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SEGREGATION AND THE SUBPRIME LENDING CRISIS

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"Reverse redlining arises in cities where there are racially segregated residential living patterns. This means that the people who are most vulnerable to abusive lending practices are geographically concentrated and therefore easily targeted by lenders," asserts John Relman (2008, 637), a prominent civil rights attorney. The Fair Housing Act of 1968 outlawed redlining, the practice of loan denial based on the racial composition of a neighborhood. This study reinforces Relman's observation about reverse redlining—a type of lending discrimination where high-cost loan products are disproportionately concentrated in low-income, minority communities—and shows that racial segregation is a powerful predictor of the proportion of metropolitan area mortgage loans that are subprime.

While there has been widespread recognition that racial minorities are among the hardest hit by the subprime mortgage crisis, racial residential segregation has not been considered a factor behind the crisis in minority communities. Blame is being directed at ill-informed consumers, lax underwriting by loan originators, the failure of regulatory agencies, predatory lending practices, greedy investors, misguided appraisers and credit rating agencies, job loss in economically distressed regions, and a range of other institutional and individual factors (Baily, Elmendorf, and Litan 2008; Gramlich 2007).[1] Virtually ignored in this debate is racial segregation.[2]

This study shows that apart from the mere percent of African Americans or Hispanics living in a metropolitan area, the more racially segregated these groups are in a metropolitan area, the more subprime loans that area is likely to have. Racial segregation is a significant predictor of the share of subprime loans, even after controlling for the percent of minorities, credit score, median home value, poverty, and education. Black segregation has a stronger effect than Hispanic segregation. These findings reveal that segregation explains, in part, the high rates of subprime lending in America's most segregated metropolitan areas. Major findings include:

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- A 10% increase in black segregation, on average, is associated with a 1.4% increase in high-cost lending.
- In a highly segregated black area, the percent increase in high-cost loans is 7%; in a highly segregated Hispanic metropolitan area the increase is 4.2%.
- Metropolitan areas with higher education levels have a lower proportion of high-cost loans.

Although there are several reasons why subprime lending proliferated in the last 10 years and various approaches that might ameliorate such lending, the findings here suggest that reducing the level of residential segregation would decrease a metropolitan area's vulnerability to subprime lending. While we did not explore the specific mechanisms by which segregation leads to higher rates of high-cost lending, it is evident that areas where minority groups are more concentrated are more susceptible to subprime lending. This report proposes policies to 1) decrease metropolitan-level segregation, 2) educate borrowers, and 3) regulate the lending industry.

Mortgage lending in minority neighborhoods

In the first half of the 20th century, lenders used neighborhood racial composition as a key determinant for loan underwriting. Loan applications from minority neighborhoods were often denied based on the premise that these areas were in decline. Lenders denied home loan applications from predominately black communities because it was assumed that home values in these areas would decline below an acceptable risk level. If home values decreased, properties would no longer meet the necessary loan collateral requirements. This practice of loan denial based on the racial composition of the neighborhood was known as redlining. Early indicators include the Federal Housing Administration's denial of loan guarantees in black neighborhoods in the 1930s, which was not officially made illegal until the passage of the Fair Housing Act of 1968 (Jackson 1985; Massey and Denton 1993). Redlining contributed to the unequal distribution of credit and equity by race in America.

To assist in the enforcement of the 1968 housing law, the Home Mortgage Disclosure Act (HMDA) of 1975, as subsequently amended, mandates that most mortgage lenders submit their individual loan level application data to the federal government. Today HMDA reports include substantial information on loan applications, including race, gender, and income of the applicant, the dollar amount, type of loan applied for (with pricing data included for selected high-priced loans), disposition of the application (i.e., whether it was approved or denied), and the census tract in which the home is located. These data are available to the general public for analysis. The loan data allow for an assessment of bank lending patterns, making it easier to detect potentially discriminatory lending patterns.

In 1977 the Community Reinvestment Act (CRA) was enacted. This law mandates that federally chartered depository institutions be responsive, consistent with safe and sound lending practices, to the credit needs of their entire service areas, including low- and moderate-income communities. Lenders with inadequate CRA records can be denied authority by the federal government to open additional branches, merge with other financial institutions, or make other changes to their business operations. HMDA and CRA were designed, in part, to alleviate inequities in credit allocation among racial groups.[3]

In 1980 the lending environment drastically changed. The Depository Institutions Deregulation and Monetary Control Act altered the mortgage pricing guidelines for national lenders. By facilitating the charging of varying rates and fees, this act laid the groundwork for risk-based pricing in mortgage lending (Smith 2007).[4] Prior to this act, borrowers whose loan applications were accepted typically received similar interest rates. But with risk-based pricing, those with more default risk factors, such as lower credit scores, down payments below 20%, and higher loan-to-value and debt-to-income ratios, receive higher rates (Chomsisengphet and Pennington-Cross 2006; Fellows 2006; Getter 2006). These new pricing, products, and underwriting procedures opened homeownership opportunities to a new set of borrowers. However, it also created the potential for a new type of lending discrimination, "reverse redlining," where high-cost loan products are disproportionately concentrated in low-income, minority communities.

In the 1990s and 2000s, with new home loan underwriting procedures, certain minority communities that

were once redlined became susceptible to reverse redlining, as high-priced lending products flooded into these areas. These high-priced lending products became extremely problematic in the mid- and late 2000s when default and foreclosure rates skyrocketed. Some homeowners who took out subprime loans were unable, for a variety of reasons, to sustain their mortgage payments. As a result, minority neighborhoods that had high levels of subprime lending in metropolitan areas like Cleveland and Baltimore became dotted with foreclosed properties. Foreclosures became linked with declining properties values (Immergluck and Smith 2005; Schloemer, Li, Ernst, and Keest 2006).

Currently, there is evidence that subprime loans have been originated in ways that disproportionately affect minority homeowners and neighborhoods. In 2006, when subprime lending peaked, 53.7% of African American, 46.6% of Hispanic, and 17.7% of white mortgage recipients received a high-priced loan. In census tracts where the population was at least 80% minority, 46.6% obtained high-priced loans, compared to 21.7% in communities where racial and ethnic minorities accounted for less than 10% of the population (Avery, Brevoort, and Canner 2007).[5] A question that arises is whether levels of segregation affect levels of subprime lending.

Data and methodology

To explore our primary question, we assembled a dataset from a variety of sources including HMDA, the American Community Survey (ACS), Census data, and Equifax. The HMDA, ACS, and Equifax data were all collected for 2006. The Census data were from 2000. We examined the percentage of originated mortgage loans that were high-cost (or subprime) according to 2006 HMDA reports.[6] This number was derived for each metropolitan area as defined by the Core Base Statistical Area (CBSA). We summed the number of prime and subprime home-purchase and refinance first lien mortgage loans for owner-occupants and divided the number of subprime loans by the total number of loans to determine the share of subprime loans originated.

The intensity of racial segregation was determined by the black and Hispanic dissimilarity indices (Cashin 2004; Timberlake and Iceland 2007). The dissimilarity index indicates how unevenly two mutually exclusive groups, in this case blacks and whites and Hispanics and whites, are distributed within a geographic area. It can be thought of as the percentage of either group that would have to move to achieve racial representation in each of the area's census tracts proportionate to the composition of the two groups in the broader region. For instance, if African Americans made up 20% of the population within a metro CBSA, the black dissimilarity index tells us the percent of African Americans or whites that would have to move to achieve the 20% level in all of the metro CBSA's census tracts. Thus, a 65 score on the black dissimilarity index means that 65% of African Americans or whites would have to move to achieve an even distribution of blacks and whites throughout the region. The higher the dissimilarity index, the more the region is segregated. Black and Hispanic dissimilarity indices were derived from the 2000 Census, the most recent available dataset that can be used to accurately construct these indices.

The control variables are attributes that previous research had identified as significantly related to the probability of subprime lending. These measures, at the metropolitan level, include the percent minority, percent below the poverty level, percent unemployed (16 years or older), percent of consumers with low credit scores (<639), median home value, and percent with college degrees.

Results

The key relationship is illustrated in **Table 1** which lists the 10 most segregated metropolitan areas and the 10 least segregated (according to the black dissimarilty index), along with the share of loans in those communities that are high priced. For example, in Detroit-Warren-Livonia, Mich., the most segregated area, 34% of loans were high priced compared to just 24% in Coeur d'Alene, Idaho, the least segregated area.

We used multivariate OLS regression models to investigate the relationship between the proportion of loans that are high-cost and the independent variables. When assessing the results, it is important to keep these three points in mind. First, none of the models contains individual-level data since we are not trying to predict individual determinants of subprime lending. Second, since our dependent variable is proportional we ran

TABLE 1

Top 10 most and least segregated metro areas and percent of high-cost loans

Ten most segregated metropolitan regions	Black segregation index	Percent of high-cost loans
Detroit-Warren-Livonia, Mich,	84	34%
Milwaukee-Waukesha-West Allis, Wisc.	81	29
Chicago-Naperville-Joliet, Ill.-Ind.-Wisc.	78	31
Cleveland-Elyria-Mentor, Ohio	77	28
Flint, Mich.	76	37
Muskegon-Norton Shores, Mich.	76	38
Buffalo-Niagara Falls, N.Y.	76	25
Niles-Benton Harbor, Mich.	73	30
St. Louis, Mo.-Ill.	73	31
Cincinnati-Middletown, Ohio-Ky.-Ind.	73	25
Average	**77**	**31**

Ten least segregated metropolitan regions		
Coeur d'Alene, Idaho	16	24%
Hinesville-Fort Stewart, Ga.	18	39
Santa Fe, N.M.	21	17
Prescott, Ariz.	21	21
Bellingham, Wash.	22	16
Boulder, Col.	23	10
Jacksonville, N.C.	24	22
Blacksburg-Christiansburg-Radford, Va.	24	20
Santa Cruz-Watsonville, Calif.	24	14
Missoula, Mont.	24	15
Average	**22**	**20**

SOURCE: Authors' analysis. See Data and Methodology (p. 3).

traditional OLS models and ones with a transformed version of our dependent variable.[7] None of the relationships among the variables changed between the two models, so we present the results from the traditional OLS regressions. Third, we could not run models with both poverty and unemployment because of issues of multicollinearity. All models were run with poverty and then re-run replacing it with unemployment. Inserting one versus the other did not alter the relationships among the variables.

The results suggest that racial segregation is an important predictor of the proportion of loans that are subprime. Holding poverty, percent minority, median home value, credit, and education constant, the level of segregation for blacks and Hispanics are statistically significant determinants of the proportion of all loans that are subprime (see **Tables 2** and **3**).[8] Black segregation, in terms of effect size, is similar to percent minority and is out ranked by credit score and education. Median home value was also statistically significant and negatively associated with the percent of subprime loans. Neither poverty nor unemployment were statistically significant predictors. According to the results, a 10% increase in black segregation, on average, is associated with a 1.4% increase in high-cost lending.

TABLE 2

Model I: Black segregation

Variables	Coefficients	
Percent in poverty	-0.00	*(0.67)*
Percent minority	0.13*	*(0.02)*
Median home value	-0.11*	*(0.03)*
Black segregation	0.14*	*(0.02)*
Percent with low credit score	0.23*	*(0.06)*
Percent with BA or higher	-0.48*	*(0.04)*

N=354
R-Squared=0.6943
*p<.01

NOTE: Standard errors in parentheses.

SOURCE: Authors' analysis. See Data and Methodology (p. 3.).

TABLE 3

Model II: Hispanic segregation

Variables	Coefficients	
Percent in poverty	-0.05	*(0.07)*
Percent minority	0.12*	*(0.02)*
Median home value	-0.14*	*(0.03)*
Hispanics segregation	0.06*	*(0.02)*
Percent with low credit score	0.25*	*(0.07)*
Percent with BA or higher	-0.48*	*(0.04)*

N=354
R-Squared=0.6312
*p<.01

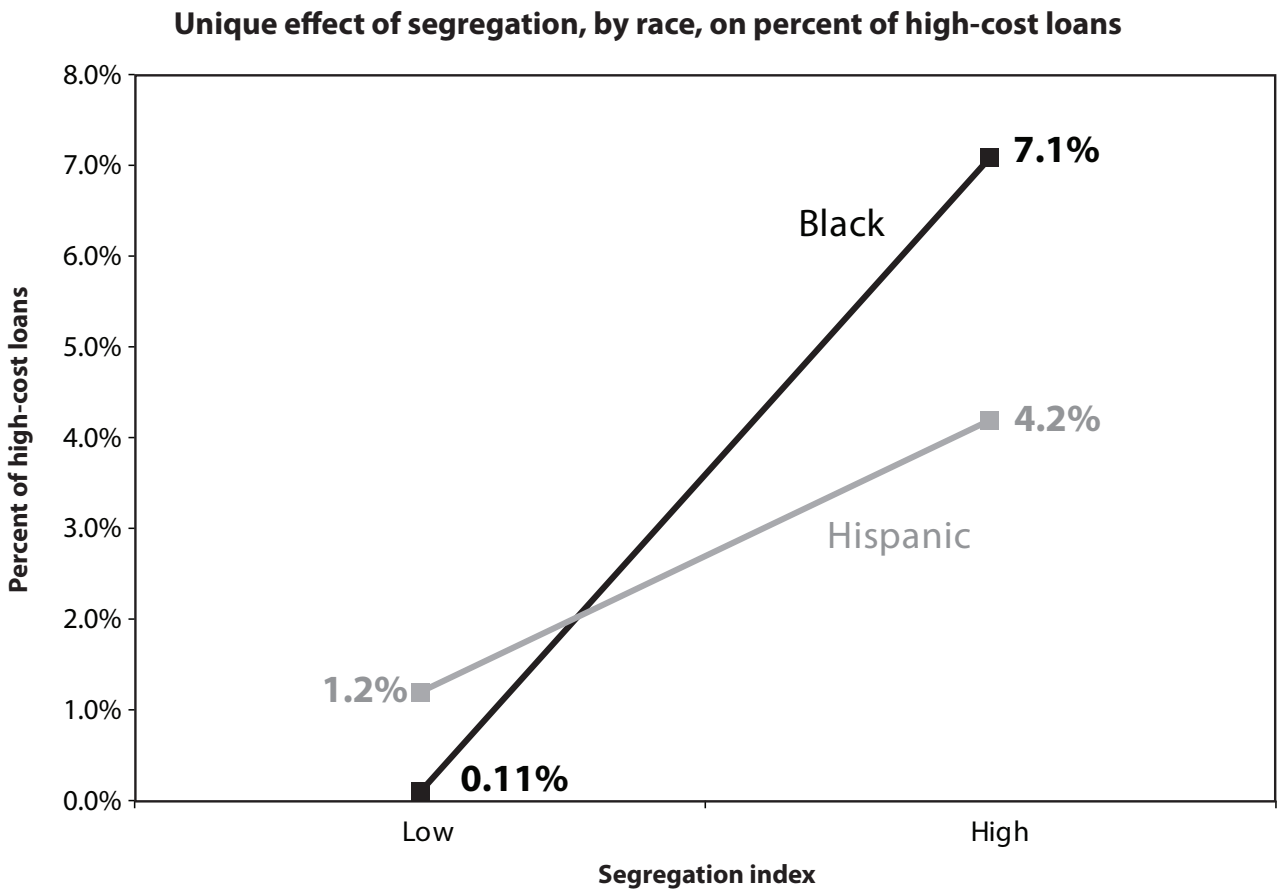
NOTE: Standard errors in parentheses

SOURCE: Authors' analysis. See Data and Methodology (p. 3).

A model was also run replacing the black dissimilarity index with the Hispanic dissimilarity index. The results show that the segregation of Hispanics has a similar but smaller effect on the percent of high-cost loans compared to black segregation level. **Table 3** indicates that the coefficient for the Hispanic dissimilarity index is 0.06. This means that a 10% increase in Hispanic segregation, on average, is associated with a 0.6% increase in high-cost lending.

Figure A demonstrates the unique effects of black and Hispanic segregation on the percent of high-cost loans in a metropolitan area. At a low level of segregation (i.e., 20 on the black segregation index) virtually no increase (0.1) in the percent of high-cost loan is attributable to black segregation. However, the slope of the variable is steep. In a highly segregated black area (i.e., 70 on the black segregation index), we can expect 7% more high-cost loans. At a low level of Hispanic segregation (i.e., 20 on the Hispanic segregation index), we can expect an additional 1.2% increase of high-cost loans. However, Hispanic segregation is associated with a slower increase in high-cost loans compared to black

FIGURE A



SOURCE: Authors' analysis. See Data and Methodology (p. 3).

segregation. We can expect 4.2% additional high-cost loans in a highly segregated Hispanic metropolitan area, and in a highly segregated black area the percent increase is 7%.

Discussion

Results show that the intensity of black segregation is similar to the percent of minorities, percent with low credit scores, median home value, and percent with a B.A. or higher degree in determining a metropolitan area's share of subprime loans. In addition, Hispanic segregation also has an effect in highly segregated areas, although less than black segregation. While past studies have found a strong association between the percent of minorities and prevalence of high-cost financial products (Avery, Brevoort, and Canner 2006; Bocian, Ernst, and Li 2008), it appears that the concentration of minorities is equally important. This suggests that there is something about segregated residential markets that leads to high rates of subprime lending, possibly giving credence to the notion that mortgage lenders find it easier to target minorities for high-priced financial products in more segregated cities.

Metropolitan areas with higher education levels have a lower proportion of high-cost loans. While not an unexpected finding, compared to other studies (e.g., Calem, Hershaff, and Wachter 2004), the magnitude of the effect, was surprising. Education seems to be the most powerful predictor compared to the percent of minorities, the concentration of minorities, median home value, and credit score. (We will discuss the implications of this finding in the policy section below.)

While it is unequivocal that segregated areas have higher proportions of subprime lending, we know little about the specific mechanisms by which residential segregation

may lead to higher rates of subprime lending. Several pathways may link the concentration of minorities to higher proportions of high-cost lending. First, neighborhood effects may play a part. High levels of segregation and poverty are associated with an increased chance of problematic behaviors and outcomes. For instance, highly segregated impoverished neighborhoods have elevated risks of teen pregnancy, crime, and school dropout rates beyond what individual characteristics would predict (Wilson 1987, 1996). It is plausible that there is an elevated community-level risk of loan default and property value depreciation, regardless of borrowers' characteristics, such as FICA credit scores and loan-to-value and debt-to-income ratios, in segregated minority communities (see Lee, Rosentraub, and Kobie 2008; Order and Zorn 2000). If this is the case, are lender underwriting procedures taking this into account in loan pricing?

Second, lenders might be targeting segregated neighborhoods for high-cost loans. It is quite possible that the concentration of minority populations makes it easier for subprime lenders to market and sell their financial products. This study provides evidence that strongly suggests that whether lenders are explicitly targeting minority communities should be further explored.

Third, it is also possible that prime lenders are reluctant to enter segregated areas and thus leave minority borrowers with little choice. It is plausible that subprime lenders might not have specifically targeted minority communities, but they may have been the only lending opportunity available to borrowers in segregated, minority communities. Finally, the effect of education could indicate that a lack of financial knowledge in isolated minority communities might have also contributed to the higher proportions of subprime lending in more-segregated regions. Further studies need to explore the mechanisms by which segregation influences patterns of high-cost lending.

Policy recommendations

Although there are several reasons why subprime lending proliferated in the last decade and various approaches that might ameliorate such lending, these findings suggest that reducing the level of residential segregation would decrease a metropolitan area's vulnerability to subprime lending. While this report does not explore the specific mechanisms by which segregation leads to higher rates of high-cost lending, it is evident that areas where minority groups are more concentrated are more susceptible to subprime lending. This report proposes policies to 1) decrease metropolitan-level segregation, 2) educate borrowers, and 3) regulate the lending industry.

1. Decrease segregation and increase affordable housing

Housing policies of the past have been linked with the concentration of minorities, particularly African Americans, in extremely segregated and impoverished communities (Carr and Kutty 2008; Massey and Denton 1993; Massey and Kanaiaupuni 1993). Today, much of the distressed public housing that once segregated minorities in inner city neighborhoods is being razed (Goetz 2003; Hyra 2008). Residents of these demolished buildings are receiving housing vouchers- a rent subsidy- to obtain private market rental units. However, evidence suggests that voucher holders are ending up in other highly segregated communities (Fischer 2003; Hartung and Henig 1997). To prevent the continuing concentration of poverty and racial disadvantage, the U.S. Department of Housing and Urban Development's Housing Choice Voucher program must be reformed to provide greater opportunities for recipients to find units in less-segregated and impoverished neighborhoods.

The Low Income Housing Tax Credit (LIHTC) program and inclusionary zoning laws are two mechanisms for increasing the number of affordable rental units in non-poverty neighborhoods. Traditionally, housing developments in low-income communities are given preferences for LIHTCs. This circumstance may indirectly increase or sustain prior levels of segregation by placing low-income residents and units in an already low-income community. To open up housing opportunities for low-income families, affordable housing developments in middle- and upper-income communities should be given priority for LIHTCs. Inclusionary zoning laws can also increase the stock of affordable housing in low-poverty areas. These local laws require new developments to set aside a certain percentage of units for affordable housing.

The federal government could provide financial incentives for municipalities to adopt zoning laws that promote the construction and redevelopment of affordable units.

Reduce discrimination in the housing industry

Housing market discrimination clearly contributes to segregation. To more effectively enforce fair housing laws already in place, the proposed Housing Fairness Act of 2009 (H.R. 476) (which supports non-profit fair housing around the country) should be enacted. This bill would increase funding for the Fair Housing Initiatives Program to $52 million and would fund a $20 million nationwide paired-testing program providing for 5,000 tests, approximately 50 in each of the nation's 100 largest metropolitan areas. In paired-testing investigations, equally qualified white and non-white auditors posing as homebuyers or renters approach housing providers, such as real estate and rental agents, mortgage lenders, and insurance agents, and inquire about the availability of the same or similar housing units or housing related services like home insurance or mortgage loans. Any differences in treatment they receive likely reflect discrimination since these auditors or testers are assigned identical qualifications and interests. Such investigations have routinely revealed discrimination in approximately one out of every five initial visits to real estate or rental agents. Discrimination in insurance and mortgage lending has also been documented using similar investigative techniques (Smith and Cloud 1997; Squires 2008b; Squires and Chadwick 2006; Turner and Skidmore 1999; Turner et al. 2002). If the real estate, mortgage, and insurance industries knew these investigations were occurring more frequently, incidents of discrimination and levels of segregation might be reduced.

2. Educate borrowers: Financial literacy

The results of this study and others (e.g., Calem, Hershaff, and Wachter 2004) show that education is highly associated with a decrease in subprime lending. Population levels of formal educational attainment are, of course, rough proxies for knowledge of the mortgage market. But programs that increase the financial competencies of borrowers could be one step to protect individuals from lenders peddling predatory subprime loans. An expansion of financial literacy programs focused specifically on negotiating the lending environment might reduce the number of individuals who take out high-cost loans.

2. Regulate the lending industry

This study focuses on the role of segregation in the subprime mortgage crisis and does not address the overall lending regulatory environment; however, several regulatory initiatives would limit the proliferation of subprime loans and associated defaults in all localities. Studies have shown that in a declining market, those who have an adequate equity stake in their home are less likely to default (Order and Zorn 2000). Some toxic subprime loans, such as those that provided 100% financing, created debt burdens for householders greater than the value of the homes when closing costs were included in the financing. The Federal Housing Administration (FHA), which was once known as the lender of last resort, provides home loan insurance on mortgages that traditionally require at least a 3% down payment.[9] Research has shown that FHA loans have a much lower default rate than other conventional subprime products (Stegman 2008). Ninety-seven percent should be the highest loan-to-value possible and we should do away with the 100% plus finance products.

Additionally, prepayment penalties should be limited, and teaser rates should be banned. Prepayment penalties make it more difficult for those who get behind in their payments to refinance or sell their homes. Even though these penalties provide banks with risk protection against early payment, they increase the likelihood that borrowers will default (Quercia, Stegman, and Davis 2007). Moreover, prepayment penalties should not be used in combination with other subprime loan characteristics, such as teaser rate loans (2/28s and 3/27s adjustable rate mortgages) and high loan-to-value ratios, which increase the likelihood of default even further (Pennington-Cross and Ho 2006). These simple product restrictions would reduce the extent of subprime loans, defaults, and foreclosures throughout the country. The National Mortgage Reform and Anti Predatory Lending Act (H.R. 1728) would reduce substantially the provision of inappropriate products in the mortgage market.

To ensure that these regulations and restrictions are followed, federal oversight is needed over the independent mortgage companies, the unregulated entities who originated the bulk of subprime mortgages (Avery, Brevoort, and Canner 2007), and the affiliated institutions that are involved in the trading of mortgage-backed securities. Currently, the CRA applies only to depository institutions, but passage of the CRA Modernization Act of 2009 (H.R. 1749) would bring unregulated mortgage lenders under its purview. Having greater oversight over independent mortgage companies would help decrease the number of high-cost loans.

Conclusion

Since 2008, lenders, regulators, elected officials, and residents have witnessed and been victimized by unprecedented turmoil in U.S. housing, banking, and related industries. That turmoil has spread worldwide. The decline in property values, coupled with record-level foreclosure rates, has crippled mortgage companies, commercial banks, and investment banks, and threatened the stability of the U.S. financial system. Despite massive government intervention in response to these crises, it remains unclear what progress has been made in restoring health to the nation's credit markets. The continuing financial and broader economic disruption can be directly linked to the proliferation and securitization of subprime mortgages. While far more rigorous regulation of the credit and financial industry sector is necessary, the context of uneven metropolitan development, generally, and racial segregation, in particular, must also be addressed.

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Endnotes

1. There is an important difference between legitimate subprime lending and predatory lending. But the line between them is not always clear. Most predatory lending occurs in the subprime market. Fannie Mae and Freddie Mac have estimated that between one-third and one-half of those receiving subprime loans would qualify for prime loans (Engel and McCoy 2002). Despite the distinction between subprime and predatory lending, it is likely the case that initiatives to reduce one will reduce the other.
2. While segregation has decreased since the 1960s, it persists in most cities, and at hypersegregated levels in many (Fischer, Stockmayer, Stiles and Hout 2004; Logan, Stults, and Farley 2004; Timberlake and Iceland 2007; Wilkes and Iceland 2004).
3. The Equal Credit Opportunity Act of 1974 also encouraged a more equitable distribution of credit in the United States (Holloway 1998).
4. Following the 1980 Act, the passage of the Alternative Mortgage Transaction Parity Act in 1982, which allowed lenders to use variable interest rates and balloon payments, and the Tax Reform Act of 1986, which allowed interest rate mortgage deductions, facilitated, to some extent, the emergence of the subprime market. Some also argue that the Financial Institutions Reform, Recovery, and Enforcement Act of 1989 contributed to the evolution of the subprime market (Weicher 2007).
5. Additional information about the history of lending to minority communities and statistical analyses not reported here is available from the authors.
6. Loans are defined as high cost when the APR is 300 basis points above a comparable Treasury note. Such high-cost loans peaked in 2006.
7. We altered our dependent variable using the following transformation ln(y/ (1-y)) to account for the bounded nature of the proportional data (see Papke and Wooldridge 1996). Using a log-odds ratio as a linear function is a recommended procedure when proportional dependent data fall between 0 and 1.
8. Separate models were estimated for black and Hispanic segregation because these variables are too related to be run in the same equation.
9. As of January 1, 2009 the FHA's minimum down payment is 3.5%.

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