess of the cutoff value of δ=1.

We can also bound the litigation coefficient by making assumptions on δ and R_{max}. If we assume that δ =1 so selection on unobservables is as strong as on observables and, as before,= that R_{max}= 1.3 R^2_{cont} then the bounds on the litigation **B** are (0.169, .218), i.e. a positive coefficient in all cases. Similarly, if we assume a much higher R_{max}= 2 R^2_{cont} then the bounds are (0.0520,.218), i.e. we can again exclude zero.

Taking the results together, the negative effect of litigation on time to completion is robust to the possible presence of unobserved variables in the data.

iii. Hazard Ratios

A different way to frame the question of relationship between litigation and completion times 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 5th March 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. Tables 8 show the Hazard Ratios and the results of the Cox regression respectively. The model satisfies tests for proportional hazards.

A hazard ratio of less than 1 indicates that increases in the variable makes the event (completion) less likely and so increase the time to completion. Thus in Table 8, as expected, litigation significantly reduces the probability of completion, increasing the time to completion will experience makes completion more probable and thus decreases the time to completion.

Table 8: Hazard Ratios (95% CI for each outcome)

_t	All Mumbai	Mumbai City	Mumbai Suburban
litigation_dummy	0.474 (0.282 to 0.797)	1.345 (0.342 to 5.286)	0.424 (0.238 to 0.756)
experience_dummy	2.339 (1.570 to 3.486)	1.897 (0.457 to 7.867)	2.317 (1.522 to 3.529)
logfsi	0.565 (0.456 to 0.6994)	0.629 (0.353 to 1.121)	0.535 (0.418 to 0.685)
redevt_dummy	1.185 (0.779 to 1.803)	1.136 (0.266 to 4.849)	1.176 (0.753 to 1.838)
sra_dummy	0.000	0.000	0.000
Industrial	0.000	0.000	0.000
Mixed	0.477 (0.172 to 1.325)	0.221 (0.012 to 3.919)	0.563 (0.187 to 1.694)
Residential	1.126 (0.487 to 2.603)	0.365 (0.041 to 3.251)	1.392 (0.558 to 3.474)

Size of the project and SRA status are associated with a decreased likelihood of completion though the effect is not significant for Mumbai City.

iv. 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.

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

	(1)	(2)	(3)
VARIABLES	All Mumbai	Mumbai City	Mumbai Suburban
litigation_dummy	0.290***	0.293***	0.287***
	(0.0350)	(0.0769)	(0.0393)
experience_dummy	-0.0897***	-0.105	-0.0866**
	(0.0345)	(0.0832)	(0.0380)
logbuilt-up	0.0326**	0.0238	0.0338*
	(0.0159)	(0.0333)	(0.0182)
redevt_dummy	-0.392***	-0.437***	-0.381***
	(0.0358)	(0.0757)	(0.0407)
sra_dummy	-0.193***	0.115	-0.234***
	(0.0415)	(0.108)	(0.0452)
Industrial	0.180	0.892	-0.107
	(0.301)	(0.603)	(0.352)
Mixed	-0.416***	-0.461*	-0.406***
	(0.0865)	(0.249)	(0.0921)
Residential	-0.541***	-0.570**	-0.539***
	(0.0816)	(0.239)	(0.0866)
Constant	7.709***	7.857***	7.685***
	(0.153)	(0.366)	(0.171)
Observations	2,486	505	1,981
R-squared	0.115	0.148	0.113
Mean log_diff_startdate_daterecd	7.4	7.5	7.4

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 start date to the date of receiving data (December 2017)

Log_diff_startdate_daterecd is the dependent variable and is the log transformation of the time under construction from start dates to date of getting the data. In all 3 columns, we see a positive and significant effect of litigation on the dependent variable. For Mumbai, time under construction is 29% 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.

Developer experience has a negative and significant effect on total time under construction for all of Mumbai and Mumbai suburban district but not for Mumbai city. The size of the project has a positive and significant effect on total time under construction for all of Mumbai but not for Mumbai city and is only significant at 10% for Mumbai Suburban.

v. Time left for completion since start of RERA

A possible bias in the data could arise due 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.[11]

Therefore, to correct for this bias, we modify our dependent variable. 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.

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

Table 10. Regression results – litigation and log of difference between RERA date and estimated completion date

	(1)	(2)	(3)
VARIABLES	All Mumbai	Mumbai City	Mumbai Suburban
litigation_dummy	0.132***	0.284***	0.0837**
	(0.0308)	(0.0703)	(0.0342)
experience_dummy	-0.193***	-0.302***	-0.161***
	(0.0304)	(0.0766)	(0.0330)
logbuilt-up	0.239***	0.225***	0.238***
	(0.0140)	(0.0303)	(0.0158)
redevt_dummy	0.128***	0.253***	0.0800**
	(0.0315)	(0.0689)	(0.0354)
sra_dummy	0.231***	0.169*	0.252***
	(0.0366)	(0.0989)	(0.0393)
Industrial	0.451*	0.722	0.491
	(0.270)	(0.556)	(0.311)
Mixed	0.156**	0.736***	0.0644
	(0.0764)	(0.222)	(0.0806)
Residential	0.0908	0.633***	0.00194
	(0.0721)	(0.214)	(0.0757)
Constant	4.547***	4.128***	4.640***
	(0.135)	(0.333)	(0.149)
Observations	2,577	525	2,052
R-squared	0.169	0.203	0.169
Mean log_reratocompletion	6.8	6.9	6.7

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

The results show that even with the modified dependent variable, the coefficient for litigation continues to be positive and significant at 1% for Mumbai and Mumbai City and positive and significant at 5% for Mumbai Suburban. 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 coefficient for developer experience is negative and significant at 1%. This can be interpreted as developer experience being associated with faster completion of projects. The coefficient for project size is positive and significant at 1%.

NATURE OF LITIGATION

i. Parties Involved

This section presents a summary of the types of cases, parties to the legal dispute, and a qualitative analysis of disputes that arise in real estate development in Mumbai. We examine all the cases for projects in Mumbai City that were heard in the High Court to identify the parties to

the dispute. The idea was to know which disputes were entirely between private parties involving the builders, promoters, housing society and other persons and the extent to which the government was party in disputes. Of the 296 cases (see Table 1) from Mumbai City in the High Court, we were able to clearly identify at least one party to the dispute in 225 cases. We classified the different actors as builder, government (this includes all levels of government and its parastatal organizations), promoter (that is, the land owner/investor), society (these are cooperative housing societies, that is, associations created by apartment owners), and private in case of all other private persons. Any parties that could not classified into these categories, were classified as "Not identified". Table 11 shows number of cases with different categories of actors as petitioners and respondents. In 64 cases, the government is the sole respondent and in 84 cases it is a joint respondent. Thus, the government is a major litigant in real estate development in Mumbai City. The builder is a litigant in 206 cases. In 73 cases, that is, 32% of all cases in High Court, the disputes are entirely between private parties (that is the parties are builders, private, promoters, or society).

Table 11. Main actors in legal disputes

Plaintiff/Petitioner	Defendant/Respondent									
		Builder	Govt.	Builder &Govt	Govt &Prom	Govt&Build &Prom	Private	Private& society	Promoter	Not Identified	Total
	Builder		53				8	5		1	67
	Private	59	1	76	4	1				2	143
	Government								1		1
	Promoter		7								7
	Society		3	3			1				7
	Total	59	64	79	4	1	9	5	1	3	225

Source: Authors' own

Note: Govt. is short for Government; Prom. is short for Promoter.

ii. Case Summaries

In Table 11, we can see that there are 53 cases where the developer/builder uses courts as a means to challenge actions of the government. One such case was regarding changes in rules with respect to lease premiums where there had been transfers of leasehold rights. The local body

in 2008 wanted to charge an increased annual lease premium[12] and reduce the time of the lease period where they were transferred. Those landowners who did not pay this increase did not get necessary permissions to continue the project. Many ongoing projects were affected by this and challenged this in the court. In the order of the *Central Mumbai Developers Welfare Association and others Vs State of Maharashtra* (Writ petition No 1251 of 2014) the High Court directed the local body to provide the necessary permissions. Due to *ad hoc* changes in rules, many projects were delayed for several years. Similar issues can be witnessed when it comes to rules governing Floor Space Index.

In another dispute between a charitable trust and the MCGM (*Shree Vardhaman Stanakvasi Jain Shravak Sangh – Dadar by its Trustees 1) Mr. Shantilal Dungarshi Maru Vs The Municipal Corporation of Greater Mumbai)*, a plot of land belonging to MCGM was leased out. In 2003, tenants of the MCGM land on this plot passed a resolution to redevelop their building and appointed a developer. In 2008, after necessary approvals to begin construction on this plot was granted, the existing occupants vacated their premises. The trust had encroached parts of the MCGM land. In 2009, the trust approached the court challenging the redevelopment and requested for it to be stopped. In 2010, MCGM took back possession of the plot after the trust failed to hand it over despite repeated requests. In 2016, the High Court found the petitioner's claims to be malafide and struck down its request to stop redevelopment of the plot. The court also went on to say that "*We find from the record that the Petitioners have engaged in a spate of litigation to somehow try and ensure that the development on FP No.267 is stalled".* Thus, very often litigations are used as a strategy to delay projects.

These disputes result in delays in commencing construction or in granting necessary approvals which are withheld by the planning authorities and ultimately delay the completion of projects.

CONCLUSION

There is considerable anecdotal evidence that real estate projects in Mumbai face tremendous delays. However, this claim and potential underlying causes have not been empirically investigated so far. This paper makes a significant contribution in providing an

[12] The amendment said that these new provisions were applicable for all lease transfers that took place since 1993.

empirical understanding of the impact of litigation on completion times of projects using a unique dataset of ongoing projects in Mumbai.

We find that litigation has a positive and significant effect on completion time, where completion time is defined as the time between the start date and estimated completion date of the project. We control for project size, experience of developer, use, whether the project is a redevelopment, and whether the project is under slum rehabilitation. The effect of litigation continues to be significant when we use a smaller, secondary dataset of actual completed projects, when using a Cox regression, using the difference between start date and date of acquiring the project data instead of the self-reported completion date, and the difference between date of registering with RERA and estimated completion date.

The paper then undertakes a qualitative examination of the nature of litigation by looking at cases in Mumbai City district that are or have been heard in the High Court. We find that the government is a major litigant and is a party to the dispute (either solely or jointly) in 148 out of 225 cases. Developers are party to the dispute in 206 cases.

The findings of the paper make a strong case to examine the underlying causes for legal disputes and introduce policy reforms to address them. Judicial pendency needs to be addressed urgently in order to reduce time taken for clearing cases. Reforms for improving the system of land titling and tenure are equally critical in lowering possibilities for disputes. A fair and incentive-compatible policy needs to be in place for dealing with encroachments on public or private lands. Finally, policy reforms have to focus on untangling the current complex regulations in order to eliminate possibilities of misuse and misinterpretation, and bringing about transparency in decision making and simplifying the process for granting approvals.

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Appendix 1. Projects, area and built up space under litigations in Maharashtra

Districts in Maharashtra	Projects count	Share of projects (%)	% Projects litigated	% Built up litigated	% Area litigated
Pune	3863	26.7	14.5	27.8	23.4
Mumbai Suburban	2385	16.5	29.0	43.9	34.7
Thane	1981	13.7	25.6	36.0	22.6
Raigarh	1412	9.8	9.3	23.4	13.9
Palghar	960	6.6	7.3	13.1	10.5
Nashik	718	5.0	5.7	15.9	12.8
Mumbai City	655	4.5	32.8	57.6	52.8
Nagpur	429	3.0	8.6	21.2	9.0
Aurangabad	327	2.3	4.0	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	7.0
Sindhudurg	150	1.0	2.7	3.7	1.0
Solapur	141	1.0	1.4	11.2	2.9
Sangli	130	0.9	2.3	8.3	8.9
Amravati	100	0.7	0.0	0.0	0.0
Ahmednagar	94	0.6	0.0	0.0	0.0
Jalgaon	60	0.4	0.0	0.0	0.0
Chandrapur	48	0.3	2.1	0.6	0.3
Nanded	26	0.2	0.0	0.0	0.0
Wardha	24	0.2	0.0	0.0	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	0.0	0.0
Bhandara	13	0.1	7.7	2.5	1.9
Osmanabad	10	0.1	0.0	0.0	0.0
Parbhani	10	0.1	0.0	0.0	0.0
Buldana	9	0.1	0.0	0.0	0.0
Latur	9	0.1	0.0	0.0	0.0
Nandurbar	6	0.0	0.0	0.0	0.0
Washim	4	0.0	0.0	0.0	0.0
beed	3	0.0	0.0	0.0	0.0
Hingoli	2	0.0	0.0	0.0	0.0
Konkan	2	0.0	0.0	0.0	0.0
Gadchiroli	1	0.0	0.0	0.0	0.0
Grand Total	14,462	100	16.06	31.2	19.1

Source: Authors' own