Developer Transparency and Mortgage Access: Expanding Homeownership

Sumit Agarwal* Mingxuan Fan† Pulak Ghosh‡ Arkodipta Sarkar§

Xiaoyu Zhang¶

August 31, 2024

Abstract

Real estate developers have become increasingly pivotal in shaping housing markets worldwide. This study examines how developers influence housing accessibility, leveraging India's Real Estate (Regulation and Development) Act (RERA). RERA mandates transparency and accountability for ongoing residential development projects, safeguarding buyer initial deposits and allowing refunds in case of default. By reducing project uncertainties—which disproportionately affect marginalized groups—we hypothesize that RERA could expand mortgage lending to previously underserved populations. Analyzing data from more than 1 million mortgage accounts, we find RERA implementation increases mortgage origination, especially for first-time borrowers, women, and marginalized groups. Post-RERA, we observe reduced project delays, lower mortgage defaults, and more affordable housing development. Additionally, we document a higher probability of exit for real estate firms following RERA implementation, suggesting a market consolidation towards more efficient and compliant developers. These findings demonstrate how improved developer practices can enhance market efficiency, expand access to homeownership, and reshape the real estate industry landscape.

Keywords: homeownership, real estate developers, mortgage, affordability

JEL Codes: O18 G21 G51

*Sumit Agarwal is at the National University of Singapore. eMail:: ushakri@yahoo.com
†Mingxuan Fan is at the National University of Singapore. eMail: mfan@nus.edu.sg
‡Pulak Ghosh is at Indian Institute of Management Bangalore. eMail: pulak.ghosh@iimb.ac.in
§Arkodipta Sarkar is at the National University of Singapore. e-Mail: asarkar@nus.edu.sg
¶Xiaoyu Zhang is at Capital University of Economics and Business. e-Mail: xiaoyuzhang@u.nus.edu

1 Introduction

Homeownership plays a crucial role in wealth accumulation and economic outcomes, prompting governments to implement policies promoting access (Chetty and Szeidl (2007), Chetty, Sándor and Szeidl (2017), Sodini et al. (2023) among others). While existing research has extensively examined policy implications on affordable housing, and household finances in this context, it has given less attention to a key intermediary in the housing market: real estate developers.

Real estate developers significantly influence housing supply, pricing, and accessibility, particularly as market concentration has increased globally. In the United States, for instance, the proportion of homes built by the top 10 builders surged from 1 in 10 in the early 1990s to nearly 1 in 3 by 2019 (National Association of Home Builders (NAHB), 2021), a trend mirrored in many other countries.[1] This increasing importance underscores the need to understand how developers' business practices, in interaction with regulatory frameworks, shape homeownership opportunities. Equally crucial is the role of mortgages in facilitating homeownership, as they provide the financial means for many individuals to purchase homes built by these developers. The interplay between developer strategies, mortgage availability, and lending practices significantly impacts housing affordability and accessibility. In this study we investigate the interplay between regulatory oversight, developers' strategies, mortgage market dynamics, and their collective impact on homeownership patterns, market structure, and affordability. By focusing on these influential market participants and financial mechanisms, we aim to provide a more comprehensive understanding of the forces shaping housing accessibility in contemporary real estate markets.

Real estate developers worldwide, including in India, often use presale contracts as their primary modus operandi. In these agreements, buyers make initial payments and subsequent installments as projects progress. However, this system is prone to defaults or

[1] BIS Report highlights the importance of the debt taken by property developers in various other countries like UK, Hong Kong, Indonesia, Malaysia, and Singapore

delays due to unforeseen shocks, market fluctuations, and liquidity issues. Critically, in environments with low regulatory supervision, there is a high incidence of fund misappropriation and tunneling, where developers divert presale funds to new projects, significantly increasing risks for buyers – primarily the most constrained buyers and lenders. For instance, Unitech, a prominent Indian real estate developer, encountered multiple delays in completing its housing projects, affecting over 20,000 homebuyers.[2] Such events highlight the risks inherent in presale contracts, which are pervasive globally, with rates of 60% in the US, 40% in the UK, over 70% in Hong Kong, and over 90% in China.

To address these issues, India introduced the Real Estate (Regulation and Development) Act (RERA). RERA aims to enhance transparency and accountability in developers' business operations by mandating project registration, detailed disclosures, adherence to timelines, and creation of escrow accounts. Its objectives include protecting homebuyers' interests, enhancing market confidence, and preventing delays through dispute mediation and penalties for non-compliance. For example, post-RERA implementation, a Delhi-based buyer received a INR 1.6 million delay penalty on a INR 13.5 million property from NexGen Infracon. Broadly, RERA increases the post-sale supervision. Overall, RERA aimed to improve the post-sale supervision of the real estate developers.

This paper examines developers' influence on homeownership, market structure, and affordability by analyzing RERA's impact. Using data on home purchases and mortgage origination of around 1.06 million individuals in India, we study how RERA affected homeownership and access to the mortgage market. We particularly focus on exploiting cross-sectional demographic variations to understand who benefits from RERA – whether it democratizes homeownership by bringing in new homeowners or if it leads to an increase in the homeownership gap.

Our empirical strategy leverages the staggered implementation of RERA across In-

[2].There has been incidence of stalled residential project in many other countries and regions, including China, Singapore, Malaysia, Thailand and Hongkong, among which, the problem is the most severe in mainland China which caused massive mortgage boycott against the banks.

dian states to identify its effects on mortgage origination and homeownership. We address three potential challenges in our empirical design: First, RERA could influence bank behavior, affecting overall credit supply. Additionally, other macroeconomic factors may impact aggregate credit supply. To mitigate these concerns, our empirical specification compares mortgage origination within branches (branch × year-quarter) across treated and control areas. This approach allows us to control for broad-based macroeconomic shocks to credit supply.

Second, selection bias may arise from systematic differences between early and late RERA adopters. Given our within-branch analysis, this concern manifests as potential differential treatment of borrowers across treated and control areas by the same branch. We address this through three mechanisms. First, we present pre-trend analyses of mortgage origination, demonstrating parallel trends between control and treated groups prior to RERA implementation. Second, our empirical specification incorporates branch × location fixed effects, controlling for time-invariant heterogeneity in branch-location relationships. Third, we conduct balance tests across control and treated states for the pre-sample period to ensure comparability of observables. These approaches collectively mitigate concerns about selection bias and strengthen the validity of our difference-in-differences identification strategy.

Third, we address potential confounding events at the state level that could drive the observed effects. We employ two strategies to mitigate this concern. Initially, we demonstrate that key macroeconomic variables potentially influencing the housing market do not differentially affect control and treated groups. Additionally, for a subset of our analysis, we exploit variation in RERA's applicability to builders within the same state. Specifically, we show that the impact is concentrated on builders and housing properties covered under RERA, while those exempt from the regulation exhibit no significant effects. This within-state comparison provides a more robust identification of RERA's causal impact, further isolating the effect from potential state-level confounders.

There are concerns surrounding difference-in-difference design using the staggered policy rollout (Baker, Larcker and Wang, 2022). We address these by checking the robustness of our analysis following Sun and Abraham (2021) and Callaway and Sant'Anna (2021).

Our empirical analysis yields four primary results. First, we find that RERA implementation leads to an increase in mortgage origination, with a more pronounced effect on new homes compared to resale properties. This increase appears to be driven by two complementary mechanisms: heightened borrower demand and expanded bank lending. On the demand side, RERA's transparency requirements and regulatory constraints on project delays likely reduce perceived risks for homebuyers, potentially stimulating demand for home purchases and associated mortgages (Kurlat and Stroebel, 2015). Concurrently, on the supply side, RERA's mandates for enhanced disclosure of housing quality and project status mitigate information asymmetries inherent in housing collateral valuation (Stroebel, 2016; Cerqueiro, Ongena and Roszbach, 2016). This improved transparency may decrease the risk associated with mortgage collateral, increasing banks' propensity to extend credit. The more substantial effect observed for new homes aligns with RERA's focus on regulating ongoing development projects. These findings suggest that RERA's impact on mortgage markets operates through both demand-side confidence effects and supply-side risk reduction, collectively enhancing market efficiency in the real estate sector.

Uncertainty surrounding collateral quality in mortgage lending can induce banks to adopt risk mitigation strategies, while simultaneously deterring vulnerable groups from homeownership, thereby exacerbating disparities in housing market participation. Banks may vertically integrate with real estate developers (Agarwal et al. (2014), Stroebel (2016) among others) or leverage existing borrower relationships to mitigate risks (Petersen and Rajan (2002), Berger and Udell (1995), Degryse and Ongena (2005), Agarwal and Hauswald (2010) among others). These practices disproportionately disadvantage minority groups and new borrowers lacking established banking connections. Concurrently, heightened uncertainty may discourage these vulnerable groups from pursuing homeownership and applying for mortgages, as they anticipate potential discrimination or unfavorable terms. Banks' use of neighborhood characteristics as risk proxies further compounds this effect, leading to preferential lending in affluent areas (Kurlat and Stroebel, 2015). Consequently, uncertainty engenders a dual impact: banks concentrate lending in perceived low-risk segments, while vulnerable groups self-select out of the housing market. This dynamic perpetuates spatial concentration of mortgage lending and reinforces socioeconomic disparities in housing finance access. The compounded effect of supply-side constraints and demand-side hesitancy among vulnerable groups potentially creates a persistent cycle of exclusion in the housing market.

Our second set of results examines the heterogeneous effects of RERA implementation across demographic and geographic dimensions. We find that RERA's introduction is associated with increased mortgage originations for first-time borrowers, improved terms for women and marginalized castes, enhanced availability for properties in emerging neighborhoods, and a spatial redistribution from metropolitan and Tier 1 cities to Tier 2 and Tier 3 cities. These findings suggest that RERA's impact extends beyond aggregate market effects, potentially reducing barriers to entry and mitigating pre-existing disparities in mortgage access. The observed patterns are consistent with a democratization of homeownership and mortgage financing, indicating that regulatory interventions can have significant distributional consequences in credit markets.

The third set of results examines RERA's impact on housing project completion and subsequent mortgage performance. Utilizing project completion data, we document a statistically significant reduction in project delays following RERA implementation. Additionally, we observe lower delinquency and default rates in mortgage loans post-RERA. These findings suggest that RERA's regulatory framework has had substantial effects on the housing market by enhancing project transparency and increasing the potential costs of delays for property developers. The resulting improvement in project completion rates appears to have facilitated greater mortgage origination while simultaneously reducing default risk.

Our final set of results examines RERA's real effects on the housing market. We find an increased propensity among developers to provide more affordable, smaller houses, coupled with a reduction in luxury housing availability. Concurrently, we observe a decrease in affordable home prices and an increase in luxury home prices. These findings suggest a significant shift in housing supply composition, consistent with a democratization of homeownership. The observed changes in housing supply and pricing structure complement our earlier findings from the mortgage market

These market outcomes can be understood through RERA's impact on developers' operational constraints and incentives. RERA directly affects real estate developers by imposing project-specific escrow requirements and prohibiting inter-project resource transfers. Additionally, it mandates prompt repayment to buyers in case of project delays. Consequently, developers' centralized budget constraints potentially transform into project-level constraints, influencing their business decisions and product choices (Stein (1997), Almeida, Kim and Kim (2015) among others). In line with the increasing constraints, we find that there is a reduction in the profitability of real estate developers and a consequent greater exit of some developers compared to other industries.

Our baseline results are robust to various robustness checks. First, there could be potential issues surrounding the approach of staggered DiD as highlighted in Baker, Larcker and Wang (2022), we address the concerns by following Sun and Abraham (2021) and Callaway and Sant'Anna (2021). Next, since many of the primary variables of interest are count-like variables we show that the results are robust to alternate specifications of using Poisson regression (Cohn, Liu and Wardlaw, 2022). We also exploit a regulatory guideline that allows some properties that are relatively smaller in plot size to be exempt from RERA. We find there is no tangible effect of impact of the implementation RERA in the non-RERA properties in the same state that implemented RERA highlighting that the effect is not driven by some state-specific unobservables that are correlated with the passage of RERA.

This paper most directly contributes to the literature studying the impact of government intervention in the housing market. Floetotto, Kirker and Stroebel (2016) lays down a general equilibrium model to study the effect of government policies like taxes on property and/or rent on home prices, quantities, and allocations, and welfare. Various other works have empirically investigated different government policies on home prices and homeownership such as tax policies (Gervais, 2002; Sommer and Sullivan, 2018), and subsidies (Berger, Turner and Zwick, 2020). However, limited attention is given to the impact of real estate developers on the housing market. In this paper we contribute to this literature by showing government policies targeted toward real estate developers mandating them to be more transparent and increasing their cost to delay on projects (RERA) can impact allocative outcomes in the housing market and consequently in the mortgage market. We find that the passage of RERA leads to greater access of housing by first-time borrowers, and borrowers from smaller regions.

Our paper also contributes to the literature studying the role of collateral and the uncertainty surrounding collateral quality in affecting household debt. There is a large extant literature that highlights the importance of information asymmetry in credit disbursement (Petersen and Rajan (1994), Karlan et al. (2009) among others). Relationship between banks and borrowers have been highlighted to reduce information assymetry and affect household debt like mortgage, credit card debt and also impacts default (Agarwal et al. (2018), Puri, Rocholl and Steffen (2017), Guiso, Sapienza and Zingales (2013) among others). In the context of the mortgage market Stroebel (2016) highlights that lenders with superior information about collateral quality can reduce foreclosure in mortgages. It builds on works of Agarwal et al. (2014) that highlight the role of vertical integration of real estate developers and banks as a tool to mitigate information uncertainty in the collateral quality. We add to this literature by showing that regulating real estate developers can create a scenario that improves transparency of the underlying collateral and facilitate higher mortgage origination.

Finally, we contribute to the literature that studies the factors that can expand or hinder access to owning homes across various groups. This can often come from a lack of access to a mortgage driven by political/ electoral factors (Akey et al. (2018), McCartney (2021) among others); discrimination across various factors such as race, gender, religion in the mortgage as well as in the housing market (Munnell et al. (1996), Bhutta and Hizmo (2021) among others) as well as self selection outside the mortgage or the housing market due to fear of getting discriminated against (Charles and Hurst (2002), Park, Sarkar and Vats (2021) among others).[3] Other factors that can impact the dispersion of ownership could be segmented nature of search in the housing market leading to excess demand in a small neighborhood (Piazzesi, Schneider and Stroebel, 2020), the potential difference in historical mortgage-market reforms (Andersen, 2011) and differential appeal of the American dream of owning a home (Agarwal, Hu and Huang, 2016). We contribute to this literature by showing that making real estate builders more transparent and reducing the potential cost of default could have asymmetric impact on groups that were previously excluded from the housing market and can lead to democratization of the homeownership landscape.

The remainder of the paper is organized as follows: Section 2 lays down the institutional nature of the housing market in India and the changes brought about by RERA. Section 3 describes the data. Section 4 lays down the empirical strategy used in the paper and section 5 presents the results. Finally, section 6 concludes.

2 Institutional Details

This section presents the institutional design of homeownership in India – the way the housing market worked before the implementation of RERA, and the necessary changes that RERA brought in the housing market.

[3]Several studies have highlighted supply-side bottlenecks that prevent access to mortgages across various groups like race, gender. See Holmes and Horvitz (1994), Tootell (1996), Ross et al. (2008), Ghent, Hernandez-Murillo and Owyang (2014), Cheng, Lin and Liu (2015), Hanson et al. (2016), Giacoletti, Heimer and Yu (2021), Bartlett et al. (2022), Ambrose, Conklin and Lopez (2021), Begley and Purnanandam (2021), Bhutta, Hizmo and Ringo (2021), Fuster et al. (2022), Howell et al. (2022), Butler, Mayer and Weston (2023), among others.

2.1 Pre-RERA Landscape of Housing Sector in India

Before the advent of the Real Estate (Regulation and Development) Act (RERA), the Indian housing sector faced a host of intricate challenges that impeded its functionality and credibility. Prior to the enactment of RERA, there was no national-level regulation concerning the pre-sale market, leading to a lack of oversight and transparency. Despite the mandatory requirement for developers to initiate projects solely after obtaining required approvals from the authorities, due to the lack of monitoring, it was common for the developers to violate these rules and launch pre-sales preemptively, sometimes before the land title was even settled.

Regarding the payment mode, it varies significantly depending on the discretion of individual developers, typically including three ways, the construction-linked plan, the downpayment plan and the flexi plan. Under the construction linked-plan, buyers initially pay a minimal proportion of the total price at the time of booking, with subsequent payments tied to the agreed-upon milestones in the construction progress. Conversely, in the downpayment plan, a small proportion, typically 10% of the total cost, is paid upfront as a downpayment, followed by a substantial portion of the remaining amount one month after the booking time, leaving only a negligible balance (around 5%) to be settled upon possession. The flexi plan, as its name suggests, offers a flexible blend of the aforementioned approaches. It incorporates an initial downpayment at the time of booking, accompanied by a smaller amount paid 30 days later, distinct from the downpayment plan's structure. The remaining sum is then tied to the construction milestones, akin to the construction-linked plan. Notably, developers often incentivize buyers by offering substantial discounts for opting for the downpayment plan, aiming to expedite the receipt of sales proceeds. Because of inadequate oversight on how the developers use the sales proceeds, it was common that they use the fund for purpose unrelated to the ongoing project, leading to construction delays to a lack of liquidity.

Under such scheme, transparency was notably lacking, leaving prospective homebuyers grappling with a shortage of comprehensive and accurate information concerning various housing projects. This lack of transparency created an atmosphere filled with uncertainties, exposing homebuyers to misleading representations and financial risks. Moreover, persistent project delays left many homebuyers in a state of uncertainty, despite significant financial commitments. Deceptive advertising, promising amenities that often failed to materialize, compounded the sector's problems. The absence of robust grievance redressal mechanisms further exacerbated homebuyers' plight, amplifying financial vulnerabilities and discontent within the housing sector. RERA's implementation not only seeks to protect homebuyers but also affects banks and financial institutions. The Act's focus on ensuring project completion within stipulated timelines and enhancing transparency can reduce default risks associated with delayed or incomplete projects, thereby positively impacting banks by mitigating non-performing assets (NPAs) and potential loan defaults related to the real estate sector. Additionally, RERA's stringent regulations and mechanisms for dispute resolution can potentially foster a more secure lending environment for banks, contributing to increased confidence in financing real estate projects.

2.2 RERA's Intervention and Key Provisions

The advent of the Real Estate (Regulation and Development) Act in March 2016 marked an epochal shift in the Indian housing sector, ushering in a paradigm of reforms aimed at rectifying long-standing industry maladies. RERA's core mandate revolved around enhancing transparency, instilling accountability, and fortifying consumer protection. Mandating the registration of real estate projects above stipulated thresholds, RERA engineered a seismic shift towards transparency, mandating developers to provide comprehensive disclosures. These encompassed detailed project timelines, layouts, approvals, and periodic progress updates, empowering buyers with crucial information for informed decision-making. Notably, the Act underscored the imperative of fair practices, imposing stringent regulations to curtail misleading advertisements and ensuring strict adherence to disclosed project plans and stipulated timelines. The introduction of escrow accounts emerged as a pivotal measure, aiming to prevent fund diversion and safeguard homebuyers' financial interests. Developers were compelled to deposit 70% of collected funds into dedicated accounts and get paid to cover the cost of the project based on the progress of the project which will be certified by the authority, thereby mitigating the risks associated with fund diversion and ensuring their judicious utilization for project completion. RERA also requires regular auditing to monitor the financial statements submitted by the developers and to ensure that the withdrawal from the escrow account has been in comliance with the progress of the projects. Crucially, RERA heralded the establishment of state-level regulatory bodies tasked with the onerous responsibility of enforcement, compliance monitoring, dispute resolution, and efficient grievance redressal, thus infusing an element of accountability and oversight within the sector. RERA also introduce rigorous punishment mechanism. Any violation of the law will incur upto 10% of estimated cost of the project and/or imprisonment upto 3 years. For any delay in the delivery of the project, the developers have to refund the buyers along with the due interest. If the buyer decides not to withdraw the property possession, the developers will compensate the buyers for the delay in the form of monthly interest till the delivery of the property.

RERA's implementation epitomized a transformative juncture, catalyzing a seismic shift towards a more transparent, accountable, and consumer-centric housing sector in India. The Act's stringent regulations and emphasis on transparency significantly bolstered buyer confidence by instilling trust in the sector's integrity. Timely project deliveries, adherence to quality standards, and the assurance of comprehensive disclosures augmented the sector's reliability, mitigating uncertainties associated with project delays and unfair practices. Additionally, RERA's pivotal focus on establishing efficient mechanisms for dispute resolution and robust grievance redressal engendered a more consumer-friendly housing market, fostering a harmonious ecosystem conducive to sustainable growth and heightened investor confidence. In essence, RERA's legacy transcends mere regulatory reforms; it has been instrumental in transforming the erstwhile opaque and uncertain housing domain into a transparent, accountable, and consumer-centric industry, envisaging a future characterized by resilience, fairness, and sustained growth. By the end of 2023, over 100,000 cases had been solved by State RERA, according to the Ministry of Housing and Urban Affairs, and over 100,000 projects were registered under RERA. [4]

2.3 Home Loan Application & Repayment in India

Application and Sanction of Loan - The home loan application process in India involves several key steps. Initially, borrowers submit applications, including personal information such as age, years until retirement, proof of salary, or proof of business address for non-salaried individuals, along with assets, liabilities, and credit scores. Lenders meticulously review these materials to assess creditworthiness and conduct property valuations, a process typically spanning 3-4 weeks. Decisions regarding loan approval, amount, and interest rate are then made by lenders. According to Reserve Bank of India (RBI) guidelines, the Loan-to-value (LTV) ratio is capped at different percentages based on loan amounts. It is capped at 90% for loans up to ₹300,000, 80% for loans between ₹300,001 to ₹750,000, and 75% for loans above ₹750,000. The interest rate is calculated by adding a risk premium to the base rate [5], with factors such as home loan scheme, credit score, collateral quality, loan tenure, LTV, occupation and gender influencing the risk premium. Female and salaried borrowers may receive interest rate concessions. The tenure of home loans are up to 30 years. Borrowers aged between 18 to 70 years old are eligilble.

If a loan application be rejected, the borrower must seek alternative lenders. Conversely, if the loan is approved, borrowers proceed to sign the loan agreement, and lenders disburse the loan amount to the seller or developer. A processing fee, typically 0.35% of the loan amount, with a minimum of ₹2,000 and a maximum of ₹10,000 rupees, is deducted from the

[4]https://www.business-standard.com/finance/personal-finance/record-rally-realty-project-registrations-under-rera-touch-1-16-lakh-in-2-years-123122200750$_1$*.html*

[5]From 1 April, 2016, the base rate is replaced by Marginal Cost of Funds based Lending Rate (MCLR).

total loan amount. However, certain categories of home loans may qualify for a waiver of this fee. The borrower commits to paying an equivalent monthly installment (EMI) as per the agreement, with charges applicable for prepayments.

Delinquent and Default - If a borrower miss fewer than three EMIs, the bank issues a warning; after three consecutive missed payments, the bank consider the borrower in default and send a notice. Borrowers could approach the lenders and explain, potentially receiving a grace period. The bank may choose to give defaulters a final 60-day notice. Failure to settle the debt within this period leads to the bank issuing another notice stating the auction date of the collateral property. Under the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFESI) Act, banks are authorized to directly auction the collateral. If the auction proceeds are not sufficient to cover the loan, banks may pursue borrowers' other assets. Missing EMI payment or default may negatively affect the credit score.

2.4 Real Estate Sector and Housing Market in India

As in many other developing countries, the real estate sector in India is closely linked to many other industries and contributes significantly to the eeconomic output. As per data provided by the Ministry of Statistics and Programme Implementation, the GVA of real estate sector reached ₹25.87 trillion in FY 2018-19, or 15.3% of total national GVA. The average growth rate of GVA by the real estate sector was 13% from FY 2014-15 to FY 2018-19.

Urban housing development has been developing rapidly during our sample period due to the steady increasing in urbanization rate. The urban housing market in India consists of the primary market where homebuyers purchase directly or with the assits of real estate brokers from the developers, and secondary market where homebuyers purchase from individuals. Figure A2 shows the quarterly housing price index by Federal Research Bank of St. Louis. Prior to 2012, the housing price in India saw a steady increase due to rapid economic development. However, the price marginally decrease from 2013 to 2014 due to oversupply and economic slow down. Form 2015 to 2018, growth of housing demand is lower due to lower real GDP growth and policy interventions such as demonetization, the launching of RERA and Goods and Service Tax Act. The housing price saw very modest appreciation. In 2019, housing price decrease marginally due to developers' liquidity crunch and a higher supply of affordable housing.

3 Data and Summary Statistics

The primary analysis of the paper hinges two different sources of data – mortgage transactions data, and data on real estate purchases. We augment these data with the information on the passage and implementation of RERA from the ministry of housing affairs in India. In this section we provide an overview of the data:

Mortgage transactions data The data includes the mortgage originated by all branches of a state-owned commercial bank in India from the 1990s to 2023. This bank is one of the largest banks in India with over 20,000 branches across all states and union territories in India. The distribution of branches across the country is presented in Panel (a) of Figure 1. The original sample includes 4 million loans. The data includes loan information, collateral attributes, borrower information, and branch information. Loan information includes the date of disbursement, loan amount, interest rate, loan term, whether the interest rate is fixed, monthly repayments, and loan performance. Attributes of the collateral include the address and the pin code of the home, the purchase price, the appraised value, and the square footage of the home. Borrower information includes each borrower's unique identifier, gender, age, occupation, income, caste, and religion. Branch information includes pin code and a unique identifier for each branch.

We keep the mortgages originated from April 2015 to December 2019 and remove the four years from 2020 to 2023 to avoid the confounding effect of the COVID-19 pandemic. We only keep the branches that issued the first mortgage before October 2016 which is the month when the first few states announced the state-level RERA policy and delete branches that started home loan business after RERA. We exclude mortgages that rank in the top and bottom 1% of all mortgages in terms of the loan amount, purchase cost, or square footage. We also removed mortgages that were missing the collateral pin code. After the screening, we have above 1 million mortgages.

Table 1 is a summary statistic of key variables. In Panel A, we construct a panel of branch and collateral pin code by calendar quarters. Every quarter, ₹786,000 or 0.39 mortgage loans are originated per branch per pin. These mortgages were obtained by 0.38 borrowers, of which 0.29 were first-time borrowers. The average size of each mortgage (=*Loan Amount/Loan Number*) is ₹2.14 million. "*Prob. of Getting Loan*" is a dummy variable equal to one if "Loan Amount" is greater than zero.

In Panel B, we construct a panel of branch and state of collateral by calendar quarters. We focus on the number of unique pin codes that received loans with this data structure. "*No. of New Pin*" represents the number of pin codes that received mortgages for the first time this quarter, while "*No. of Existing Pin*" represents the number of pin codes that obtained loans previously. Each quarter, on average 1.46 pin codes within a state obtain a mortgage from each branch, with only 0.01 obtaining a loan for the first time.

In Panel C, we examine the loan-level data. The average interest rate is 8.61%, and the average loan amount is ₹2million. The average cost of these houses is ₹3.46 million, and the build-up area of 906.20 sq ft. The average loan-to-value ratio is 56.72%. 27% of the borrowers are female, 58% are first-time borrowers and 5% belong to the backward caste.

Real Estate data The data includes residential real estate development projects across 12 cities in 9 Indian states between 2010 and 2020. It contains detailed project characteristics such as location, developer information, property segment, project score, RERA status, delays, number of units, unit size, and transacted prices. We restrict the data to projects launched five years before and after the RERA enactment in the respective states. This results in a total of 13,357 development projects.

Panel D provides the summary statistics of project-level variables. The average project size is 293.84 units. Among all projects, 21% of the units are affordable apartments with another 21% as luxury apartments. The mean project score is 6.64 with an average delay of 14.41 months. The average unit size is 1,378.14 square feet and the average per square feet price is ₹4,183.88.

Impelementation of RERA The dates of RERA implementation are collected from the official RERA website for each state, and we manually collect the date from news articles if the official notification is not available in the official RERA website for some states. The quarterly implementation of RERA across various states is presented graphically in Figure 1 Panel B. We find significant variations across the country in the timing of the implementation.

State Macroeconomic variables We observe state-specific macroeconomic variables like GDP per capita, Gross value added for the construction sector, the CPI of housing, and the credit issued by scheduled commercial banks from the handbook of Indian statistics maintained by the Reserve Bank of India.

4 Empirical Strategy

In this section, we describe the primary empirical strategy of the paper to first study the effect of RERA on mortgage outcome exploring the proprietary data on a large bank in India. Next, we also exploit the real estate data to understand the impact on the housing market.

4.1 Effect on Mortgage

We adopted a staggered Diff-in-diff approach that compares the states that have implemented RERA with the states that have yet to implement it. As introduced in Section 2, RERA was announced at the national level by the federal government in 2016, while the state government has the discretion to decide when to implement the Act.

In our baseline regression, we examine the impact of RERA on mortgage loans originating to the borrowers whose collateral is located in the treated states. Our empirical specification is below:

$$Y_{bpq} = \beta \cdot Post_{p(b)q} + \alpha_{b,p} + \alpha_{b,q} + \varepsilon_{bpq} \tag{1}$$

Where Y_{bpq} includes (1) the probability of receiving a loan from branch b in a pin code p in the quarter q; (2) the amount loan originated by branch b to the residents whose collateral is located in a pin code p in the quarter q; (3) the number of total borrowers receiving a loan from branch b and whose collateral is located in a pin code p in the quarter q; (4) the average size of a loan from branch b in a pin code p in the quarter q; (5) the total number of first-time borrowers receiving a loan from branch b whose collateral is located in pin code p; (6) the total number of existing borrowers receiving a loan from branch b whose collateral is located in pin code p. "Post" is the binary variable that takes 1 if a postcode p belongs to the state after the adherence to RERA, from a branch b. The regression specifications include $\alpha_{b,p}$ branch×pin fixed effect and $\alpha_{b,q}$ is the branch × year-quarter fixed effects. Branch×year-quarter allows to control for the unobserved affecting a branch in a quarter and allows the identification to come from within branch mortgage origination across two pin codes, one that is in a state that has implemented RERA and the other in the state that has not implemented RERA. Branch×pincode allows to control for any time-invarant effect of a branch's propensity to originate mortgage to a pincode like distance, home bias etc and allows the estimation to come from time series variation in the status of the implementation of RERA in a state.

To capture the dynamic changes of the effect over time, we define a series of binary variables "$Event_{pq}$" to indicate each event quarter from 4 quarters before to 8 quarters after the implementation of RERA in each state. Additionally, we define two binary variables "$Event_{pq(<=-5)}$" to capture the quarters leading up to the fourth quarter preceding the implementation, and "$Event_{pq(>=9)}$" to capture the quarters following the ninth quarter post-implementation. Y_{bpq} include the same set of variables as in equation (1). Other variables are defined same as in equation (1). To show the aggregated effect of the policy in each event quarter t, we visualize the cumulative effect $b_t = \sum_{q=-4}^{t} \beta_q$.

$$Y_{bpq} = \beta_{q(<=-5)} \cdot Event_{pq(<=-5)} + \sum_{q=-4, q\neq -1}^{8} \beta_q \cdot Event_{pq} + \beta_{q(>=9)} \cdot Event_{pq(>=9)} + \alpha_{b,p} + \alpha_{b,q} + \varepsilon_{bpq} \quad (2)$$

We also investigate the changes in mortgage attributes including the loan amount, LTV, and interest rate using the data at loan-level with the regression specified in equation (1).

We then conduct heterogeneous tests to examine the differential effect of RERA on collaterals located in different cities. Specifically, we run the following regression with data at the branch × pin code level:

$$Y_{bpq} = \beta_1 \cdot Post_{p(b)q} \times Tier3 + \beta_2 \cdot Post_{p(b)q} \times Tier2 + \beta_3 \cdot Post_{p(b)q} \times Tier1 + \alpha_{b,p} + \alpha_{b,q} + \varepsilon_{bpq} \quad (3)$$

where the binary variables *"Tier 3"*, *"Tier 2"*, and *"Tier 1"* take 1 if the collateral is located in a tier 3, tier 2 or tier 1 city, respectively, and 0 otherwise.

We use the following specification to examine the effect on borrowers with different socio-economic status.

$$Y_{bpq} = \beta_1 \cdot Post_{p(b)q} \times Group + \beta_2 \cdot Post_{p(b)q} + \beta_3 \cdot Group + \alpha_{b,p} + \alpha_{b,q} + \alpha_{s,q} + \alpha_{s,g} + \varepsilon_{bpq} \quad (4)$$

where *"Group"* is a binary variable indicating the gender, income of the borrower and whether the borrower is a new borrower or not. In this specification we can also include state×quarter fixed effects denoted with $\alpha_{s,q}$ that allows us to control for any corresponding state-specific macroeconomic confounders. We also include state × Group fixed effects denoted by $\alpha_{s,g}$ to control for any time-invariate characteristics of each group in different states.

4.2 Effect on Housing Projects

To evaluate the effect of RERA on housing project characteristics, we estimate a project level regression with the following specification:

$$Y_{ijq} = \beta \cdot Post_{ijq} + \alpha_j + \gamma_q + \varepsilon_{ijq} \tag{5}$$

where Y_{ijq} includes project segment, score, delay, average unit size, and launch price per per square feet for project i in city j during quarter q. The regression specifications include city fixed effect α_j and quarter fixed effects γ_q. The city fixed effect allows to control for any time-invariant heterogeneities in a city and allows the identification to come from the time-varying status of RERA implementation. Meanwhile year-quarter fixed effects allows the identification to come from cross section across cities.

We evaluate the effect of RERA enactment on RERA-registered projects and its spillover effects on non-registered projects through the following specifications:

$$Y_{ijq} = \beta_1 \cdot Post_{ijq} \times R + \beta_2 \cdot Post_{ijq} \times NR + \alpha_j + \gamma_q + \varepsilon_{ijq} \tag{6}$$

where the binary variables "R" and "NR" take 1 if the project is RERA-registered or not registered respectively, and 0 otherwise.

The evolutionary effect of RERA on housing project characteristics is estimated using the following specifications:

$$Y_{ijq} = \sum_{q=-5}^{-2} \beta_q \cdot Event_{jq} + \sum_{q=0}^{9} \beta_q \cdot Event_{jq} + \alpha_j + \gamma_q + \varepsilon_{ijq} \tag{7}$$

while the evolutionary effect by RERA-registration status is evaluated using:

$$Y_{ijq} = \sum_{q=-5}^{-2} \beta_q \cdot Event_{jq} + \sum_{q=0}^{9} \beta_{1q} \cdot Event_{jq} \times R + \sum_{q=0}^{9} \beta_{2q} \cdot Event_{jq} \times NR + \alpha_j + \gamma_q + \varepsilon_{ijq} \tag{8}$$

We further investigate the effect of of RERA by property segment using the following specification:

$$Y_{ijq} = \beta_1 \cdot Post_{ijq} \times Seg1 + \beta_2 \cdot Post_{ijq} \times Seg2 + \beta_3 \cdot Post_{ijq} \times Seg3 + \alpha_j + \gamma_q + \varepsilon_{ijq} \quad (9)$$

where the binary variables *"Seg 1"*, *"Seg 2"*, and *"Seg 3"* take 1 if the development project belongs to affordable, mid, and luxury segment, respectively, and 0 otherwise.

5 Result

This section presents the results from the empirical analysis described in Section 4. First, using the detailed data on mortgages, we study the impact of RERA on mortgage origination, and exploit various geographic and demographic cross-sections. Next, we look at data on real estate projects to study the impact of RERA on the various aspects of homeownership market.

5.1 Effect of RERA on Mortgage Origination

We start by investigating the effect of RERA on mortgage origination, which is one of the primary cornerstones of homeownership.[6] We use the staggered implementation of RERA and perform a difference-in-difference empirical strategy using the baseline regression specification (1). The results are reported in Table 2. In the first two columns, the dependent variable is a binary variable taking the value 1, if a home mortgage loan is extended by a branch to a pincode. We find an increase in 0.8 percentage point in the probability of the extension of the loan to a pincode after the RERA was implemented in a state compared to a state where it was not yet implemented. Given than the unconditional mean is around 16 percent, the effect indicates more than 5% change in the probability of getting a mortgage. In

[6] A large number of homes are purchased through mortgage borrowing. The 2021 Statistics Research Department report - *"Number of new home sales in the U.S. 2000-2020, by financing type"* states that two in three home purchases between 2000 and 2020 were financed through a conventional mortgage.

column 1 we include branch×year-quarter and Pincode fixed effects. While in column 2 we include branch×year-quarter and branch×pincode fixed effects. Branch×year-quarter allows to control for an unobserved affecting a branch in a quarter and allows the identification to come from within branch mortgage origination across two pin codes, one that is in a state that has implemented RERA and the other in the state that has not implemented RERA. Branch×pincode allows to control for any time invarying effect of a branch's propensity to originate mortgage to a pincode like distance, home bias etc and allows the estimation to come from time series variation in the status of the implementation of RERA in a state. In columns 3 and 4 of Table 2, the main variable of interest is the amount of loans disbursed. We transform the variable by ln(.01+.). We find that after the implementation of RERA there is over 15% of increase in the disbursal of home loans. In column 3 we include branch×year-quarter and Pincode fixed effects. While in column 4 we include branch×year-quarter and branch×pincode fixed effects. Similarly we find around 4% increase in the numbers of loans disbursed in the pincodes that implemented RERA. The effects are largely similar in columns 5 and 6 of Table 2. Taken together the results highlight that there is an increase in both extensive margin as well as the aggregate mortgage loans disbursed after the implementation of RERA.

Next, we investigate the dynamic version of regression specification (1) as presented in the empirical specification (2). Since the effect can persist over years, we are interested in plotting the cumulative effect as of each period by following the methodology in Agarwal and Qian (2014). The results are reported in the Figure 2. In Panel A, we show the dynamic trend in the amount of loan disbursed. There is no difference between the treated and control group before the implementation of RERA, however, we see a sharp increase in the difference in lending towards the pincode belonging to states that had implemented RERA. The strictly identified *zero* coefficient in the pre-shock period also allows us to validate the parallel trend assumption that is imperative in any DiD analysis. We observe similar patterns in the number of loans and the probability of loan disbursal presented in Panels B and C of

Figure 2.

Robustness Checks: We perform a series of tests to check the robustness of our baseline specification. First to address the criticisms laid out for the staggered difference-in-difference methodology highlighted in Baker, Larcker and Wang (2022), we use estimation process laid down in Sun and Abraham (2021) and Callaway and Sant'Anna (2021). We present the results in Appendix Tables (A1) and (A2).

We address concerns of potential usage of log(1+.) transformation of count-like variables by using the Poisson and inverse-sin transformation as highlighted in Cohn, Liu and Wardlaw (2022). We present the results in Table A3.

The primary granularity at which RERA is implemented is at the state level. However, to control for local unobservables we study at the granularity of pincode. However, it could be the concern that the increase in observations are artificially increasing the t-statistic. To address this we perform our modified baseline specification by collapsing the data at the branch-state-quarter level, instead of the granularity of branch-pin-quarter. The result is reported in Table A4.

We also show attempt to address the non-random implementation of RERA in a state by showing that any of the observable state-specific factors does not seem to affect the timing of the implementation of RERA in a state. We present the relationship between state specific macroeconomic factors and the implementation of RERA in Appendix Table A5. We find no effect on lagged GDP, growth of construction sector, aggregate flow of credit, and aggregate house price index on the probability of the implementation of RERA. We also include these variables as controls in our baseline specification and find that the baseline results are qualitatively and quantitatively unchanged. The results are reported in Appendix Table A6.

We also randomly allocate the status of RERA across the states and plot the distribution. Our coefficient lies outside the distribution. We report the placebo result in Appendix Figure A1.

In order to address that concern that the treated and control groups might be geographically apart and hence are different in various dimension and are not comparable, we restrict the sample to the pincodes belonging districts that straddle the border of the state as depicted in Figure A3. We perform the regression specification (1) on these set of districts and present the results in Table A7. The results are similar to our baseline specification.

5.2 Heterogeneity

In this section, we probe the various heterogeneities in the data to better understand the pathways through which the implementation of RERA can affect the dynamics in the housing market. We explore the following characteristics – borrowers with a history, status of the collateral, location of borrowers, gender, income and caste of the borrowers.

We start by exploring variation across borrowers with a history of existing relationships with the branch. The idea of the test is that in the presence of asymmetric information, the relationship between a bank and a borrower can mitigate such friction (Boot and Thakor (2000), Sufi (2007) among others). As we explain in section 2, before the implementation RERA there was uncertainty about the quality of the collateral, consequently to mitigate such risk, less loans could be given to new borrowers and higher loans to borrowers with an existing relationship. Consequently, after the passage of RERA that led to greater transparency in the underlying collateral, we would expect less reliance on the past relationship and consequently higher lending to first-time borrowers.

We present a cross-sectional analysis of new vs existing borrowers, presented in Table 3. In columns 1-2 we use the empirical specification (1) separately for new and existing borrowers. The main dependent variable is the natural logarithm of the number of borrowers of each type. We find that there is an increase in 2.4% of the number of new borrowers, however, we do not find any economic or statistically significant effect for the existing borrowers. Next, we look at the number of pincodes a branch is lending to in states that have implemented RERA. The idea again follows that the branch after the implementation of RERA would be willing to lend in areas where it had never lent before and thereby did not have any relationship (Agarwal and Hauswald, 2010). We report the result in column 3 of Table 3. We find that a branch lends to 6.1% more pincodes in after the implementation of RERA in a state. We also use loan-level data in column 4, which measures the intensive margin. We find the quantity of loans to new borrowers goes up compared to existing borrowers.

We also present a dynamic version of the effects of RERA on new and existing borrowers in Figure 3. In Panel A, we present the result on the total number of borrowers, we find an increase in the total number of borrowers after RERA and no effect prior to implementation of RERA. In Panel B, we present the effect on new borrowers and show an increase in new borrowers after RERA, meanwhile we do not find any tangible effect of RERA on the existing borrowers, presented in Panel C of Table 3.

RERA targets the presale housing market, so it should directly impact the mortgage loans borrowed on new apartments, while the effect may also spillover to the resale market. We next explore the heterogeneous effect on the loans originated against collaterals of different status, i.e., new and resale housing. We repeat the regressions specified in equation (1), and separately define the dependent variable Y_{bpq} for loans originated against new and resale housing. Specifically, Y_{bpq} includes (1) the probability of receiving a loan originated on new housing from branch b in a pin code p in the quarter q; (2) the probability of receiving a loan originated on resale housing from branch b in a pin code p in the quarter q; (3) the amount loan originated by branch b for which the collateral is a new housing located in a pin code p in the quarter q; (4) the amount loan originated by branch b for which the collateral collateral is a resale housing located in a pin code p in the quarter q; (5) the number of total borrowers receiving a loan from branch b and whose collateral is a new housing located in a pin code p in the quarter q; (6) the number of total borrowers receiving a loan from branch b and whose collateral is a resale housing located in a pin code p in the quarter q.

The results reported in Table 3 suggest that mortgage loan originated on new housing account for most of the increase in loan origination. Columns 1-2 show that the probability to originating a loan on new housing is 0.6 percentage points higher, while the probability of originating a loan on resale housing is only insignificantly higher by 0.2 percentage points.. Columns 3-4 show that the mortgage loans originated on new housing in each quarter increase by 11%, while the increase in loans originated on resale housing increase by an insignificant 3.7%. Similarly, the number of loans originated on new housing is 2.9% higher, while only 0.8% higher on resale loans.

Next, we explore the dimension of the geographic location of the home that is purchased – whether it is purchased in a tier 1 vs tier 2 vs tier 3 city in Table 5. A metropolitan or tier 1 city is a place that has one of the highest commercial value as well as better information on the business in general and the underlying quality housing projects that are being built. Meanwhile, there is a higher degree of uncertainty in projects that are built in tier 3 cities. Consequently, given our thesis implementation of RERA would increase the propensity to lend more to the tier 3 cities.

In Table 6, we examine the effect of RERA implementation on mortgage characteristics, including the LTV (Loan-to-value ratio) and interest rate. The result shows that even though the implementation of RERA incur more loan origination, it does not have a significant effect on the LTV and interest rate of new mortgages. However, there is a significant heterogeneity. The mortgage loans originated to the new borrowers, female borrowers, low income borrowers and borrowers from backward castes have a relatively higher LTV and lower interest rate. The LTV of mortgage loan originated to the new borrowers increase by 2.805 percentage points, and the interest rate is 4.1 basis points lower. The LTV of mortgage loan originated to the female borrowers increase by an insigificant 0.406 percentage points, and the interest rate is 3.9 basis points lower. The LTV of mortgage loan originated to borrowers whose annual income is below ₹480,000 increase by 0.693 percentage points, and the interest rate is 10.5 basis points lower. The LTV of mortgage loan issued to the backward castes increase by 0.453 percentage points, while the interest rate decrease by an insignificant 17.4 basis points. This result suggest that the disadvantaged borrowers receive mortgage loans with better terms. In Table A8, we re-run this test by including controls for borrower characteristics, including income, gender, age and nature of occupation. We also use interest spread as the dependent variable in Table A9. The results are consistent with the baseline results reported in Table 6.

5.3 Effect on Housing Projects

In this section, we investigate the effect of RERA on the characteristics of housing projects, including unit size, per-square-foot price, and project quality, which may in turn affect housing affordability.

We start by presenting the overall trends in Figure 4 Panels (a) -(b). Prior to the implementation of state-level RERA regulations, we observe a steady rise in the size of residential units and the per-square-foot prices. Both factors could make homes less affordable for potential buyers. The implementation of RERA interrupted these trends, leading to a slowdown in the growth of both unit size and per-square-foot price. Our empirical results from staggered difference-in-differences regressions, presented in Table 7, are consistent with these observations. As shown in Panel B columns (1) and (2), the implementation of RERA reduces the unit size by 13% for RERA-registered projects with no statically significant changes in per-square-foot prices; while for non-registered projects, both unit size and per-square-foot price reduces, by 6.1% and 8.6% respectively. For both types of projects, houses become more affordable after the implementation of RERA.

We further examine RERA's impact on housing affordability by estimating its heterogeneous effects across different market segments, namely, affordable, mid-tier and luxury sectors. As shown in Table 7 Panel C columns (1) and (2), we find a decrease in both unit size and per-square-foot price for affordable and mid-tier housing sectors, with affordable sector experiencing a larger reduction. The unit size and per-square-foot price for luxury homes, on the other hand, increases. Additionally, without changes in the trend of total housing supply before and after the implementation of RERA, as shown in Figure 5(a), the proportion of affordable apartments increases while the proportion of luxury apartments reduces (Figure 5(b) and (d)). Combining this evidence, the implementation of RERA makes more homes accessible to potential buyers at a lower price.

Prior to RERA, there was a decline in the quality of housing projects indicated by a decrease in project scores, as shown in Figure 4 Panel (c). Project quality deterioration slowed down for RERA-registered projects and our empirical estimates show a 0.79 point increase in project score post-RERA implementation (column 3 of Panel B in Table 7). This increase indicates an enhancement in collateral quality, potentially facilitating greater access to credit for home purchases and consequently improving housing affordability.

We conduct event studies to understand the evolutionary effect of RERA on housing project characterises. The results are presented in Figure 6 and 8 (a). We observe statistically insignificant differences between the pre-RERA estimates to that of the baseline period, which is the quarter before RERA implementation, validating the difference-in-differences research design.

5.4 Delay and Default

Figure 4 Panel (d) shows a trend of increasing delays in the completion of housing projects, which is slowed down post-RERA implementation for the registered projects, while the delays for non-registered projects continued to increase at a faster speed. Column 4 in Panel B of Table 7 shows that the estimated delays for RERA-register projects reduces by 5.088 months on average while it increases by 3.667 months. Column 4 in Panel C of Table 7 further shows reduced delays in the affordable housing sector and an increase in delays for luxury homes. The dynamic effect of RERA on delays in completion of housing projects by RERA-registration status is presented in Figure 8 (b).

Next, we investigate if the implementation of RERA had any effect on the performance of the mortgages outstanding. The premise is that given the nature of RERA, delays go down and consequently loans are less likely to be in default. Also the transparency of the projects also allows the banks to make a better screening on loans, as well as borrowers to make a more informed purchase choice. The results are reported in Table 8. In column 1 we find that the probability of a loan to be delinquent within 1 year of the disbursal is lower by around 1.3%. In column 2 we find that there is a reduction of 25.8% loans under default for the loans that were disbursed after the implementation of RERA in a state. We also find a reduction in the total number of months for which a loan continued to be in default. In column 4 we also find a reduction in the proportion of loans that were categorized as under default. The results overall show a reduction in delinquency of mortgage loans disbursed after the implementation of RERA.

5.5 Effect on Developers

Finally, we study the effect that RERA had on real estate developers. RERA imposes stricter regulations and transparency requirements, which increase compliance costs and limit developers' ability to divert funds between projects. The Act mandates that a significant part of project funds be held in escrow accounts, reducing financial flexibility and potentially increasing borrowing costs. Additionally, RERA's provisions for timely project completion and penalties for delays may lead to higher operational costs and reduced profit margins. The increased transparency and accountability also empower buyers, potentially limiting developers' ability to inflate prices or engage in unfair practices. These regulatory pressures, combined with the need for greater upfront capital and professional management, may force smaller or less efficient developers out of the market.

Given this premise, we find that there is a decline in Return on asset and return on equity of the real estate firms compared to other firms. The results are reported in table 9. In columns 1, 2, and 3 we find a reduction in ROA and ROTA of around 45 basis points, which is almost 10% decline over the average. In column 3 we find 7 percentage point decline in the return on equity of the real estate companies, which is close to 30% decline given that the average ROE is around 21%.

We examine the dynamic trend of exit probabilities for real estate firms relative to those in other industries. To isolate the RERA effect, we compute de-meaned average exit probabilities by removing the average exit probability for firms in each state and year. Figure 7 illustrates these de-meaned averages, contrasting real estate firms with those in other sectors. Our analysis reveals a marked increase in real estate firm exits following RERA implementation, while exit rates in other industries remain relatively stable. This disparity indicates RERA's significant and disproportionate impact on the real estate sector, potentially catalyzing industry-wide restructuring.

We further substantiate these findings through regression analysis, presented in columns 4 and 5 of Table 9. The results demonstrate a statistically significant higher exit probability for real estate firms post-RERA. However, we note that the coefficient estimates may be imprecise due to the limited number of total firm exits in our sample. Despite this limitation, the combined visual and statistical evidence strongly suggests RERA's significant effect on real estate firm survival rates.

6 Concluding Remarks

In conclusion, the growing influence of real estate developers on homeownership globally highlights a significant trend with implications for housing accessibility. However, this rise in prominence is accompanied by risks such as project delays, cost overruns, defaults, and fraud. However, empirical evidence linking these risks to the broader real economy remains limited. This study addresses this gap by examining the interplay between regulatory oversight, improved business practices, and their collective impact on shaping the homeownership landscape, focusing on the adoption of RERA in India.

The implementation of RERA in India, designed to safeguard homebuyers and regulate real estate developers, has unique implications. Analyzing data on more than 1 million individuals, our study uncovers significant findings. Firstly, RERA significantly boosts mortgage origination, particularly benefiting first-time borrowers and marginalized groups. This supports the idea that transparency requirements introduced by RERA decrease risks associated with collateral, making banks more inclined to originate mortgages. Secondly, RERA prompts a shift towards more affordable housing, reducing delays, defaults, and enhancing overall market transparency. This not only addresses the uncertainties surrounding the quality of collateral but also leads to a democratization of the homeownership landscape.

The study's empirical strategy, leveraging the staggered implementation of RERA across states, overcomes potential challenges such as broader macroeconomic shocks, time-invariant differences, and confounding events. The robustness of our baseline results to various checks strengthens the credibility of our findings. Moreover, our results show that regulations targeting real estate developers can impact allocative outcomes, mortgage origination, and homeownership across diverse demographic and geographic groups.

Beyond the impact on the mortgage market, RERA induces transformative effects on the housing market itself. It encourages real estate developers to provide more affordable, smaller houses, thereby democratizing access to homeownership. Additionally, RERA significantly reduces delays in project completion, leading to lower delinquency and default rates in mortgage loans. These outcomes collectively underscore the positive influence of regulatory measures in enhancing market transparency, protecting homebuyers' interests, and reshaping the dynamics of the real estate and mortgage markets.

In summary, this study aligns with economic theories highlighting the essential role of market participants in shaping allocative outcomes. Economic models often emphasize the significance of transparent information and reduced uncertainty in fostering efficient markets. Our study provides empirical insights into the regulatory mechanisms influencing real estate developers. This resonates with economic theories that underscore the role of regulatory interventions in correcting information asymmetries, fostering transparency, and mitigating risks. The findings contribute to the broader literature on government interventions in housing markets, demonstrating how regulatory measures, when well-designed, can democratize homeownership, reshape market dynamics, and align with fundamental economic principles. As economies worldwide grapple with the challenges posed by the housing sector, our findings offer valuable insights for policymakers, researchers, and industry stakeholders aiming to strike a balance between promoting market dynamism and safeguarding the interests of homebuyers.

References

Agarwal, Sumit, and Robert Hauswald. 2010. "Distance and private information in lending." *The Review of Financial Studies*, 23(7): 2757–2788.

Agarwal, Sumit, and Wenlan Qian. 2014. "Consumption and debt response to unanticipated income shocks: Evidence from a natural experiment in Singapore." *American Economic Review*, 104(12): 4205–4230.

Agarwal, Sumit, Gene Amromin, Claudine Madras Gartenberg, Anna L Paulson, and Sriram V Villupuram. 2014. "Homebuilders, affiliated financing arms, and the mortgage crisis." *Economic Perspectives*, 38(2).

Agarwal, Sumit, Luojia Hu, and Xing Huang. 2016. "Rushing into the American dream? House prices growth and the timing of homeownership." *Review of Finance*, 20(6): 2183–2218.

Agarwal, Sumit, Souphala Chomsisengphet, Chunlin Liu, Changcheng Song, and Nicholas S Souleles. 2018. "Benefits of relationship banking: Evidence from consumer credit markets." *Journal of Monetary Economics*, 96: 16–32.

Akey, Pat, Christine Dobridge, Rawley Heimer, and Stefan Lewellen. 2018. "Pushing boundaries: Political redistricting and consumer credit." *Available at SSRN 3031604*.

Almeida, Heitor, Chang-Soo Kim, and Hwanki Brian Kim. 2015. "Internal capital markets in business groups: Evidence from the Asian financial crisis." *The Journal of Finance*, 70(6): 2539–2586.

Ambrose, Brent W, James N Conklin, and Luis A Lopez. 2021. "Does borrower and broker race affect the cost of mortgage credit?" *The Review of Financial Studies*, 34(2): 790–826.

Andersen, Hans Skifter. 2011. "Motives for tenure choice during the life cycle: the importance of non-economic factors and other housing preferences." *Housing, Theory and Society*, 28(2): 183–207.

Baker, Andrew C, David F Larcker, and Charles CY Wang. 2022. "How much should we trust staggered difference-in-differences estimates?" *Journal of Financial Economics*, 144(2): 370–395.

Bartlett, Robert, Adair Morse, Richard Stanton, and Nancy Wallace. 2022. "Consumer-lending discrimination in the FinTech era." *Journal of Financial Economics*, 143(1): 30–56.

Begley, Taylor A., and Amiyatosh Purnanandam. 2021. "Color and credit: Race, regulation, and the quality of financial services." *Journal of Financial Economics*, 141(1): 48–65.

Berger, Allen N, and Gregory F Udell. 1995. "Relationship lending and lines of credit in small firm finance." *Journal of business*, 351–381.

Berger, David, Nicholas Turner, and Eric Zwick. 2020. "Stimulating housing markets." *The Journal of Finance*, 75(1): 277–321.

Bhutta, Neil, and Aurel Hizmo. 2021. "Do minorities pay more for mortgages?" *The Review of Financial Studies*, 34(2): 763–789.

Bhutta, Neil, Aurel Hizmo, and Daniel Ringo. 2021. "How Much Does Racial Bias Affect Mortgage Lending? Evidence from Human and Algorithmic Credit Decisions."

Boot, Arnoud WA, and Anjan V Thakor. 2000. "Can relationship banking survive competition?" *The journal of Finance*, 55(2): 679–713.

Butler, Alexander W, Erik J Mayer, and James P Weston. 2023. "Racial disparities in the auto loan market." *The Review of Financial Studies*, 36(1): 1–41.

Callaway, Brantly, and Pedro H.C. Sant'Anna. 2021. "Difference-in-Differences with multiple time periods." *Journal of Econometrics*, 225(2): 200–230. Themed Issue: Treatment Effect 1.

Cerqueiro, Geraldo, Steven Ongena, and Kasper Roszbach. 2016. "Collateralization, bank loan rates, and monitoring." *The Journal of Finance*, 71(3): 1295–1322.

Charles, Kerwin Kofi, and Erik Hurst. 2002. "The transition to home ownership and the black-white wealth gap." *Review of Economics and Statistics*, 84(2): 281–297.

Cheng, Ping, Zhenguo Lin, and Yingchun Liu. 2015. "Racial discrepancy in mortgage interest rates." *The Journal of Real Estate Finance and Economics*, 51(1): 101–120.

Chetty, Raj, and Adam Szeidl. 2007. "Consumption commitments and risk preferences." *The Quarterly Journal of Economics*, 122(2): 831–877.

Chetty, Raj, László Sándor, and Adam Szeidl. 2017. "The effect of housing on portfolio choice." *The Journal of Finance*, 72(3): 1171–1212.

Cohn, Jonathan B, Zack Liu, and Malcolm I Wardlaw. 2022. "Count (and count-like) data in finance." *Journal of Financial Economics*, 146(2): 529–551.

Degryse, Hans, and Steven Ongena. 2005. "Distance, lending relationships, and competition." *The Journal of Finance*, 60(1): 231–266.

Floetotto, Max, Michael Kirker, and Johannes Stroebel. 2016. "Government intervention in the housing market: Who wins, who loses?" *Journal of Monetary Economics*, 80: 106–123.

Fuster, Andreas, Paul Goldsmith-Pinkham, Tarun Ramadorai, and Ansgar Walther. 2022. "Predictably unequal? The effects of machine learning on credit markets." *The Journal of Finance*, 77(1): 5–47.

Gervais, Martin. 2002. "Housing taxation and capital accumulation." *Journal of Monetary Economics*, 49(7): 1461–1489.

Ghent, Andra C, Ruben Hernandez-Murillo, and Michael T Owyang. 2014. "Differences in subprime loan pricing across races and neighborhoods." *Regional Science and Urban Economics*, 48: 199–215.

Giacoletti, Marco, Rawley Heimer, and Edison G Yu. 2021. "Using High-Frequency Evaluations to Estimate Discrimination: Evidence from Mortgage Loan Officers." *Available at SSRN 3795547*.

Guiso, Luigi, Paola Sapienza, and Luigi Zingales. 2013. "The determinants of attitudes toward strategic default on mortgages." *The Journal of Finance*, 68(4): 1473–1515.

Hanson, Andrew, Zackary Hawley, Hal Martin, and Bo Liu. 2016. "Discrimination in mortgage lending: Evidence from a correspondence experiment." *Journal of Urban Economics*, 92: 48–65.

Holmes, Andrew, and Paul Horvitz. 1994. "Mortgage redlining: Race, risk, and demand." *The Journal of Finance*, 49(1): 81–99.

Howell, Sabrina T, Theresa Kuchler, David Snitkof, Johannes Stroebel, and Jun Wong. 2022. "Lender automation and racial disparities in credit access." *Journal of Finance*.

Karlan, Dean, Markus Mobius, Tanya Rosenblat, and Adam Szeidl. 2009. "Trust and social collateral." *The Quarterly Journal of Economics*, 124(3): 1307–1361.

Kurlat, Pablo, and Johannes Stroebel. 2015. "Testing for information asymmetries in real estate markets." *The Review of Financial Studies*, 28(8): 2429–2461.

McCartney, W Ben. 2021. "Does Household Finance Affect the Political Process? Evidence from Voter Turnout During a Housing Crisis." *The Review of Financial Studies*, 34(2): 949–984.

Munnell, Alicia H, Geoffrey MB Tootell, Lynn E Browne, and James McEneaney. 1996. "Mortgage lending in Boston: Interpreting HMDA data." *The American Economic Review*, 25–53.

Park, Seongjin, Arkodipta Sarkar, and Nishant Vats. 2021. "Political voice and (mortgage) market participation: Evidence from minority disenfranchisement." *Available at SSRN 3891961*.

Petersen, Mitchell A, and Raghuram G Rajan. 1994. "The benefits of lending relationships: Evidence from small business data." *The journal of finance*, 49(1): 3–37.

Petersen, Mitchell A, and Raghuram G Rajan. 2002. "Does distance still matter? The information revolution in small business lending." *The journal of Finance*, 57(6): 2533–2570.

Piazzesi, Monika, Martin Schneider, and Johannes Stroebel. 2020. "Segmented housing search." *American Economic Review*, 110(3): 720–759.

Puri, Manju, Jörg Rocholl, and Sascha Steffen. 2017. "What do a million observations have to say about loan defaults? Opening the black box of relationships." *Journal of Financial Intermediation*, 31: 1–15.

Ross, Stephen L, Margery Austin Turner, Erin Godfrey, and Robin R Smith. 2008. "Mortgage lending in Chicago and Los Angeles: A paired testing study of the pre-application process." *Journal of Urban Economics*, 63(3): 902–919.

Sodini, Paolo, Stijn Van Nieuwerburgh, Roine Vestman, and Ulf von Lilienfeld-Toal. 2023. "Identifying the benefits from homeownership: A Swedish experiment." *American Economic Review*, 113(12): 3173–3212.

Sommer, Kamila, and Paul Sullivan. 2018. "Implications of US tax policy for house prices, rents, and homeownership." *American Economic Review*, 108(2): 241–274.

Stein, Jeremy C. 1997. "Internal capital markets and the competition for corporate resources." *The journal of finance*, 52(1): 111–133.

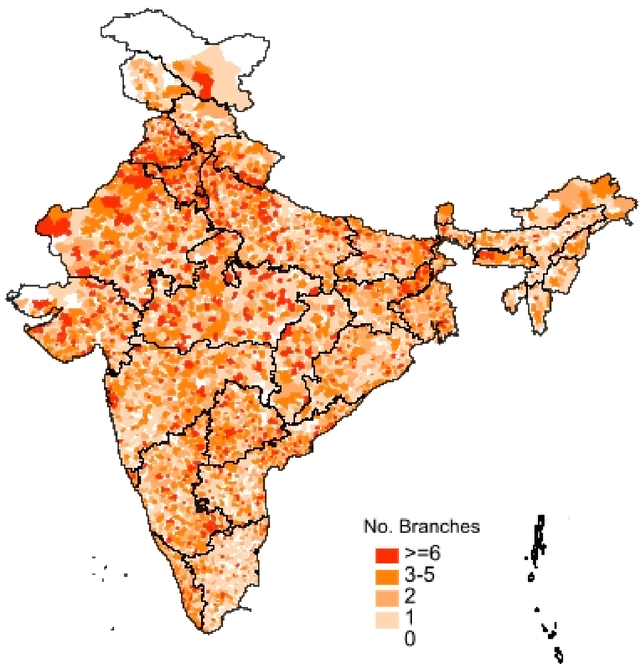
Stroebel, Johannes. 2016. "Asymmetric information about collateral values." *The Journal of Finance*, 71(3): 1071–1112.

Sufi, Amir. 2007. "Information asymmetry and financing arrangements: Evidence from syndicated loans." *The Journal of Finance*, 62(2): 629–668.

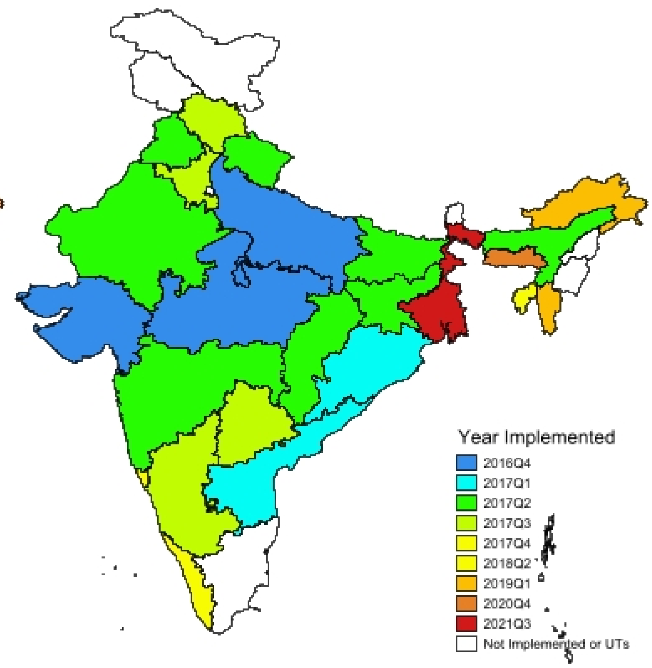
Sun, Liyang, and Sarah Abraham. 2021. "Estimating dynamic treatment effects in event studies with heterogeneous treatment effects." *Journal of Econometrics*, 225(2): 175–199.

Tootell, Geoffrey MB. 1996. "Redlining in Boston: Do mortgage lenders discriminate against neighborhoods?" *The Quarterly Journal of Economics*, 111(4): 1049–1079.

Figure 1: Location of the Bank Branches and Timing of RERA Implementation



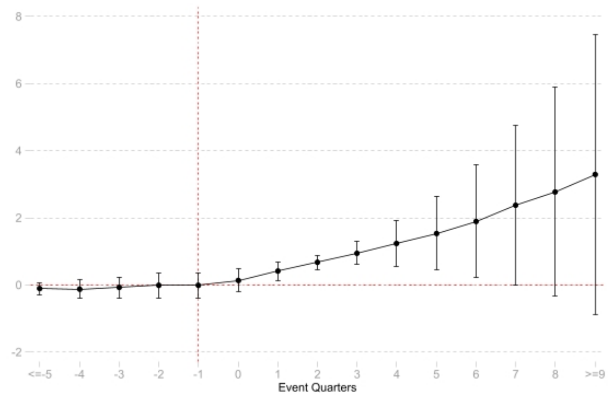
(a) Number of Branches in Each Pincode



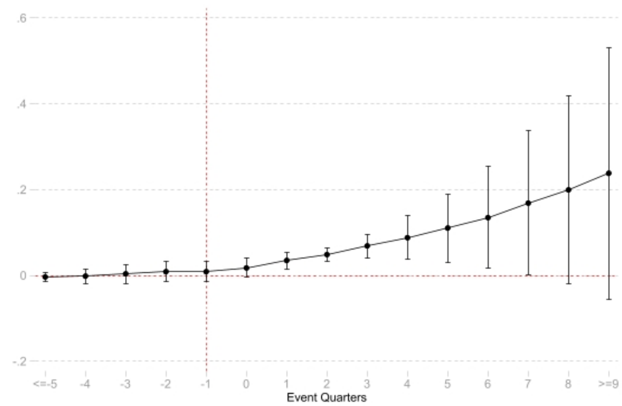
(b) Years Implementing RERA

This table presents the distribution of branches across the various pin codes in India, presented in Panel A. Panel B presents the timing for the implementation of RERA across different states in India.

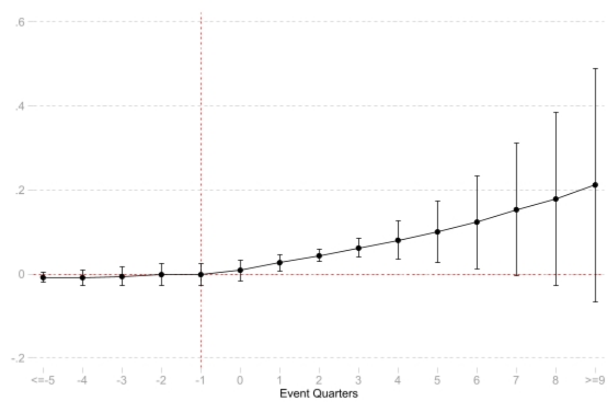
Figure 2: Evolution Lending around RERA Act



(a) Amount of Loan Disbursal



(b) Number of Loan Disbursal



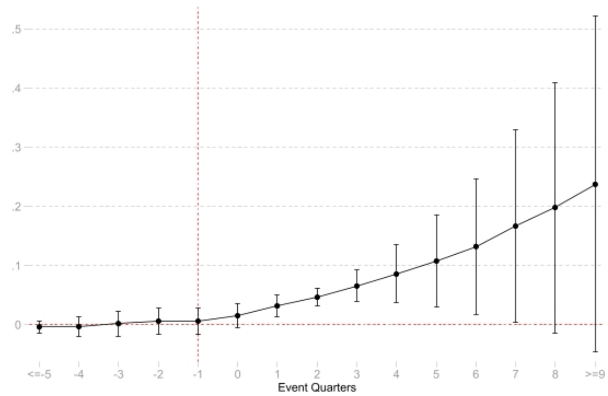
(c) Probability of Loan Disbursal

This figure plots the evolution of the loans disbursed around the passage of Real Estate Regulatory Authority (RERA) Act. We plot $\{\beta_q\}$ from the specification

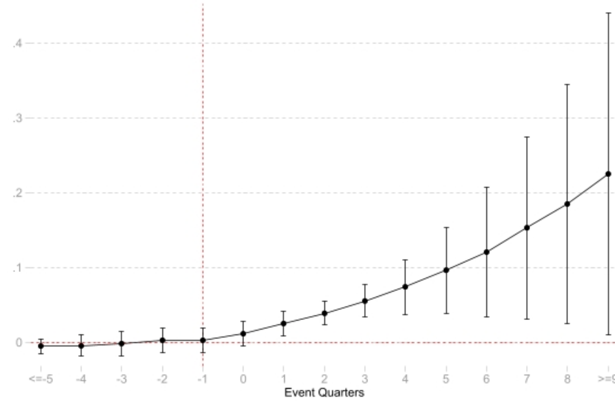
$$Y_{bpq} = \beta_q(<= -5) \cdot Event_{pq(<=-5)} + \sum_{q=-4, q\neq -1}^{8} \beta_q \cdot Event_{pq} + \beta_q(>= 9) \cdot Event_{pq(>=9)} + \alpha_{b,p} + \alpha_{b,q} + \varepsilon_{bpq}$$

Where Y_{bpq} is: the amount of loan disbursal by branch b to a pin code p in the quarter q in Panel (a), the number of loan disbursal by branch b to a pin code p in the quarter q in Panel (b), the probability of disbursal of a loan by branch b to a pin code p in the quarter q in Panel (c), the average size of loan by branch b to a pin code p in the quarter q in Panel (c). We include branch × pincode fixed effects $\alpha_{b,p}$ and branch × quarter fixed effects $\alpha_{b,q}$

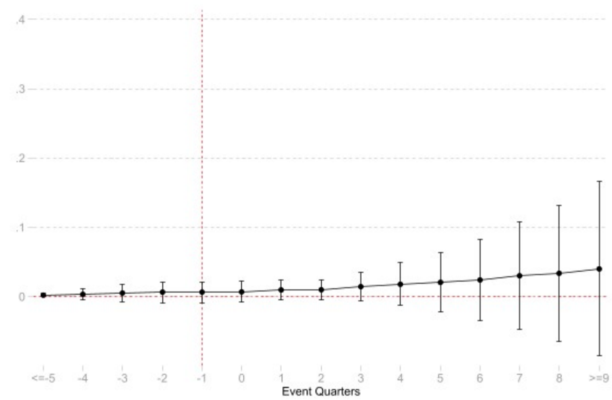
Figure 3: New vs. Existing Borrowers around RERA Act



(a) Total Number of Borrowers



(b) Number of New Borrowers



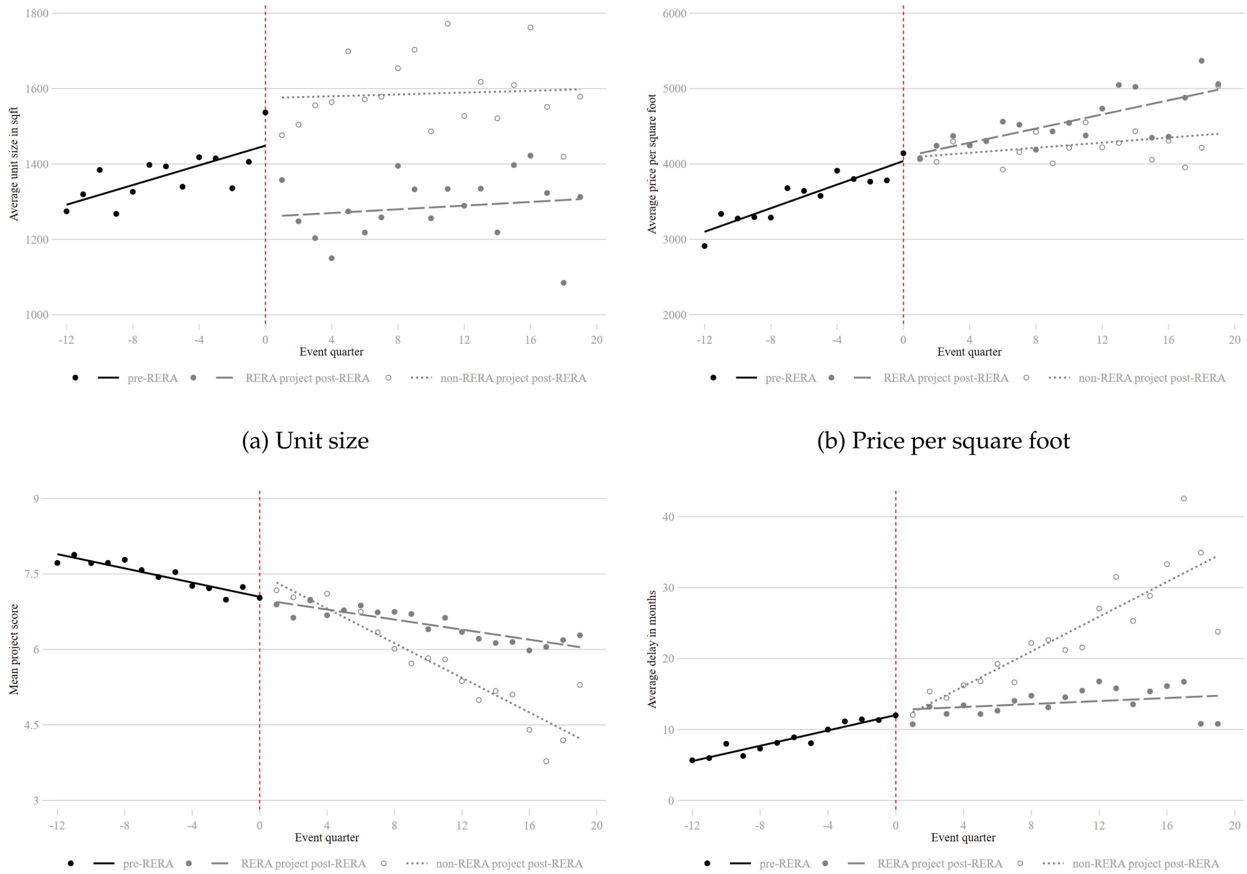
(c) Number of Existing Borrowers

This figure plots the evolution of the number of borrowers around the passage of Real Estate Regulatory Authority (RERA) Act. We plot $\{\beta_q\}$ from the specification

$$Y_{bpq} = \beta_q(<= -5) \cdot Event_{pq(<=-5)} + \sum_{q=-4,q\neq-1}^{8} \beta_q \cdot Event_{pq} + \beta_q(>= 9) \cdot Event_{pq(>=9)} + \alpha_{b,p} + \alpha_{b,q} + \varepsilon_{bpq}$$

Where Y_{bpq} is: the amount of loan disbursal by branch b to a pin code p in the quarter q in Panel (a), the number of loan disbursal by branch b to a pin code p in the quarter q in Panel (b), the probability of disbursal of a loan by branch b to a pin code p in the quarter q in Panel (c), the average size of loan by branch b to a pin code p in the quarter q in Panel (c). We include branch $\times$ pincode fixed effects $\alpha_{b,p}$ and branch $\times$ quarter fixed effects $\alpha_{b,q}$

Figure 4: Trends in Housing Project Characteristics by RERA-Registration Status



(a) Unit size

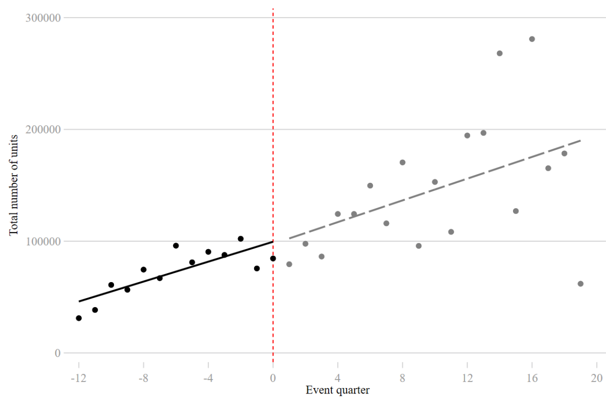
(b) Price per square foot

(c) Project Score

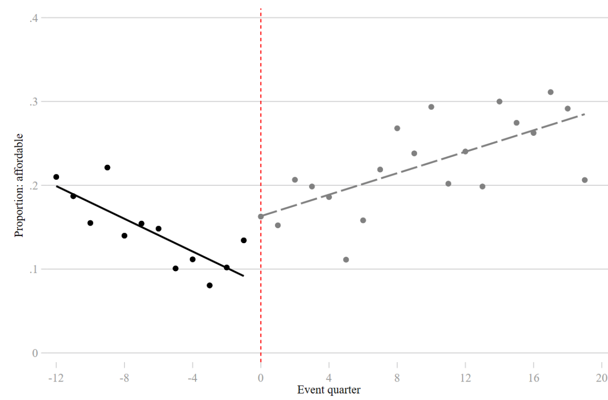
(d) Delay

The figure shows the trends in the mean unit size (Panel (a)), price per square foot (Panel (b)), project score (Panel (c)), delay in month (Panel (d)) for all housing development projects in each quarter before the state-level RERA-enactment and for housing projects by RERA-registration status in each quarter after the state-level RERA-enactment.

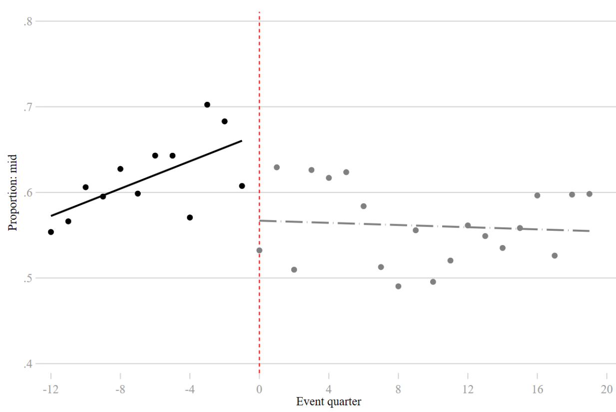
Figure 5: Trends in Various Segments of Housing Market



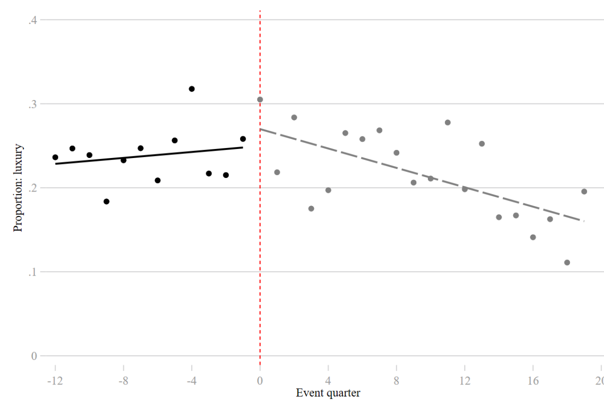
(a) Overall



(b) Affordable Sector



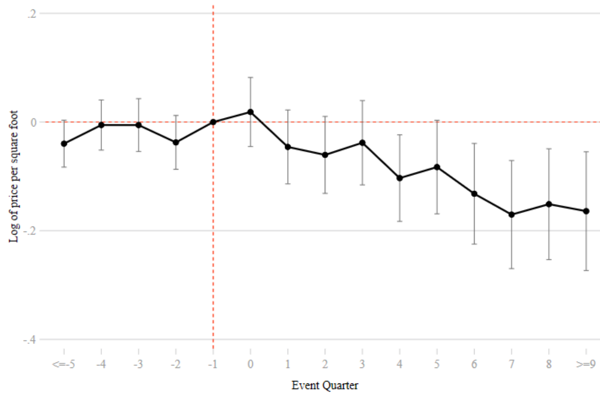
(c) Mid-Tier Sector



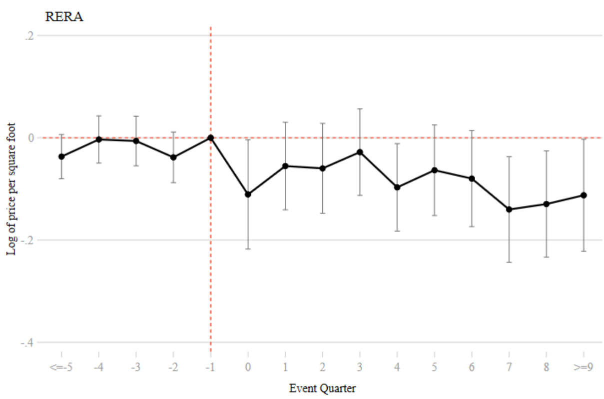
(d) Luxury Sector

The figure shows the trends the total number of housing units developed (Panel (a)) and the proportion of affordable, mid-tier, and luxury housing units (Panels (b)-(d)) in each quarter before and after the state-level RERA-enactment.

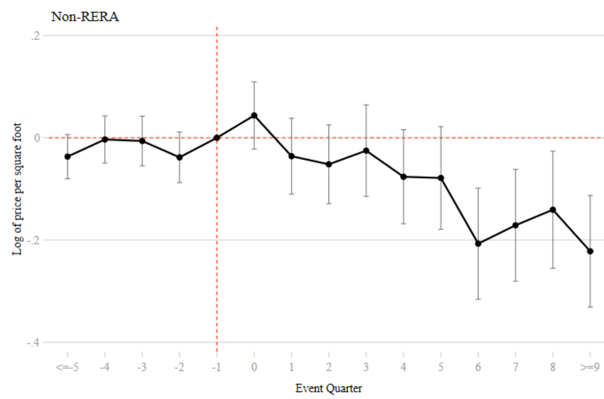
Figure 6: Evolutionary Effect of RERA on Price Per Square Foot



(a) Overall



(b) RERA



(c) Non-RERA

Panel (a) of this figure plots the evolutionary effect of RERA on price per square foot estiamted using the following specification:

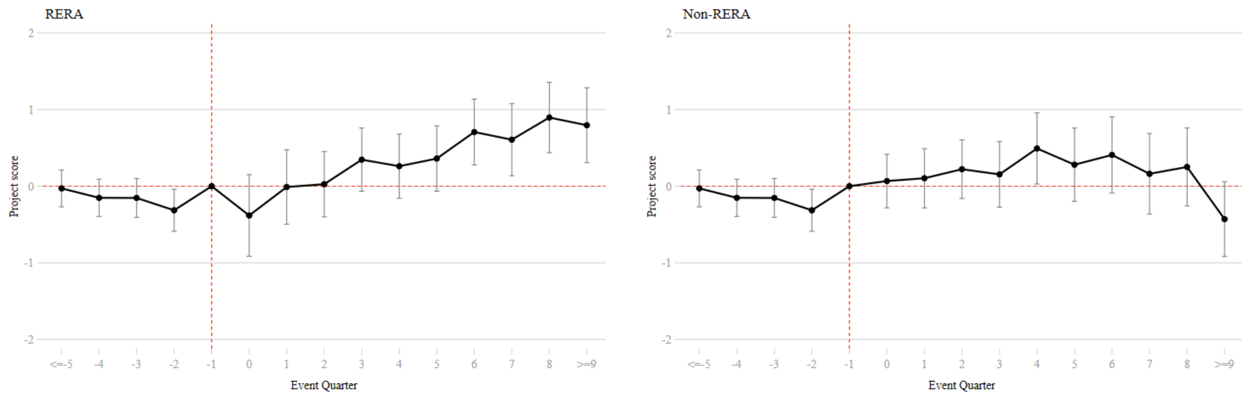
$$Y_{ijq} = \sum_{q=-5}^{-2} \beta_q \cdot Event_{jq} + \sum_{q=0}^{9} \beta_q \cdot Event_{jq} + \alpha_j + \gamma_q + \varepsilon_{ijq}$$

Panel (b) plots the evolutionary effects by registration status estimated from the specification of

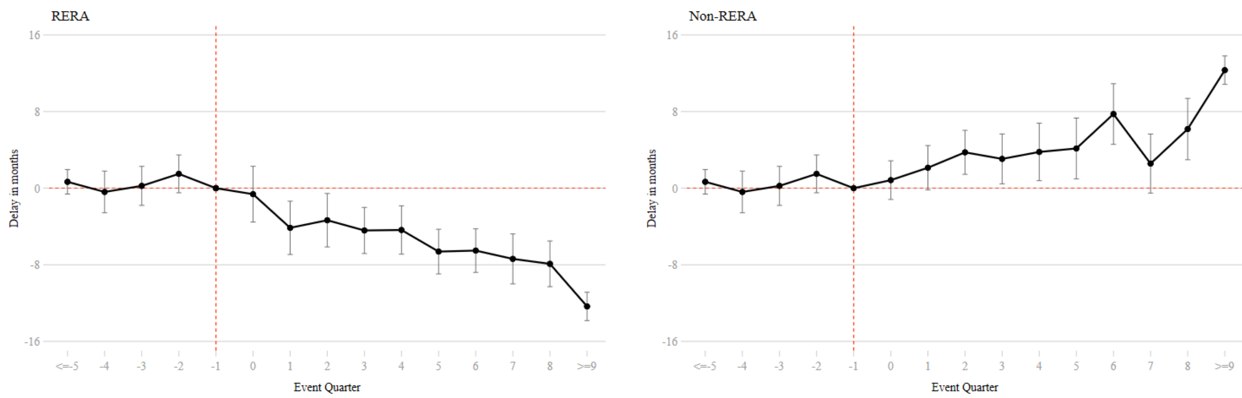
$$Y_{ijq} = \sum_{q=-5}^{-2} \beta_q \cdot Event_{jq} + \sum_{q=0}^{9} \beta_{1q} \cdot Event_{jq} \times R + \sum_{q=0}^{9} \beta_{2q} \cdot Event_{jq} \times NR + \alpha_j + \gamma_q + \varepsilon_{ijq}$$

where Y_{ijq} is the log of price per square foot, project score, and delay in month for project i in city j in the quarter q. We include city fixed effects α_j and year-quarter fixed effects γ_q.

Figure 7: Evolutionary Effect of RERA on Housing Project Characteristics



(a) Project score



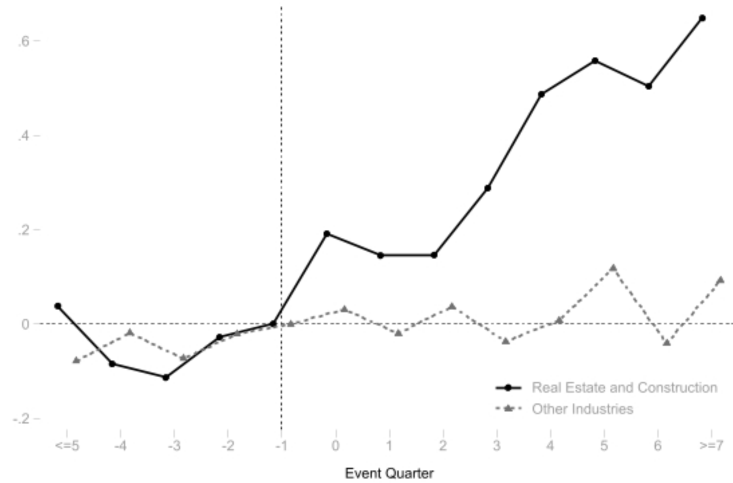
(b) Delay

This figure plots the evolutionary effect of RERA on housing project characteristics by registration status estimated from the specification

$$Y_{ijq} = \sum_{q=-5}^{-2} \beta_q \cdot Event_{jq} + \sum_{q=0}^{9} \beta_{1q} \cdot Event_{jq} \times R + \sum_{q=0}^{9} \beta_{2q} \cdot Event_{jq} \times NR + \alpha_j + \gamma_q + \varepsilon_{ijq}$$

where Y_{ijq} is project score (Panel (a)) and delay in month (Panel (b)) for project i in city j in the quarter q. We include city fixed effects α_j and year-quarter fixed effects γ_q.

Figure 8: Evolutionary Effect of RERA on Housing Project Characteristics



This figure plots the evolutionary effect of RERA on firm exit by industry. We remove the state effect and year-quarterly time trend from the number of firms that shut down in each state and year-quarter, and plot the average number of residuals by whether the firms is in the real estate and construction industry.

Table 1: Summary Statistics

Variables	(1) N	(2) Mean	(3) Std. Dev.	(4) Median
	Panel A Branch×Pin level			
Loan Amount	3,003,748	712,824.60	3,267,085.30	0.00
Loan Number	3,003,748	0.36	1.57	0.00
No. of Borrowers	3,003,748	0.35	1.52	0.00
No. of New Borrowers	3,003,748	0.26	1.26	0.00
Loan Size	474,621	2,114,940.24	1,338,693.37	1,800,000.00
Prob. of Getting Loan	3,003,748	0.16	0.36	0.00
	Panel B Branch×State level			
No. of Pin	148,124	1.07	2.41	0.00
No. of New Pin	148,124	0.00	0.06	0.00
No. of Existing Pin	148,124	1.07	2.40	0.00
	Panel C Loan Level			
Interest Rate	962,763	8.69	1.21	8.75
Loan Amount	950,154	1,904,126.70	1,301,430.76	1,600,000.00
Square Footage	944,246	885.80	767.56	824.37
Purchase Cost	943,606	3,238,181.82	2,547,394.55	2,775,000.00
LTV	910,014	56.26	23.50	59.34
Price\Sq. Feet	927,929	166,166.46	3,461,991.35	3,742.68
Loan\Sq. Feet	932,154	117,914.30	2,125,319.57	2,388.80
Female borrower=1	962,763	0.27	0.44	0.00
New borrower=1	962,763	0.82	0.38	1.00
Backward Caste	962,763	0.05	0.22	0.00
	Panel D Project level			
Number of Units	13,357	297.97	490.51	134.00
Project Segment (Affordable=1)	13,357	0.21	0.41	0.00
Project Segment (Luxury=1)	13,357	0.21	0.41	0.00
Project Score	13,357	6.64	2.07	6.90
Delay in Months	13,357	14.41	17.59	8.00
Square Footage	13,357	1,378.14	885.13	1,200.00
Price\Sq. Feet	13,357	4,183.88	2,107.49	3,700.00

This table reports the summary statistics of the primary variable of interest. Panel A reports the summary with the data granularity being branch× pin of collateral×quarter. The granularity of Panel B being branch× state of collateral×quarter. Panel C is the analysis at the loan level. Panel D provides summary statistics of the data on real estate development projects.

Table 2: Effect of RERA on Mortgage Lending

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dep. Var.	Binary loan = 1		Amount of Loan		Number of Loan		Average Loan Size	
Post	0.008***	0.008***	0.152***	0.152***	0.038***	0.038***	-0.010	-0.092
	(0.001)	(0.001)	(0.023)	(0.023)	(0.006)	(0.006)	(0.036)	(0.079)
Observations	3,003,748	3,003,748	3,003,748	3,003,748	3,003,748	3,003,748	378,647	281,399
R-squared	0.180	0.375	0.181	0.387	0.194	0.434	0.499	0.638
Branch*Pin FE	No	Yes	No	Yes	No	Yes	No	Yes
Pin FE	Yes	No	Yes	No	Yes	No	Yes	No
Branch*YQ FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

This table reports the results from the following regression specification:

$$Y_{bpq} = \beta_q \cdot Post_{p(b)q} + \alpha_{b,p} + \alpha_{b,q} + \varepsilon_{bpq}$$

Where Y_{bpq} is: the probability of receiving a loan from branch b in a pin code p in the quarter q in Panel in columns 1 and 2; the amount of total borrowers receiving a loan from branch b in a pin code p in the quarter q in Panel in columns 3 and 4; the number of total borrowers receiving a loan from branch b in a pin code p in the quarter q in Panel in columns 5 and 6; the average size of a loan from branch b in a pin code p in the quarter q in Panel in columns 7 and 8. *Treat* is the binary variable that takes 1 if a postcode p belongs to the state after the adherence to RERA, from a branch b. The regression specifications include $\alpha_{b,p}$ representing branch×pin fixed effects and $\alpha_{b,q}$ is the branch × quarter fixed effects. Robust standard errors clustered by state are reported in parenthesis.

Table 3: Effect of RERA on Mortgage Lending – New vs Existing Borrowers

Dep. Var.	(1) Number of New Borrowers	(2) Number of Existing Borrowers	(3) Amount Loan to New Borrowers	(4) Amount Loan to Existing Borrowers	(5) Number of Pincodes
Post	0.024***	0.009	0.088***	0.062*	0.061*
	(0.003)	(0.001)	(0.020)	(0.035)	(0.003)
Observations	3,003,748	3,003,748	3,003,748	3,003,746	836,247
R-squared	0.528	0.466	0.376	0.364	0.768
Branch*Pin FE	Yes	Yes	Yes	Yes	No
Branch*YQ FE	Yes	Yes	Yes	Yes	Yes
Branch*State FE	No	No	No	No	Yes

Columns 1 to 4 of this table report the results from the following regression specification:

$$Y_{bpq} = \beta_q \cdot Post_{p(b)q} + \alpha_{b,p} + \alpha_{b,q} + \varepsilon_{bpq}$$

where Y_{bpq} include (1) the number of new borrowers (column 1), (2) the number of existing borrowers (column 2), (3) the amount of loans to new borrowers (column 3), (4) the amount of loans to existing borrowers from branch b in a pincode p in the quarter q (column 4). The regression specifications include $\alpha_{b,p}$ for branch×pin fixed effects and $\alpha_{b,q}$ is the branch × quarter fixed effects. Column 5 estimate the following regression:

$$Y_{bsq} = \beta_q \cdot Post_{s(b)q} + \alpha_{b,s} + \alpha_{b,q} + \varepsilon_{bsq}$$

where Y_{bpq} is the number of pin condes that receive the loans from branch b in a state s in the quarter q. The regression specifications include $\alpha_{b,s}$ for branch×state fixed effects and $\alpha_{b,q}$ is the branch × quarter fixed effects.
In columns 1 to 4 the granularity of the specification is at branch ×pin × quarter level. In column 5 the granularity of the specification is at branch ×state × quarter level. Robust standard errors clustered by state are reported in parenthesis.

Table 4: Effect of RERA on Mortgage Lending – New vs Resale Apartments

Collateral Status	(1) New	(2) Resale	(3) New	(4) Resale	(5) New	(6) Resale	(7) New	(8) Resale
Dep. Var.	Binary loan = 1		Amount of Loan		Number of Loan		Number of Borrowers	
Post	0.006***	0.002	0.110***	0.037	0.029***	0.008	0.028***	0.008
	(0.001)	(0.001)	(0.019)	(0.024)	(0.005)	(0.006)	(0.005)	(0.006)
Observations	3,004,584	3,004,584	3,004,584	3,004,584	3,004,584	3,004,584	3,004,584	3,004,584
R-squared	0.353	0.384	0.360	0.392	0.391	0.426	0.392	0.427
Branch*Pin FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Branch*YQ FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

This table repeats the baseline regression reported in Columns 2, 4, and 6 of Table 2 by replacing the dependent variable considering the loan originated against new (Columns 1, 3, 5, and 7) and resale apartments (Columns 2, 4, 6, and 8).

The regression specification is

$$Y_{bpq} = \beta_q \cdot Post_{p(b)q} + \alpha_{b,p} + \alpha_{b,q} + \varepsilon_{bpq}$$

Where Y_{bpq} is: the probability of receiving a loan from branch b in a pin code p in the quarter q in panel in columns 1 and 2; the amount of total borrowers receiving a loan from branch b in a pin code p in the quarter q in panel in columns 3 and 4; the number of total borrowers receiving a loan from branch b in a pin code p in the quarter q in panel in columns 5 and 6. *Treat* is the binary variable that takes 1 if a postcode p belongs to the state after the adherence to RERA, from a branch b. The regression specifications include $\alpha_{b,p}$ representing branch×pin fixed effects and $\alpha_{b,q}$ is the branch × quarter fixed effects. Robust standard errors clustered by state are reported in parenthesis.

Table 5: Effect of RERA on Mortgage Lending – Geographic Disparity

Dep. Var.	(1) Binary loan = 1	(2) Amount of Loan	(3) Number of Loan	(4) Number of New Borrowers
Post*Tier 3	0.008***	0.157***	0.039***	0.024***
	(0.002)	(0.036)	(0.010)	(0.008)
Post*Tier 2	0.002	0.032	0.012	0.009
	(0.004)	(0.087)	(0.026)	(0.023)
Post*Tier 1	-0.006**	-0.129**	-0.037**	-0.020
	(0.002)	(0.049)	(0.015)	(0.012)
Observations	3,003,748	3,003,748	3,003,748	3,003,748
R-squared	0.375	0.387	0.434	0.416
Branch*Pin FE	Yes	Yes	Yes	Yes
Branch*YQ FE	Yes	Yes	Yes	Yes

This table reports the results from the following regression specification:

$$Y_{bpq} = \beta_1 \cdot Post_{p(b)q} + \beta_2 \cdot Post_{p(b)q} \times Tier2 + \beta_3 \cdot Post_{p(b)q} \times Tier1 + \alpha_{b,p} + \alpha_{b,q} + \varepsilon_{bpq}$$

where Y_{bpq} includes (1) the probability of receiving a loan from branch b in a pin code p in the quarter q in panel in column 1; (2) the amount of total borrowers receiving a loan from branch b in a pin code p in the quarter q in panel in column 2; (3) the number of total borrowers receiving a loan from branch b in a pin code p in the quarter q in panel in column 3; (4) the number of new borrowers who receive a loan from branch b in a pin code p in the quarter q in panel in column 4. $Post_{p(b)q} isthebinaryvariablethattakes1ifapostcodepbelongstothestateaftertheadherencetoRERA,fromabranchb.Theregressionspe$ *fixed effects and* $\alpha_{b,q}$ *is the branch* $\times$ *quarter fixed effects. Robust standard errors clustered by state are reported in parenthesis.*

Table 6: Effect of RERA on Loan Characteristics

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	All		New Borrowers		Female		Low Income		Backward Caste	
Dep. Var.	LTV	Interest Rate	LTV	Interest Rate	LTV	Interest Rate	LTV	Interest Rate	LTV	Interest Rate
Post	4.967*	0.058								
	(2.481)	(0.066)								
Post*Group			2.805***	-0.041*	0.406	-0.039**	0.693***	-0.105***	0.453**	-0.174
			(0.473)	(0.022)	(0.323)	(0.014)	(0.183)	(0.019)	(0.201)	(0.015)
Observations	948,856	962,763	948,856	931,369	948,856	928,713	468,030	475,810	948,856	963,214
R-squared	0.361	0.510	0.477	0.528	0.363	0.524	0.410	0.537	0.361	0.510
Branch*pin FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Branch*YQ FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State * Group FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State* YQ FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Columns 1-2 in this table reports the results from the following regresion specification:

$$Y_{bpq} = \beta_q \cdot Post_{p(b)q} + \alpha_{b,p} + \alpha_{b,q} + \varepsilon_{bpq}$$

Columns 3-8 in this table reports the results from the following regression specification separately for various groups:

$$Y_{bpq} = \beta_1 \cdot Post_{p(b)q} \times Group + \beta_2 \cdot Post_{p(b)q} + \alpha_{b,p} + \alpha_{b,q} + \alpha_{s,q} + \alpha_{s,g} + \varepsilon_{bpq}$$

Where Y_{bpq} is the loan to value (LTV) and interest rate of a loan from branch b in a pin code p in the quarter q. We study the effect for all borrowers in columns 1 and 2. The binary variable *Group* takes 1 when a borrower is first time borrower in columns 3 to 4, takes 1 when a borrower is female in columns 5 to 6, takes 1 when the borrower's income is below ₹480,000, and takes 1 when the borrower is from a backward caste. *Post* is the binary variable that takes 1 if a postcode p belongs to the state after the adherence to RERA, from a branch b. The regression specifications include $\alpha_{b,p}$ for branch×pin fixed effects, $\alpha_{b,q}$ for branch × quarter fixed effects, $\alpha_{s,q}$ for state × quarter fixed effects, and $\alpha_{s,g}$ for state × group fixed effects. The granularity of the specification is at the loan level. Robust standard errors clustered by state are reported in parenthesis.

Table 7: Effect of RERA on Housing Project Characteristics

Dep. Var.	(1) Ln (size)	(2) Ln(price\sqft)	(3) Score	(4) Delay
Panel A Overall effect				
Post	-0.082***	-0.064**	0.224**	1.015
	(0.028)	(0.025)	(0.107)	(0.895)
Panel B Effect by RERA-registration status				
Post*Non-RERA	-0.061**	-0.086***	-0.023	3.667***
	(0.028)	(0.025)	(0.110)	(0.919)
Post*RERA	-0.130***	-0.013	0.791***	-5.088***
	(0.030)	(0.026)	(0.114)	(0.969)
Panel C: Effect by market segment				
Post*Affordable	-0.555***	-0.437***	-0.082	-2.095**
	(0.028)	(0.025)	(0.116)	(0.953)
Post*Mid	-0.143***	-0.086***	0.725***	-0.422
	(0.027)	(0.024)	(0.108)	(0.906)
Post*Luxury	0.475***	0.325***	-0.481***	6.717***
	(0.029)	(0.026)	(0.114)	(1.030)
Observations	13,357	13,357	13,357	13,357
City FE	Yes	Yes	Yes	Yes
Year-month FE	Yes	Yes	Yes	Yes

Panel A of this table reports the overall effect estimated from the following specification:

$$Y_{ijq} = \beta \cdot Post_{ijq} + \alpha_j + \gamma_q + \varepsilon_{ijq}$$

Panel B of this table reports the effects by RERA-registration status using the following specification:

$$Y_{bpq} = \beta_1 \cdot Post_{ijq} \times R + \beta_2 \cdot Post_{ijq} \times NR + \alpha_j + \gamma_q + \varepsilon_{ijq}$$

and Panel C of this table reports the effects by housing segment estimated using:

$$Y_{bpq} = \beta_1 \cdot Post_{ijq} \times Seg1 + \beta_2 \cdot Post_{ijq} \times Seg2 + \beta_3 \cdot Post_{ijq} \times Seg3 + \alpha_j + \gamma_q + \varepsilon_{ijq}$$

where Y_{ijq} is the log of unit size, log of price per square foot, project score, and delay in months for columns (1) to (4), respectively. *Post* is a binary variable that takes the value of 1 if project i in city j is launched after the state-level enactment of RERA. All regressions include city fixed effects α_j and quarter fixed effects γ_q. Robust standard errors are reported in parenthesis.

Table 8: Effect of RERA on Loan Performances

	(1)	(2)	(3)	(4)
	Loan Level			Branch*Pin
Dep. Var.	Default=1	ln(Amount Loan in Default)	ln(Number of Default Months)	Proportion of Loan in Default
Post	-0.013***	-0.258***	-0.067***	-0.019***
	(0.003)	(0.054)	(0.013)	(0.006)
Observations	963,320	961,112	961,112	281,399
R-squared	0.278	0.276	0.326	0.539
Branch*Pin FE	Yes	Yes	Yes	Yes
Branch*YQ FE	Yes	Yes	Yes	Yes
SE Cluster	State	State	State	State

This table reports the effect of RERA on loan performances measured by the probability to default within one year after loan sanctioning ("*Default=1*", column 1), amount of loan under default within one year after loan sanctioning ("*ln(Amount Loan in Default)*", column 2), number of months in default for each loan within one year after loan sanctioning ("*ln(Number of Default Months)*", column 3), and the proportion of loan under default within one year among the loan sanctioned by a branch b to pincode p in quarter t ("*Proportion of Loan in Default*", column 4). The coefficients are estimated from the following regression specification:

$$Y_{bpq} = \beta_q \cdot Post_{p(b)q} + \alpha_{b,p} + \alpha_{b,q} + \varepsilon_{bpq}$$

$Post_{p(b)q}$ is the binary variable that takes 1 if a postcode p belongs to the state after the adherence to RERA, from a branch b. The regression specifications include $\alpha_{b,p}$ branch×pin fixed effects and $\alpha_{b,q}$ is the branch × quarter fixed effects. Robust standard errors clustered by state are reported in parenthesis.

Table 9: Effect of RERA on Firm Performances

VARIABLES	(1) ROA	(2) ROTA	(3) ROE	(4) Exit = 1	(5)
Post	0.001	0.013	1.498	-0.114	-0.201*
	(0.058)	(0.060)	(1.136)	(0.106)	(0.110)
Post*RE	-0.447***	-0.469***	-7.795***	0.402***	0.402***
	(0.076)	(0.078)	(2.004)	(0.057)	(0.057)
RE				-0.734***	-0.734***
				(0.039)	(0.039)
Observations	913,546	913,546	913,546	646	646
R-squared	0.628	0.639	0.620	0.410	0.482
Firm FE	Yes	Yes	Yes	No	No
FinYear FE	Yes	Yes	Yes	No	No
State FE	No	No	No	Yes	Yes
Year Quarter FE	No	No	No	Yes	Yes
Mean of DV	-4.71	-2.43	21.16	.59	.59

This table reports the effect of RERA on the performances of real estate developers, measured by ROA, ROAT, ROE, and the probability of shutting down (*Exit* = 1). ROA is the net profit divided by the total asset, ROAT is the EBIT divided by the total asset, and ROE is the net profit divided by the book value of equity. From columns 1 to 3, the coefficients are estimated from the following regression specification:

$$Y_{fy} = \beta_1 \cdot Post_{f(s)y} \cdot RE_f + \beta_2 \cdot Post_{f(s)y} + \alpha_f + \alpha_y + \varepsilon_{fy}$$

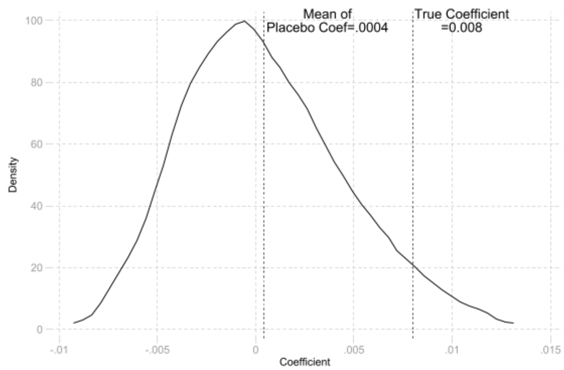
$Post_{f(s)y}$ is an indicator variable that takes the value of 1 for firms located in the treated states after RERA implementation. RE_f is an indicator variables that takes the value of 1 for real estate developers. α_f and α_y represent firm fixed effects and financial year fixed effects, respectively. Robust standard errors clustered by firm are reported in parenthesis. From colums 4 to 5, the coefficients are estimated from the following regression specification:

$$Y_{sq} = \beta_1 \cdot Post_{f(s)q} \cdot RE_f + \beta_2 \cdot Post_{sq} + \alpha_s + \alpha_q + \varepsilon_{fq}$$

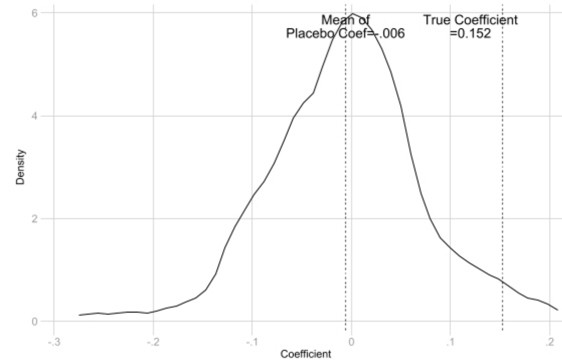
$Post_{sy}$ is an indicator variable that takes the value of 1 for treated states after RERA implementation. RE_f is an indicator variables that takes the value of 1 for real estate developers. α_s and α_q represent state fixed effects and year quarter fixed effects, respectively

Internet Appendix

Figure A1: Placebo Test with Random Timing of RERA Implementation

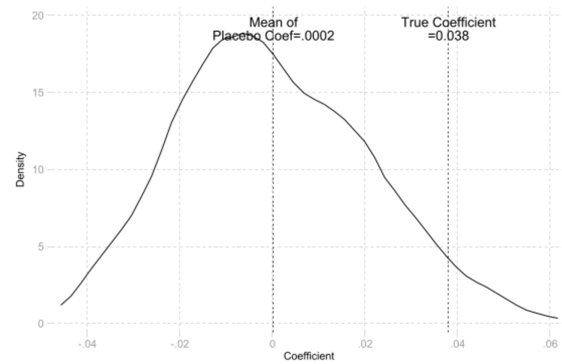


(a) Binary loan = 1



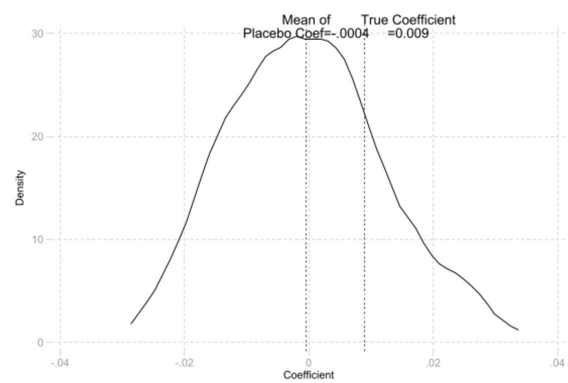
(b) Amount of Loan

(c) Number of Loan



(d) Number of Borrower

(e) Number of New Borrower



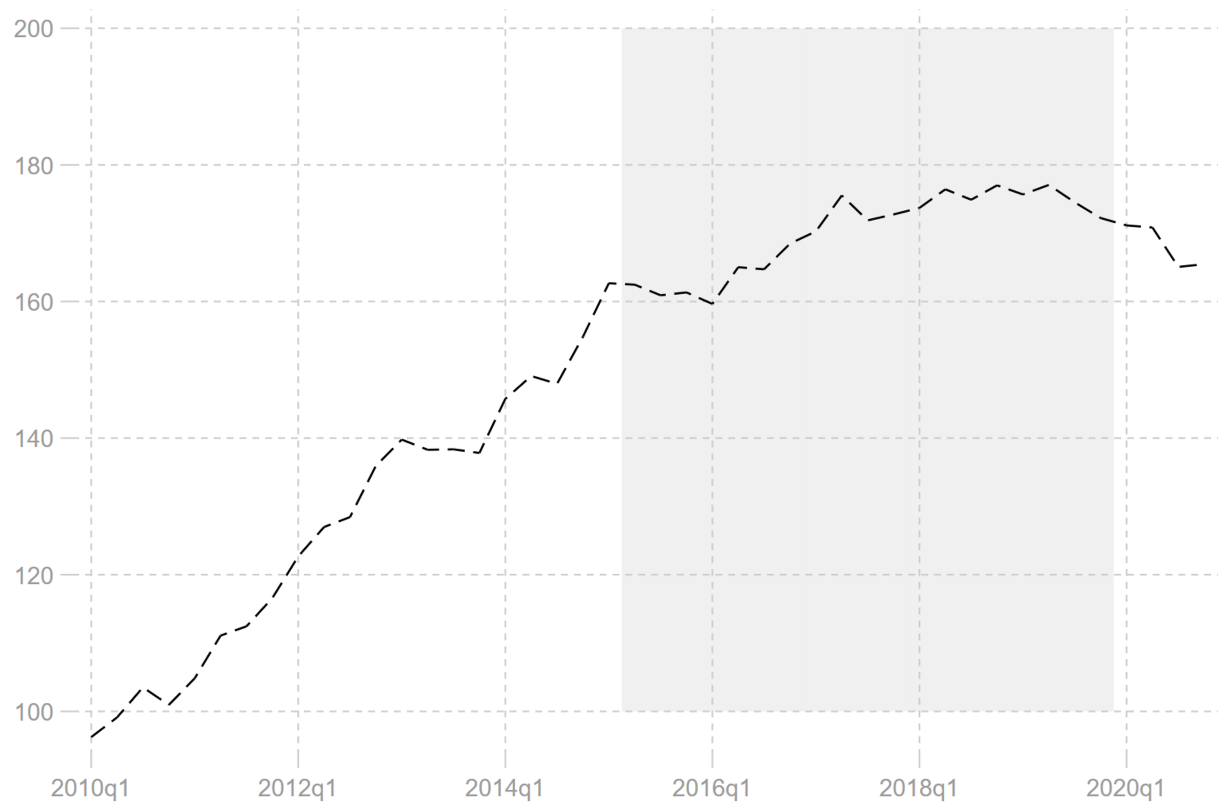
(f) Number of Existing Borrower

This figure plots the coefficients of the placebo tests. We randomly assign a quarter of policy implementation for each state and rerun the baseline specifcation below:

$$Y_{bpq} = \beta_q \cdot Post_{p(b)q} + \alpha_{b,p} + \alpha_{b,q} + \varepsilon_{bpq}$$

We plot the coefficient β_q in the figures for the dependent variables including *Binary loan* = 1, *Amount of Loan*, *Number of Loan*, *Number of Borrowers*, *Number of New Borrowers* and *Number Existing Borrowers*. The last five variables are in log term.

Figure A2: National Housing Price Index



The figure visualizes the housing price index from 2010 to 2020 in India. The grey shaded area is our sample period from 2015 Q2 to 2019 Q4. Data source: Federal Reserve Bank of St. Louis (https://fred.stlouisfed.org/series/QINR628BIS).

Table A1: Effect of RERA on Mortgage Lending – Interaction Weighted Estimator

Dep. Var.	(1) Binary loan = 1	(2) Amount of Loan	(3) Number of Loan	(4) Number of Borrower	(5) Number of New Borrower	(6) Number of Exsiting Borrower
Post	0.009***	0.141***	0.010***	0.010***	0.007***	0.003**
	(0.003)	(0.049)	(0.003)	(0.003)	(0.003)	(0.001)
Observations	1,897,104	1,897,104	1,897,104	1,897,104	1,897,104	1,897,104
R-squared	0.412	0.426	0.593	0.597	0.564	0.476
Branch*Pin FE	Yes	Yes	Yes	Yes	Yes	Yes
Branch*YQ FE	Yes	Yes	Yes	Yes	Yes	Yes
SE Cluster	State	State	State	State	State	State

This table rerun the results reported in Tables 2 and 3 using the Interaction Weighted estimator as in Sun and Abraham (2021) to address the estimation bias of staggered DID. Robust standard errors clustered by state are reported in parenthesis.

Table A2: Effect of RERA on Mortgage Lending – Callaway & Sant' Anna (2021)

Dep. Var.	(1) Binary loan = 1	(2) Amount of Loan	(3) Number of Loan	(4) Number of Borrower	(5) Number of New Borrower	(6) Number of Exsiting Borrower
ATT	0.020***	0.303***	0.026***	0.026***	0.016***	0.015***
	(0.007)	(0.107)	(0.007)	(0.007)	(0.005)	(0.004)
Observations	1,920,348	1,920,348	1,920,348	1,920,348	1,920,348	1,920,348
Branch*Pin FE	Yes	Yes	Yes	Yes	Yes	Yes
YQ FE	Yes	Yes	Yes	Yes	Yes	Yes
SE Cluster	State	State	State	State	State	State

This table rerun the results reported in Tables 2 and 3 using the DID with multiple periods estimator developed in Callaway and Sant'Anna (2021) to address the estimation bias of staggered DID. Robust standard errors clustered by state are reported in parenthesis.

Table A3: Effect of RERA on Mortgage Lending – Poisson

	(1)	(2)	(3)	(4)	(5)
Data Structure		Branch-pin-YQ			Branch-State-YQ
Dep. Var.	Amount of Loans	Number of Loans	Number of New Borrowers	Number of Borrowes	Number of Pins
treat	0.157***	0.169***	0.143***	0.162***	0.137***
	(0.022)	(0.024)	(0.036)	(0.045)	(0.024)
Observations	2,514,548	2,514,548	2,166,480	2,514,548	120,042
R-squared	0.66	0.56	0.53	0.56	0.66
Branch*Pin FE	Yes	Yes	Yes	Yes	No
Branch*YQ FE	Yes	Yes	Yes	Yes	Yes
Branch*State FE	Yes	Yes	Yes	Yes	Yes

This table rerun the results reported in Tables 2 and 3 using poisson regression. We use the following regression specification:

$$Y_{bpq} = \beta_q \cdot treat_{p(b)q} + \alpha_{b,p} + \alpha_{b,q} + \varepsilon_{bpq}$$

Where Y_{bpq} is: the probability of receiving a loan from branch b in a pin code p in the quarter q in panel in columns 1 and 2; the amount of total borrowers receiving a loan from branch b in a pin code p in the quarter q in panel in columns 3 and 4; the number of total borrowers receiving a loan from branch b in a pin code p in the quarter q in panel in columns 5 and 6; the average size of a loan from branch b in a pin code p in the quarter q in panel in columns 7 and 8. *treat* is the binary variable that takes 1 if a postcode p belongs to the state after the adherence to RERA, from a branch b. The regression specifications include $\alpha_{b,p}$ representing branch×pin fixed effects and $\alpha_{b,q}$ is the branch × quarter fixed effects. Robust standard errors clustered by state are reported in parenthesis. Robust standard errors clustered by state are reported in parenthesis.

Table A4: Effect of RERA on Mortgage Lending – Branch State Quarter

Dep. Var.	(1) Binary loan $=1$	(2)	(3) Amount of Loan	(4)	(5) Number of Loan	(6)	(5) Average Loan Size	(6)
Post	0.022***	0.022***	0.423***	0.423***	0.108**	0.108**	-0.023	0.001
	(0.005)	(0.005)	(0.091)	(0.091)	(0.027)	(0.027)	(0.048)	(0.032)
Observations	148,124	148,124	148,124	148,124	148,124	148,124	6,398	12,195
R-squared	0.797	0.302	0.814	0.299	0.855	0.297	0.740	0.583
Branch*Pin FE	Yes	No	Yes	No	Yes	No	Yes	No
Branch*YQ FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	Yes	No	Yes	No	Yes	No	Yes

This table rerun the results reported in Tables 2 and 3 using data at branch × state × quarter level. We use the following regression specification:

$$Y_{bsq} = \beta_q \cdot Post_{s(b)q} + \alpha_{b,s} + \alpha_{b,q} + \varepsilon_{bsq}$$

Where Y_{bsq} is: the amount of total borrowers receiving a loan from branch b in a state s in the quarter q in panel in column 1; the number of loans from branch b in a state s in the quarter q in panel in column 2; the number of new borrowers receiving a loan from branch b in a state s in the quarter q in panel in column 3; the number of total borrowers receiving a loan from branch b in a state s in the quarter q in panel in column 4; the number of pincodes receiving a loan from branch b in a state s in the quarter q in panel in column 5. *Post* is the binary variable that takes 1 if a state s belongs to the state after the adherence to RERA, from a branch b. The regression specifications include $\alpha_{b,s}$ representing branch×state fixed effects and $\alpha_{b,q}$ is the branch × quarter fixed effects. Robust standard errors clustered by state are reported in parenthesis.

Table A5: Balance Test

	(1)	(2)	(3)	(4)	(5)
Dep. Var.			Post = 1		
ln(GDP per Capita)	-0.564				-0.548
	(0.627)				(0.593)
ln(GVA Construction)		0.481			0.421
		(0.349)			(0.278)
ln($CPI_H PIndex$)			0.036		0.041
			(0.073)		(0.076)
ln(Credit Scheduled Commercial Bank)				-0.512	-0.313
				(0.316)	(0.270)
Observations	196	196	196	196	196
R-squared	0.791	0.795	0.790	0.797	0.802
Year FE	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes

This table report the association between the timing of RERA implementation and the variables representing the economic development of each state. We run the following specification:

$$Post_{s,t} = X_{s,t} + \alpha_s + \alpha_t + \epsilon_{s,t}$$

where $Post_{s,t}$ is the binary variable that take 1 if a state s is treated in year t. $X_{s,t}$ includes GDP per capita, Gross value addded for the construction sector, the CPI of housing, and the credit issued by scheduled commercial banks. In columns 1 to 5, the sample period is from 2015 to 2019. Robust standard errors clustered by state are reported in parenthesis.

Table A6: Baseline Results with State Year-Level Controls

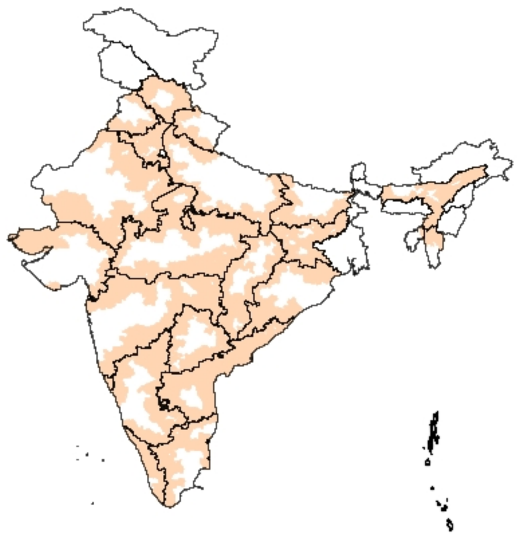
Dep. Var.	(1) Binary loan = 1	(2) Amount of Loan	(3) Number of Loan	(4) Number of Borrower	(5) Number of New Borrower	(6) Number of Exsiting Borrower
Post	0.007***	0.126***	0.030***	0.030***	0.018*	0.005
	(0.002)	(0.039)	(0.010)	(0.010)	(0.009)	(0.008)
Observations	3,003,748	3,003,748	3,003,748	3,003,748	3,003,748	3,003,748
R-squared	0.375	0.387	0.434	0.435	0.416	0.390
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Branch*Pin FE	Yes	Yes	Yes	Yes	Yes	Yes
Branch*YQ FE	Yes	Yes	Yes	Yes	Yes	Yes

In this table, we rerun the baseline results reported in Tables 2 and 3 by including the variables representing the economic development of each state. We use the following regression specification:

$$Y_{bpq} = \beta_q \cdot Post_{p(b)q} + \alpha_{b,p} + \alpha_{b,q} + X_{sq} + \varepsilon_{bpq}$$

Where Y_{bpq} is: the probability of receiving a loan from branch b in a pin code p in the quarter q in panel in column 1; the amount of total borrowers receiving a loan from branch b in a pin code p in the quarter q in panel in column 2; the number of total borrowers receiving a loan from branch b in a pin code p in the quarter q in panel in column 3; the average size of a loan from branch b in a pin code p in the quarter q in panel in column 4; the number of new borrowers receiving a loan from branch b in a pin code p in the quarter q in panel in column 5; the number of existing borrowers receiving a loan from branch b in a pin code p in the quarter q in panel in column 6. *Post* is the binary variable that takes 1 if a postcode p belongs to the state after the adherence to RERA, from a branch b. The regression specifications include $\alpha_{b,p}$ representing branch×pin fixed effects and $\alpha_{b,q}$ is the branch × quarter fixed effects. The control variables denoted by X_{sq} include GDP per capita, Gross value addded for the construction sector, the CPI of housing, and the credit issued by scheduled commercial banks Credit Scheduled Commercial Bank. Robust standard errors clustered by state are reported in parenthesis.

Figure A3: Districts on State Borders Included in the Sample



The map visualizes the districts on the state borders included in the regressions reported in Table A7.

Table A7: Baseline Results Keeping Border Districts

Dep. Var.	(1) Binary loan = 1	(2) Amount of Loan	(3) Number of Loan	(4) Number of Borrower	(5) Number of New Borrower	(6) Number of Exsiting Borrower
Post	0.008***	0.153***	0.039***	0.039***	0.024***	0.016
	(0.002)	(0.031)	(0.008)	(0.008)	(0.007)	(0.010)
Observations	1,597,159	1,597,159	1,597,159	1,597,159	1,597,159	1,597,159
R-squared	0.400	0.412	0.458	0.459	0.439	0.408
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Branch*Pin FE	Yes	Yes	Yes	Yes	Yes	Yes
Branch*YQ FE	Yes	Yes	Yes	Yes	Yes	Yes

This table rerun the results reported in Tables 2 and 3 by restricting the sample to bordering areas as shown in figure A3. We use the following regression specification:

$$Y_{bpq} = \beta_q \cdot Post_{p(b)q} + \alpha_{b,p} + \alpha_{b,q} + \varepsilon_{bpq}$$

Where Y_{bpq} is: the probability of receiving a loan from branch b in a pin code p in the quarter q in panel in column 1; the amount of total borrowers receiving a loan from branch b in a pin code p in the quarter q in panel in column 2; the number of total borrowers receiving a loan from branch b in a pin code p in the quarter q in panel in column 3; the average size of a loan from branch b in a pin code p in the quarter q in panel in column 4; the number of new borrowers receiving a loan from branch b in a pin code p in the quarter q in panel in column 5; the number of existing borrowers receiving a loan from branch b in a pin code p in the quarter q in panel in column 6. *treat* is the binary variable that takes 1 if a postcode p belongs to the state after the adherence to RERA, from a branch b. The regression specifications include $\alpha_{b,p}$ representing branch×pin fixed effects and $\alpha_{b,q}$ is the branch × quarter fixed effects. Robust standard errors clustered by state are reported in parenthesis.

Table A8: Robustness Test: Adding Controls to Table 6

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Group by	All		New Borrowers		Female		Low Income		Backward Caste	
Dep. Var.	LTV	Interest Rate	LTV	Interest Rate	LTV	Interest Rate	LTV	Interest Rate	LTV	Interest Rate
Post	7.842***	-0.158								
	(1.424)	(0.104)								
Post*Group			2.704***	-0.037***	0.205	-0.045***	0.516***	-0.100***	0.376*	-0.023
			(0.445)	(0.013)	(0.350)	(0.010)	(0.177)	(0.019)	(0.194)	(0.019)
ln(income)	0.075	-0.033***	0.075***	-0.033***	0.077	-0.033***		0.074	-0.033***	
	(0.045)	(0.003)	(0.045)	(0.001)	(0.045)	(0.001)		(0.045)	(0.003)	
Female	0.715**	-0.010	0.699***	-0.010**			0.746**	-0.011	0.714**	-0.010
	(0.289)	(0.021)	(0.285)	(0.005)			(0.295)	(0.022)	(0.288)	(0.021)
New Borrower	23.164***	0.033**			23.157***	0.033***	23.183***	0.031*	23.166***	0.033**
	(0.553)	(0.016)			(0.553)	(0.006)	(0.554)	(0.015)	(0.553)	(0.016)
Age	-0.309***	-0.002	-0.308***	-0.002***	-0.309***	-0.001***	-0.308***	-0.002	-0.308***	-0.002
	(0.019)	(0.001)	(0.019)	(0.000)	(0.019)	(0.000)	(0.019)	(0.001)	(0.019)	(0.001)
Govt Staff	1.570***	-0.287***	1.580***	-0.286***	1.577***	-0.284***	1.503***	-0.279***	1.544***	-0.284***
	(0.276)	(0.029)	(0.272)	(0.006)	(0.271)	(0.006)	(0.271)	(0.029)	(0.276)	(0.029)
Observations	467,549	475,312	467,549	475,007	467,549	475,007	467,549	475,312	467,549	475,312
R-squared	0.526	0.543	0.527	0.543	0.526	0.543	0.526	0.544	0.526	0.543
Branch*pin FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Branch*YQ FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State * Group FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State* YQ FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

This table rerun the results reported in Table 6 by including borrower characteristics, including the annual income, gender, an indicator of first-times borrower, age and an indicator of government staff.

Table A9: Robustness Test: Effect on Interest Spread

	(1)	(2)	(3)	(4)	(5)
Group by	All	New Borrowers	Female	Low Income	Backward Caste
Dep. Var.			Interest Spread		
Post	0.064				
	(0.064)				
Post*Group		-0.041*	-0.039**	-0.105***	-0.018
		(0.022)	(0.014)	(0.019)	(0.015)
Observations	963,214	963,214	963,214	475,810	963,214
R-squared	0.541	0.542	0.542	0.576	0.542
Branch*pin FE	Yes	Yes	Yes	Yes	Yes
Branch*YQ FE	Yes	Yes	Yes	Yes	Yes
State * Group FE	No	Yes	Yes	Yes	Yes
State* YQ FE	No	Yes	Yes	Yes	Yes

This table rerun the results reported in Table 6 by replacing the dependent variable with the interest spread. Prior to April 2016, interest spread is calculated by deducting the base rate from loan interest rate. Beginning in April 2016, the interest spread was calculated by subtracting the Marginal Cost of Funds based Lending Rate (MCLR) from the loan interest rate, in accordance with the formula change mandated by the Reserve Bank of India.