

More than Intent: Evaluating Publicness in Mortgage Lending

Stephanie Moulton¹
Doctoral Student & Associate Instructor
School of Public and Environmental Affairs
Indiana University, Bloomington IN

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Introduction

All organizations are public. Barry Bozeman (1987) advanced this line of thinking two decades ago, challenging researchers to move beyond a dichotomous view of public and private organizations. Not only are private organizations subject to public regulations and constraints, they also often provide for public services and outcomes. Questions arise about providing for such public outcomes with competing private demands and incentives (Bardach and Lesser 1996; Moe 2001; Wise 1990). This is nowhere more apparent today than in the mortgage lending industry².

The public interest in mortgage lending has evolved significantly over the past century, from intervening in a market where only the wealthy could afford mortgage financing in the 1930's to a market today where mortgage financing *in some form* is available to most everyone. From 1982 to 2005, homeownership rates increased from 64.8 to 69 percent nationwide (HUD 2006). Relaxed underwriting requirements, new mortgage products, and decreased discrimination have removed many barriers to homeownership. Due to changes in mortgage lending, the underserved homebuyer today is a highly targeted individual with substantial credit and income needs, often falling victim to subprime or predatory loans. The public interest in mortgage lending today, therefore, is not simply to increase homeownership opportunities, but to ensure affordable sustainable homeownership (HUD 2004; Shlay 2006; Kivell 2006; Williams et al 2005; Carasso 2005; Carliner 1998).

Mortgage Revenue Bond (MRB) programs, administered predominately by state housing finance agencies, are a tax subsidy initiative to facilitate low income homeownership. In 2005 alone, 9.8 billion dollars was generated through the sale of tax exempt mortgage revenue bonds by state housing finance agencies, subsidizing roughly 90,000 home purchases by low income borrowers across the United States (National Council of State Housing Finance Agencies 2006-1), representing the largest tax expenditure of the federal government benefiting low income homebuyers. State housing agencies sell MRB's to investors at low interest rates (who accept the low rates because they receive tax free interest earnings), and then use the interest savings to buy down the interest rates of mortgages for low income homebuyers. One of the stated public objectives for the MRB program is to serve borrowers not likely to be served by conventional lending programs (National Council for State Housing Finance Agencies 2006-2). Previous research, while outdated, is skeptical about the ability of MRB programs to serve public interests in light of the private interests served by such programs for lenders, realtors, sellers, builders and even state agencies (Durning 1992; Durning 1987; Cooperstein 1992)³.

²Regardless of the exact cause of the "subprime mortgage crisis" and its appropriate fix (for example, see Schwartz and Bajaj 2007), the reaction to the crisis raises awareness of the underlying, and sometimes conflicting private and public interests in mortgage lending (Immergluck 2004).

³In an article published in the Journal of Policy Analysis and Management two decades ago, Durning (1987) raised serious concern about the capitalization effects of MRB subsidies, whereby more than 20 percent of the value of

The purpose of this analysis is to evaluate the role of the originating lender in providing for public outcomes in the MRB program, including not only serving highly targeted underserved borrowers, but providing for sustainable homeownership over time. As the primary point of contact for potential borrowers, the originating lender is the “street level bureaucrat”, largely responsible for determining *who* applies for *what* mortgage programs and the nature of the initial services that they receive (Lipsky 1980; HUD 1998). Using a unique dataset including borrower characteristics and loan payment performance of more than 5,000 borrowers participating in Indiana’s MRB program from 2003-2006, as well as HMDA (Home Mortgage Disclosure Act) data on more than 200 private lending institutions, this analysis employs a multilevel research design to analyze the interactive effects of borrower risk and lender characteristics on loan performance of borrowers over time.

This analysis offers two distinct contributions to the literature. First, for housing policy researchers and analysts, this analysis for the first time examines the role of the originating lender in providing for two often conflicting public goals of homeownership policies: serving the underserved and ensuring sustainable homeownership. This analysis finds that not only do certain lender characteristics predict mortgage delinquency, but that there is a nonlinear interaction between borrower risk and lender characteristics. While lender characteristics may not influence the payment performance of lower risk borrowers, such characteristics appear to have a significant effect on the payment performance of higher risk borrowers. This finding is important given that the majority of underserved borrowers targeted by public homeownership initiatives are also borrowers with higher risk.

Second, this analysis furthers the theoretical development of the “public” in public management. Based on a framework of organizational publicness grounded in institutional theory (Moulton 2007), this analysis suggests that while measures of intended publicness, typically from the regulatory environment, may predict superficial public outcomes such as participation in the public MRB program, they are less predictive of (and at times counterproductive to) substantive public outcomes in the MRB program, including reduced mortgage delinquency among high risk borrowers. By contrast, normative and cultural cognitive influences of organizational publicness are significantly predictive of substantive public outcomes. The implications of these findings for public homeownership policies and initiatives, as well as public management theory in general, are discussed.

MRB subsidies benefited the seller or builder (through increasing the purchase price knowing that the MRB subsidy was available), or purchasers who simply bought more house to match the reduced interest rate.

Public Outcomes in Mortgage Lending

To evaluate the role of the originating lender on public outcomes, it is first necessary to define public outcomes. Public outcomes in mortgage lending can be understood from two perspectives: (1) the types of borrowers served by particular lending institutions, and the extent to which lending institutions are reaching the “underserved” populations; and (2) the factors that contribute to mortgage sustainability (lack of default and foreclosure) over time. While providing mortgages to underserved individuals is of considerable public importance, and has been throughout the history of mortgage lending (Immergluck 2004), a focus on the sustainability of homeownership, particularly among the targeted underserved populations, is becoming increasingly important to the success (or failure) of public homeownership initiatives.

Public involvement in mortgage lending exists based on the assumption that the mortgage lending market has imperfections, such as information asymmetries between borrowers and lenders, and potential for negative externalities as in the case of foreclosure (Immergluck 2004; Barr 2005). The very initiation (and continuation) of the Home Mortgage Disclosure Act (HMDA) in 1975 and the Community Reinvestment Act (CRA) in 1977 signals that lenders can play a critical role in who receives (and now, at what cost they receive) mortgage credit. In general, HMDA requires federally regulated mortgage originators (including conventional lenders, mortgage companies, thrifts, and independent agencies) making conventional and government guaranteed mortgages within Standardized Metropolitan Areas to disclose publicly certain data on each loan originated, annually. In the 2005 HMDA data, the nearly 8,850 lenders reporting comprised roughly 80 percent of all home lending activity in the U.S. (Avery, Brevoort, and Canner 2006). HMDA’s sister legislation, the CRA, places additional requirements on depository institutions in congruence with their annual HMDA reports.

The availability of HMDA and CRA data, combined with the pre and post 1970’s allegations of redlining in mortgage lending, prompted a volumous body of literature on lending patterns to underserved (low income and minority) borrowers and neighborhoods, focusing on approval and denial rates of applications for mortgages among differing populations (see most famously the “Boston Fed Study” by Munnell, Tootell and Browne 1996; see also Ladd 1998 for a solid review of the literature). While initially, such analyses focused broadly without accounting for specific lender differences, more recent research has begun to focus on the heterogeneity among lending institutions that contributes to variations in who is being served. Such analyses include variables such as lender financial attributes, operating position and marketing position, size (assets and originations), institution type, composition of lender workforce, branch locations and location of control (in state or out of state). In general, the inclusion of such variables increases the predictive ability of the decision to serve a particular individual with a mortgage (Harrison 2001; Williams and Nesbia 1997; Avery, Beeson and Sniderman 1994; Phillips-

Patrick and Rossi 1996; Kim and Squires 1995). Avery, Beeson and Sniderman (1994) find that as much as 75-90% of the variation in approval rates for lenders is based on the lenders' institutional size and focus, or its "market position". Phillips-Patrick and Rossi (1996) note that it is the "dynamics of the mortgage market and the participants, both borrower and lender, that determine lending outcomes" (22).

While no known research focuses specifically on the publicness of lender characteristics and outcomes, research employing HMDA data often treats the degree of lending to traditionally underserved borrowers and areas as an indicator of lender responsiveness to public influence. HMDA and CRA are often referred to as "regulations from below", whereby community groups pressure lending institutions to make commitments for targeted low income lending (Fishbein 1992; Avery, Bostic, Calem and Canner 1999; Shlay 1999; Schwartz 1999). In a study of Indiana lending institutions, Williams and Nesiba (1997) developed a "Community Mortgage Relative Performance Index (CMRPI)," based on the percentage of loans lenders made to low income areas, minority areas, and low income or black individuals. They refer to the percent of loans that go to low income and minority neighborhoods and individuals as the bank's "community reinvestment market share" (91). Shlay (1999) focuses on the change in the percent of loans to underserved individuals and areas over time, she terms "high CRA lending".

Some challenge that smaller, community based lending institutions are better suited to serve the needs of low income borrowers (Nakamura 1994; Immergluck 2004); however, research on lending to underserved areas and borrowers finds that in general larger, non-local institutions provide a higher degree of lending volume in underserved areas than small community banks (Campen 1993; Avery, Beeson and Sniderman 1999; Avery, Bostic, Calem and Canner 1999; Williams and Nesiba 1997). Research on lender consolidation finds that the consolidation process (by which small banks become part of larger institutions) does not decrease lending activity to low income borrowers, and in fact may increase the ability of the lender to serve low income borrowers (Avery, Bostic, Calem and Canner 1999)⁴. Further, banks with less regulation, such as consumer finance corporations, lend more to low income communities than do more traditional, heavily regulated lending institutions (Williams and Nesiba 1997). Lending institutions located in areas with community based CRA agreements were not

⁴This may be due in part to "informational returns to scale", whereby larger institutions obtain enough volume in certain low income neighborhoods to become specialists in such communities, or because larger volume lending allows for greater diversification of credit risk, thereby allowing larger lenders to assume more risk than smaller institutions. Further, larger institutions are more likely to have access to advanced technology beneficial not only for more efficiently originating loans, but also for handling the sometimes complex requirements of public loan programs that target low income borrowers (Campen 1993; Avery, Beeson and Sniderman 1999; Avery, Bostic, Calem and Canner 1999).

more likely to have increased lending volume to underserved borrowers and areas over time compared with non CRA agreement based lending institutions (Shlay 1999).

These findings suggest that lenders in general, regardless of regulation or orientation, are becoming more “public” in that they are serving previously underserved populations. Some are less optimistic. While CRA and GSE regulations may have contributed to the increase in lending to underserved areas, Williams, McConnell and Nesiba raise the concern that subprime lending may have contributed just as substantially (2001; 2005). Subprime lending comprised an estimated 20 percent of the mortgage lending market in 2005 (26.2 percent of all reported loans) up from 15.5 percent in 2004 and 5 percent in 1994 (Avery, Brevoort and Canner 2006). Further, a substantial portion of the gains made in homeownership among underserved low income and minority individuals was through subprime lending. Williams, Nesiba and McConnel (2005) refer to the increase in subprime lending among the underserved populations as the new “inequality” in mortgage lending, surpassing the racial and geographic inequalities of the past. Often, subprime loans provide higher cost mortgages with ambiguous terms to borrowers with lower incomes and less financial savvy. It is no surprise, then, that subprime mortgages have considerably higher rates of default than prime mortgages. Immergluck and Smith found that subprime mortgages originated in a Chicago neighborhood led to foreclosure at a rate of twenty times or more the rate of prime mortgages (2004).

In light of changes in mortgage lending, public initiatives are challenged to move beyond simply serving the underserved populations, to ensuring sustainable affordable homeownership for appropriately targeted borrowers (HUD 2004). Research on mortgage sustainability, particularly as it relates to originating lenders, is less pervasive, largely because there is no publicly available data on mortgage performance over time as there is on loan applications and denials through HMDA. In general, analyses of mortgage sustainability focus on one of two perspectives: an option based perspective or a triggering events perspective. Quercia and Stegman (1992) provide a review of the literature on mortgage loan performance, heavily grounded in the “option-based” perspective, where a borrower evaluates his or her options (a form of cost-benefit calculus) prior to making a decision to default on a mortgage. With this view in mind, the amount of equity in the home, or the loan to value ratio, is the best predictor of mortgage default as the borrower will not default when the equity outweighs the cost on the loan (borrower could sell the home for a profit). Other factors such as the age of the loan, borrower income, debt ratios and the sales price of the home also have influence, but they suggest this is secondary to the role that equity plays in the default decision.

Under the triggering events perspective, while negative equity may be a necessary condition for default, it is not a sufficient condition. Individuals experience delinquency or default based on their vulnerability in the presence of a triggering event (due to financial conditions, lack of information or

education, social support, etc). Increased use of credit scoring and risk based pricing in mortgage lending is predicated on this perspective, as credit score is one indicator of a borrower's vulnerability to future default and the ability to overcome a personal event which may foster a personal financial crisis (Avery, Bostic, Calem and Canner 1996). In fact, analyses incorporating credit scoring information into models predicting delinquency and default consistently find a strong significant relationship between lower credit scores and increased mortgage delinquency (Quercia, Stegman, Davis and Stein 2002; Avery, Bostic, Calem and Canner 1996; Calem and Wachter 1999). For example, Calem and Wachter (1999) found that the probability of being 60 days or more delinquent is 4 times more likely for borrowers with credit scores near the low end of the score range as for borrowers with scores near the high end.

Pre-purchase interventions, such as credit counseling and homebuyer education, are based on the assumption that there are "avoidable" factors associated with loan delinquency, such as lack of borrower information that can be addressed prior to origination to reduce the probability of delinquency in the presence of a triggering event (Baku and Smith 1998; Lax et al 2004)⁵. Preliminary empirical evidence suggests that certain types of pre-purchase counseling and education reduce the risk of delinquency (Hartarska, Gonzalez-Vega and Dobbs 2002; Hira and Zorn 2002). Using a pool of 40,000 mortgages originated under Freddie Mac's "Affordable Gold" mortgage program, Hira and Zorn (2002) were able to isolate borrowers who received counseling prior to purchase, as well as the medium through which the counseling was provided, and borrowers who received no pre-purchase counseling. Tracking the borrowers' mortgage payment patterns for two to seven years after home purchase, Hira and Zorn found that individual counseling and face to face classroom education reduced the rate of delinquency 41 percent and 23 percent respectively.

Little known scholarly research directly evaluates the role of the *originating lender* on mortgage default. Analyzing the influence of seven different *lender-servicers* on the cure rate of 30-day delinquent mortgages, Stegman et al (2006) find significant differences at the lender servicer level for low income borrowers participating in the Community Advantage Program, a low income homeownership program in North Carolina. For example, while controlling for loan and borrower characteristics, the odds of a borrower curing a delinquency were significantly reduced 51 percent for one particular lender servicer, and significantly increased 45 percent for a different lender servicer. In a qualitative evaluation of *nonprofit* neighborhood lending organizations, Baku and Smith (1998) find that institutional and structural characteristics of the lending organization, including perceptions of key staff, sources of

⁵Relying on survey data conducted for Freddie Mac by the Gallup Organization, Lax et al (2004) provide evidence that borrowers receiving subprime loans were less prepared prior to purchase than their prime counterparts, for example, 72.4% of prime borrowers reported that they were very familiar with mortgage terms (such as principal and interest and down payment), compared to only 51.7% of subprime borrowers. Twice as many subprime borrowers reported being not at all familiar compared with prime borrowers.

funding, and basic procedural structures, vary considerably among organizations with high default and low default mortgages. Of considerable importance to organizational publicness, organizations receiving predominately public funds for their lending programs tend to have higher delinquency rates than those with a substantial mix of private funding.

Preliminary empirical evidence suggests that lender differences not only may account for borrower selection, but that such differences may also be related to mortgage default. Thus, this brief review of the literature demonstrates the increasing importance of balancing risk and sustainability when originating lenders target the underserved for homeownership. Originating lenders may be able to influence not only the types of borrowers served, but also their sustainability over time by *targeting and selecting underserved borrowers who are appropriately prepared for homeownership*, and by *providing for additional preparation and support* prior to purchase. While it has been demonstrated, at least preliminarily, that originating lenders have the potential to provide for outcomes that are more public in nature, the next section of this analysis focuses on the “why” question. Theoretically, why would originating lenders pursue public outcomes?

Public Management Theory and Organizational Publicness

Understanding “why” relies on the theory of organizational publicness to evaluate the relationship between the originating lender and public outcomes. Based on Wamsley and Zald’s discussion of political and economic authority that constrain and shape the behavior of organizations (1973), Bozeman (1987) defines organizational publicness as constraint by “political authority”, whereby all organizations have some degree of political authority constraining their behavior, and those that are more public are those with a higher degree of constraint by political authority (and lesser constraint by economic authority). Political refers to matters of organizational legitimacy and power. Economy, on the other hand, is the system used by an organization to produce its output, specifying details of the task that maximize efficiency (Wamsley and Zald 1973). Research employing measures of organizational publicness confirms the distinctiveness of the concept, suggesting that it provides additional explanatory value beyond dichotomous public and private indicators based on organizational form (Bozeman and Bretchneider 1994; Bozeman and Kingsley 1998; Coursey and Bozeman 1990; Goldstein and Naor 2005; Scott and Falcone 1998). However, the additional explanatory value of the concept to explain varying public outcomes has been more modest (Heinrich and Fournier 2004).

In a forthcoming article, Moulton (2007) suggests that a critical reason for the lack of connection between publicness and public outcomes is due to an oversimplification of the concept of publicness, as constraint by government authority (typically measured as amount of funds from government sources). Based on insights from open systems perspectives of organizations, including neo-institutional and

resources dependence theory, Moulton suggests that while direct government influence may measure “intended” publicness, it is not necessarily a complete measure of “realized” publicness (Mintzberg 1987; Scott 2003). Rather than measuring publicness as strictly a “pre-determined independent variable” (as through intended publicness), Moulton suggests that realized publicness can be properly viewed as a dependent variable, or the extent to which the organization engages in behavior that is more public in nature.

By defining realized publicness as a dependent variable, open-natural systems theories of organizations can be used to identify those influences in the organizational field likely to contribute to or deter from realized publicness. The institutional environment includes the regulative (coercive), normative, and cultural cognitive (mimetic) features of an organization’s environment that “provide guidelines and resources for acting as well as prohibitions and constraint on action” (Scott 2001; 50). By contrast, the material resource environments of organizations include the technical considerations of organizations. Such technical considerations are embedded within an institutional environment, and as such, the technology is framed and shaped by the institutional environments (Scott 2003). Both the institutional and material resource environment can provide legitimacy for organizational action.

To the extent that an organization’s products or services can be easily measured in terms of economic efficiency, an organization is predominately subject to controls from the material resource environment (technological controls). However, to the extent that an organization’s products or services cannot be easily measured, it falls subject to a greater degree of institutional control (Scott 2003). This underlies a primary “a priori” assumption about public organizations, that because they lack an economic market for their outputs, they are more subject to other forms of control that may be considered “less efficient” (Dahl and Lindblom 1976; Rainey and Bozeman 2000). In a recent study of institutional theory and public organizations, Frumkin and Galaskiewicz (2004) find that public organizations are more susceptible to institutional influence than private organizations, due in large part to purposive goal ambiguity (inherent in the types of services provided) that begets institutional rather than economic authority. It would seem a natural extension, therefore, that private organizations pursuing public outcomes would also be more susceptible to influences from the institutional environment.

Descriptions of the regulative institutional environment often reference government authority as a critical source of regulatory institutional control. Ironically, however, such regulative influences are more likely to result in “strategic decoupling,” where the organization may superficially give the appearance of influence by the regulation, but actually not change its behavior significantly. By contrast, normative and cultural cognitive influences are more likely to result in genuine behavioral change (Scott 2003). Combining the insights of neo-institutional theory, in particular the regulative, normative and cultural cognitive nature of institutions with resource dependence theory, Moulton (2007) develops a

framework for understanding the environmental influences of realized publicness, reproduced as Appendix 1 of this article. An important distinction is made between intended influences, (based on agency and access) that are intentionally public or private (Benn and Gaus 1983), and influences that are not “intentionally” public or private, but nonetheless transmit public or private interests, termed normative-cultural influences of publicness. Public and private influences are not necessarily in conflict; however, as organizations are dependent on their environments for resources and legitimacy, some degree of public influence (intended or normative-cultural) must be present for an organization to exhibit realized publicness (and thus pursue public outcomes). Further, to the extent that an organization has more normative-cultural influences of publicness, its behavior is likely to result in more substantive public outcomes (rather than strategically decoupled public behavior).

Publicness and Mortgage Lending: Hypotheses

The conceptualization of publicness provided above, inline with neo-institutional theory, stresses the importance of organizational legitimacy for pursuing public outcomes. Thus, to the extent that the private market provides legitimacy for particular mortgage originations, it is likely that the *public* aspects of the lender’s environment have little influence on the lender’s behavior. However, to the extent that the private market does not provide legitimacy for particular mortgage originations, it is likely that the publicness of the lender’s environment is a critical determinant of the behavior of the originating lender. Further, the legitimacy provided by the market is linked to the uncertainty of the transaction (Goodrick and Salancik 1996).⁶

For mortgage lending in general, uncertainty has been greatly reduced through pre-purchase measurable indicators of borrower risk. In particular, credit score measures have been documented as significant predictors of mortgage default in most every known study in which they are employed (for recent trends see Retsinas and Belsky 2005; Barakova and Bostic, et al. 2003). This success in risk assessment has led to the popularity of automated underwriting and risk based pricing, where lenders evaluate the default risk of the borrower prior to purchase with a simple click of a button, and distribute mortgage prices to borrowers that match the risk presented by the borrower.

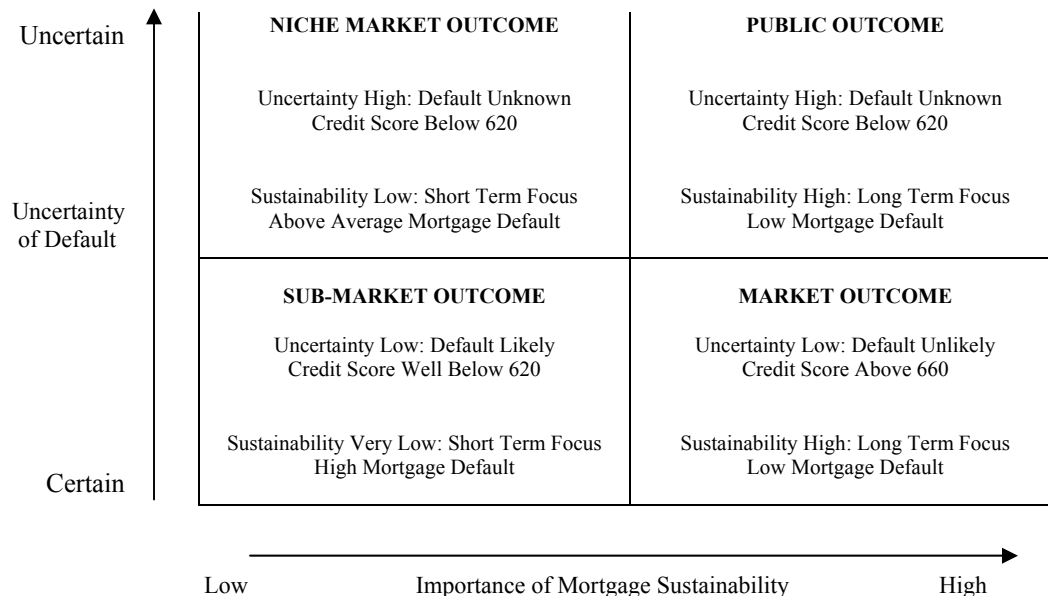
For borrowers at the high end or low end of the risk continuum, this “cost benefit calculus” reduces uncertainty quite effectively and drives lending decisions. In mortgage lending, there are generally three “tiers” of borrowers. Borrowers with credit scores above 660 are considered to have very

⁶ Goodrick and Salancik (1996) provide an excellent discussion of the role of uncertainty in organizational response, using data on the uncertainty in cesarean birth procedures in hospitals. While hospital “regulatory” guidelines provide clear direction for the conditions under which cesarean operations are appropriate or not appropriate in extreme circumstances (necessary for survival or completely elective), hospital regulations are ambiguous for moderate situations. It is in such situations that normative and cultural cognitive aspects of the institution (they refer to as organizational discretion) are able to influence the decision to perform a cesarean operation.

little risk of default, borrowers with credit scores between 620-660 have low to marginal risk of default, and borrowers with credit scores below 620 are considered to have higher risks of default, with scores substantially below 620 having the highest risk of default (Barakova et al 2003). One might find that for individuals falling on either extreme (for example, possessing very good credit or very poor credit) there is little cross lender variation in the decision to approve or deny a mortgage loan. With this being said, it can be generally agreed that “market authority” provides the basis for most mortgage decisions where there is little uncertainty, and does so efficiently and effectively. However, for marginal borrowers, there is still a significant amount of uncertainty. Traditionally underserved homebuyers often fall into this “marginal borrower” category, as many have marginal credit.

In addition to the uncertainty of borrowers (as determined by credit risk), the “market authority” for lending decisions is guided by the lender’s appetite for long term risk, or conversely, the importance of long term sustainability. Certain types of lenders, in particular subprime lenders, specialize in high risk lending and are less concerned with long term sustainability than prime mortgage lenders. At the extreme end of the spectrum, predatory lenders make their profit entirely “upfront” and have no concern for the long term sustainability of the mortgage. While this discussion of uncertainty (as guided by credit risk) and sustainability (as defined by long term mortgage default) is a broad oversimplification of the complexities of the mortgage lending market, it provides a general framework to identify the potential influence for environmental publicness on mortgage loan originations. The combinations of uncertainty and sustainability that potentially influence public outcomes are provided in figure 1, below. Influences of publicness are most likely for those outcomes that fall in the public quadrant of the figure.

Figure 1: Uncertainty, Sustainability and Public Outcomes in Low Income Mortgage Lending



Uncertainty causes lenders to seek additional sources of legitimacy. If it is not provided by their private market (as in specialized lenders, upper left quadrant), then they will not provide the service without additional sources of legitimacy to reduce the uncertainty of the transaction.

One way to reduce the uncertainty is to reduce the probability of delinquency. This might occur in one of two ways: (1) obtaining additional information about the borrowers to select, target or market to borrowers that are less likely to become delinquent (more prepared for homeownership, a better fit); or (2) by providing additional services to uncertain borrowers (such as education to prepare them) to reduce the uncertainty of such borrowers. Lenders won't engage in either of these if they receive all of their legitimacy from the private market. These are more costly, and less efficient than simply denying uncertain applicants (traditional lenders), or loaning to large volumes of uncertain applicants to offset risk (specialty lenders).

The likelihood of originators looking to additional sources to reduce uncertainty depends in part on their cultural cognitive and normative environment. Who are they legitimate to? Local lenders are more likely to be concerned with legitimacy to their communities (not just their private market stakeholders). In essence, this is a normative effect, as they are part of a group, a community, that holds certain norms about serving underserved borrowers without delinquency. At a deeper level, lenders that share the certain cultural-cognitive values are also more likely to seek legitimacy to these shared values. The decision to provide or not to provide high cost loans might represent particular values about lending practices.

For lenders in the MRB program, while they do not receive public funding, they are often subject to HMDA and CRA (and even GSE) reporting requirements, that regulate (informally or formally) targeting a significant portion of their lending volume to underserved borrowers. Further, MRB lenders that have a large volume of their borrowers from the MRB program may be dependent on the program for resources. These "regulatory" influences may encourage the lenders to participate in the MRB program. Such "regulation," however, does not stipulate how services are provided or the outcomes of such lending. Thus, for lenders in the MRB program, the regulatory environment may be a necessary, but not sufficient condition to provide for public outcomes. The normative and cultural cognitive environment of lenders, "unintended" influences of publicness, may be more predictive of their likelihood to provide for public outcomes.

Based on the above discussion, testable propositions and hypotheses are developed.

Propositions:

P₁₋₁: Characteristics of the originating lender will have the most influence on outcomes for borrowers with considerable uncertainty, as measured by credit scores below 620.

P₁₋₂: Conversely, for borrowers with credit scores above 660, characteristics of the originating lender will have little influence on borrower outcomes.

Hypotheses:

H₂₋₁: An increase in the regulatory publicness of a lender will increase the probability of superficial public outcomes, such as participation in the public MRB program.

H₂₋₂: An increase in the regulatory publicness of a lender will have no influence on the probability of substantive public outcomes, such as reduced delinquency for high risk borrowers.

H₃₋₁: An increase in the normative and/ or cultural cognitive publicness of a lender will increase the probability of substantive public outcomes, such as reduced delinquency for high risk borrowers.

Data

To complete this analysis, two primary datasets were used. First, borrower level measures were developed through a unique dataset of Indiana's Mortgage Revenue Bond program; containing data on all 7,835 borrowers purchasing homes with interest rates subsidized by the Indiana MRB program from years 2003-2006. This dataset was compiled from borrower level data provided by the loan servicer for Indiana's MRB program, U.S. Bank, and from data from the Indiana Housing and Community Development Authority (IHCDA), the administrator of the Indiana MRB program. The dataset includes critical information about borrowers, including credit, income and affordability information, general borrower demographics, purchase characteristics including loan amount and census tract of home purchase, and payment performance information as of January 1, 2007. Due to missing data on particular variables (see borrower descriptive statistics in Table 3), complete information at the borrower level that could also be linked to lender HMDA data files was available for 5,095 borrowers.

There are several benefits to using this dataset. First, while IHCDA subsidizes the interest rate on the MRB loans, the public agency does not work directly with the beneficiaries. Private lenders are the entities that implement the program. They receive funding to implement the program on a per loan basis, through loan origination fees, just as they would for purely private transactions. In Indiana, more than 50 private lenders originate loans using the MRB program (not including branch offices), providing considerable variation at the level of the loan originator. Second, after originating the loans, the private lenders are required to sell the MRB loans to U.S. Bank (the chosen servicer by IHCDA) within 60 days of closing. Because of this requirement, servicer variation is held constant on all MRB mortgages, and

any observed lender variation is from the originating lender. This offers this analysis a unique opportunity to isolate the effects of the originating lender. Third, to be eligible for an MRB subsidized mortgage in Indiana, borrowers must have incomes below 115% of area median. Further, IHCDCA makes downpayment assistance available (through a separate pool of funds) for borrowers with incomes less than 80% of area median. Other requirements for eligibility are determined by the originating lender, as necessary to be purchased by U.S. Bank. Finally, critical terms of the loans subsidized by the MRB program are determined by IHCDCA, including a pre-determined below market fixed interest rate and 30 year amortization. Thus, variations typically due to the type of mortgage receive (or the cost of the mortgage) are held constant across borrowers at any given point in time.

In addition to borrower level data, measures for originating lenders were developed from the Home Mortgage Disclosure (HMDA) Loan Application Register (LAR) and Transmittal Information Sheet (TIS) data files for all loans originated in Indiana as recorded through HMDA in 2005. The LAR files provide data on each loan applied for at the reporting institution in the given calendar year, with information including loan amount, borrower income, race and ethnicity, approve/ deny decision and rationale, location of purchase⁷, and (as of 2004) interest rate information if the loan is considered “high cost”. The TIS files provide information of the type of originating loan institution, its source of regulation, location of headquarters, and asset and loan volume information. For the aggregate lender analysis, all lenders receiving 100 or more applications for mortgage purchases in Indiana were included, for a total of 266 lending institutions. For the multilevel borrower and lender analysis, LAR and TIS data for each lender originating mortgages in the MRB program that were also required to report HMDA data were included (regardless of total Indiana volume), for a total of 49 lending institutions.

Finally, community level data from the US Bureau of the census captures variables at the county and census tract level. The use of HMDA data files to generate lender characteristics is common practice in the literature (Avery, Bostic, Calem and Canner 1999; Harrison 2001; Kim and Squires 1995; Williams and Nesiba 1997 & 2001), as is linking HMDA data to data from the US Census Bureau (Kim and Squires 1995; Harrison 2001; Williams and Nesiba 1997).

Overview of Methods

This analysis is divided into two parts. First, to contextualize the originating lenders participating in the MRB program and to identify aggregate trends among participating lenders, descriptive statistics, comparisons of means and multivariate logistic regressions are completed on the 266 lending institutions reporting at least 100 applications for mortgage financing to HMDA in 2005. Lender characteristics,

⁷Reporting institutions are not required to provide geographic information for home purchases located outside of an MSA.

including indicators of lender publicness, are employed to predict lender participation in the MRB program. While the hypotheses developed in this article are designed to test the multilevel design, understanding the aggregate trends for MRB and non MRB lenders informs the complete analysis.

Second, the core of the analysis consists of a multilevel research design including lender and census characteristics linked to borrower level characteristics and outcomes to predict the types of borrowers served by particular lenders and the payment performance of borrowers over time. Descriptive statistics for the three levels of analysis (borrower, lender and census tract) are provided, and means are compared for the variables at the three levels based on the income of the borrowers (low income, or < 80% of area median, and not low income, or > 80% of area median). Comparisons of means are next provided based on the delinquency status of borrowers for model variables. Outcomes of borrowers served, including delinquency and foreclosure, are predicting using multivariate logistic regression, with and without interaction terms, to identify possible interactions between lender characteristics and borrower risk⁸.

Aggregate Lender Analysis: Measures & Descriptions

Aggregate measures of lender characteristics were developed from the 2005 HMDA LAR and TIS data files for all Indiana lenders with 100 or more reported mortgage applications (n=266). The primary independent variables capture publicness characteristics of the lender, including traditional *regulative* measures of “community reinvestment” such as volume of service to underserved borrowers and areas, as well as more *normative and cultural* aspects of the lending environment, including volume of high cost lending, denial rates, and location of lender headquarters (a dummy variable for whether or not the lender is headquartered out of state). In addition to the primary independent variables, control variables for *lender demographics* and *agency type* (defined by source of regulation) were included. The primary dependent variables for the aggregate analysis measure participation in the public MRB program in Indiana.

TABLE 1 HERE

Table 1 provides descriptive statistics for the aggregate lender characteristics, including comparison of means based on whether or not the lender originated loans in Indiana’s MRB program anytime during 2003-2006. In general, lenders participating in the MRB program tend to be larger, with assets nearly four times as large as non MRB lenders (49.3 billion compared with 13.3 billion) serving

⁸ Alternative model specifications have been developed using hierarchical linear modeling, to account for the leveled nature of the data (Heinrich and Fournier 2004; Lynn, Heinrich and Hill 2001). Because the outputs of the HLM models using a binary logistic regression are more difficult to interpret using the current statistical software, this analysis reports the results of the multivariate logistic regression. In general, the results found using the multivariate logistic regression are robust under the HLM specification. Preliminary results of the HLM models are available from the author, and are reproduced in part in Moulton and Reingold (2007).

more than three times as many borrowers in 2005 (1,051 originations compared with 272 originations). Also, 36 percent of MRB lenders are regulated by the Office of the Comptroller of the Currency (OCC), a regulating body that typically oversees commercial banks and mortgage companies owned by depository institutions, compared with only 14 percent of non MRB lenders. Further, none of the lenders participating in the MRB program are credit unions (regulated by the NCUA) compared with 8 percent of non-MRB lenders, and less than 5 percent of MRB lenders are thrifts, compared to 20 percent of non-MRB lenders.

Aggregate characteristics of lender publicness are also provided on Table 1. While previous research has not specifically measured the publicness of originating lenders, the volume of lending to underserved borrowers and areas often serve as measures of the degree to which lenders are influenced by public HMDA and for certain lenders, CRA influence (Williams and Nesiba 1997; Shlay 1999). Further, the Government Sponsored Entity (GSE)'s Fannie Mae and Freddie Mac are required by law to provide a certain percent of their total loan volume to underserved areas, a requirement that trickles down to the originating lenders selling loans to the GSE's. Thus, such measures are viewed as suggestive of regulatory publicness in this analysis. Underserved areas are defined in this analysis in line with the GSE definition of an underserved area, as a census tract with median income at or below 120 percent of the metropolitan area and a minority population of 30 percent or greater, or a census tract with a median income at or below 90 percent of the median income of the metropolitan area (Williams, McConnell and Nesiba 2001). In general, Indiana lenders originate about 6.6 percent of mortgage loans in underserved areas, comprising 7 percent of their total dollars invested,⁹ with no real difference between MRB and non-MRB lenders. Roughly 10 percent of Indiana lenders' total mortgage originations are to low income borrowers, defined as having incomes less than 80 percent of the area median income, with no real difference between MRB and non-MRB lenders.

Several measures are also included that capture the normative and cultural-cognitive environment of the lender. First, measures of a lender's volume of high cost lending provide an indicator of the cultural-cognitive environment of the lending institution, where cultural-cognitive influences are defined as the shared values of the organization. At the extreme, lenders are considered by HUD to be "subprime" lenders if more than 50 percent of their lending volume is in subprime loans (HUD 2007). Interest rate data is reported to HMDA if the APR on a given loan is three percentage points above a comparable US Treasury APR in the same period. While not all loans with cost information reported would be considered subprime (HUD 2007), the reporting of such cost information provides a rough estimate of the proportion of loans originated by a lender that are higher cost than typical prime loans in the same period.

⁹ Throughout this analysis, loans originated include those originations for home purchase, owner occupied, one to four unit family dwellings only.

In Indiana, 21.5 percent of all mortgage originations for home purchase in 2005 were high cost, comprising roughly 20 percent of the total dollar volume in mortgage originations. There is a significant difference between MRB participating lenders and non-MRB lenders ($p < .01$); while less than one in ten mortgage originations for MRB lenders were high cost (and 12 percent of all low income originations), one in four of the originations for non-MRB lenders were considered high cost (with 28 percent of all low income originations). Denial rates of lenders are also indicative of the lender culture. Non-MRB lenders have denial rates nearly twice as large as MRB lenders, 8 percent and 13 percent, respectively, of all mortgage applications were denied ($p < .01$).

Finally, the localness of the lender is considered an important indicator of the publicness of the lender's normative environment. The publicness of a lender is predicated on the degree to which the lender is subject to public influence for legitimacy. Practically speaking, lenders are more likely to be subject to public influence if they are located in proximity to the source of the public influence. Traditional models of community based lending are grounded on the assumption that lenders headquartered in the same community in which they do business are more likely to consider the values and needs of their community when making decisions (Immergluck 2004; Taub 1988). Such lenders may be more likely to engage in community partnerships to ensure sustainable homeownership for their borrowers, as their future business "security" is dependent upon their legitimacy in the community over time. Roughly 61 percent of the lenders reporting HMDA data in 2005 were headquartered out of state, with no real difference between MRB and non-MRB participating lenders.

Aggregate Lender Analysis: Model Specifications

The purpose of the multivariate models in this section of the analysis is to identify overall lender characteristics predicting lender participation in the MRB program. As such, the logistic regression models 1 and 2 employ the following general equation:

$$Y_i = \alpha_1 + b_1P1 + b_2P2 + b_3P3 + b_4P4 + b_5S + b_6R + a_i, \text{ where}$$

- Y_i = Participation in the MRB program, measured as a dummy variable, where 1 = participation. For model 2, the dependent variable is measured as degree of participation in the MRB program, where participation is coded "1" if the lender originated more than 10 MRB loans from 2003-2006;
- $P1$ = Publicness indicator for underserved areas, as percent of total dollars invested in underserved areas;
- $P2$ = Publicness indicator for high cost loans, as percent of total dollars invested in low income borrowers that are mortgages with high cost;
- $P3$ = Publicness indicator for denial rate, as percent of total mortgage applications denied;
- $P4$ = Publicness indicator for localness, measured as a dummy variable, where 1 = lender

headquarters located outside of Indiana;
S = Control variable indicators for organizational size, including assets, originations and percent of total lending volume in Indiana in 2005; and
R= Control variables for regulator, where each regulator is measured as a dummy variable.

Aggregate Lender Analysis: Results

Table 2 presents the logistic regression results predicting lender participation in the MRB program (model 1) and degree of participation in the MRB program (model 2). The measure for regulatory publicness, percent of lending to underserved areas, positively predicts participation in the MRB program ($p < .10$ and $p < .05$ for models 1 and 2 respectively). A one percent increase in the percent of dollars invested in underserved areas increases the odds of participating in the program by 8 percent, and increases the odds of substantial participation (model 2) by 14.1 percent, holding all other variables constant. Further, the cultural cognitive measure of publicness related to high cost lending significantly predicts participation in the MRB program ($p < .05$), where a one percent increase in the percent of dollars invested in high cost loans to low income individuals decreases the odds of participating in the program by 2.3 percent and decreases the odds of substantial participation (model 2) by 5.6 percent, holding all other variables constant. Denial rate and location of lender headquarters do not significantly predict participation in the MRB program.

Lender size, measured as the number of originations in 2005 positively predicts participation in the MRB program, where larger lenders are substantially more likely to participate in the program (a one unit increase in the log of lender's assets increases the odds of lender participation by 191 percent, and substantial participation by 407 percent). The size of the lender's assets, however, is not a significant predictor of participation, nor is the volume of lending in Indiana. Finally, lending institutions that are regulated by the Office of the Comptroller of the Currency (OCC), predominately commercial banks and mortgage companies owned by depository institutions, are nearly 5 times more likely to participate substantially in the MRB program than other types of lending agencies ($p < .05$).

TABLE 2 HERE

Multilevel Analysis: Measures & Descriptions

The complete multivariate model for this analysis includes variables located at three levels: borrower, lender and census tract. Descriptive statistics have been prepared for each level, including comparison of means based on income of borrowers served ($< 80\%$ of area median and $> 80\%$ of area median), and are presented on Tables 3, 4 and 5. Measures of borrower risk presented on Table 3, including credit score, income, minority status and age, are consistently employed in models predicting loan delinquency (Avery et al 1996; Calem and Wachter 1999; Stegman et al 2006). The average gross household income of borrowers in the MRB program is \$2,868 per month, or \$34,416 annually. The

average credit score for borrowers in the program is 664, just above the cutoff of 660 for marginal risk. However, borrowers with higher incomes (> 80% AMI) have significantly higher credit scores, with an average score of 671, than borrowers with lower incomes, with an average score of average 660 ($p < .001$).

Loan purchase characteristics included on Table 3 are also consistently employed in empirical analyses predicting delinquency, though indicators for affordability and loan to value (LTV) ratios are typically presented as dummy variables in multivariate analyses (Quercia and Stegman 1992; Stegman et al 2006; Calem and Wachter 1999). In general, borrowers with lower incomes tend to have significantly lower loan amounts, by an average of more than \$25,000 ($p < .001$), and tend to have higher affordability ratios ($p < .001$)¹⁰. Ironically, borrowers in the MRB program with lower incomes have significantly lower LTV ratios than borrowers with higher incomes, 94 percent LTV compared to 98 percent LTV respectively. This is likely due to the fact that borrowers with incomes below 80 percent AMI participating in the Indiana MRB program are also eligible to receive downpayment assistance from the state housing finance agency. In fact, 85 percent of all borrowers with incomes less than 80 percent AMI received downpayment assistance from the state housing finance agency. Finally, the average interest rate of 5.55 percent reflects the below market subsidized interest rate of the MRB program. All borrowers purchasing homes at any given point in time through the MRB program receive the same subsidized interest rate set by the state housing finance agency.

Lender characteristics are presented on Table 4. Of note, low income individuals are served by larger institutions, on average, as indicated by the number of loans originated and asset size ($p < .001$). Further, while commercial banks originate nearly 60 percent of all MRB mortgages, a significantly smaller proportion of the loans to low income individuals are originated from commercial banks, and a significantly higher proportion are from mortgage and independent companies ($p < .001$). There are no significant differences in the publicness characteristics of lenders by income of borrowers served, with one exception. A significantly higher proportion ($p < .001$) of low income individuals (57 percent) receive MRB mortgages from lenders headquartered out of state compared with higher income individuals (51 percent).

Finally, census tract characteristics are presented on Table 5. Lower income MRB borrowers purchase homes in census tracts with a significantly larger proportion of low income residents ($p < .001$), and also a significantly larger minority population ($p < .001$). The census tracts of low income purchasers tend to have a smaller population, on average, and tend to have a slightly lower percent of owner

¹⁰ Affordability ratios represent the borrower's monthly house payment as a percent of the borrower's monthly income. Front end ratios are simply the monthly house payment divided by income. Back end, or debt ratios are the borrower's monthly house payment plus all financed monthly debt divided by the borrower's gross monthly income. Front end ratios in excess of 29% and back end, or debt ratios in excess of 36% are generally considered high.

occupied housing. The neighborhoods of lower income purchasers appear to have a bit more stability, with the average duration of tenure being 7.18 years, compared to 6.87 years for higher income purchasers ($p < .001$).

The primary dependent variables in this analysis measure the sustainability of homeownership for underserved populations. Several variables capture sustainability, and are presented on Table 6. Two common measures in the literature are delinquency and foreclosure of mortgages. More than one in four borrowers in the MRB program have been ever late more than thirty days, and nearly 15 percent have been ever late more than sixty days, though these rates are significantly lower for higher income borrowers ($p < .001$). Further, 5.4 percent of MRB borrowers purchasing homes between 2003-2006 have foreclosed as of January 1, 2007, with a significantly lower rate of 3.07 percent for higher income borrowers, compared to 5.73 percent for lower income borrowers.

TABLES 3- 6 HERE

Multilevel Analysis: Model Specifications

To test the hypotheses presented in this article, three model specifications are developed. The basic multilevel models (model 1 for each category of dependent variable) take the following general form:

$$(1) Y_i = \alpha_1 + b_1BR + b_2BC + b_3LP + b_4LC + b_5C + \epsilon_i, \text{ where}$$

Y_i = Sustainability outcome measure; Dummy variable measuring delinquency (ever >30 days; ever >60 days) or foreclosure status;

BR = Variable for borrower risk (uncertainty), measured by credit score;

BC = Borrower characteristics, including income, loan to value ratio, front end ratio, household size, age of borrower, minority status, and duration of tenure;

LP = Publicness indicators for lenders, including percent underserved and MRB volume (regulatory), high cost dummy variable (cultural-cognitive) and location of headquarters dummy variable for out of state (normative).

LC = General lender characteristics, including type of lender and lender size (measured by lending volume); and

C = Census tract characteristics of home purchase, including median income, percent urban and homeownership rate.

The more fully developed multilevel model (model 2 for each dependent variable), including the interaction terms for lender publicness, lender characteristics and borrower risk, is as follows:

$$(2) Y_i = \alpha_1 + b_1BR + b_2BC + b_3LP + b_4(LP * BR) + b_5LC + b_6(LC * BR) + b_7C + \epsilon_i, \text{ where}$$

where

$LP * BR$ = Lender publicness measures for high cost lending (cultural cognitive) and out of state (normative), multiplied by borrower risk (credit score); and

$LC * BR$ = Lender type measures, including commercial bank, mortgage company or thrift, multiplied by borrower risk (credit score).

Finally, the full model for comparison (model 3 for each category of dependent variable), is as follows:

$$(3) Y2_i = \alpha_1 + b_1BR + b_2BC + b_3LP + b_4LC + b_5C + a_i, \text{ where}$$

$Y2$ = The sustainability outcome measure for a subset of the total sample, based on credit score of the borrower, where the low credit subset includes only those borrowers with a credit score below 620, and the high credit subset includes only those borrowers with a credit score above 660.

Multilevel Analysis: Results

To begin the multilevel analysis, the relationships between the model variables at the three levels and the primary dependent variables are reviewed using comparison of means tests, presented on table 7. There are a few notable considerations. First, borrowers who are delinquent have significantly lower credit scores than borrowers who are not delinquent ($p < .001$). Interestingly, this difference is most apparent for borrowers ever late more than 30 days, with an average credit score of 525, compared with a score of 676 for those not ever late more than 30 days. Borrowers who are delinquent also have lower incomes, on average, and higher affordability and loan to value ratios, as predicted by option theories of default. Not surprisingly, borrowers who are delinquent have owned their home longer (as much as 243 days longer, on average) than borrowers who have never been delinquent ($p < .001$).

There are also a few differences at the lender level. First, delinquencies by type of lender differ significantly for loans originated by commercial and independent institutions, where commercial bank originations comprise a slight but significantly ($p < .05$) smaller proportion of delinquent mortgages (58% compared with 60%), and thrift originations comprise a slight, but significantly ($p < .01$) larger proportion of delinquent mortgages (16% compared with 13%). Thrift originations comprise a significantly ($p < .05$) larger proportion of foreclosures (3.27% compared with 1.77%). and differences for foreclosure by type of bank differ significantly for loans originated by thrift institutions. Two of the lender publicness characteristics stand out, the cultural cognitive measure for high cost, and the normative measure for out of state. High cost is a dummy variable coded "1" if the lender originated any high cost loans, as reported to HMDA, in 2005. For those loans ever more than 60 days delinquent, 87 percent were originated by lenders reporting high cost loans, compared with 82 percent of high cost originations not delinquent ($p < .001$), and 89 percent of those loans that foreclosed were originated by lenders reporting high cost loans, compared with 82 percent of high cost originations not foreclosed ($p < .001$). The differences for loans originated by out of state lenders are even more pronounced. For loans ever more than 60 days delinquent, 66 percent were originated by lenders from out of state, while for loans not delinquent, only 52 percent were originated by lenders from out of state ($p < .001$).

Finally, there is only one slight difference at the census tract level. Loans ever thirty days or more delinquent were for homes located in census tracts with slightly lower median incomes ($p < .05$) than loans not delinquent, though this difference is not significant for higher levels of delinquency.

TABLE 7 HERE

The results of the multivariate logistic regressions for the multilevel models are provided on tables 8, 9 and 10, by dependent variable (> 30 days late, > 60 days late, and foreclosed). When controlling for the other variables in model 1, credit score strongly predicts mortgage delinquency and foreclosure, where a unit increase in a borrower's credit score decreases a borrower's odds of delinquency or foreclosure by 1.4 percent ($p < .001$). Holding all other model variables at their mean, moving from a credit score of 620 to a credit score of 660 cuts the odds of being ever 60 days or more delinquent nearly in half, from a 13 percent probability of being delinquent to an 8 percent probability of being delinquent. This influence of credit holds across most models, though the effect is even stronger for borrowers with credit scores above 660 (model 3). Interestingly, the effect loses significance for predicting foreclosure among borrowers with credit scores below 620 (model 3, table 10), as other variables become more important.

Income, age and household size are also significant predictors of mortgage delinquency and foreclosure across most models. Similar to credit, the effects of income are most substantial (and significant) for borrowers with high credit, and are not significant for borrowers with low credit. An increase in one unit log of income decreases the odds of being ever more than 60 days delinquent by 82.6 percent for borrowers with credit scores above 660 ($p < .001$), however, an increase in income does not significantly reduce the odds of delinquency for borrowers with low credit (Table 9). The affordability ratio (front end ratio) does not appear to be a significant predictor of mortgage delinquency or foreclosure, except for borrowers with credit scores above 660 (model 4 across all tables). The effect is in the opposite direction than would be expected for such borrowers, where an increase in the affordability ratio is associated with a decrease in the odds of delinquency or foreclosure. As such, the front end ratio is likely capturing something about the value of the home rather than the affordability of the borrower¹¹. Loan to value ratio has a significant effect on the probability of being ever 60 days delinquent, though this effect is not significant for borrowers with low credit score, and is strongest for borrowers with high credit scores (Table 9). Holding all other model variables at their mean, moving from an LTV of 80

¹¹An alternative specification was developed with the sales price of the home as a control variable in all models. While this removes the significance of the front end ratio in the high credit model, it is strongly collinear with monthly income, and thus reduces the efficiency of the measure for income. Further, sales price is not an independently significant predictor of delinquency in the models. As income is a critical variable in this analysis, sales price was omitted from the specification.

percent to an LTV of 100 percent increases the probability of being ever 60 days or more delinquent from 1.9 percent to 2.7 for borrowers with credit scores above 660.

Pertinent to the research questions in this analysis, characteristics of the originating lender do appear to have a significant effect on the probability of delinquency and foreclosure, particularly for borrowers with high risk (low credit). First, the type of lender has a modest effect on delinquency, and only for certain outcomes. When the originating lender is a commercial bank, there is a slight decrease in the probability of default, particularly when controlling for the interaction between borrower risk (credit) and type of lender (model 2). While only a small percentage of loans in the sample were originated by thrifts (less than 2 percent of the total, or 132 borrowers), these loans appear to have a moderately higher risk ($p < .10$) of being ever more than 60 days delinquent (table 9), and a significantly higher risk of foreclosure ($p < .001$), particularly for those borrowers with lower credit. In fact, loans originated by thrifts were 4.6 times more likely to foreclose overall, and for borrowers with low credit, such originations were 6.3 times more likely to foreclose¹². Lender size, measured by the volume of originations in 2005 as reported to HMDA, does not appear to have an effect on outcomes.

Of greatest interest, however, measures of lender publicness are consistently predictive of delinquency and foreclosure, particularly for borrowers with higher risk. The localness of the lender, a measure of normative publicness, is consistently significantly predictive of mortgage delinquency and foreclosure, except for borrowers with low risk (credit scores above 660). Out of state originations are nearly twice as likely to become ever 60 days delinquent or foreclose as in state originations ($p < .001$). For borrowers with credit scores below 620, in state originations have a predicted probability of 16 percent delinquency, compared with 25 percent predicted delinquency for out of state originations. Similarly, for borrowers with credit scores below 620, originations out of state have a predicted foreclosure rate of 10 percent, compared with just over 5 percent for in state originations ($p < .05$). Whether or not a lender provides high cost loans, a measure of the cultural-cognitive publicness of a lender, is also predictive of delinquency and foreclosure, particularly for low credit borrowers. Borrowers with loans originated by high cost lenders are nearly twice as likely to become ever 60 days delinquent, and more than three times as likely to foreclose ($p < .10$). For borrowers with credit scores below 620, high cost originations are nearly four times as likely to foreclose ($e^b = 3.75$, $p < .10$), with a predicted probability of foreclosure of 2.7 percent for originations from non-high cost lenders, and a predicted foreclosure of 9.5 percent for originations from high cost lenders, holding all other values at their mean.

¹²It is important to remember that any observed effect due to lender differences are attributable to the originating lender, as all loans are serviced by the same servicer within 60 days of closing.

Finally, measures of regulative lender publicness, including percent of loans to underserved areas and percent of MRB volume, are moderately predictive of delinquency and foreclosure, but in the opposite direction. The percent volume of underserved lending measures the dollar amount of loans that the originating lender has invested in GSE identified underserved areas, as a proportion of their total volume. The average lender invests roughly 6 percent of their total lending volume in underserved originations. The predicted probability of ever 60 days delinquent for a loan by an originator with 5 percent underserved volume is 7 percent, compared with 9 percent for an originator with 10 percent invested in underserved lending ($p < .05$). The average percent of total originations that were from the Indiana MRB program in 2005 was 1.8 percent. The predicted probability of ever 60 days delinquent is 7 percent for an originator with 1.8 percent of their total lending volume in MRB loans, compared with 9 percent predicted probability for an originator with 5 percent of their total lending volume in MRB loans ($p < .05$).

Characteristics of the census tract of purchase appear to be moderately related to loan performance, though not particular to high or low risk borrowers. Most significantly, an increase in the median income of the census tract of purchase decreases the probability of delinquency, though it appears to have no effect on the probability of foreclosure. Also of note, an increase in the homeownership rate of the census tract of purchase slightly increases the probability of ever more than 30 and more than 60 days delinquency ($p < .01$ & $p < .05$), though homeownership rate has no significant effect on foreclosure. The urbanness of the census tract of purchase does not appear to have a significant influence on the probability of default or foreclosure, except for borrowers with higher credit. There is a slight significant ($p < .10$) decrease in the probability of delinquency associated with an increase in the percent of the census tract considered urban for borrowers with credit scores above 660.

TABLES 8, 9 & 10 HERE

Discussion of Findings

The key finding of this analysis is that certain originating lender characteristics, particularly related to their institutional environment, appear to play a role in predicting borrower delinquency and foreclosure. In other words, all other things being held constant, borrowers are more or less likely to be ever delinquent or foreclose, depending on characteristics of their originating lenders. This effect is most pronounced for higher risk borrowers (with credit scores below 620). In particular, higher risk borrowers with loans originated by out of state lenders are more likely (nearly two times as likely) to become delinquent or foreclose than their counterparts with loans originated by in state lenders. Higher risk borrowers with MRB loans originated by lenders that also provide high cost loans are also more likely to become delinquent or foreclose (even though their loans are not high cost loans), than are MRB borrowers with loans originated by lenders that do not provide high cost loans (nearly two times as likely

to become delinquent, and more than three times as likely to foreclose). Interestingly, higher risk borrowers with loans originated by lenders that provide a higher volume of lending to underserved areas experience a higher probability of delinquency and foreclosure than borrowers with loans originated by lenders who provide a lower volume of lending to underserved areas. Finally, borrowers with loans originated by lenders that originate a larger proportion of MRB loans are more likely to be ever delinquent or foreclose than borrowers with loans originated by lenders with MRB loans as a smaller proportion of their total lending volume.

In considering the validity of these findings, it is important to recall the research design. For all of the MRB borrowers included in this analysis, the loan servicer is held constant. All MRB mortgages are sold to the same servicer within 60 days of closing. The observed effects at the originator level can not systematically be due to differences in the lender servicer (or servicing behavior after closing). Also, all MRB mortgages have the same terms; they all are 30 year amortizing fixed mortgages, with the same interest rate set by IHCD for any given point in time, conforming to the same requirements of the purchaser servicer (US Bank). Observed differences at the originator level cannot be systematically due to differences in the cost of the loan, or the terms of the loan. In addition to controls established by nature of the program design, statistical controls provide additional validity to the observed effects of the originating lender. The observed effects are robust after statistically controlling for critical borrower level variables, such as credit, income, LTV, affordability ratios, household size, age, and minority status, as well as controlling for critical community level variables (at the census tract level), including income of the community, homeownership rates in a community and the urbaness of a community. Several other specifications were analyzed, including adding to the model sales price of the home, differences between the appraised value and sales price, values of homes in the area of purchase, and numerous census tract level variables. With each alternative specification, the lender variables were robust; the direction and significance of the coefficients did not change.

One might explain the observed findings, in light of the research design and statistical controls, in one of two ways. First, one might conclude that the variation being attributed to the originating lender in this analysis is really due to some omitted variable. For this to be possible, the omitted variable would have to systematically vary with the characteristic of the originating lender in question¹³. The observed results at the level of the originating lender might actually be due to an omitted variable bias. While this

¹³For example, one might suggest that borrower employment history is a critical variable omitted from this analysis, and that this omission biases the results. It is important to note that previous analyses of mortgage delinquency have been conducted with employment history, and have found no statistically significant effect after controlling for other critical variables included in this analysis, such as income, credit and LTV. Nonetheless, it is possible that certain types of lenders, for example those headquartered out of state, are less particular about employment history than lenders headquartered in state. Then suppose that this difference in particularity about employment history is really driving the difference observed with the originating lender “localness” on mortgage delinquency.

is possible, it is not likely based on previous studies of delinquency, and the inclusion of critical variables in the models specified.

This leads to the second, and more interesting, explanation. Certain characteristics of the originating lender have a significant, and substantive, effect on the probability of borrower delinquency and foreclosure. If this explanation is preferred, one might next consider, how can this be so? What is it about the originating lender that predicts borrower delinquency or foreclosure? While the underlying mechanism is not directly observed in this analysis, there are at least two plausible hypotheses that one might generate, based on the observed variations: one about who they are serving, and the second about how they are serving them. First, originating lenders may serve different types of borrowers based on less observable characteristics, obtained either through tacit (or local) knowledge (of the borrower or lender), or through strategic marketing to particular types of borrowers. Research suggests that the way in which lenders market their lending products, and who they target, is an important determinant of the type of borrower likely to walk through their doors to apply for a loan (Avery, Beeson and Sniderman 1994; Phillips-Patrick and Rossi 1996). This is one criticism of relying strictly on HMDA data to analyze lender activity among the underserved. Such data says nothing about how the lender markets its products to borrowers, or who they target. Holding credit score, income, and other demographics constant, certain groups of borrowers are more likely to be prepared for homeownership than other groups of borrowers. Lenders with local knowledge of their communities may be better positioned to identify and attract such borrowers. Further, targeting certain groups with particular marketing practices may in large part determine the selection of prepared versus unprepared borrowers, all other things being equal¹⁴. This is important to understand, because it implies that originating lenders with higher delinquencies may be just as successful at attracting borrowers with lower delinquency if they develop their local knowledge and/or target their products differently.

In addition to differences due to lender “selection” or targeting and marketing, the differences observed at the originating lender level may be due to direct intervention of the originating lender to prepare borrowers before or at the time of purchase. Certain originating lenders may provide different services (such as homebuyer education or counseling) or offer different sources of support (such as linking the borrower to a community network) prior to or concurrent to loan origination, that in turn reduce the probability of default. Preliminary research on homebuyer education and counseling programs suggest that such services may actually reduce delinquency for borrowers, holding other risk factors such

¹⁴For example, a lender that markets its products through a nonprofit homeownership education program is likely to attract a more prepared borrower than a lender that markets its products through phone solicitation. It may be that lenders headquartered out of state are more likely to rely on phone solicitation, while lenders headquartered in state are more likely to rely on community groups to market their programs.

as credit and income, constant (Hirad and Zorn 2002)¹⁵. Again, this is important to understand, because it would allow originating lenders to decrease their probability of borrower delinquency if they provide the more effective type of borrower education prior to purchase. These two hypotheses about through what mechanisms the differences observed contribute to reduced delinquency are beyond the scope of this present analysis, but are critical for future research.

Finally, there are a few additional caveats that need to be mentioned when interpreting these findings. First, the generalizeability of these findings to other lending programs (and to other points in time) cannot be evaluated with this analysis. While the benefit of using data on one controlled program setting is that it provides design controls for otherwise intervening variables that would require statistical controls, such as holding the servicer constant and loan terms constant, one of the drawbacks of using such data is the potential limit to the generalizability of the findings outside of the context of the MRB program, and the MRB program in Indiana, specifically. Future analyses are necessary that apply the models specified in this analysis to other public mortgage programs. Second, the construct validity of the measures for publicness in this analysis is subject to researcher discretion. That out of state lending represents a measure for normative publicness, and high cost lending represents a measure for cultural-cognitive publicness, are highly contextual to the policy issue being analyzed. While such measures likely capture a piece of the underlying constructs, this analysis does not suggest that such measures are fully developed conceptualizations of publicness. However, as this analysis is one of the first to empirically test the constructs of normative and cultural cognitive publicness, it is understandable that such concepts would lack complete conceptualization. Further refinement of the constructs is necessary for future theoretical development of the concepts of publicness in private organizations.

Conclusions

The primary contribution of this analysis is to call attention to the influence of the originating lender on public outcomes, not just for serving the underserved, but also for sustainable homeownership. In addition to the implications discussed for homeownership research and policies, these findings contribute to the theoretical discussion of managing publicness in private organizations. In particular, much of the focus in the past has been on regulative aspects of publicness, including direct funding from government, communications with government, and regulations from government. While such regulative publicness is likely a necessary condition to induce participation in certain public activities, regulative publicness alone may not be sufficient to ensure public outcomes.

¹⁵Picking on the out of state originators again, it may be that in state originators rely on local community groups to provide counseling and education prior to purchase, while out of state originators rely more heavily on telephone or book counseling prior to purchase, a medium which research suggests has no effect on delinquency (Hirad and Zorn 2002). Thus, the observed difference at the originator level is due to differences in the types of education provided by the originating lender.

Building on the insights of dimensional publicness and neo-institutional theory, this analysis suggests that cultural cognitive and normative aspects of publicness are potentially crucial to public outcomes, particularly in the presence of uncertainty (as in the case of borrowers with lower credit scores in this analysis). In fact, while regulative publicness predicts participation in the public program, it is normative and cultural cognitive publicness that predict public outcomes (regulative publicness by itself is actually negatively associated with public outcomes). Both are thus necessary, one to induce participation, and the other to ensure the quality of service provision necessary for public outcomes.

The concepts of normative and cultural cognitive publicness parallel recent discussion of public values in the public management literature (Antonsen and Jorgensen 1997; Bozeman 2002; Bozeman and Sarewitz 2005; Haque 2001; Jorgensen and Bozeman 2007); however, the literature on public values lacks institutional grounding. How are the values transmitted, and how would one change or alter the values to achieve public outcomes? Conceptualizations of public management as governance, and as a configuration of organizations and institutions offer much insight (Hill and Lynn 2005; Lynn, Heinrich and Hill 2001; Milward and Provan 2000; Wise 1990)¹⁶. Thus, viewing normative and cultural cognitive publicness as institutions that can be identified (and perhaps manipulated), brings back the ability to manage publicness, even in private organizations. This has been demonstrated through the direct application of such insights to public homeownership programs administered by private lenders.

¹⁶In a publication from the Office of Policy Development and Research with the U.S. Department of Housing and Urban Development, the importance of the originating lender as part of a larger community is underscored in one of the opening paragraphs: “Applying for a mortgage is only the final stage of a series of contacts between a potential applicant and various individuals and institutions. These contacts are embedded in social networks within local communities and influence every aspect of the pre-application phase of mortgage lending. . . . The decision to apply for a mortgage is as much social as it is economic; thus successful strategies must identify and develop the social and community networks that encourage minority-LMI borrowers to try to become homeowners and apply for a mortgage” (1998, ii).

Table 1: Descriptive Statistics: Lender Characteristics, General

Variable	Full Sample n=266		By MRB Status ¹	
	Mean	SD	n=42 MRB	n=224 Not MRB
<i>Lender Demographics</i>				
Assets (thousands)	\$19,000,000	87,600,000	\$49,300,000 (24,700,000)	\$13,300,000 ** (4,321,063)
Average Loan Amount (thousands)	\$116.18	31.28	\$125.66 (3.15)	\$114.15 * (2.17)
Total Dollars in Indiana (thousands)	\$46,079.58	102,015.30	\$129,267.10 (31,375.77)	\$30,421.24 *** (3,730.84)
Total LAR 2005 ²	89,846	242,882	177,344 (12,098)	73,440 ** (67,902)
Indiana LAR 2005	395	839	1,051 (260)	272 *** (31)
<i>Publicness: Underserved Volume</i>				
Percent Dollars Invested in Underserved Areas	5.19%	0.0617	4.9% (0.006)	5.3% (0.004)
Percent of Loans Originated in Underserved Areas	6.61%	0.0752	6.0% (0.007)	6.8% (0.005)
Percent of Loans Originated to Low Income Individuals	10.46%	0.0841	9.60% (0.007)	10.6% (0.006)
<i>Publicness: High Cost Volume</i>				
Percent Dollars Invested in High Cost Loans	19.60%	0.3279	7.0% (0.021)	22.8% ** (0.024)
Percent of Loans with High Cost	21.48%	0.3313	8.9% (0.023)	24.7% ** (0.024)
Percent Dollars in Low Income, are Low Income w/	25.25%	0.3619	12.20% (0.032)	27.80% ** (0.026)
<i>Publicness: Denial Rate &</i>				
Percent of Loans Denied	12.01%	0.1057	7.7% (0.011)	13.1% ** (0.008)
Percent of Low Income Loans Denied	17.44%	0.1755	12.8% (0.018)	18.6% * (0.012)
Lender Headquarters Out of State	61.3%	0.488	61.9% (0.08)	61.2% (0.03)
Percent of Loans in Indiana	11.0%	0.146	12.4% (0.03)	10.7% (0.01)
<i>Agency Type (Regulator)</i>				
OCC: Office of the Comptroller of the Currency	17.3%	0.379	35.7% (0.07)	13.6% *** (0.02)
FRS: Federal Reserve System	10.5%	0.307	16.7% (0.06)	9.2% ^ (0.02)
FDIC: Federal Deposit Insurance Corporation	16.2%	0.369	14.3% (0.05)	16.5% (0.03)
OTS: Office of Thrift Supervision	17.7%	0.382	4.8% (0.03)	20.1% * (0.02)
NCUA: National Credit Union Administration	6.4%	0.245	0.0% (0.00)	7.6% ^ (0.02)
HUD: Dept. Housing and Urban Development	32.0%	0.467	28.6% (0.07)	32.6% (0.03)

^ p < .10; * p < .05; ** p < .01 *** p < .001

¹MRB status is a dummy variable for participation in the Mortgage Revenue Bond program. Two tailed z tests and t tests used to compare proportions and means, respectively; Standard Errors for z & t tests in parantheses

²LAR= Loan Application Register; Number of loans reported on the 2005 LAR for HMDA

Table 2: Logistic Regression Predicting Participation in State Public Lending Program

	<i>Participation In Program</i>		<i>Degree of Participation</i>	
	1		2	
	β	e^{β}	β	e^{β}
<i>Publicness Indicators</i>				
Underserved Areas	0.0765 ^ (0.043)	1.079	0.132 * (0.061)	1.141
High Cost Loans	-0.0233 * (0.012)	0.977	-0.058 ** (0.022)	0.943
Denial Rate	-0.0391 (0.037)	0.962	-0.022 (0.051)	0.978
Out of State	-0.021 (0.552)	0.979	0.39 (0.568)	1.477
<i>Control Variables</i>				
Total Originations (log)	1.068 ** (0.213)	2.908	1.625 ** (0.304)	5.076
Assets (log)	-0.114 (0.113)	0.892	-0.168 (0.146)	0.846
Indiana Volume (%)	0.0052 (0.017)	1.005	0.024 (0.020)	1.024
OCC	1.539 * (0.793)	4.660	1.065 (1.049)	2.901
FRS	1.086 (0.859)	2.963	1.548 (1.100)	4.701
FDIC	1.054 (0.802)	2.870	1.562 (1.016)	4.768
OTS	-0.901 (0.980)	0.406	-0.553 (1.143)	0.575
HUD ¹				
Constant	-6.243 **		-9.942 **	
Pseudo R ²	0.287 **		0.401 **	
<i>n</i>	253		253	

^ p < .10; * p < .05; ** p < .01

¹This is the omitted category for regulator in this regression.

Table 3: Descriptive Statistics: Borrower Characteristics

	Full Sample			By % AMI ¹	
	Mean	SD	n	> 80% AMI	< 80% AMI
<i>Borrower Demographics</i>					
Credit Score	664.13	64.64	6012	671.4 (1.67)	659.67 *** (1.14)
Monthly Income	2,867.48	970.13	7498	4,121.70 (19.05)	2,546.75 *** (10.81)
Age	31.51	10.49	5271	30.93 (0.25)	31.76 *** (0.18)
Household Size	2.32	1.35	5291	2.02 (0.03)	2.45 *** (0.02)
Black or Hispanic	13.88%	0.35	7291	10.82% (0.01)	15.24% *** (0.01)
<i>Loan Purchase Characteristics</i>					
Original Loan Amount	87,366.70	29,063.56	7835	108,762.80 (686.97)	82,624.15 *** (440.63)
Sale Price	93,841.12	27,090.65	6913	111,090.20 (729.09)	89,512.95 *** (420.12)
Days Since Purchase as of 1/1/2007	713.85	418.49	7835	420.08 (7.42)	556.32 *** (5.11)
Percent AMI (by county)	72.52%	23.00%	5282	102.00% (0.003)	60.12% *** (0.002)
LTV Ratio	94.55%	13.39%	7797	97.94% (0.001)	93.52% *** (0.002)
Front End Ratio	24.07%	7.18%	7493	19.49% (0.001)	25.25% *** (0.001)
Back End (Debt) Ratio	34.37%	9.51%	6888	31.24% (0.002)	34.84% *** (0.002)
DPA Dummy	60.48%	48.89%	5291	1.23% (0.003)	85.37% *** (0.006)
FHA Dummy	75.86%	42.79%	7835	59.58% (0.012)	78.37% *** (0.007)
New Home Dummy	19.18%	39.37%	3322	27.73% (0.013)	14.51% *** (0.008)
Interest Rate	5.55	0.42	7835	5.59 (0.010)	5.59 (0.010)
Monthly P & I ²	498.65	166.27	7835	623.01 (3.950)	473.63 *** (2.530)
Monthly Escrow ²	121.89	56.10	7835	122.64 (1.550)	118.82 *** (0.910)
Monthly MIP ²	34.05	19.60	7835	42.34 (0.630)	33.05 *** (0.300)

[^] p < .10; * p < .05; ** p < .01 *** p < .001

¹AMI= Area Median Income. Two tailed z tests and t tests used to compare proportions and means, respectively; Standard Errors for z & t tests in parantheses. For %AMI t-tests, n= total n less 2,518; or a maximum of 5,257; 30% of n > 80% AMI; 70% of n < 80% AMI.

²Monthly P & I, Monthly Escrow, and Monthly MIP are portions of the borrower's monthly mortgage payment, where "P & I" referse to the prinicpal and interest portion of the payment, "escrow" refers to escrow payments collected for annual taxes and insurance; and "MIP" refers to mortgage insurance premium

Table 4: Descriptive Statistics, Lender Characteristics¹

	Full Sample			By % AMI ²	
	Mean	SD	n	> 80% AMI	< 80% AMI
<i>Lender Demographics</i>					
Total Loans Originated (2005)	539,976	828,043	7132	459,984 (19,561)	563,120 (14,451) ***
Assets- 2005 (in thousands)	\$35,800,000	76,888,888	7132	\$28,000,000 (1,319,500)	\$37,200,000 (1,399,675) ***
Commercial Bank	59.73%	0.490	7132	64.39% (0.013)	56.18% (0.008) ***
Mortgage Company	24.34%	0.429	7132	21.30% (0.011)	25.79% (0.007) ***
Independent Company	14.08%	0.348	7132	11.40% (0.009)	15.84% (0.006) ***
Thrift	1.85%	0.135	7132	2.92% (0.003)	2.19% (0.004)
<i>Lender Publicness</i>					
Proportion of Originations MRB 2005	1.77%	0.032	7132	1.59% (0.001)	1.68% (0.001)
Percent Invested in Underserved Areas	5.61%	0.022	7132	5.60% (0.001)	5.70% (0.000)
Percent Invested Low Income High Cost	19.78%	0.203	7127	20.42% (0.006)	19.43% (0.003)
Headquarters out of State	53.97%	0.498	7132	50.57% (0.013)	57.04% (0.008) ***
<i>Lender Market Behavior</i>					
Percent Loans not Sold	14.01%	0.160	7132	14.27% (0.004)	13.21% (0.003)
Percent Loans Sold Secondary Market	27.42%	0.298	7132	24.85% (0.008)	29.09% (0.005)
Percent Loans Home Purchase	67.17%	0.170	7132	67.80% (0.005)	66.77% (0.003) *
Percent Loans Refinance	29.87%	0.145	7132	29.21% (0.004)	30.48% (0.003) ***
Percent Loans Conventional	68.89%	0.192	7132	69.64% (0.005)	68.75% (0.003)
Percent Loans FHA	30.74%	0.196	7132	29.94% (0.005)	30.90% (0.003)

[^] p < .10; * p < .05; ** p < .01 *** p < .001

¹The lender characteristics on this table are the average of lender characteristics as attached to each individual borrower in the program.

²AMI= Area Median Income. Two tailed z tests and t tests used to compare proportions and means, respectively; Standard Errors for z & t tests in parantheses. For %AMI t-tests, n= total n less 2,518; or a maximum of 5,257; 30% of n > 80% AMI; 70% of n < 80% AMI.

Table 5: Descriptive Statistics, Census Tract of Purchase

	Full Sample			By % AMI ¹	
	Mean	SD	n	> 80% AMI	< 80% AMI
<i>Census Demographics</i>					
Population	5,446.08	2,613.19	7776	5,913.14 (77.370)	5,315.58 *** (40.370)
Percent Minority	10.50%	13.64%	7776	8.90% (0.003)	10.39% *** (0.002)
Percent Black	6.50%	12.36%	7776	5.07% (0.003)	6.35% *** (0.002)
Percent FHH	11.68%	5.70%	7700	11.02% (0.001)	12.09% *** (0.001)
Percent Below 200% Poverty	29.03%	14.41%	7776	27.22% (0.004)	30.92% *** (0.002)
Percent Below 50% Poverty	4.23%	3.31%	7776	3.93% (0.001)	4.57% ** (0.001)
Percent Public Assistance	2.89%	2.48%	7700	2.59% (0.001)	3.19% *** (0.000)
Unemployment Rate	4.88%	0.8	7835	4.73 (0.020)	4.89 *** (0.010)
<i>Census Housing Demographics</i>					
Percent Owner Occupied Housing	68.58%	14.22%	7700	70.32% (0.004)	67.94% *** (0.002)
Percent Vacant Housing	4.99%	2.87%	7700	4.81% (0.001)	5.06% *** (0.001)
Percent Housing Lacks Plumbing	0.33%	0.72%	7700	0.32% (0.000)	0.30% (0.000)
Age of House (years)	34.22	14.46	7776	31.36 (0.370)	35.42 *** (0.235)
Duration of Residence (years)	7.05	2.41	7700	6.87 (0.060)	7.18 *** (0.038)
Duration of Homeowner Residence	9.97	3.97	7776	9.53 (0.100)	10.15 *** (0.059)
Duration of Renter Residence	2.01	1.92	7773	1.97 (0.050)	1.91 (0.200)

^ p < .10; * p < .05; ** p<.01 *** p<.001

¹AMI= Area Median Income. Two tailed z tests and t tests used to compare proportions and means, respectively; Standard Errors for z & t tests in parantheses. For %AMI t-tests, n= total n less 2,518; or a maximum of 5,257; 30% of n > 80% AMI; 70% of n < 80% AMI.

Table 6: Descriptive Statistics, Borrower Outcomes

	Full Sample			By % AMI ¹	
	Mean	SD	n	> 80% AMI	< 80% AMI
<i>Loan Payment Performance</i>					
Late (Ever Late > 30 days, foreclosure or bankruptcy)	26.32%	0.44	7835	14.75% (0.009)	27.23% (0.007) ***
Very Late (Late > 60 days, foreclosure or bankruptcy)	14.87%	0.36	7835	7.40% (0.006)	15.00% (0.006) ***
Ever Late < 30 days ²	37.08%	0.48	7835	24.71% (0.010)	38.59% (0.008) ***
Ever Late 30- 60 days ²	22.44%	0.41	7835	12.39% (0.008)	23.65% (0.007) ***
Ever Late > 60 days ²	11.56%	0.32	7835	4.92% (0.005)	11.92% (0.005) ***
Ever Late ²	42.69%	0.49	7835	28.80% (0.010)	44.40% (0.008) ***
Foreclosed ²	5.42%	0.23	7835	3.07% (0.004)	5.73% (0.004) ***
Bankruptcy ²	1.14%	0.11	7835	1.02% (0.003)	1.13% (0.002)
Paid in Full ²	4.42%	0.21	7835	1.79% (0.003)	2.34% (0.003)

[^] p < .10; * p < .05; ** p < .01 *** p < .001

¹AMI= Area Median Income. Two tailed z tests and t tests used to compare proportions and means, respectively; Standard Errors for z & t tests in parentheses. For %AMI t-tests, n= total n less 2,518; or a maximum of 5,257; 30% of n > 80% AMI; 70% of n < 80% AMI.

²These categories are not necessarily mutually exclusive. For example, some borrowers that were 60 days delinquent were also 30 days delinquent; OR, some borrowers that filed bankruptcy were also 60 days delinquent, etc. Further, percent AMI information was not available for borrowers purchasing homes in 2003, and thus the paid in full rates (as well as the foreclosure rates) are noticeably lower proportional to the total paid in full and foreclosure rates.

Table 7: Comparison of Means, Model Variables on Dependent Variables

	Late >30 Days ¹		Late > 60 Days ¹		Foreclosed ¹	
	No	Yes	No	Yes	No	Yes
<i>Borrower Characteristics</i>						
Credit Score	676.45 (0.93)	525.07 *** (1.43)	670.95 (0.88)	617.6 *** (1.88)	666.25 (0.85)	619.08 *** (3.22)
Monthly Income	\$2,700.18 (11.89)	\$2,543.86 *** (17.59)	\$2,684.10 (22.96)	\$2,515.71 *** (10.94)	\$2,669.69 (10.25)	\$2,474.37 *** (39.54)
LTV	94.37% (0.002)	95.04% * (0.003)	94.42% (0.002)	95.29% * (0.003)	94.55% (0.002)	94.51% (0.007)
Front End Ratio	25.46% (0.001)	26.15% *** (0.002)	25.54% (0.001)	26.26% ** (0.002)	25.60% (0.001)	26.46% * (0.003)
Household Size	2.2 (0.02)	2.72 *** (0.04)	2.25 (0.02)	2.79 *** (0.06)	2.3 (0.02)	2.79 *** (0.08)
Age of Borrower	31.66 (0.17)	31.01 ^ (0.27)	31.64 (0.16)	30.57 ** (0.36)	31.57 (0.15)	30.23 * (0.63)
Minority	13.04% (0.005)	16.22% *** (0.008)	13.56% (0.004)	15.72% * (0.011)	13.99% (0.004)	11.78% (0.017)
Duration of Tenure	657.5 (5.59)	871.62 *** (7.82)	677.71 (5.16)	920.71 *** (9.70)	701.86 (4.88)	922.78 *** (16.18)
<i>Lender Characteristics</i>						
Commercial Bank	60.46% (0.007)	57.72% * (0.011)	60.27% (0.006)	56.72% * (0.015)	59.76% (0.006)	59.19% (0.025)
Mortgage Company	24.30% (0.006)	24.46% (0.010)	24.14% (0.006)	25.58% (0.013)	24.50% (0.005)	21.70% (0.021)
Independent Company	13.31% (0.005)	16.18% ** (0.009)	13.78% (0.004)	15.76% ^ (0.011)	13.97% (0.004)	15.90% (0.018)
Thrift Company	1.93% (0.002)	1.63% (0.003)	1.83% (0.002)	1.95% (0.004)	1.77% (0.002)	3.27% * (0.009)
Lender Volume	534,277 (11,235)	555,701 (19,938)	533,108 (10,484)	578,502 ^ (27,204)	540,952 (10,089)	523,425 (41,668)
Percent Underserved Areas	5.60% (0.000)	5.70% (0.000)	5.59% (0.000)	5.73% * (0.001)	5.59% (0.000)	6.02% *** (0.001)
High Cost Low Income (Dummy)	81.64% (0.005)	85.11% *** (0.008)	81.79% (0.005)	86.90% *** (0.010)	82.17% (0.005)	89.17% *** (0.016)
Percent MRB Volume	1.77% (0.000)	1.77% (0.001)	1.78% (0.000)	1.68% (0.001)	1.78% (0.000)	1.48% ^ (0.001)
Out of State	51.33% (0.007)	61.25% *** (0.011)	51.83% (0.006)	65.99% *** (0.014)	53.24% (0.006)	66.25% *** (0.024)
<i>Census Tract Characteristics</i>						
Median Income	\$42,860.66 (263.71)	\$42,150.24 * (267.56)	\$42,741.14 (151.68)	\$42,289.74 (358.74)	\$42,672.00 (143.73)	\$42,714.00 (595.86)
Percent Urban	80.45% (0.004)	80.55% (0.007)	80.48% (0.004)	80.45% (0.010)	80.52% (0.004)	79.74% (0.016)
Homeownership Rate	68.56% (0.002)	68.63% (0.003)	68.56% (0.002)	68.72% (0.004)	68.55% (0.002)	69.22% (0.007)

^ p < .10; * p < .05; ** p < .01 *** p < .001

¹Two tailed z tests and t tests used to compare proportions and means, respectively; Standard Errors for z & t tests in parantheses. The number of observations varies by both independent and dependent variable. For the dependent variables, n is as follows: Late >30, no= 5,773 yes 2,062; Late >60, no= 6,670 yes = 1,165; Foreclosed, no= 7,410 yes= 425.

Table 8: Logistic Regression Predicting Borrower Outcomes, Ever Late >30 days

	Ever Late > 30 Days						Late >30 Days			Late >30 Days		
	Full Model						Among Low Credit			Among High Credit		
	1			2			3			4		
	β	SE	e ^b	β	SE	e ^b	β	SE	e ^b	β	SE	e ^b
<i>Borrower Characteristics</i>												
Credit Score (reversed model 2)	-0.014 ***	0.001	0.986	0.010 ***	0.002	1.010	-0.006 **	0.002	0.994	-0.015 ***	0.002	0.985
Monthly Income (log)	-0.522 **	0.166	0.594	-0.542 ***	0.168	0.581	-0.324	0.271	0.723	-1.323 ***	0.312	0.267
LTV	0.003	0.003	1.003	0.003	0.003	1.003	0.006	0.009	1.007	0.007	0.005	1.007
Front End Ratio	-0.002	0.008	0.998	-0.003	0.008	0.997	0.001	0.013	1.001	-0.028 *	0.014	0.972
Household Size	0.183 ***	0.032	1.200	0.184 ***	0.032	1.202	0.156 ***	0.047	1.169	0.297 ***	0.067	1.346
Age of Borrower	-0.013 **	0.005	0.987	-0.012 **	0.005	0.988	-0.010	0.007	0.990	-0.028 **	0.009	0.973
Minority	-0.067	0.109	0.935	-0.056	0.109	0.945	0.095	0.156	1.100	-0.439	0.29	0.645
Duration of Tenure	0.002 ***	0.000	1.002	0.002 ***	0.000	1.002	0.002 ***	0.000	1.002	0.002 ***	0.001	1.002
<i>Lender Characteristics</i>												
Commercial Bank	-0.074	0.126	0.928	-1.746 **	0.600	0.175	0.023	0.188	1.023	-0.444 *	0.237	0.641
Mortgage Company	-0.159	0.181	0.853	-0.483	0.692	0.617	-0.398	0.288	0.672	-0.415	0.338	0.661
Thrift Company	0.323	0.284	1.382	-3.501 ^	2.152	0.030	0.706 ^	0.398	2.026	-1.436	1.063	0.238
Independent Company ¹												
Lender Volume (log)	-0.013	0.031	0.987	-0.008	0.031	0.992	0.031	0.052	1.032	-0.062	0.057	0.940
Percent Underserved Areas	-0.001	0.025	1.000	0.001	0.025	1.000	0.004	0.041	1.003	-0.014	0.044	0.986
High Cost Low Income	0.467 *	0.207	1.595	0.679	0.691	1.971	0.521 ^	0.313	1.690	0.302	0.372	1.353
Percent MRB Volume	0.039	0.025	1.039	0.039	0.026	1.039	0.087 *	0.042	1.092	-0.016	0.043	0.985
Out of State	0.160 ^	0.097	1.173	-0.781	0.506	0.458	0.439 **	0.166	1.550	-0.093	0.171	0.912
Commercial Bank*Credit				0.005 **	0.002	1.005						
Mortgage Company*Credit				0.001	0.002	1.001						
Thrift*Credit				0.012 ^	0.006	1.012						
Out of State*Credit				0.003 ^	0.002	1.003						
High Cost*Credit				-0.001	0.002	0.999						
<i>Census Tract Characteristics</i>												
Median Income (log)	-0.836 ***	0.230	0.433	-0.839 ***	0.230	0.432	-0.485	0.363	0.615	-0.413	0.423	0.662
Percent Urban	-0.001	0.001	1.000	0.000	0.001	1.000	-0.001	0.002	1.000	-0.004 ^	0.002	0.996
Homeownership Rate	0.014 **	0.005	1.014	0.014 **	0.005	1.014	0.005	0.007	1.005	0.010	0.008	1.01
Constant	18.673 ***	2.367		6.487 **	2.484		7.589 *	3.946		23.762 ***	4.354	
Psuedo R ²	0.191 ***			0.194 ***			0.103 ***			0.148 ***		
n	5095			5095			1306			2522		

^ p < .10; * p < .05; ** p < .01 *** p < .001

¹Dummy variables are used to capture the four main types of lenders in the MRB program (Commercial, Mortgage, Thrift, and Independent). For each regression, Independent serves as the reference category and thus is left out of the regression.

Table 9: Logistic Regression Predicting Borrower Outcomes, Ever Late >60 days

	Ever Late > 60 Days						Late > 60 Days			Late > 60 Days		
	Full Model						Among Low Credit			Among High Credit		
	1			2			3			4		
	β	SE	e ^b	β	SE	e ^b	β	SE	e ^b	β	SE	e ^b
<i>Borrower Characteristics</i>												
Credit Score (reversed model 2)	-0.014 ***	0.001	0.986	0.009 **	0.003	1.009	-0.006 ***	0.002	0.994	-0.018 ***	0.003	0.983
Monthly Income (log)	-0.682 ***	0.214	0.505	-0.693 ***	0.215	0.500	-0.272	0.310	0.762	-1.635 ***	0.460	0.195
LTV	0.008 ^	0.004	1.008	0.008 *	0.005	1.008	0.001	0.010	1.001	0.020 **	0.007	1.020
Front End Ratio	-0.013	0.009	0.988	-0.013	0.010	0.987	0.008	0.014	1.008	-0.080 ***	0.021	0.923
Household Size	0.198 ***	0.040	1.220	0.202 ***	0.040	1.224	0.184 ***	0.054	1.202	0.317 ***	0.098	1.373
Age of Borrower	-0.022 ***	0.006	0.978	-0.022 ***	0.006	0.979	-0.020 *	0.009	0.980	-0.028 *	0.014	0.973
Minority	-0.130	0.136	0.878	-0.128	0.137	0.880	-0.222	0.181	0.801	0.192	0.355	1.211
Duration of Tenure	0.002 ***	0.000	1.002	0.002 ***	0.000	1.002	0.002 ***	0.000	1.002	0.002 ***	0.000	1.002
<i>Lender Characteristics</i>												
Commercial Bank	0.059	0.156	1.061	-1.821 *	0.783	0.162	0.177	0.215	1.193	-0.492	0.324	0.611
Mortgage Company	0.059	0.233	1.060	-0.290	0.901	0.749	-0.234	0.341	0.792	-0.172	0.483	0.842
Thrift Company	0.644 ^	0.342	1.904	-0.780	2.160	0.459	0.769 ^	0.447	2.157	—	—	—
Independent Company ¹												
Lender Volume (log)	-0.004	0.040	0.996	0.003	0.040	1.003	0.046	0.061	1.047	-0.072	0.082	0.931
Percent Underserved Areas	0.061 *	0.032	1.063	0.062 *	0.032	1.064	0.064	0.048	1.066	0.027	0.063	1.027
High Cost Low Income	0.567 ^	0.301	1.763	0.077	0.954	1.080	0.675 ^	0.421	1.964	0.232	0.588	1.261
Percent MRB Volume	0.071 *	0.037	1.074	0.070 *	0.037	1.072	0.092 ^	0.055	1.097	0.028	0.067	1.028
Out of State	0.509 ***	0.129	1.664	0.119	0.697	1.126	0.605 **	0.200	1.831	0.360	0.255	1.434
Commercial Bank*Credit				0.006 **	0.002	1.006						
Mortgage Company*Credit				0.001	0.003	1.001						
Thrift*Credit				0.004	0.006	1.004						
Out of State*Credit				0.001	0.002	1.001						
High Cost*Credit				0.001	0.003	1.001						
<i>Census Tract Characteristics</i>												
Median Income (log)	-0.711 **	0.291	0.491	-0.712 **	0.292	0.491	-0.690 ^	0.417	0.502	0.378	0.616	1.459
Percent Urban	-0.001	0.002	0.999	-0.001	0.002	0.999	0.000	0.002	1.000	-0.005 ^	0.003	0.995
Homeownership Rate	0.011 *	0.006	1.012	0.012 *	0.006	1.012	0.013	0.008	1.013	0.003	0.012	1.003
Constant	16.641 ***	2.982		4.892	3.153		7.836 ^	4.500		17.804 **	6.186	
Pseudo R ²	0.198 ***			0.2 ***			0.114 ***			0.172 ***		
n	5095			5095			1306			2475		

^ p < .10; * p < .05; ** p < .01 *** p < .001

¹Dummy variables are used to capture the four main types of lenders in the MRB program (Commercial, Mortgage, Thrift, and Independent). For each regression, Independent serves as the reference category and thus is left out of the regression.

Table 10: Logistic Regression Predicting Borrower Outcomes, Foreclosed

	Foreclosed Full Model						Foreclosed Among Low Credit			Foreclosed Among High Credit		
	1			2			3			4		
	β	SE	e ^b	β	SE	e ^b	β	SE	e ^b	β	SE	e ^b
<i>Borrower Characteristics</i>												
Credit Score (reversed model 2)	-0.013 ***	0.001	0.987	0.007	0.005	0.993	-0.005	0.003	0.995	-0.018 ***	0.005	0.983
Monthly Income (log)	-0.710 *	0.325	0.492	-0.728 *	0.328	0.483	-0.682	0.451	0.506	-1.764 **	0.722	0.171
LTV	0.005	0.006	1.005	0.005	0.006	1.005	0.017	0.015	1.018	0.008	0.011	1.008
Front End Ratio	-0.017	0.014	0.983	-0.018	0.014	0.982	-0.015	0.020	0.985	-0.074 *	0.033	0.929
Household Size	0.194 ***	0.059	1.214	0.202 ***	0.060	1.223	0.184 *	0.077	1.202	0.258 ^	0.153	1.295
Age of Borrower	-0.023 *	0.010	0.978	-0.023 **	0.010	0.978	-0.020	0.013	0.980	-0.013	0.020	0.987
Minority	-0.432 *	0.221	0.649	-0.431 *	0.222	0.650	-0.537 *	0.279	0.585	-1.506	1.031	0.222
Duration of Tenure	0.001 ***	0.000	1.002	0.001 ***	0.000	1.001	0.002 ***	0.000	1.002	0.002 ***	0.000	1.002
<i>Lender Characteristics</i>												
Commercial Bank	0.192	0.235	1.212	-2.372 *	1.134	0.093	0.359	0.310	1.432	-0.474	0.486	0.623
Mortgage Company	0.247	0.379	1.281	-0.280	1.367	0.756	0.047	0.531	1.048	0.251	0.754	1.285
Thrift Company	1.537 ***	0.408	4.649	0.248	2.362	1.281	1.843 ***	0.520	6.318	—	—	—
Independent Company ¹												
Lender Volume (log)	-0.041	0.064	0.960	-0.027	0.064	0.973	0.001	0.093	1.001	-0.150	0.130	0.861
Percent Underserved Areas	0.162 ***	0.050	1.176	0.165 ***	0.051	1.180	0.176 **	0.074	1.192	0.100	0.100	1.105
High Cost Low Income	1.232 *	0.548	3.427	1.521	1.527	4.577	1.320 ^	0.751	3.745	1.019	1.120	2.771
Percent MRB Volume	0.148 *	0.069	1.159	0.149 *	0.070	1.161	0.166 ^	0.101	1.181	0.069	0.132	1.072
Out of State	0.466 *	0.204	1.593	-0.108	1.026	0.897	0.685 *	0.311	1.983	0.341	0.386	1.406
Commercial Bank*Credit				0.008 *	0.003	1.008						
Mortgage Company*Credit				0.001	0.004	1.001						
Thrift*Credit				0.004	0.007	1.004						
Out of State*Credit				0.002	0.003	1.002						
High Cost*Credit				-0.001	0.004	0.999						
<i>Census Tract Characteristics</i>												
Median Income (log)	-0.236	0.432	0.790	-0.238	0.433	0.788	-0.612	0.581	0.542	1.644 ^	0.938	5.175
Percent Urban	-0.002	0.002	0.998	-0.002	0.002	0.998	-0.001	0.003	0.999	-0.004	0.005	0.996
Homeownership Rate	0.007	0.008	1.007	0.008	0.009	1.008	0.009	0.011	1.009	-0.011	0.018	0.989
Constant	9.717 *	4.445		6.625	5.320		6.558	6.348		5.833	9.346	
Pseudo R ²	0.144 ***			0.147 ***			0.097 ***			0.142 ***		
n	5095			5095			1306			2475		

^ p < .10; * p < .05; ** p < .01 *** p < .001

¹Dummy variables are used to capture the four main types of lenders in the MRB program (Commercial, Mortgage, Thrift, and Independent). For each regression, Independent serves as the reference category and thus is left out of the regression.

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Appendix 1

External Influences of Realized Publicness

<i>Neo-Institutional Framework</i>	Sources of Transmission	Public	Private
Intended	<i>Agency and Access</i>	<i>Agents of the Public/ Open to the Public</i>	<i>Agents of Private Enterprise</i>
	<i>Regulative/ Coercive</i>	Publicly Owned Organization	Privately Owned Corporation
	Regulations	Legislation Judicial Precedents Executive Oversight Formal Rulemaking	Market Mechanisms
	Resource Provision	Government Sources: Budget Allocations, Grants & Contracts	Market Sources: Pricing Mechanisms, Fees for Services
Unintended	<i>Location of Interests Served</i>	<i>Broad Public/ Community</i>	<i>Particularistic Interests/ Market</i>
	<i>Normative</i>	Community Based Partnerships	Market Based Partnerships
	Agency & Staff Certifications	Based on Social Welfare Principles	Based on Business Principles
	<i>Cultural Cognitive/ Mimetic</i>	Community Oriented Beliefs and Values	Market Oriented Beliefs and Values
	Constituent Feedback	Citizen	Customer

Source: Moulton (2007), Table 1