Home Purchasing Subsidies, Adverse Selection and Mortgage Performance

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Abstract

We find that home affordability policy induces the marginal buyers to take home loans and they are more likely to be delinquent in subsequent payments. India government increased total income tax exemption limit by 50,000 INR (US $ 833) in July 2014. The sectional exemption limits for both the principle and interest payment of home loans were also increased by US$833. We find that there are more loans (250%) with low credit limit originated in two months following the policy announcement. The loans originated in the two months are shorter in loan term, smaller in required monthly installment and borrowed by younger people but with similar interest rate. The delinquency rate in September in the next fiscal year is 1.14%, 1.22% and 1.27% higher for the loans originated in July, August and September respectively compared than those originated in May and June. Controlling for all the other loan level and consumer level observable characteristics, the significantly higher delinquent rate remains. Such effect is more pronounced for the regions with higher growth rate of GDP per capita and GDP of construction. We thus argue that home affordability policy has a distortion effect over some marginal buyers who are induced to rush into the housing market and they may over-estimate their repayment capability.

Keywords: homeownership subsidy, fiscal policy, income tax, mortgage delinquency, household financial mistakes

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1. Introduction

In this paper, we provide the new evidence on the side effect of the homeownership affordability policy. We find that the increase in subsidy of home purchasing may induce some potential marginal home buyers to rush into the market and these households are more like to be delinquent on mortgage loan payments subsequently. Failing to make correct decisions on the timing, amount and duration of the mortgage loans taken may make the household deviate from the optimal consumption pass and bring them large financial loss.

Policies in promoting homeownership (e.g. home mortgage interest deduction) are world widely adopted however it is still controversial. The supporting view[5] argues that there is positive externality of home ownership as households may care more about the social community. They may also be more likely to commit to long run investment like children's education and participate in political voting. There are survey results suggesting that homeownership also increases subjective well beings. However, on the other side, the objection views argue that the subsidy of homeownership reduces government revenue and is essentially the wealth redistribution and increases the wealth inequality[6]. Moreover, there may be behavior distortion effect for a sub group of the population. However, limited empirical evidence has been found in supporting the distortion effect concerns. Our paper contributes to the literature by documenting a new distortion effect triggered by the homeownership subsidy policy.

In this paper, we utilize an exogenous policy change on income tax exemption limit in India announced in July 2014 as a qausi natural experiment to study how the tax benefit on home purchasing will affect the potential home buyers. The income tax exemption limit was increased by 50,000 INR ($833 USD) for the principle payment and interest payment of home mortgage loans. The policy may grant the home mortgage loan borrowers higher tax rebate. Firstly, we find that, following the policy announcement

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[5] DiPasquale and Galeser (1999) shows that homeowners are more social responsible citizens, Green and White (1997) shows that the homeowners spend more time on raising children and Rossi and Weber(1996) shows that the homeowners have higher life satisfaction. Weiss et, al. (2011) studies the homeownership effect on neighborhood satisfactions. Engelhardt et. al. (2010) shows that homeownership positively affects political engagement for the low income households. Dietz and Haurin (2003) provide a literature review on the study of social consequences of homeownership. Glaeser and Shapiro (2003) overviews the studies on the benefit of the home mortgage interest deduction.

[6] Poterba (1992) points out that half of the tax loses associated with mortgage interest deductions accrued to the 8% of taxpayers with the highest economics incomes. Poterba and Sinai (2008) studies the distribution of tax benefits associated with the mortgage interest and property tax deductions. Hilber and Turner (2014) argues that homeowners respond more slowly to the labor market.

there is a large spike of new home mortgage loans origination in two months' time for the lower approved credit limit loans and the loans with shorter loan terms. These mortgage loans have lower collateral value, equated monthly installment (EMI) and are borrowed by younger people. However, the interest rate and original loan to value ratios are similar between the loans originated in two months' time before and after the policy announcement.

Secondly, we find that the low credit limit mortgage loans originated in two months' time after the policy change have higher delinquency rate (more than 60 days delinquency) at September in the next fiscal year. With a Logit model controlling for interest rate, we find the marginal effect of the delinquency rate for the loans originated in July, August and September in FY 2014 are on average 2.73%, 1.91% and 2.25% higher than the mortgage loans originated right before the policy announcement. After controlling for all available mortgage loans borrower characteristics, the significant results remain. We do not find such effect for the mortgage loans with the higher approved credit limit or longer loan terms in FY 2014 and in any other fiscal years with no policy change. Our results suggest that the marginal home buyers rush into the market because of the income tax incentive but they choose to take the mortgage loans beyond their repayment capacity at the moment and thus become delinquent on loan payment subsequently.

Thirdly, we also find that such distortion effect over marginal home buyers is more pronounced for regions (in districts) with higher average past 5 years' growth rate of GDP per capita and the GDP growth rate of the construction sector. The results imply that if the region experiences rapid growth in housing market and thus housing price, the potential marginal home loan buyers' decisions are more likely to be distorted and they are more likely to end up with the difficulty in making required payment on time.

There are several advantages with our empirical setting in establishing the causality inference. Firstly, the policy change announcement was not during the regular time as FY 2014 was the general election year. The union budget was only announced by the new party on power in July instead of the end of February as usual. The policy change can hardly be anticipated by the general public. Moreover, though the announcement is delayed, the policy effective date is the same as usual from the beginning of FY 2014 which is March. From the observation that the public only takes the reaction upon the policy announcement date instead of the policy effective date, we argue that the increase in tax benefit on home purchasing is an exogenous shock to the potential home buyers. Secondly, we compare the subsequent

mortgage loan performance among the mortgage loans originated in a narrow time window (i.e. June VS July). It is plausible to assume that these mortgage loans borrowers are subject to the similar economic conditions, housing price changing trend, the supply of housing and the related regulatory rules. The only difference is that the mortgage loan buyers' pool has been distorted as some marginal buyers enter the market due to the income tax exemption incentive. Thirdly, we have a large sample of disaggregated mortgage loan data with rich mortgage loan characteristics from the regions all over India. The data is from a commercial bank in India with the largest market share in consumer banking. We can identify the location of the underlying real estate of the mortgage loans and thus control for the regional unobservables. Moreover, we have a panel of mortgage loan status of three years and thus we can utilize the mortgage loans originated in non-policy change year for placebo tests to validate our identification methodology.

Our paper contributes to the literature in several ways. Firstly, we provide a new evidence of the distortion effect of home loan subsidies policy. The previous literature concentrates on whether such policy increases housing price, promotes the homeownership rate, generates social benefits and reduces government revenue. We are the first to point out that the policy may induce some marginal potential home buyers to rush in buying a home and these people have higher credit risk which cannot be identified and priced correctly by the lenders. Secondly, our paper contributes to the areas in studying household financial decision mistakes. Our results show that the policy change without adequate financial education may lead the financially unsophisticated households to make suboptimal financial decisions and suffer from the substantial financial loss later in life. Thirdly, this paper also adds values to the mortgage loan default literature. The 2008 subprime mortgage crisis indicates that household credit crisis may trigger the global financial turmoil. We study the effect of the fiscal policy change on mortgage loan default. Our results suggest that households' excessive or mistiming taking of mortgage debt may lead them to default on the loans.

This paper is structured as follows. The literature review is in the second section. The policy background and institutional details will be discussed in the third section. We will develop the hypothesis and discuss the methodology in the fourth section. The data and sample are described in the fifth section. The results will be presented and discussed in the sixth section. Finally, we will conclude the paper in the last section.

2. Literature Review

Our paper is mainly related to three strands of the literature namely home ownership subsidy policies, household financial literacy and mistakes and mortgage loan default. We will briefly review the existing literature and discuss how our paper makes the contribution to the literature.

Firstly, the literature does not find strong effect of the home ownership affordability policy in promoting housing demand in the long run. Sinai and Waldforgel (2005) finds moderate effect of the housing subsidies on the occupied housing stock for the low income people. Hilber and Turner (2014) find that the mortgage interest deduction boosts homeownership attainment only of high-income households in less tightly regulated housing markets in the US and the mortgage interest deduction policy is ineffective to promote homeownership for the others. Bourassa et. al. (2013) conducts an international survey and argues that mortgage interest deductions does not increase home ownership rate. However, researchers find that the favorable homeownership policy alters households' decision on purchasing time and mortgage loan choices. Martins and Villanueva (2006) finds that loan size concentrated at the discontinuity point of the budget constraint eligible individuals for the subsidized interest rate policy. Fetter (2013) studies the special policy for veterans and finds that mortgage subsidies shift home purchase earlier in life. Agarwal, Hu and Huang (2015) finds that households are more likely to rush into the housing market when the house price grows rapidly.

Besides, our paper is also related to a young literature in understanding the household financial literacy and why households frequently make financial mistakes. Campbell (2016) points out that "when households lack the intellectual capacity to manage their financial decisions, they make mistakes that lower their own welfare and can also have broader consequences for the economy." Calvet, Campbell and Sodini (2007) assess the households in Sweden and find they have poorly diversified portfolio. Choi, Laibson and Madrian (2011) find that people forego retirement fund arbitrage opportunities with large profit. Lusardi and Scheresbert (2013) find that the young people with low level of financial literacy are more likely to have the high cost borrowing. Lusardi and Mitchell (2014) provide an overview of the theories and evidence on the financial literacy literature.

Purchasing a home and taking a mortgage loan are one of the most important and careful financial decisions that the household need to make in his life. However, researchers have found that households also make substantial mistakes in making decisions in regards to home purchasing and mortgage loans

and thus suffer from a big financial loss. Agarwal and Mazumder (2013) find that household makes financial mistakes in choosing home equity loans. Agarwal, Rosen and Yao (2015) also argue that households make refinancing mistakes by not filing for the refinancing at the correct timing. Keys, Pope and Pope (2016) finds that 20 percent unconstrained households whom refinancing was optimal had not done so. Why would households make financial mistakes? Andersen (2015) examines whether inattention or inertia could explain the mortgage refinancing mistakes and they argue that the inattention problem could be the main reason. The lack of financial literacy and the limited intellectual capacity are another major concerns of the researchers and policy makers. Gatherwood and Weber (2015) studies a survey conducted in UK and find that households have low financial literacy related to mortgages. Among the renters, the mortgage financial literacy is substantially worse. Geradi, Goette and Meier (2010) finds the correlation between financial literacy and mortgage default in the US. Moreover, the behavior economics studies highlight the importance of the biased belief which may make the household's decision making deviate from the optimal. Stago and Zinman (2009) demonstrate that households have the exponential growth bias which means they have the tendency to underestimate an interest rate given other loan terms. More biased households borrow more and save less and favor shorter maturities.

The other literature which our paper relates to is to understand what determines the mortgage loan default. The 2008 subprime mortgage loan crisis draw substantial attention from the researchers and governors in understanding the impact and consequences of household mortgage loan default and why household default on their mortgage loans. The papers include but not limited to Mian and Sufi (2009), Demyank and Hemert (2009), Mian and Sufi (2011) Guiso, Sapienza and Zingales (2013). Rajan, Seru and Vig (2015) point out that the reasons of the failure of the models in predicting the mortgage default could be due to the selection of the reported borrower characterizes from the banks. The banks report the characteristics which imply good credit quality of the borrowers to the investors and price the mortgage loan based on these characteristics. However, the unreported borrower characteristics imply a lower borrower credit quality. Jiang, Nelson and Vytlacil (2014) also highlight the importance of information falsification on mortgage delinquency. Consistently, our paper finds that the banks cannot price the mortgage loan borrowers' credit risk correctly in the post policy change period.

3. Policy Background

The India finance minster Arun Jaitley announced the 2014-2015 India union budget in July 2014. The union budget generally covers the fiscal policy change which will be implemented in the coming fiscal year. For example, the fiscal year 2014 (FY 2014) in India is from 1st April 2014 to 31st March 2015. The union budget is usually announced by the end of February each year but due to the general election of FY 2014, the union budget delivery is delayed and announced by the new party on power in July. However, it is still effective from 1st April 2014 to 31st March 2015.

In the union budget FY 2014, the total income tax exemption limit was increased by 50,000 India Rupee (833 US dollars) for the salaried workers below the age of 80. For example, for the taxed individual below the age of 60, the exemption limit is raised from 200,000 INR to 250,000 INR. For the detailed explanation of the policy change over the entire population, please refer to Appendix A.1. In India, all the income tax exemptible items are classified into different categories. For each category, there is also an exemption limit. For the section of 80 C, the income tax exemption limit was increased by 50,000 India Rupee from 100,000 India Rupee to 150,000 India Rupee. The section 80C (Appendix A.2) includes mainly long term investment instruments like public provident fund (PPF), long term fixed deposit, health insurance and tuition fees etc. In section 80C, there are two items related to home purchasing namely the principle part of home mortgage loan repayment and the stamp duty and registration charges for self-occupied house. Moreover, under section 24 (Appendix A.2), the income tax exemption limit for the interest payment part of self-occupied house property was increased by 50,000 India Rupee from 150,000 INR to 200,000 INR.

How much more tax benefit a potential home loan borrower can obtain from the policy change depends on his utilization on other tax exemptible items. The exact amount of the saving on income tax depends on which age and income slab the individual belongs to. I will use a typical individual in terms of age and income as an example to demonstrate how the new policy will change the total income tax payable to a potential home buyer. For example, an individual is below 60 years old and has the total annual income of 800,000 INR. He used to have 150,000 INR exposures to section 80C and thus exhausts the exemption limit of the section 80C in FY 2013. He also has 50,000 INR exposures to other sections of exemptible items and hence he exhausts the total income tax exemption limit of 200,000 INR in FY 2013. If he purchases a house in FY 2013, though the principle and interest payment for the mortgage loan are the eligible tax exemption items, he gets no further income tax deduction since he has exhausted

the previous total exemption limit. With the new policy in FY 2014, if either total annual principle payment, stamp duty or the interest payment of the home mortgage is more than 50,000 INR, he can get extra 50,000 INR deducted from his total taxable income for the computation of income tax payable. Previously in FY 2013, the taxable income is 800,000 INR-200,000 INR=600,000 INR. However, in FY 2014, it becomes 800,000INR-250,000 INR=550,000 INR. Since the extra tax exemptible amount of 50,000 INR is deducted from the tax slab with the tax rate of 20%, then the individual can save up to 10,000 INR (166 US dollar) more from the income tax payment. The extra benefit from reduced income tax will be sustained for a few years as the repayment structure of the mortgage loans remains similar in the early periods before maturity.

The next natural question following is that whether there is policy uncertainty in the future after FY 2014. Will the government shift down the exemption limit in the next union budget? Ex ante, this is not likely the case as the trend of the income tax policy is to raise the exemption limit and enlarge the pools for the eligible exemptible items in the past decades. Ex post, in FY 2015, the income tax exemption limit remains and the government further raises the bar in FY 2016. Therefore, it is reasonably to believe that the household would anticipate the new income exemption policy in favor of home purchase will be sustained in the future. Therefore, the income tax savings from the new policy we calculate in the above example can be regard as a stable future cash flow before the mortgage loan maturity.

4. Hypothesis Development and Methodology

The increase in income exemption limit for the principle and interest payment for the self-occupied home mortgage loans may alter household's home purchasing decisions for several reasons. Firstly, given the fixed real estate purchasing, loan amount and borrowing cost, there may be more income tax rebated and this is a permanent income increase for the individual. The increase in permanent income may make the household to purchase a larger or more expensive house. Secondly, in order to exhaust the income tax exemption limit, the household may have incentive to buy a larger and more expensive home and thus take a larger loan with the higher required monthly principle and interest payment. However, within our empirical setting, we cannot identify the household who are not eligible (e.g. non salaried workers) or affected (e.g. total savings eligible for income tax exemption has exceeded the new limit) by

the policy change which can serve as a good control sample. Therefore, we are not being able to test the above hypothesis.

Large literature has documented that household may have bounded rationality and not be financially sophisticated enough to make the optimal financial decisions. With the increase in income tax incentive, the potential home buyers may rush into the market with a down payment lower than what they would have prepared if there were no policy change. Moreover, to take the full advantage of the exemption limit, they may take shorter loan to maturity and endure a larger required amount of payment. If the households fail to make the precise calculation and overestimate their repayment capacity, they may have difficulty in meeting the repayment requirement subsequently and become delinquent on their mortgage loans. However, if the bank can detect such adverse selection of the mortgage loan borrowers and price the loans accordingly, we should not expect to observe the mortgage loans originated in the post policy announcement period are more likely to be delinquent subsequently. Thus we have the following hypothesis.

H1: Controlling for mortgage loan price, the mortgage loan performance should be the same for the mortgage loans originated in a short period.

$$Delinquency_{i,t,l} = d_{i,0} + \gamma_t \sum_{t=5}^{10} Month_{i,t} + \mu_i Interest_i + \delta_l + \varepsilon_{i,t,l} \quad (1)$$

We test Hypothesis I with the above equation (1). $Delinency_i$ represents whether the mortgage loan i is at delinquency status in one year time. It takes the value of 1 if the mortgage loan is delinquent on payment and 0 if the account is on current. The delinquency status refers to either to be delinquent for more than 60 days or default in different regressions. $Month_{i,t}$ represents in which month the mortgage loan i is originated. It takes the value of 1 if the mortgage loan i is originated in month t and 0 otherwise. We restrain the time period from April to October and the delinquency rate in April is absorbed in the constant term. $Interest_i$ is the interest rate of the mortgage loan i. δ_l is the regional fixed effect based on where the underlying real estate locates. The regional fixed effect absorbs the unobservable local effects (e.g. housing price trend) that may influence the delinquency behavior. For the geographical location, we can be precise at the state cross district level. $\varepsilon_{i,t}$ is the white noise error term. We estimate regression equation (1) with both OLS model and Logit model. Since the loans are originated in a few months' time, it is reasonable to assume that the mortgage borrowers are subject to the same economic

environment (e.g. unemployment rate), housing price trend and the cost of default. Our key assumptions is that the mortgage loan borrowers in short period before and after the policy announcement face the same benefit and cost of default on the loans.

The lender of mortgage loans may fail to price the riskiness of some mortgage loans in the post policy announcement period with their existing pricing model. The mortgage borrower pool has been changed due to the tax incentive introduced by the new policy. If the observable characteristics of the mortgage loan borrowers can explain the higher delinquency rate, then the lender just need to incorporate those characteristics into the pricing model and may avoid suffering from the loss due to default. Thus, we have the following null hypothesis.

H2: Controlling for mortgage loan price and observable mortgage loan borrower characteristics, the mortgage loan performance should be the same for the mortgage loans originated in a short period.

$$Delinquency_{i,t,l} = d_{i,0} + \gamma_t \sum_{t=5}^{10} Month_{i,t} + \mu_i Interest_i + \beta_i X_i + \delta_l + \varepsilon_{i,t,l} \quad (2)$$

The other specifications are the same as in regression equation (1) except that we include X_i which represents mortgage loan i's borrower observable characteristics. We estimate regression equation (2) with both OLS model and Logit model.

Our sample tests reject both H1 and H2. The results imply that there are unobservable mortgage loan borrower characteristics driving the higher delinquency rate and this cannot be captured and priced properly by the lenders. We would like to further investigate on the regional characteristics and the distortion effect of the increased tax benefit on the marginal mortgage loan borrowers. Agarwal, Hu and Huang (2015) show that households rush into the housing market with the rapid increase of housing price. Thus, it is interesting to examine the interaction effect of the fiscal policy stimulus and the rapid housing price increase. We thus estimate the following regression equation.

$$Delinquency_{i,l} = d_{i,0} + \gamma_t \sum_{t=5}^{10} Month_{i,t} \times High_{i,l} + \mu_i Interest_i + m_t + \delta_l + \varepsilon_{i,t,l} \quad (3)$$

For all the districts in our sample, we sort them based on some district level measures (i.e. average past 5 year GDP growth rate, demographical composition). $High_{i,l}$ takes the value of 1 if the district where the

mortgage loan's underlying real estate located is above the median and 0 otherwise. m_t represents the mortgage loan origination month fixed effect. δ_l represents the district level fixed effect. $\varepsilon_{i,t,l}$ is the white noise. Therefore, the coefficient γ_t is similar to a DID estimator which captures the relative difference in delinquency rate for the regions with high and low certain measures in month t in comparison with the baseline month. We estimate regression (3) with the OLS model as the non-linear model has shortcomings in estimating the interaction terms.

5. Data and Sample

We have a large representative disaggregated mortgage loan panel data from a commercial bank with the largest market share in India. For each mortgage loan, we have its repayment starting date, approved credit limit (loan amount), loan term (in months), primary collateral value and the address of the underlying real estate asset at the state cross district level. We also have the panel data of loan status at September 2013, September 2014 and September 2015 respectively. At these three points of time, we know the loans' end of day balance, interest payment, interest rate and the repayment status. For the variable of the repayment status, it is classified as accounts on current, accounts with 1-month, 2- month, 3-month delinquency and default. For the mortgage loan borrowers, we know their age and marital status.

Initially, we have in total 2,476,061 mortgage loans in the sample. We drop the observations with the missing values of the key mortgage loan characteristics. We will focus on the mortgage loans originated around the policy announcement month of July and in the FY 2014. We will also keep the mortgage loans originated in FY 2013 and FY 2012 for placebo tests. Thus, we drop the mortgage loans originated before FY 2012. In the end, we have a sample of 524,083 mortgage loans.

The other two datasets are India yearly district level GDP data and 2011 district level census data. For the GDP data, we have both the total and sector level real and nominal GDP indices including agriculture, construction, manufacturing and banking industries. For the 2011 census data, we have variables capturing the demographical composition of each district. There are in total 675 districts in India and after merging with the mortgage loan data, we have 619 districts covered in the sample. This implies that our mortgage loan data covers a large geographical area in India.

6. Results

We start with reporting the distribution of the newly originated loans before and after the policy announcement and compare their mortgage loan and borrower characteristics. Later, we report the results on comparing the loan performance of the mortgage loans originated before and after the policy announcement date. Next, we examine whether the difference in subsequent loan performance can be explained by mortgage price and other observable characteristics. In the last part, we perform regional heterogeneity test to understand in which regions the distortion effect is stronger.

6.1 Distribution and characteristic of newly originated home loans

Firstly, we would like to examine whether there are potential home purchasers induced to take the mortgage loans after the policy announcement. The increased income tax exemption policy is eligible to all the tax payable potential home buyers and our data do not permit us to identify a control group of households which are not subject to the policy change. However, we can utilize the loan originations in FY 2012 and FY 2013 to infer the counterfactual seasonal pattern without such policy change. We thus present the distribution of No. of newly originated home loans over the calendar months in FY 2012, FY 2013 and FY 2014 as shown in Figure 1. From Figure 1.1, we can observe that only for the year FY 2014, after the policy announcement month of July, there is an observational increase in the number of newly originated loans in August and September. For all the other months, the pattern of the No. of newly originated loans is almost parallel for FY 2012, FY 2013 and FY 2014.

To take a closer look at what types of new loans are originated upon policy announcement, we plot the number of newly originated loans by loan characteristics as shown in Figure 1.2 and Figure 1.3. From Figure 1.2, among the mortgage loans with total approved credit limit less than 600,000 INR, there is a huge spike of newly originated loans in August and September only in FY 2014. There are around 10,000 new loans with the credit limit less than 600,000 INR originated in August and September which is equivalent to a 250% increase compared with April to June. For all the other months, the number of newly originated loans pattern is in general parallel to each other for FY 2012, FY 2013 and FY 2014. Among the mortgage loans with the approved credit limit more than 600,000 INR, we do not observe such spikes in August and September. All through the fiscal year, the number newly originated loans are in parallel pattern for FY 2012, FY 2013 and FY 2014. We find similar results by dividing the sample

based on the loan term at the mortgage loan originations. In Figure 1.3, among the loans with loan term less than 180 months, following the policy announcement in July, there is a spike in terms of the number of new loans originated in August and September in FY 2014. We do not find such change in loan demand for the mortgage loans with more than 180 months maturity and in the other fiscal years FY 2012 and FY 2013.

It is worth well to notice that the increase in demand of home purchasing does not persist after September in FY 2014. The number of newly originated loans falls back to the amounts similar to the months before the policy change and the same months in the previous fiscal years. Our results are consistent with the literature documenting that the home mortgage loan subsidies policy has little effect on the housing demand and home ownership rate.

[insert Figure 1 here]

The natural next step is to examine whether loans originated during the spike period are different from the others in terms of loan characteristics and loan borrower characteristics. We report the summary statistics of the mortgage loans originated in each month of FY 2014 as below in Table 1. From the table we can observe that the mortgage loans originated in August and September FY 2014 are borrowed by the younger individuals. The mortgage loans have about 10 months shorter loan terms to maturity. The approved credit loan limit is also smaller by about 300,000 INR. To evaluate how much the required monthly repayment is given the shorter loan term and the smaller approved loan credit limit, we compute equated monthly installment (EMI) to proxy for that. The EMI[7] is computed based on the approved loan credit limit, loan terms at origination and the interest rate at September 2015. The loans originated in August and September FY 2014 have about 5,000 INR lower EMI which implies the lower repayment burden. The primary collateral value is about 800,000 INR lower for the mortgage loans originated in August and September FY 2014. As a comparison, we produce the same summary statistics table for FY 2013 and report it in Appendix A.3. There are no obvious different features of the mortgages originated in August and September in FY 2013 compared with all the other months.

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[7] We do not have the loan type description. Most mortgage loans in India are under floating interest rate. Therefore, our computation of EMI is not accurate. Since we would like to focus on the relative difference of EMI for the mortgage loans originated in different months, the inaccuracy issue of EMI is less concerned.

We also report the summary statistics of the interest rate at Sep FY 2015[8] and the ratio of the approved loan credit limit over primary collateral value. For these two features, we do not observe the loans originated in August and Sep are very different from all the other months for both the the average and median value. The ratio of approved loan credit limit over primary collateral value is a proxy for loan-to-value ratio at origination which is a key variable in explaining mortgage loan non-performance tendency. The interest rate reflects how the debt lender evaluates the underlying default risk of the creditor.

[insert Table 1 here]

6.2 Mortgage loan performance and its origination month

In this section, we would like to examine the next year performance of the mortgage loans originated during the spike period in FY 2014. Firstly, we provide the unconditional percentage of non-performing loans at September in the next fiscal year after loan's origination as shown in Figure 2 below. For example, the first bar represents the percentage of non-performing mortgage loans at September FY 2013 for the loans originated in April FY 2012. The different colors in the bar are the percentage of loans in 1-month, 2-month, 3-month delinquency and default respectively as explained in the figure legend. For each cluster of three bars, we are comparing the mortgage performance at September FY 2013, September FY 2014 and September FY 2015 of the loans which are originated in the same calendar month in FY2012, FY 2013 and FY 2014 respectively. The comparison is holding the months after origination till the performance status date constant. The comparison between the bars in the same position but from different clusters is to compare the performance of the mortgage loans originated in neighboring months in the same fiscal year.

The attention should be drawn for the three spikes for the loans originated in July, August and September in FY 2014. They have much higher percentage of non-performing loans in about one year time after origination. The percentage of non-performing mortgage loans is fairly even over months for FY 2012 and FY 2013. For July to September FY 2014, no matter comparing with the neighboring months or the same months in previous fiscal years, the loans originated during these period have much

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[8] Most the mortgage loans are under floating rate. We have the loans' interest rate data at Sep 2013, Sep 2014 and Sep 2015.

higher delinquency rate in about one year time. We thus argue that the phenomena are not due to some other seasonal reasons and more likely to be related to the policy change in July FY 2014.

[insert Figure 2 here]

To further investigate on whether the mortgage loans with higher delinquency rate are the loans induced by policy change, we produce the summary statistics of the percentage of non-performing loans based on loan characteristics and the results are reported in Table 2 below. We measure the percentage of the non-performing loan by the percentage of mortgage loans with at least 2 month delinquency, the percentage of default loans and the percentage of the mortgage loans with at least 2 month delinquency out of the non-default loans. We divide the sample by the loan terms and the approved loan credit limit at origination. From the table, we can observe that the mortgage loans originated in July, August and September FY 2014 with loan term shorter than 180 months and the approved loan credit limit less than 800,000 INR have higher non-performing rate by all three non-performing percentage measures. However, we do not find such pattern for the loans with loan term longer than 180 months and the approved loan credit limit larger than 800,000 INR. To eliminate the concern of any potential seasonal patterns, we provide the same summary statistics table as in FY 2013 reported in Appendix A.4. We do not find any results as we find for FY 2014.

Consistent with our findings in the section 6.1, the increased mortgage loan demands upon policy announcement are from the loans with the smaller loan amount and shorter loan terms and also for the same group of loans, the household borrowers are more likely to be delinquent in the later payments. We thus argue that the policy incentive may effectively attract the households who are not that financially sound and have the home purchasing plan to rush into the market. They cannot afford more expensive real estate and also have relatively poorer credit standard to obtain high credit limit. The policy incentive induces them to purchase the home earlier than when they would have without the policy change. Either they have not saved the enough down payment, prepared enough precautionary savings or they may over estimate their repayment capability. We also observe that their mortgage loans have shorter loan term to maturity. These household ends up with having financial distress and thus not being able to meet the mortgage loan repayment requirement.

[insert Table 2 here]

6.2   Pricing of the non-performing risk and mortgage loan performance

From the household's perspective, having financial distress and difficulty in making loan repayment on time reduces their well beings. From the bank's perspective, it is crucial to ask whether the banks can identify the riskier loan borrowers and price them accordingly. Moreover, we would like to examine whether the unconditional average results found in section 6.2 is driven by a few regions in the country. Therefore, we conduct the tests as shown in Table 3 below. We estimate both the linear OLS model and Logit model including the interest rate as the control variable with regional fixed effect imposed. We find that mortgage loans originated in July, August and September in FY 2014 have statistically significant higher 2-month delinquency rates. The interest rate variable is positively statistically significant for all six regressions which imply that the loan price explains significant portion of the delinquency behavior. However, the interest rate cannot fully explain it and in which months when the mortgage loans are originated still matter. The results suggest ex ante the bank cannot fully price the extra credit risk.

With the Logit model, we also estimate and report the marginal effect. Holding all the other variables at average, the mortgage loans originated in July, August and September in FY 2014 are 1.14%, 1.22% and 1.27% respectively more likely to be at least 2-month delinquent by September FY 2015. The average at least 2-month delinquent rate for the mortgage loans originated from April to June FY 2014 is about 5%. It means for the mortgage loans originated from July to September FY 2014, the loan non-performance tendency is around 20% higher. The effect is both statistically and economically significant. We do not have strong results for the propensity to default since we only have the loan status data by September 2015 but not any further. Literature has documents that the chance for the households with 2-month delinquency on their mortgage loans to come back to continue the loan repayment is low. Researchers frequently use the more than 2 month delinquency status as a measure for default on mortgages. Therefore, we argue that 2-month delinquency has a high chance to end up with the default on the loan which is the real economic consequences for the debtor.

As a reference group, we also conduct the tests over the mortgage loans originated in FY 2012 and FY 2013 and report the results in Appendix A.5. For all the month dummy variables, they are statistically

insignificant and economically small. With no policy change in income tax incentive on home purchasing, we do not observe any results as we find in FY 2014 for the previous fiscal years.

[insert Table 3 here]

In the next step, we zoom in with the characteristics of the mortgage loans that increase in demand following the policy announcement. We re-conduct the tests on the propensity to be delinquent with the subsamples of the mortgage loans divided by approved loan credit limit and loan terms at origination. The results are reported in Table 4 below. For the mortgage loans with approved loan credit limit less than 800,000 INR and loan terms shorter than 180 months, controlling for the interest rate, the mortgage loans originated from July to September are more likely to be delinquent for more than 2 months by September 2015. Holding all the other variables at average, the mortgage loans with approved credit limit less than 800,000 INR originated in July, August and September in FY 2014 are 2.73%, 1.91% and 1.25% respectively more likely to be at least 2-month delinquent by Sep FY 2015. In the contrary, the interest rate can fully explain the delinquency and default rate of the mortgage loans with larger approved credit limit and longer loan terms. All the monthly dummy variables are not significant and small in magnitude. The results suggest the higher delinquency rate that the bank cannot identify and price properly is from the mortgage loans of the marginal home buyers who constitute the spikes of mortgage loan demand that we observe following the policy announcement.

[insert Table 4 here]

6.3   Observable borrower characteristics and mortgage loan performance

The agency problem of adverse selection refers to the situation that the agent has unobservable characteristics that cannot be obtained by the principle and these characteristics are associated with unpleasant consequences from the principle's point of view. In the following tests, we aim to examine whether all the other observable mortgage loan borrowers characteristics can fully predict the propensity to be delinquent on the repayment. We are limited in loan borrowers' demographical data that observable to the bank. We include all such information available including the marital status, age and whether the loan borrower ever has more than one mortgage loans with the bank. The results are

reported below in Table 5. Given all these control variables, when the mortgage loan originated is still positively statistically significantly related to the delinquency propensity from July to September in FY 2014.

There may be other observable loan borrowers' characteristics that are available to the bank but not accessible from the researcher's perspective. However, it is unlikely that the bank fails to price the mortgage loan risk correctly based on all these observable characteristics. It is more likely that there are unobservable characteristics of the mortgage loan borrowers that are associated with lower repayment capability. We therefore argue that there are some risker households adversely being selected into the mortgage loan market right after the income tax incentive policy announcement.

[insert Table 5 here]

6.4   Regional economic growth, demographical features and distortion effect

In this section, we conduct the heterogeneity tests based on the regional economic growth and demographical features to further understand what can explain the distortion effect of home affordability policy over the marginal home buyers.

Firstly we hypothesize that households may be more likely to rush to buy a home without being financially ready and well calculated given an unanticipated shock of the increase in income tax incentive in the regions with rapid housing price growth. The household may be more eager to buy a real estate to ride on the capital gain from owning the property. Due to the specialty of India, there is no good quality housing price data available and thus we use district level GDP data and sector wise GDP data as a proxy for the growth of housing market. In Figure 3 below, we plot the number of new mortgage loans originated over months in FY 2014 by districts with either high GDP growth rate (i.e. more than the median level of GDP growth rate among all districts in the sample) or low GDP growth rate (i.e. less than the median level of GDP growth rate among all districts in the sample). The GDP growth rate is measured by the average annual GDP growth rate from 2010 to 2014. We can observe that for the districts with a high growth rate of GDP per capita and GDP in construction sectors, there is a large increase in home purchasing in August and September in FY 2014 compared with the districts with relative lower growth rate of GDP per capita and GDP in construction sectors. However, if we use

the district level GDP growth rate on the other two sectors (i.e. manufacture band banking) which are not that closely related to the housing market, we do not find much difference in terms of the increase in housing purchase in August and September FY 2014 between the districts with the high and low GDP growth rates.

[insert Figure 3 here]

In the next, we examine whether the districts with higher average GDP growth rate related to housing market have higher mortgage loan delinquency rates in the post policy announcement period. We conduct the tests and report the results in Table 6 below. The interaction term of the calendar *month* and the indicator *High* for the districts with the corresponding GDP growth rate higher than the median is the variable of interest. We find that for the GDP growth rate of total real GDP, GDP per capita and GDP of the construction sector, the districts with higher average GDP growth rate have statistically significantly higher delinquency rate (at least 2-month delinquency) for the mortgage loans originated in either July, August or September in FY 2014. We do not find such results if we use the GDP growth rate on the sectors of agriculture, manufacture or banking.

Consistent with our findings on the increase in housing purchase demand following the policy announcement, the districts with higher increase in housing purchase demand in August and September FY 2014 have significantly more non-performing mortgage loans by September FY 2015. These districts, in the past five years, experience relatively higher growth in overall economy and especially in the construction sector. The findings are in line with our hypothesis that the marginal potential home buying households in the area with rapid housing price growth are more likely to rush in taking a loan and end up with financial distress.

[insert Table 6 here]

Furthermore, we would like to investigate on whether the demographical compositions of the districts are correlated with the distortion effect. For each of the districts in the sample, we compute its percentage of literate population, percentage of children, percentage of working labors and percentage of scheduled caste[9]. The interaction term of the calendar *month* and the indicator *High* for the districts with

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[9] Scheduled castes are various officially designated groups of historically disadvantaged people in India.

the corresponding demographical composition rate higher than the median is the variable of interest. The results are reported in Table 7 below. We find that for the districts with more children, rate have statistically significant higher delinquency rate (at least 2-month delinquency) for the mortgage loans originated in August and September in FY 2014. The regions with high percentage of working labor have higher delinquency rate during July compared with the regions with lower percentage of working labor. We also find some significant effect between the regions of more scheduled caste population and the fewer scheduled caste population in August.

[insert Table 7 here]

7 Conclusion

There have been hot debates on whether we should have policy to promote home affordability, what the best policy instrument is and how to tax the real estate ownership. With the advance of financial industry, for the people whom the home ownership is a concern from the policy makers' point of view are the people who will buy a home by taking a mortgage loan. Therefore, whether the policy will alter the household's incentive, purchasing target and behavior is an important question as it will affects the household's subsequent well-beings and also the credit risk for the lenders.

Our paper suggests, for a sub group of population who are not very financially sound and with limited financial literacy, they may make mistakes in taking the mortgage loans too early or too much facing the sudden policy incentive change and suffer from the financial distress later in life. Our paper has a lot of policy implications. We highlight a side effect of the adjustment of income tax policy on homeownership. We would suggest the policy makers to make enough effort in educating the public to understand what the exactly the policy means to them and how to adjust their original life plan accordingly.

Nevertheless, there are limitations with our paper. We are unable to investigate on the channel of why the household cannot fulfill the repayment requirement. Are they buying a more expensive house, paying a lower down payment or requiring a shorter loan term than they would without the policy change? The question is important and interesting and we will leave it for the future research.

Reference

Agarwal, S., & Mazumder, B. (2013). Cognitive abilities and household financial decision making. *American Economic Journal: Applied Economics*, *5*(1), 193-207.

Agarwal, S., Hu, L., & Huang, X. (2015). Rushing into the American Dream? House Prices Growth and the Timing of Homeownership. *Review of Finance*, *20*(6), 2183-2218.

Agarwal, S., Rosen, R. J., & Yao, V. (2015). Why Do Borrowers Make Mortgage Refinancing Mistakes?. *Management Science*, *62*(12), 3494-3509.

Andersen, S., Campbell, J. Y., Nielsen, K. M., & Ramadorai, T. (2015). *Inattention and inertia in household finance: Evidence from the Danish mortgage market* (No. w21386). National Bureau of Economic Research.

Bourassa, S., Haurin, D., Hendershott, P., & Hoesli, M. (2013). Mortgage interest deductions and homeownership: An international survey. *Journal of Real Estate Literature*, *21*(2), 181-203.

Calvet, L. E., Campbell, J. Y., & Sodini, P. (2007). Down or out: Assessing the welfare costs of household investment mistakes. *Journal of Political Economy*, *115*(5), 707-747.

Campbell, J. Y. (2016). Richard T. Ely Lecture Restoring Rational Choice: The Challenge of Consumer Financial Regulation. *The American Economic Review*, *106*(5), 1-30.

Choi, J. J., Laibson, D., & Madrian, B. C. (2011). $100 bills on the sidewalk: Suboptimal investment in 401 (k) plans. *Review of Economics and Statistics*, *93*(3), 748-763.

Demyanyk, Y., & Van Hemert, O. (2009). Understanding the subprime mortgage crisis. *The Review of Financial Studies*, *24*(6), 1848-1880.

Dietz, R. D., & Haurin, D. R. (2003). The social and private micro-level consequences of homeownership. *Journal of urban Economics*, *54*(3), 401-450.

DiPasquale, D., & Glaeser, E. L. (1999). Incentives and social capital: Are homeowners better citizens?. *Journal of urban Economics*, *45*(2), 354-384.

Engelhardt, G. V., Eriksen, M. D., Gale, W. G., & Mills, G. B. (2010). What are the social benefits of homeownership? Experimental evidence for low-income households. *Journal of urban Economics*, *67*(3), 249-258.

Fetter, D. K. (2013). How do mortgage subsidies affect home ownership? Evidence from the mid-century GI Bills. *American Economic Journal: Economic Policy*, *5*(2), 111-147.

Gathergood, J., & Weber, J. (2015). Is Poor Financial Literacy a Barrier to Home Ownership?.
Gerardi, K., Goette, L., & Meier, S. (2010). Financial literacy and subprime mortgage delinquency: Evidence from a survey matched to administrative data.

Glaeser, E. L., & Shapiro, J. M. (2003). The benefits of the home mortgage interest deduction. *Tax policy and the economy*, *17*, 37-82.

Green, R. K., & White, M. J. (1997). Measuring the benefits of homeowning: Effects on children. *Journal of urban economics*, *41*(3), 441-461.

GRINSTEIN-WEISS, M. I. C. H. A. L., Yeo, Y., Anacker, K., Van Zandt, S., Freeze, E. B., & Quercia, R. G. (2011). HOMEOWNERSHIP AND NEIGHBORHOOD SATISFACTION AMONG LOW-AND MODERATE-INCOME HOUSEHOLDS. *Journal of Urban Affairs*, *33*(3), 247-265.

Guiso, L., Sapienza, P., & Zingales, L. (2013). The determinants of attitudes toward strategic default on mortgages. *The Journal of Finance*, *68*(4), 1473-1515.

Hilber C A L, Turner T M. The mortgage interest deduction and its impact on homeownership decisions[J]. Review of Economics and Statistics, 2014, 96(4): 618-637.
Poterba, J., & Sinai, T. (2008). Tax expenditures for owner-occupied Housing: Deductions for Property Taxes and mortgage interest and the exclusion of imputed rental income. *The American Economic Review*, *98*(2), 84-89.

Jiang, W., Nelson, A. A., & Vytlacil, E. (2014). Liar's loan? Effects of origination channel and information falsification on mortgage delinquency. *Review of Economics and Statistics*, *96*(1), 1-18.

Keys, B. J., Pope, D. G., & Pope, J. C. (2016). Failure to refinance. *Journal of Financial Economics*, *122*(3), 482-499.

Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. *Journal of Economic Literature*, *52*(1), 5-44.

Mian, A., & Sufi, A. (2009). The consequences of mortgage credit expansion: Evidence from the US mortgage default crisis. *The Quarterly Journal of Economics*, *124*(4), 1449-1496.

Mian, A., & Sufi, A. (2011). House prices, home equity–based borrowing, and the us household leverage crisis. *The American Economic Review*, *101*(5), 2132-2156.

Poterba, J. M. (1992). *Taxation and housing: Old questions, new answers* (No. w3963). National Bureau of Economic Research.

Rajan, U., Seru, A., & Vig, V. (2015). The failure of models that predict failure: Distance, incentives, and defaults. *Journal of Financial Economics*, *115*(2), 237-260.

Rossi, P. H., & Weber, E. (1996). The social benefits of homeownership: Empirical evidence from national surveys. *Housing policy debate*, *7*(1), 1-35.

Sinai T, Waldfogel J. Do low-income housing subsidies increase the occupied housing stock?[J]. Journal of public Economics, 2005, 89(11): 2137-2164.

Stango, V., & Zinman, J. (2009). Exponential growth bias and household finance. *The Journal of Finance*, *64*(6), 2807-2849.

Figures

Figure 1.1 Distribution of Newly Originated loans over Fiscal Year and Months
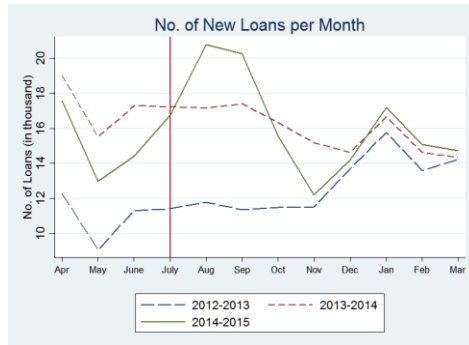
The above figure plots the number of new mortgage loans initiated for each fiscal year and months. The blue dotted line is for FY 2012. The red dotted line is for FY 2013 and the green solid line if for FY 2014. The red vertical line indicates the policy announcement month of July, The vertical axis is in household loans and the horizontal axis represents the calendar months.

Figure 1.2
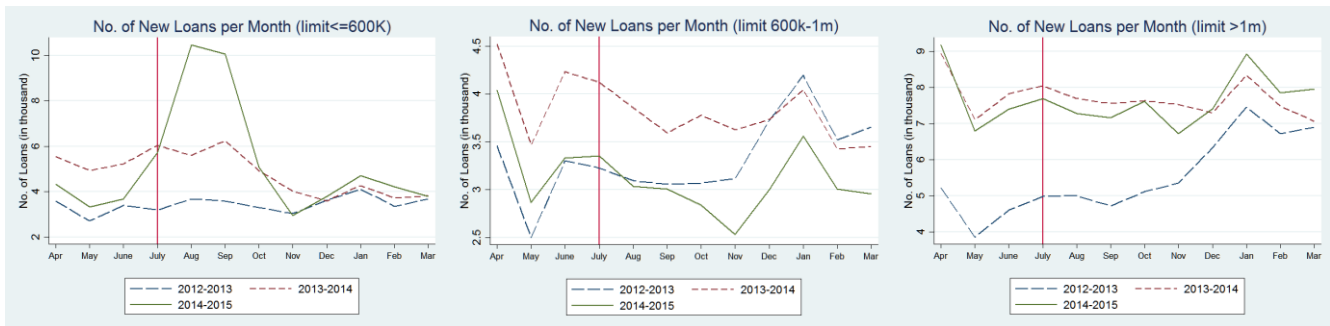
For the above three figures, we plot the number of loans distribution based on initial mortgage approved credit limit. Panel A is for the mortgage loans with loan amount below 600,000 INR. Panel B is for the mortgage loans with loan amount from 600,000 INR to 1 million INR. Panel C is for the mortgage loans with loan amount above the value of 1 million.

Figure 1.3
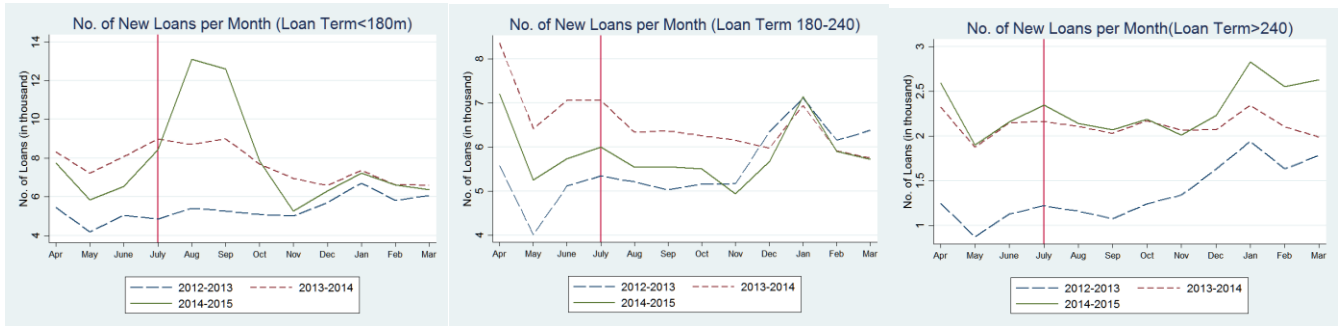
For the above three figures, we plot the number of loans distribution based on loan terms. Panel A is for the mortgage loans shorter than 180 months. Panel B is for the mortgage loans with the loan term between 180 months and 240 months. Panel C is for the mortgage loans longer than 240 months.

Figure 2 Loan Performance over Payment Starting months
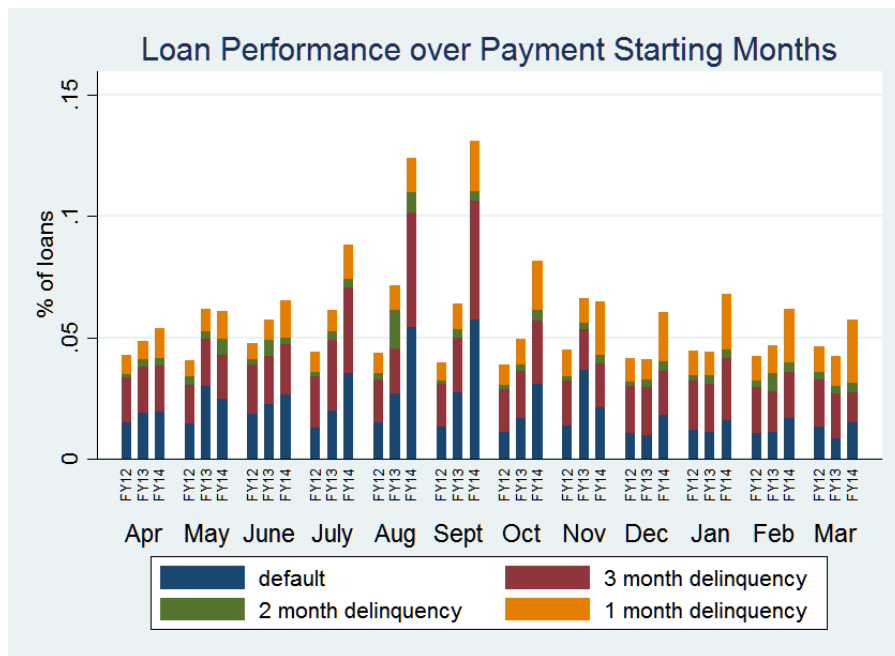
The above figure shows the loan performance in September in the next year after the loan's initiation. Three bars in one cluster refer to the loans originated in the same calendar month. Each of the bar refers to the loans originated in the corresponding fiscal year and month. For example, the first bar represents the loan performances at Sep FY 2013 of the mortgage loans originated in April FY 2012. Within the bar, the orange color, green color, red color and blue color are for the percentages of the loans in one month, 2-month, 3-month delinquency and default respectively.

Figure 3 Newly Originated Loans across Districts
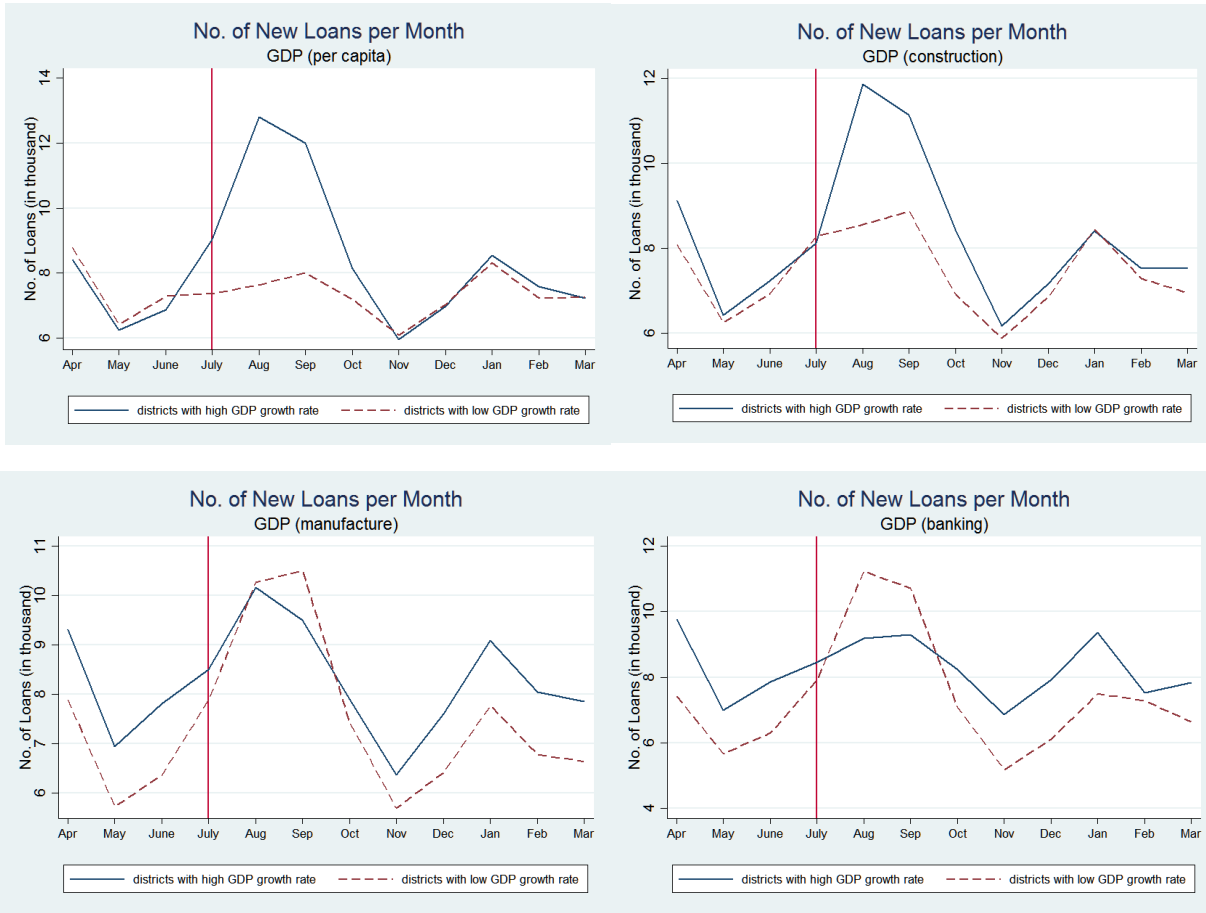
The above graph shows the number of new mortgage loans over months during FY 2014 in different disctricts. The blue line represents the districts with the GDP growth rate higher than the median among all the disctricts in the sample. The red doctted line represents the districts with the GDP growht rate lower than the median among all the disctricts in the sample. The GDP growth rates are measured for GDP per capita, GDP of the construction sector, GDP of the manufacture sector and GDP of the banking sector. The GDP growth rate is the average of the past five year's GPD growth rate before FY 2014. GDP growth rate $= \frac{1}{5}(\sum_{t=2010}^{2014} \frac{GDP_t - GDP_{t-1}}{GDP_{t-1}})$. The red verticle line indicates the policy annoucement month of July. The vertical axis is in thousand number of loans. The horizontal aixs indicates the calendar months in FY 2014.

Tables

Table 1 Summary Statistics of Mortgage Loan and Borrower Characteristics

The following table reports the summary statistics of the mortgage loan and borrower characteristics for the loans initiated from April to March during FY 2014. We report the number of loans initiated, mean, median and standard deviation of loan borrower's age, loan term (in months), approved loan limit (in 1000 INR), annual interest rate (at Sep 2015), EMI (equated monthly installment in 1000 INR), primary collateral value (in 1000 INR) and the ratio between approved loan limit and primary collateral value. The EMI is computed by EMI $=$

$$\frac{approved\ loan\ limit \times \frac{r}{12} \times (1+\frac{interest\ rate}{12})^{loan\ term}}{(1+\frac{interest\ rate}{12})^{loan\ term}-1}.$$

FY 2014	N	mean	median	sd	mean	median	sd	mean	median	sd	mean	median	sd
			age			loan term			approved loan limit			interest rate	
month													
Apr	16,957	44.79	44	9.44	203.39	198	61.65	1494.72	1100	3370.69	9.67	9.85	1.03
May	12,564	44.69	44	9.62	202.03	192	62.30	1430.61	1100	1680.78	9.75	9.85	0.99
June	13,944	44.38	44	9.42	203.79	196	60.58	1422.45	1058	1749.79	9.71	9.85	0.96
July	16,240	43.87	43	9.59	199.99	181	59.73	1267.85	1000	1635.83	9.76	9.85	0.86
Aug	20,253	42.86	42	9.67	190.01	180	56.06	964.278	600	1466.35	9.80	9.95	0.78
Sept	19,763	42.76	42	9.63	189.27	180	56.36	974.907	601	1432.63	9.81	9.95	0.76
Oct	15,074	43.60	43	9.53	200.43	180	60.50	1310.58	1000	1716.83	9.75	9.85	0.85
Nov	11,749	44.20	44	9.67	206.75	204	62.24	1510.53	1185	2272.15	9.58	9.85	1.07
Dec	13,689	44.48	44	9.73	205.64	198	61.22	1426.12	1100	1870.16	9.46	9.85	1.19
Jan	16,616	44.39	44	9.70	207.99	204	62.18	1455.37	1100	1874.62	9.41	9.85	1.25
Feb	14,588	44.11	44	9.78	208.73	201	61.77	1509.15	1100	3452.87	9.40	9.85	1.22
Mar	14,255	43.94	44	9.65	208.68	204	63.46	1529.01	1170	2036.77	9.48	9.85	1.13

FY 2014	N	mean	median	sd	mean	median	sd	mean	median	sd
			EMI			primary collateral value			approved loan limit/primary collateral value	
month										
Apr	16,957	15.24	11.23	31.56	2787.99	2000	5539.65	0.580	0.61	0.203
May	12,564	14.64	11.21	17.61	2713.85	1980	4373.88	0.576	0.60	0.203
June	13,944	14.59	11.05	19.25	2655.19	1960	3889.83	0.580	0.61	0.198
July	16,240	12.98	9.78	17.95	2389.18	1746	4150.53	0.580	0.62	0.201
Aug	20,253	9.85	6.34	14.54	1820.22	1093	4255.44	0.588	0.62	0.188
Sept	19,763	9.95	6.57	14.34	1837.48	1150	3284.09	0.586	0.63	0.188
Oct	15,074	13.36	10.61	17.68	2446.18	1820	3614.66	0.591	0.62	0.196
Nov	11,749	15.21	11.72	23.17	2869.18	2043	5728.26	0.587	0.62	0.203
Dec	13,689	14.24	11.19	18.60	2720.60	2000	5012.52	0.579	0.61	0.203
Jan	16,616	14.41	10.95	18.45	2813.20	2000	8330.27	0.577	0.61	0.204
Feb	14,588	14.96	11.03	35.23	2874.69	1995	8956.15	0.585	0.63	0.204
Mar	14,255	15.22	11.62	20.20	2837.44	2080	3920.46	0.583	0.62	0.202

Table 2 Summary Statistics of Mortgage Loan Performance

The following table reports the percentage of non-performance mortgage loan accounts at September of the next year after the loan's origination. Panel A reports the results by dividing the sample based on loan terms (in months). Panel B reports the results by dividing the sample based on approve loan credit limit. Column (1) is for the number of loans originated in the corresponding month during FY 2014. Column (2) reports the percentage of loans with more than 2 month delinquency at September FY 2015 over the total number of mortgage loans originated during the corresponding month in FY 2014. Column (3) reports the percentage of loans default at September FY 2015 over the total number of mortgage loans originated during the corresponding month in FY 2014. Column (4) reports the percentage of loans with more than 2 month delinquency at September FY 2015 over the total number of non-default loans originated in the corresponding month in FY 2014.

Panel A: by loan term	loan term <=180				loan term >180			
month	N	%(more than 2 month delinquency/total No. of loans)	%(default loans/total No. of loans)	%(more than 2 month delinquency/total No. non-default loans)	N	%(more than 2 month delinquency/total No. of loans)	%(default loans/total No. of loans)	%(more than 2 month delinquency/total No. non-default loans)
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Apr	7,404	6.58%	3.80%	2.89%	9,270	2.29%	0.51%	1.79%
May	5,591	8.53%	5.12%	3.60%	6,754	2.15%	0.46%	1.70%
June	6,251	8.80%	5.41%	3.59%	7,531	2.02%	0.52%	1.51%
July	8,127	12.72%	6.66%	6.50%	7,969	2.22%	0.45%	1.78%
Aug	12,835	15.97%	8.36%	8.31%	7,290	2.57%	0.51%	2.07%
Sept	12,336	16.53%	8.97%	8.31%	7,273	2.13%	0.48%	1.66%
Oct	7,611	10.56%	5.85%	5.01%	7,304	1.74%	0.37%	1.37%
Nov	4,997	8.00%	4.58%	3.59%	6,575	1.63%	0.32%	1.31%
Dec	6,021	7.64%	3.80%	3.99%	7,537	1.23%	0.27%	0.97%
Jan	6,861	8.69%	3.53%	5.35%	9,487	1.64%	0.33%	1.32%
Feb	6,328	7.59%	3.63%	4.10%	8,010	1.25%	0.26%	0.99%
Mar	6,053	5.65%	3.32%	2.41%	7,903	1.24%	0.25%	0.99%

Panel B: by approved loan credit	approved loan credit limit <=800,000 INR				approved loan credit limit > 800,000 INR			
Apr	6,036	8.28%	4.89%	3.57%	10,638	1.87%	0.31%	1.57%
May	4,532	10.99%	6.71%	4.59%	7,813	1.59%	0.17%	1.42%
June	5,063	11.04%	6.77%	4.58%	8,719	1.64%	0.39%	1.26%
July	7,140	14.89%	7.76%	7.73%	8,956	1.65%	0.26%	1.40%
Aug	11,735	17.65%	9.27%	9.23%	8,390	1.98%	0.26%	1.72%
Sept	11,347	18.15%	9.85%	9.20%	8,262	1.63%	0.28%	1.36%
Oct	6,264	12.63%	7.09%	5.96%	8,651	1.62%	0.32%	1.30%
Nov	3,964	9.91%	5.85%	4.31%	7,608	1.50%	0.24%	1.26%
Dec	5,047	9.02%	4.48%	4.75%	8,511	1.15%	0.27%	0.88%
Jan	6,161	9.98%	4.17%	6.06%	10,187	1.34%	0.16%	1.19%
Feb	5,438	8.90%	4.40%	4.71%	8,900	1.08%	0.13%	0.95%
Mar	5,025	6.95%	4.20%	2.87%	8,931	1.02%	0.11%	0.91%

Table 3 Mortgage Loan Origination and Loan Performance

The following table reports the results on estimating regression equation (1). Panel A estimates the OLS regression equation and Panel B estimates the Logit model. The tests are over the mortgage loans originated from April to October in FY 2014. In column (1),with all the mortgage loans, the dependent variable takes the value of 1 if the mortgage loan is at least 2 month delinquent at Sep FY 2015 and zero otherwise. In column (2), we restrain the sample of the non-default loans at Sep FY 2015. In column (3), the dependent variable takes the value of 1 if the mortgage loan is default at Sep FY 2015. The explanatory variable of calendar month takes the value of 1 if the mortgage loan is originated in the corresponding month and zero otherwise. The interest rate is at the date of Sep FY 2015. In Panel A, We control for state cross district fixed effect and the standard error is clustered at the state cross district level. In Panel B, we impose the state dummy variables and report the marginal effect for the coefficient estimation of July, Aug and Sep. *,**,*** represents statistical significance at 90%,95% and 99% levels.

Panel A: OLS	(1)	(2)	(3)	Panel B: Logit	(1)	(2)	(3)
	all loans	non default loans	all loans		all loans	non default loans	all loans
	=1 if more than 2	=1 if more than 2			=1 if more than 2	=1 if more than 2	
VARIABLES	month delinquency	month delinquency	=1 if default	VARIABLES	month delinquency	month delinquency	=1 if default
May	0.00142	0.000670	0.00103	May	0.0375	0.0145	0.0306
	(0.00326)	(0.00231)	(0.00231)		(0.0713)	(0.0913)	(0.0836)
June	0.00336	4.84e-05	0.00367	June	0.155	0.0364	0.281*
	(0.00477)	(0.00322)	(0.00380)		(0.158)	(0.134)	(0.150)
July	0.00683*	0.00624**	0.000773	July	0.321**	0.365**	0.249*
	(0.00407)	(0.00296)	(0.00285)		(0.137)	(0.148)	(0.134)
				marginal effect	1.14%	0.35%	
					(0.0046)	(0.0035)	
Aug	**0.0151*****	0.0113***	0.00463	Aug	0.344***	0.440***	0.215*
	(0.00498)	(0.00294)	(0.00376)		(0.106)	(0.111)	(0.111)
				marginal effect	1.22%	0.79%	
					(0.0035)	(0.0022)	
Sept	0.0103*	0.00855**	0.00224	Sept	0.357**	0.405**	0.281**
	(0.00563)	(0.00383)	(0.00393)		(0.144)	(0.172)	(0.119)
				marginal effect	1.27%	0.88%	0.36%
					(0.049)	(0.0035)	(0.0016)
Oct	-0.000667	2.88e-05	-0.000706	Oct	0.0991	0.109	0.0849
	(0.00408)	(0.00276)	(0.00300)		(0.137)	(0.170)	(0.0990)
interest rate	0.0127***	0.00671***	0.00644***	interest rate	0.857***	0.724***	0.898***
	(0.00197)	(0.000922)	(0.00138)		(0.248)	(0.167)	(0.285)
Constant	-0.0566***	-0.0318***	-0.0282**	Constant	-12.40***	-11.10***	-15.43***
	(0.0198)	(0.00954)	(0.0137)		(2.473)	(1.712)	(2.802)
State*District fixed effect	Y	Y	Y	state fixed effect	Y	Y	Y
Observations	110,879	106,851	110,879				
R-squared	0.131	0.057	0.104	Observations	111,055	107,018	108,613

Table 4 Mortgage Loan Origination and Loan Performance by Loan Characteristics

The following table reports the results by estimating logit regression model (1). Panel A presents the test results by splitting the sample based on loan approved credit limit and Panel B presents the results by splitting the sample based on loan term (in months). In column (1),with all the mortgage loans, the dependent variable takes the value of 1 if the mortgage loan is at least 2 month delinquent at Sep FY 2015 and zero otherwise. In column (2), we restrain the sample of the non-default loans at Sep FY 2015. In column (3), the dependent variable takes the value of 1 if the mortgage loan is default at Sep FY 2015. The explanatory variable of calendar month takes the value of 1 if the mortgage loan is originated in the corresponding month and zero otherwise. The interest rate is at the date of Sep FY 2015. For all the regressions, the dummy variables indicating state cross district are included. *,**,*** represents statistical significance at 90%,95% and 99% levels.

	Panel A: By loan approved credit limit						Panel B: By loan terms					
	approved credit limit<=800,000 INR			approved credit limit>800,000 INR			loan term <=180 mths			loan term>180mths		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
	all loans	non default loans	all loans	all loans	non default loans	all loans	all loans	non default loans	all loans	all loans	non default loans	all loans
VARIABLES	=1 if more than 2 month delinquency	=1 if more than 2 month delinquency	=1 if default	=1 if more than 2 month delinquency	=1 if more than 2 month delinquency	=1 if default	=1 if more than 2 month delinquency	=1 if more than 2 month delinquency	=1 if default	=1 if more than 2 month delinquency	=1 if more than 2 month delinquency	=1 if default
May	0.104	0.110	0.0710	-0.157	-0.0979	-0.567	0.0813	0.0936	0.0402	-0.0709	-0.0806	-0.0216
	(0.0664)	(0.0794)	(0.0851)	(0.139)	(0.132)	(0.356)	(0.0829)	(0.106)	(0.0940)	(0.140)	(0.156)	(0.282)
June	0.231*	0.211*	0.238*	-0.156	-0.244*	0.216	0.234*	0.162	0.278**	-0.127	-0.179	0.0616
	(0.130)	(0.114)	(0.131)	(0.113)	(0.126)	(0.252)	(0.132)	(0.128)	(0.124)	(0.118)	(0.135)	(0.208)
July	0.298***	0.505***	0.0987	-0.123	-0.114	-0.175	0.319***	0.485***	0.144	-0.0482	-0.0405	-0.0691
	(0.0853)	(0.131)	(0.0827)	(0.115)	(0.116)	(0.230)	(0.0967)	(0.151)	(0.0882)	(0.124)	(0.130)	(0.210)
marginal effect	2.73%	2.37%					2.12%	1.69%				
	(0.0073)	(0.0059)					(0.0061)	(0.005)				
Aug	0.209***	0.454***	-0.0183	0.137	0.152*	0.0280	0.241***	0.455***	0.0288	0.178*	0.193*	0.130
	(0.0695)	(0.0853)	(0.0683)	(0.0901)	(0.0918)	(0.207)	(0.0731)	(0.0964)	(0.0752)	(0.107)	(0.115)	(0.171)
marginal effect	1.91%	2.13%					1.60%	1.60%				
	(0.0061)	(0.0038)					(0.0046)	(0.003)				
Sept	0.247***	0.456***	0.0506	-0.145	-0.131	-0.221	0.282***	0.460***	0.103	-0.0824	-0.0860	-0.0552
	(0.0855)	(0.0841)	(0.0895)	(0.122)	(0.131)	(0.271)	(0.0928)	(0.103)	(0.0950)	(0.117)	(0.131)	(0.243)
marginal effect	2.25%	2.14%					1.88%	1.58%				
	(0.0076)	(0.0036)					(0.0060)	(0.003)				
Oct	0.0462	0.180*	-0.0618	-0.0934	-0.130	0.0595	0.0959	0.213*	-0.0106	-0.208*	-0.204*	-0.211
	(0.0744)	(0.101)	(0.0688)	(0.0957)	(0.105)	(0.251)	(0.0811)	(0.118)	(0.0674)	(0.107)	(0.124)	(0.250)
interest rate	0.538**	0.490***	0.544**	1.211***	1.104***	1.199***	0.655**	0.553**	0.678**	0.929***	0.943***	0.845**
	(0.226)	(0.190)	(0.248)	(0.160)	(0.131)	(0.149)	(0.312)	(0.261)	(0.327)	(0.133)	(0.106)	(0.350)
Constant	-9.865***	-9.837***	-11.12***	-15.30***	-14.23***	-18.71***	-11.72***	-10.95***	-13.93***	-12.32***	-12.46***	-14.38***
	(2.250)	(1.900)	(2.453)	(1.580)	(1.303)	(1.468)	(3.100)	(2.616)	(3.216)	(1.357)	(1.088)	(3.524)
Observations	48,520	44,451	48,244	62,103	61,933	58,312	57,599	53,607	55,817	53,083	52,846	50,785

Table 5 Mortgage Loan Origination, Observable Borrower Characteristics and Loan Performance

The following table reports the results by estimating regression equation (2). Panel A estimates the OLS regression model and Panel B estimates the Logit model. In column (1),with all the mortgage loans, the dependent variable takes the value of 1 if the mortgage loan is at least 2 month delinquent at Sep FY 2015 and zero otherwise. In column (2), we restrain the sample of the non-default loans at Sep FY 2015. In column (3), the dependent variable takes the value of 1 if the mortgage loan is default at Sep FY 2015. The explanatory variable of calendar month takes the value of 1 if the mortgage loan is originated in the corresponding month and zero otherwise. The interest rate is at the date of Sep FY 2015. We also include the individual characteristics data. The variable *multiple loans* takes the value of 1 if the loan borrower has any other mortgage loans ever and 0 otherwise. The variable *married* takes the value of 1 if the loan borrower is married and 0 if he or she is single. The variable missing takes the value of 1 if either the age variable or the marital status of the loan borrower is missing and 0 otherwise. For all the regressions, we impose the state cross district fixed effect. The standard error is clustered at state cross district level. *,**,*** represents statistical significance at 90%,95% and 99% levels.

Panel A: OLS	(1)	(2)	(3)	**Panel B**: Logit	(1)	(2)	(3)
	all loans	non default loans	all loans		all loans	non default loans	all loans
	=1 if more than 2	=1 if more than 2			=1 if more than 2	=1 if more than 2	
VARIABLES	month delinquency	month delinquency	=1 if default		month delinquency	month delinquency	=1 if default
May	0.00149	0.000591	0.00118		0.0421	0.0120	0.0446
	(0.00329)	(0.00232)	(0.00234)		(0.0728)	(0.0920)	(0.0841)
June	0.00328	-0.000112	0.00374		0.153	0.0313	0.283*
	(0.00481)	(0.00324)	(0.00383)		(0.156)	(0.131)	(0.148)
July	0.00652	0.00618**	0.000497		0.311**	0.361**	0.229*
	(0.00407)	(0.00296)	(0.00285)		(0.132)	(0.145)	(0.128)
Aug	0.0148***	0.0110***	0.00456		0.327***	0.430***	0.188*
	(0.00494)	(0.00294)	(0.00375)		(0.0977)	(0.105)	(0.104)
Sept	0.00971*	0.00833**	0.00180		0.335**	0.393**	0.246**
	(0.00560)	(0.00380)	(0.00393)		(0.135)	(0.162)	(0.114)
Oct	-0.00108	-6.87e-05	-0.00108		0.0852	0.104	0.0590
	(0.00407)	(0.00277)	(0.00301)		(0.131)	(0.165)	(0.0958)
interest rate	0.0127***	0.00688***	0.00625***		0.854***	0.727***	0.895***
	(0.00219)	(0.00102)	(0.00158)		(0.258)	(0.170)	(0.302)
mutiple loans	0.00735*	0.00438	0.00333		-0.0691	0.0238	-0.233
	(0.00432)	(0.00266)	(0.00352)		(0.0666)	(0.0867)	(0.160)
married	0.00353	0.00109	0.00264		0.0518**	0.0108	0.0891**
	(0.00370)	(0.00237)	(0.00264)		(0.0233)	(0.0342)	(0.0370)
age	-0.000459***	-0.000155**	-0.000348***		-0.00843**	-0.00471	-0.0121***
	(0.000145)	(7.60e-05)	(0.000112)		(0.00356)	(0.00350)	(0.00271)
missing	0.00742	0.00261	0.00505		0.128**	0.0824	0.159**
	(0.00466)	(0.00283)	(0.00384)		(0.0588)	(0.0734)	(0.0635)
Constant	-0.0400*	-0.0278**	-0.0137		-12.04***	-10.92***	-14.94***
	(0.0227)	(0.0112)	(0.0163)		(2.590)	(1.700)	(3.006)
State*District Fixed Effect	Y	Y	Y		Y	Y	Y
Observations	110,102	106,086	110,102				
R-squared	0.131	0.057	0.105		110,257	106,236	107,831

Table 6 Regional Economic Growth and Mortgage Loan Performance

The following table reports the results by estimating regression equation (3). The tests are conducted over the mortgage loans originated from April to October in FY 2014. The dependent variable takes the value of 1 if the loan status is at least delinquent for 2 months at Sep FY 2015 and 0 otherwise. The calendar month variable (e.g. May) takes the value of 1 if the mortgage loan is originated in the corresponding month in FY 2014 and 0 otherwise. The dummy variable *high* takes the value of 1 if the underlying real estate is in the district with the GDP growth rate higher than the median and 0 otherwise. Each column refers to the GDP growth rate computed for real total GDP, GDP per capita, GDP for construction section, GDP for agriculture section, GDP for manufacture section and GDP for banking section respectively. The GPD growth rate is the average of the past 5 year's GDP growth rate of the district. GDP growth rate $= \frac{1}{5}(\sum_{t=2010}^{2014} \frac{GDP_t - GDP_{t-1}}{GDP_{t-1}})$. For all the regressions, we impose the year cross month fixed effect and state cross district fixed effect. The standard error is clustered at state cross district level *, **, *** represents statistical significance at 90%, 95% and 99% levels.

VARIABLES	(1) GDP	(2) GDP per capita	(3) GDP(construction)	(4) GDP(argriculture)	(5) GDP(manufacture)	(6) GDP(banking)
May*High	-0.00666	0.00409	0.00348	0.00543	0.000216	0.00339
	(0.00650)	(0.00661)	(0.00647)	(0.00652)	(0.00691)	(0.00708)
June*High	0.00837	0.0125	0.00884	0.0122	-0.00391	-0.00331
	(0.00978)	(0.0100)	(0.00962)	(0.00945)	(0.0105)	(0.0104)
July*High	0.00650	0.00987	0.0214***	-2.47e-05	0.00165	0.00972
	(0.00816)	(0.00817)	(0.00800)	(0.00816)	(0.00837)	(0.00849)
Aug*High	0.0212**	0.0257***	0.0287***	0.0130	-0.00212	-0.00282
	(0.00949)	(0.00951)	(0.00935)	(0.00958)	(0.00995)	(0.0101)
Sep*High	0.0174	0.0283***	0.0204*	0.00619	0.0107	-0.00245
	(0.0111)	(0.0107)	(0.0109)	(0.0115)	(0.0111)	(0.0114)
Oct*High	0.00784	0.00987	0.0139*	0.00662	0.0130	0.00736
	(0.00819)	(0.00826)	(0.00805)	(0.00810)	(0.00817)	(0.00875)
interest_rate	0.0126***	0.0126***	0.0127***	0.0126***	0.0127***	0.0127***
	(0.00197)	(0.00197)	(0.00196)	(0.00197)	(0.00197)	(0.00197)
Constant	-0.0570***	-0.0573***	-0.0565***	-0.0566***	-0.0564***	-0.0566***
	(0.0199)	(0.0199)	(0.0196)	(0.0198)	(0.0198)	(0.0199)
year*month fixed effect	Y	Y	Y	Y	Y	Y
state*district fixed effect	Y	Y	Y	Y	Y	Y
Observations	110,879	110,879	110,879	110,879	110,879	110,879
R-squared	0.131	0.131	0.131	0.131	0.131	0.131

Table 7 Regional Demographic Composition and Mortgage Loan Performance

The following table reports the results by estimating regression equation (3). The tests are conducted over the mortgage loans originated from April to October in FY 2014. The dependent variable takes the value of 1 if the loan status is at least delinquent for 2 months at Sep FY 2015 and 0 otherwise. The calendar month variable (e.g. May) takes the value of 1 if the mortgage loan is originated in the corresponding month in FY 2014 and 0 otherwise. The dummy variable *high* takes the value of 1 if the underlying real estate is in the district with the demographic composition rate higher than the median and 0 otherwise. Column (1), (2) and (3) refers to the demographic composition measured by the percentage of literate people out of the district population, the percentage of children out of the district population and the percentage of working labor out of the district population. For all the regressions, we impose the year cross month fixed effect and state cross district fixed effect. The standard error is clustered at state cross district level *, **, *** represents statistical significance at 90%,95% and 99% levels.

VARIABLES	(1) literacy rate	(2) % children	(3) % working labor	(4) % scheduled caste
May*High	0.00282	0.00699	0.00455	0.00562
	(0.00783)	(0.00748)	(0.00657)	(0.00663)
June*High	-0.0118	0.0178*	0.00479	0.0127
	(0.0114)	(0.0108)	(0.00953)	(0.00961)
July*High	0.00361	0.0130	0.0167**	0.00782
	(0.00871)	(0.00852)	(0.00806)	(0.00814)
Aug*High	0.00452	0.0232**	0.0111	**0.0201****
	(0.00996)	(0.00944)	(0.0100)	**(0.00934)**
Sep*High	-0.000578	0.0231**	0.00143	0.0173
	(0.0110)	(0.0106)	(0.0111)	(0.0109)
Oct*High	0.00588	0.00574	0.00979	-0.00108
	(0.00876)	(0.00857)	(0.00797)	(0.00812)
interest_rate	0.0127***	0.0126***	0.0127***	0.0127***
	(0.00197)	(0.00197)	(0.00197)	(0.00197)
Constant	-0.0565***	-0.0577***	-0.0571***	-0.0569***
	(0.0198)	(0.0198)	(0.0197)	(0.0197)
year*month fixed effect	Y	Y	Y	Y
state*district fixed effect	Y	Y	Y	Y
Observations	110,879	110,879	110,879	110,879
R-squared	0.131	0.131	0.131	0.131

Appendix

A.1 India Income Tax Exemption Policy

This table summarizes the basic Indian income tax schedule for three fiscal tax years: FY2013 (before policy change); FY2014 (policy change); and FY 2015 (post policy change). Fiscal tax year is from April 1st to March 31st; for example, FY2013 is from April 1st, 2013 to March 31st, 2014. India's income tax schedule varies by age group. Within each age group, tax rates also vary by net income level. For example, suppose an individual A is below 60 years old and has the total income of 300,000 Indian Rupee in FY201, then she does not pay income tax on the 200,000 income if she has 200,000 Indian Rupee of long-term savings that can be exempted and pays income tax only on the 100,000 net income that is above the limit. Her total FY2013 income tax is thus 10,000 Indian Rupee (100,000*10%). The net income is obtained by deducting the amount of exemption from the total income. Following the same example, suppose that the individual A's total income remains at 300,000 Indian Rupee in FY2014. Given the 50,000 Indian Rupee increase in the exemption limit, her net income can be 50,000 Indian Rupee if she increases her long-term savings to 250,000 Indian Rupee and her FY2014 income tax is 5,0000 Indian Rupee, which is half the income tax she paid in FY2013. The total exemption limit is also varies by age group. Within each age group, the total exemption limit on long-term savings was increased. For example, the total income exemption limit is raised by 50,000 Indian Rupee from FY 2013 to 300,000 Indian Rupee in FY 2014 for residents below the age of 80; this increased limit remain higher in the following fiscal tax year FY2015.

FY 2013			FY 2014			FY 2015
Age below 60						
income level	Tax Rate	exemption limit	income level	Tax Rate	exemption limit	exemption limit
<=Rs. 200,000	Nil		<=Rs. 250,000	Nil		
Rs. 200,001-Rs.500,000	10%	Rs. 200,000	Rs. 250,001-Rs.500,000	10%	Rs.250,000	Rs.250,000
Rs. 500,001-Rs.1,000,000	20%		Rs. 500,001-Rs.1,000,000	20%		
>=1,000,001	30%		>=1,000,001	30%		
Age 60-80						
income level	Tax Rate	exemption limit	income level	Tax Rate	exemption limit	exemption limit
<=Rs. 250,000	Nil		<=Rs. 300,000	Nil		
Rs. 250,001-Rs.500,000	10%	Rs.250,000	Rs. 300,001-Rs.500,000	10%	Rs.300,000	Rs.300,000
Rs. 500,001-Rs.1,000,000	20%		Rs. 500,001-Rs.1,000,000	20%		
>=1,000,001	30%		>=1,000,001	30%		
Age >80						
income level	Tax Rate	exemption limit	income level	Tax Rate	exemption limit	exemption limit
<=Rs. 500,000	Nil		<=Rs. 500,000	Nil		
Rs. 500,001-Rs.1,000,000	20%	Rs. 500,000	Rs. 500,001-Rs.1,000,000	20%	Rs. 500,000	Rs. 500,000
>=1,000,001	30%		>=1,000,001	30%		

A.2 Exemptible Items under Section 80C and Section 24

- The exemptible Items under Section 80C are as the following.

Provident Fund (PF): Any contributions to Provident Fund, Voluntary Provident Fund (VPF) or savings made in Public Provident Fund (PPF) are eligible for income tax deduction under section 80C of Indian Income Tax Act.

Life Insurance Premiums: Any Life Insurance premiums (for one or more insurance policies) paid by you for yourself, your spouse or your children is eligible under income tax deduction under section 80C of Indian Income Tax Act.

ELSS Equity Linked Saving Schemes: Any investment made in certain Mutual Funds called equity linked saving schemes qualifies for section 80C deduction. Please note that not all mutual fund investments are eligible for this deduction. Some examples of ELSS funds are: SBI Magnum Tax Gain, HDFC Tax Saver, HDFC Long term advantage, etc.

ULIP (Unit Linked Insurance Plan): Investments made in certain ULIPs of Unit Trust of India and LIC of India are eligible for 80C deduction.

Bank Fixed deP.O.S.its or Term deP.O.S.its of >5 years: According to a relatively new provision amount saved in fixed deP.O.S.its of term at least five years is eligible for income tax deduction under section 80C of Indian Income Tax Act.

Principal part of EMI on Housing Loan: If you are paying EMI on a housing loan, note that the EMI (equated monthly installments) consists of two parts - principal part and interest part. The principal part of the EMI on your housing loan is eligible for income tax deduction under section 80C. Note that the interest part is also eligible for tax deduction, however not under section 80C but section 24.

Tuition Fees: Amount paid as tuition fee for the education of two children of the assesse is eligible for deduction under section 80C of Indian Income Tax Act.

Other 80C deductions: Amount saved in National Saving Certificate (NSC), Infrastructure Bonds or Infra Bonds, amount paid as stamp duty and registration charges while buying a new home are eligible for income tax deductions under section 80C of Indian Income Tax Act.

- **Section24 (b)**

Deduction of interest on borrowed capital from house property income. This deduction is allowed only in case of house property which is owned and is in the occupation of the person for his own residence. The purpose of borrowing capital could be repair or renewal or reconstruction of the house or acquisition or construction of the house.

A.3

Table A.3 Summary Statistics of Mortgage Loan and Borrower Characteristics (FY 2013)

The following table reports the summary statistics of the mortgage loan and borrower characteristics for the loans initiated from April to March during FY 2014. We report the number of loans initiated, mean, median and standard deviation of loan borrower's age, loan term (in months), approved loan limit (in 1000 INR), annual interest rate (at Sep 2015), EMI (equated monthly installment in 1000 INR), primary collateral value (in 1000 INR) and the ratio between approved loan limit and primary collateral value. The EMI is computed by EMI =

$$\frac{approved\ loan\ limit \times \frac{r}{12} \times (1+\frac{interest\ rate}{12})^{loan\ term}}{(1+\frac{interest\ rate}{12})^{loan\ term}-1}.$$

FY 2013	N	mean	median	sd	mean	median	sd	mean	median	sd	mean	median	sd
month			age			loan term			approved loan limit			interest rate	
Apr	18,422	47.79	45	16.8	201.42	198	57.95	1392.65	1000	2612.64	10.07	10.25	1.35
May	15,011	47.13	45	16.0	196.88	192	61.61	1278.24	1000	1716.77	10.18	10.25	1.18
June	16,812	46.83	44	16.1	199.83	192	57.51	1290.84	1000	1818.67	10.14	10.25	1.07
July	17,725	46.21	44	15.7	197.37	183	58.14	1254.97	961	1722.25	10.15	10.25	1.00
Aug	16,648	46.02	44	15.5	197.15	180	58.92	1254.79	1000	1713.74	10.17	10.25	0.95
Sept	16,998	45.71	44	15.4	196.62	180	57.82	1215.20	950	2099.96	10.12	10.25	1.02
Oct	15,906	45.89	44	15.5	199.83	192	59.75	1351.69	1000	2326.00	10.08	10.25	1.07
Nov	14,765	46.23	44	15.9	197.91	192	65.21	1367.91	1000	1725.76	10.13	10.30	0.96
Dec	14,267	46.47	44	16.4	202.18	192	59.67	1426.25	1000	3120.17	10.13	10.30	0.97
Jan	16,232	46.28	44	16.0	202.34	195	59.27	1356.57	1008	1529.60	10.09	10.30	1.02
Feb	13,836	46.09	44	16.4	203.18	198	60.36	1379.75	1075	1476.58	10.06	10.25	0.97
Mar	13,859	46.09	44	16.1	200.79	192	61.05	1381.87	1000	1636.87	9.99	10.25	1.07

FY 2013	N	mean	median	sd	mean	median	sd	mean	median	sd
month			EMI			primary collateral value			approved loan limit/primary collateral value	
Apr	18,422	14.67	10.59	26.88	2456.64	1700	5407.29	0.583	0.62	0.203
May	15,011	13.54	10.28	18.38	2350.47	1690	5347.42	0.576	0.60	0.203
June	16,812	13.58	10.28	18.85	2337.21	1700	4096.64	0.575	0.60	0.204
July	17,725	13.23	9.92	17.82	2233.49	1600	3505.80	0.586	0.60	0.200
Aug	16,648	13.26	10.06	18.03	2319.23	1652	7151.35	0.584	0.60	0.202
Sept	16,998	12.81	9.82	21.59	2180.73	1536	3657.74	0.583	0.60	0.199
Oct	15,906	14.24	10.57	26.10	2463.54	1755	4941.30	0.577	0.60	0.203
Nov	14,765	14.44	10.93	17.94	2530.45	1843	4367.19	0.572	0.60	0.203
Dec	14,267	15.04	10.93	31.19	2586.65	1862	5784.89	0.584	0.61	0.201
Jan	16,232	14.27	10.93	16.51	2498.96	1875	3712.49	0.578	0.60	0.202
Feb	13,836	14.40	11.21	15.22	2518.09	1890	6927.35	0.588	0.62	0.201
Mar	13,859	14.44	10.83	16.94	2544.06	1842	3861.74	0.583	0.61	0.202

A.4

Table A.4 Summary Statistics of Mortgage Loan Performance (FY 2013)

The following table reports the percentage of non-performance mortgage loan accounts at September of the next year after the loan's origination. Panel A reports the results by dividing the sample based on loan terms (in months). Panel B reports the results by dividing the sample based on approve loan credit limit. Column (1) is for the number of loans originated in the corresponding month during FY 2013. Column (2) reports the percentage of loans with more than 2 month delinquency at September FY 2014 over the total number of mortgage loans originated during the corresponding month in FY 2013. Column (3) reports the percentage of loans default at September FY 2014 over the total number of mortgage loans originated during the corresponding month in FY 2013. Column (4) reports the percentage of loans with more than 2 month delinquency at September FY 2014 over the total number of non-default loans originated in the corresponding month in FY 2013.

Panel A: by loan terms	loan term <=180				loan term >180			
month	N	% (more than 2 month delinquency/total No. of loans)	% (default loans/total No. of loans)	% (more than 2 month delinquency/total No. non-default loans)	N	% (more than 2 month delinquency/total No. of loans)	% (default loans/total No. of loans)	% (more than 2 month delinquency/total No. non-default loans)
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Apr	8,009	6.09%	3.48%	2.70%	10,337	2.67%	0.74%	1.94%
May	7,011	8.30%	5.55%	2.91%	8,000	2.70%	0.86%	1.85%
June	7,848	7.86%	4.05%	3.97%	8,910	2.35%	0.73%	1.63%
July	8,745	8.39%	3.61%	4.96%	8,879	2.24%	0.42%	1.83%
Aug	8,478	10.14%	5.04%	5.38%	8,139	2.10%	0.38%	1.73%
Sept	8,771	8.30%	4.93%	3.55%	8,093	2.30%	0.46%	1.85%
Oct	7,465	5.77%	2.99%	2.87%	8,295	2.25%	0.55%	1.71%
Nov	6,736	10.11%	7.72%	2.59%	7,869	1.87%	0.30%	1.57%
Dec	6,361	4.46%	1.68%	2.83%	7,725	2.29%	0.45%	1.85%
Jan	7,145	4.67%	1.89%	2.84%	8,949	2.53%	0.50%	2.03%
Feb	6,405	5.54%	2.11%	3.51%	7,714	1.93%	0.35%	1.59%
Mar	6,371	4.11%	1.48%	2.68%	7,428	2.10%	0.36%	1.74%
Panel B: by approved loan credit limit	approved loan credit limit <=800,000 INR				approved loan credit limit > 800,000 INR			
Apr	7,575	7.38%	4.28%	3.24%	10,771	1.90%	0.30%	1.61%
May	6,495	9.96%	6.65%	3.55%	8,516	1.77%	0.31%	1.47%
June	7,080	9.24%	5.10%	4.36%	9,678	1.78%	0.23%	1.55%
July	7,892	9.55%	4.22%	5.57%	9,732	1.84%	0.21%	1.64%
Aug	7,222	12.21%	6.02%	6.59%	9,395	1.59%	0.24%	1.34%
Sept	7,763	9.53%	5.73%	4.03%	9,101	1.91%	0.26%	1.65%
Oct	6,530	6.80%	3.71%	3.21%	9,230	1.89%	0.29%	1.60%
Nov	5,529	12.46%	9.55%	3.22%	9,076	1.53%	0.18%	1.36%
Dec	5,184	5.92%	2.39%	3.62%	8,902	1.73%	0.20%	1.53%
Jan	6,023	6.39%	2.56%	3.94%	10,071	1.74%	0.26%	1.48%
Feb	5,159	7.29%	2.91%	4.51%	8,960	1.43%	0.13%	1.30%
Mar	5,318	5.30%	2.05%	3.32%	8,481	1.60%	0.14%	1.46%

A.5

Table A.5 Mortgage Loan Origination and Loan Performance (FY 2013 and FY 2012)

The following table reports the results on estimating regression equation (1). Panel A estimates the OLS regression equation and Panel B estimates the Logit model. The tests are over the mortgage loans originated from April to October in FY 2013 and FY 2014 respectively. In column (1),with all the mortgage loans, the dependent variable takes the value of 1 if the mortgage loan is at least 2 month delinquent at Sep FY 2014/2013 and zero otherwise. In column (2), we restrain the sample of the non-default loans at Sep FY 2014/2013. In column (3), the dependent variable takes the value of 1 if the mortgage loan is default at Sep FY 2014/2013. The explanatory variable of calendar month takes the value of 1 if the mortgage loan is originated in the corresponding month and zero otherwise. The interest rate is at the date of Sep FY 2014/2013. In Panel A, We control for state cross district fixed effect and the standard error is clustered at the state cross district level. In Panel B, we impose the state dummy variables. *,**,*** represents statistical significance at 90%,95% and 99% levels.

Panel A: OLS	FY 2013			FY 2012		
	(1)	(2)	(3)	(1)	(2)	(3)
	all loans	non default loans	all loans	all loans	non default loans	all loans
VARIABLES	=1 if more than 2 month delinquency	=1 if more than 2 month delinquency	=1 if default	=1 if more than 2 month delinquency	=1 if more than 2 month delinquency	=1 if default
May	0.00363	-0.00338	0.00750*	-0.00130	-0.000454	-0.000750
	(0.00466)	(0.00234)	(0.00392)	(0.00314)	(0.00239)	(0.00205)
June	0.00252	0.000561	0.00226	0.00494	0.00224	0.00294
	(0.00342)	(0.00200)	(0.00267)	(0.00337)	(0.00239)	(0.00286)
July	0.000503	0.00472*	-0.00424	0.00114	0.00345	-0.00225
	(0.00409)	(0.00247)	(0.00337)	(0.00387)	(0.00261)	(0.00293)
Aug	0.00643	0.00592	0.000653	-0.00203	0.000891	-0.00291
	(0.00542)	(0.00453)	(0.00311)	(0.00323)	(0.00227)	(0.00223)
Sept	-0.00609	-0.00510**	-0.00107	-0.00476	-0.00290	-0.00191
	(0.00409)	(0.00255)	(0.00306)	(0.00306)	(0.00221)	(0.00216)
Oct	-0.0102***	-0.00457**	-0.00586**	-0.00382	-0.000358	-0.00343
	(0.00358)	(0.00209)	(0.00259)	(0.00321)	(0.00227)	(0.00226)
interest rate	0.00910***	0.00515***	0.00444**	0.00320	0.00475***	-0.00132
	(0.00245)	(0.000839)	(0.00188)	(0.00252)	(0.000866)	(0.00210)
Constant	-0.0436*	-0.0247***	-0.0234	0.00126	-0.0278***	0.0270
	(0.0247)	(0.00877)	(0.0188)	(0.0258)	(0.00902)	(0.0215)
State*District fixed effect	Y	Y	Y	Y	Y	Y
Observations	106,764	104,492	106,764	65,681	64,866	65,681
R-squared	0.088	0.044	0.098	0.057	0.029	0.078
Panel B: Logit						
May	0.125	-0.143	0.393*	0.00373	-0.0264	0.0452
	(0.141)	(0.111)	(0.207)	(0.110)	(0.141)	(0.179)
June	0.143	0.0956	0.205	0.215*	0.154	0.305
	(0.122)	(0.0777)	(0.213)	(0.119)	(0.0949)	(0.230)
July	0.116	0.215	-0.0343	0.0772	0.205	-0.138
	(0.191)	(0.143)	(0.294)	(0.128)	(0.154)	(0.274)
Aug	0.279	0.330	0.198	-0.00253	0.0692	-0.111
	(0.214)	(0.220)	(0.224)	(0.118)	(0.114)	(0.279)
Sept	0.0638	-0.0624	0.220	-0.0510	-0.0345	-0.0115
	(0.160)	(0.107)	(0.257)	(0.131)	(0.141)	(0.199)
Oct	-0.132	-0.0968	-0.167	-0.0843	0.0608	-0.201
	(0.168)	(0.0944)	(0.297)	(0.149)	(0.128)	(0.254)
interest rate	0.520	0.522***	0.547	0.0866	0.574**	-0.161
	(0.368)	(0.136)	(0.594)	(0.303)	(0.235)	(0.278)
Constant	-8.919**	-8.912***	-11.34*	-5.639*	-11.01***	-4.414
	(3.835)	(1.438)	(6.250)	(3.120)	(2.483)	(2.760)
state fixed effect	Y	Y	Y	Y	Y	Y
Observations	107,597	104,952	105,010	65,641	64,705	64,407