

Impact of Subprime Mortgage Meltdown on Location and Volume of Home foreclosures

Introduction

In recent times, the economy of the United States has been experiencing a serious downturn and is even purportedly headed toward a long-time recession. One of the primary factors responsible for this downturn has been the crisis in the housing market that was largely influenced by the market failures of the subprime mortgages. Although complex and spread over various institutions and factors, the subprime mortgage crisis traces its roots to the bursting of the housing bubble that had driven prices high in the previous decade and to the high default rates on subprime and other adjustable rate mortgages provided to people with shaky credit histories and lower abilities to honor their loans. This led to a trickle up effect on the larger financial sector as banks and financial institutions experienced liquidity problems owing to rising defaulting mortgages and decreased consumer spending causing a severe deleterious effect on the economy.

Inability to pay off rising mortgage costs due to adjusting interest rates, lending institutions had no choice but to foreclose on defaulting properties causing the already-shaky homeowners to be forced out of their homes. This led to a flood of foreclosures of properties causing an overabundance of homes in the market compounded by falling demand thus triggering off a major housing crisis (Leinberger, 2008). The effect of foreclosures however was not uniform across regions and demographics and seemed to affect certain populations like low-income individuals and minorities more than others leading to accusations of discriminatory behavior on part of lending institutions. Already encumbered with the traditional problems of predatory lending and redlining of certain neighborhoods, financial institutions faced an uphill battle in convincing the government and its stakeholders that foreclosure tendencies were not dictated by such erstwhile discriminatory practices (Apgar & Duda, 2005). It may be argued that banks, lending institutions and other financial organizations did not overtly discriminate against certain populations and were simply acting within the economic mechanisms of the free

market. But upon examining the larger picture of subprime mortgage lending and its subsequent effect albeit unintentional on foreclosures of and differential economic effect on certain vulnerable populations, it may be suggested that effects of the subprime meltdown has been especially and disproportionately harsher toward those populations.

This paper seeks to understand those underlying connections between the impact of subprime mortgage crisis on home foreclosures and its subsequent differential effect on certain vulnerable populations. The paper will also try to understand the spatial relationships of foreclosures brought on by the subprime crisis to find out if such foreclosures are characterized by location and type of neighborhood. Due to the proprietary nature of most foreclosure and housing data and the lack of availability thereof, this paper will restrict itself to constructing a research framework on delineating the relationship of foreclosures caused by the subprime crisis and the location and demographic characteristics of properties impacted by such foreclosures. The goal of this study is to analyze the economic disparity of homeowners that are more likely to be affected by subprime-influenced foreclosures and the subsequent remedial measures that are being proposed by the executive, legislative, and even the judicial arm of the government. I will begin by examining the origins of subprime mortgages, its impact on homeownership, benefits and costs for homeowners, and the subsequent fall from grace due to its alleged role in the current housing crisis. Specifically, I will examine the literature for the role of such subprime mortgages in rising incidences of home foreclosures and also examine the deleterious effect of such foreclosures on not only the economic state of the region but also the social and physical aspects. Also, I will attempt to relate the incidences of foreclosures on certain neighborhoods that house vulnerable populations and examine the role of targeted subprime loans that have worsened not only the health of such neighborhoods but have also severely impacted the economy at large. Additionally, I will briefly mention the potential solutions that are currently offered in order to solve or at least mitigate the foreclosures wrought on by the subprime mortgage crisis. Finally, I will draft a research plan that will include data

sources to help us understand the differential impact of the subprime mortgage crisis on certain vulnerable populations due to home foreclosures.

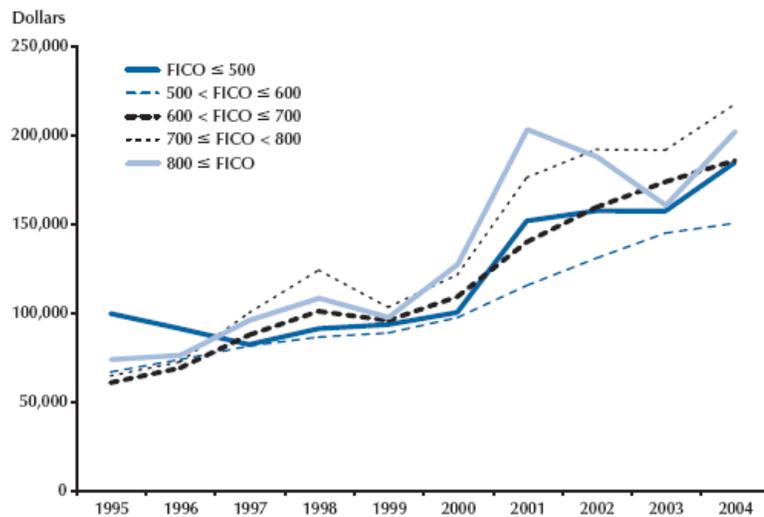
Subprime Mortgages – Rise and Decline

The subprime mortgage offerings are a recent and growing phenomenon in the housing market that seeks to offer credit to individuals that are otherwise considered a high-risk proposition. The rise of the subprime market can be primarily attributed to the emphasis of homeownership as a wealth-building tool as well as changes in the monetary and fiscal policies of the government that made banks and lending institutions more open to offering loans to individuals that had low credit history and thereby higher risk of repayment (Chomsisengphet and Pennington-Cross, 2006). The subprime market grew from \$65 billion in 1995 to more than \$500 billion in 2004, constitutes nearly 15% of the housing market and 20 percent of home mortgage originations (Weicher, 2007). Eligibility for subprime mortgage loans is dictated by low credit scores of borrowers and their inability to pay the requisite amount of down payment that is standard in other housing loans. Since a weak credit history is generally associated with higher delinquent rates and greater number of defaulting loans, the interest rates for subprime loans is predictably higher than standard prime loans (Pennington-Cross, 2003). However, in lieu of this higher interest rates, individuals with a weak credit history that otherwise would have been denied opportunities for homeownership are offered a chance to build wealth and assets provided of course, they can meet their financial obligations as stipulated by the terms and conditions of the subprime mortgage.

The economic logic for the lending institutions in providing a subprime loan is the premium above the prevailing prime market rate in terms of higher interest rates that a borrower must pay in order to gain access to the housing market. The higher interest rates are a function of lower down payments and lower credit scores (Pennington-Cross, 2003). Additionally this additional premium depends and varies over time on the expected risk of borrower's failure as a homeowner to meet mortgage requirements. The cost of the loan is further compounded by its termination profile i.e. the likelihood that the borrower will either prepay or default on the loan and the grade

of the loan i.e. Premier Plus, Premier, A-, B, C, and C- which is determined by borrower's applicant's mortgage or rent payment history, bankruptcies, and total debt-to-income ratio (Chomsisengphet and Pennington-Cross, 2006). Additionally, as mentioned before the subprime loan terms also depend on the amount of down payment. Traditionally over 10-15%, the subprime market considering the clientele it serves lowers that amount to almost zero. Although the interest rate is observed to be stable until the down payment remains at 10% or above, any further drops below lead to lender hiking up interest rates to an extent that 100 percent LTV (loan-to-value) i.e. with zero down payment can be charged an interest rate of nearly 7.5 compared to 5.65 for a down payment of 40 percent or more in California for individuals with comparable credit scores (Chomsisengphet and Pennington-Cross, 2006). As seen here, even within the subprime market, interest rates and loan availability can differ significantly depending on the loan package, specific credit history of the borrower, and the level of LTV chosen by the borrower. Thus, the subprime mortgages can be assumed to be targeted at individuals with limited if not damaged financial history, limited financial means, and higher risk for lending institutions that can result in greater negative effects if those risks are not borne out and such effects can be multiplicative as number of individuals defaulting on subprime loans increase. The role of the FICO credit score in determining the amount of loan fell especially for those below 500 as subprime loans were offered at an increasing rate (see figure). We shall note the demographics and populations that may be targeted, intentionally or otherwise for subprime loans that possibly lead to higher rates of foreclosures causing further decline in already-distressed neighborhoods.

Loan Amounts by Credit Score



SOURCE: LoanPerformance ABS securities data base of subprime loans.

[from Chomsisengphet and Pennington-Cross, 2006]

Another reason for rise in the subprime market is the role of the government in promoting homeownership as a wealth- and societal-building tool and although such policies have failed to account for individuals with limited means or homeowners in distressed neighborhoods that see little or no value appreciation, that tax code and subsequent legislations continue to promote homeownership. The Depository Institutions Deregulation and Monetary Control Act (DIDMCA) in 1980 and The Alternative Mortgage Transaction Parity Act (AMTPA) in 1982 opened the door for variable & often higher rates of interests to consumers and balloon payments which previously was not permitted (Chomsisengphet and Pennington-Cross, 2006). The Tax Reform Act of 1984 terminated income tax deductibility of all consumer interest except home mortgages which shifted the market from consumer loans to home equity lending.

Further, the Financial Institutions Reform, Recovery and Enforcement Act of 1989 (FIRREA) made it more profitable for traditional mortgage lenders and even banks to operate as mortgage bankers by allowing them to sell mortgages to the secondary markets and not holding them in their portfolio due to stringent regulatory restrictions.

Additionally, the federal government encourages such mortgage-backed securities market that allows lending institution to distribute the risks. This allowed banks and financial institutions to use 'securitization' to pass on the rights of mortgage payments and related credit including default risk to third-party investors via mortgage-backed securities (MBS) and collateralized debt obligations (CDO). This wide dispersion of risk and failure of connectivity of the effect on financial institutions in case of defaults led them to open the options for higher-risk loans such as subprime mortgages to individuals with lower ability to repay and higher incidences of defaulting. Additionally, the Community Reinvestment Act (CRA) is also have purportedly lead to the subprime expansion by forcing banks to lend to high-risk consumers (Liebowitz, 2008) and the repeal of the Glass-Steagall Act in 1999 also may have hastened the subprime crisis by allowing the banks and financial institutions to consolidate their loans into securities-backed package available for secondary markets (Kuttner, 2007).

In addition to the subprime loan conditions that sought higher interests, certain loans were characterized by adjustable rates wherein the interest rate is periodically adjusted depending on certain financial indices. Typically such adjustable rate mortgages (ARM) start out with a low interest rate and after the period of adjustment rise to a higher rate. Such ARMs are based on the economic logic that if borrowers are willing to assume the risk of interest change, then they can lower their initial payments under the lower interest rate. Although such loans provide a relief in the short term, the higher interest rate imposed after the period of adjustment can prove to be financially unmanageable for individuals who have not prepared for the change. Coupled with subprime lending rates, such ARMs can often prove to be deceptive to high-risk borrowers who may not be able to think beyond the short term and cannot afford mortgage payments after the rates have adjusted. We shall examine the risk of such ARMs in face of declining housing prices and rising interest rates on vulnerable populations in declining neighborhoods.

The Subprime Mortgage Crisis and Advantage for Homeownership Myth

The failings of the subprime housing crisis are evident in the same factors that evidently make it an attractive option for consumers with high risk and low credit scores. The crisis can be traced to the bursting of the housing bubble that had inflated home prices to astronomical levels over the past decade. This unprecedented surging movement in housing value led to a boom in residential construction and also to much speculation in hot housing markets like Florida and California. Predictably, the natural economic cycle of supply and demand that would cause prices to fall due to excessive supply would catch up as Arthur Nelson (2006) did in a model for future demand for various types of housing. He predicts a likely surplus of 22 million large-lot homes (houses built on a sixth of an acre or more) by 2025. Such an overabundance of housing stock naturally caused a steep drop in price and even led to slum-like behavior in typical suburban neighborhoods (Leinberger, 2008). In addition, much of this housing demand was directed toward first-time homeowners causing the homeownership rate to peak at 69% in 2004 (Housing Vacancy Survey, 2004) and a bulk of this homeownership drive was driven by the use of subprime mortgage loans. Fueled by consumerism, rising home values in the 90s led people to take second mortgages by refinancing their homes using lower and often subprime rates in order to use those funds for consumer spending. The government played its part by promoting consumerism as a way to boost the economy especially after a brief recession in 2001.

Subprime borrowers typically have one or more of the following characteristics: a history of credit delinquencies and default, bankruptcies or public record filings on their records, high levels of non-real estate debt, little wealth to offer in terms of down payment, residence in an area with a less stable labor or housing markets (Pennington-Cross, 2002; Nichols, Pennington-Cross and Yezer, 2005; Courchane, Surette, and Zorn, 2004; Gramlich, 2004). Since most of such borrowers used subprime mortgages and often with adjustable rates that began rising starting in 2004, the depreciation of their home values made it impossible to refinance. Ill-equipped with financial management

skills and flat incomes in an economy with rising inflation and living costs, these high-risk borrowers often found themselves unable to pay off monthly mortgages leading to foreclosures. Imperfect information or even obfuscating disclosures on part of the lending institutions made these high-risk demographic extremely vulnerable to rapid changes in the fiscal markets.

In a competitive mortgage market caused by legislative changes, brokers were more than twice as likely to originate low/no doc loans than retail channels, and were more likely to originate hybrid ARMs to high-risk borrowers (Golding, Green, and McManus, 2008). This risky behavior was offset by the fact that the capital risk was dispersed through securitization of mortgages in the secondary market through financial instruments like mortgage-backed securities (MBS) and collateralized debt obligations (CDO) and the actual lender had little risk beyond the immediate brokerage fees they hoped to garner from each transaction. Excessive reliance on rating agencies that provided overzealous and optimistic predictions of future housing prices and neglected changing market conditions wrought on by rising supply of homes created a substantial difference between the ratings and the actual risk in structured products based on subprime loans (Golding, Green, and McManus, 2008). Thus combined with unawareness of excessive supply of housing stock, imperfect information regarding the financial and housing market, over-optimism of future housing price, offering mortgage credit to high-risk consumers without adequate collateral, imperfect rating of loans in a rapidly changing economy, and dispersion of risk through secondary market mechanisms hastened the inevitability of the subprime mortgage crisis. The added emphasis on expansion of homeownership as a primary benefit of subprime loans is discussed below.

The subprime mortgages considered a market innovation undoubtedly opened the housing markets to consumers who otherwise were excluded from owning a home. Expanding the home buying opportunities for households relied on the traditional thought of building wealth and procuring appreciating assets that would ultimate lead to financial stability. The housing literature also has shown a strong association of home

ownership and improved property maintenance & longer tenure lengths that ultimately lead to increased property prices and neighborhood stability (Rohe & Stewart, 1998) however effects of homeownership on low-income and minority populations have been at best indifferent (Rohe, Van Zandt, and McCarthy, 2002) and not as significantly beneficial as the upper-income populations. The differences are stark especially if the homes are located in disadvantaged and distressed neighborhoods that do not appreciate in value as compared to average appreciation in the region. The Center for Responsible Lending reports that the subprime mortgage offerings in fact have reduced chances for homeownership as the number of subprime foreclosures exceeded the number of subprime mortgages originated for first-time homebuyers for each year between 1998 and 2006. The Center for Responsible Lending in a report titled, Net Drain in Homeownership (2007) estimates that since 1998 only 9% of the subprime loans have gone toward first-time homebuyers and such subprime instruments were in fact primarily used to refinance homes and thus is responsible for only 9% in the role in increasing homeownership. As will be discussed in a later section, such subprime loans, refinanced or new, were primarily responsible for default and subsequent foreclosures especially those characterized by adjustable rates (see table):

TABLE 1: Estimated New Homeownership from Subprime Lending

| Year | Total Subprime Loans Originated ⁶ | Subprime Loans Used for Home Purchases | | Estimated Subprime Loans to First-Time Homebuyers ⁷ (Homeownership Gain) | |
|----------------------|--|--|-------------------|---|-------------------|
| | | Number | % of all SP Loans | Number | % of all SP Loans |
| 1998 | 962,273 | 293,012 | 30% | 73,253 | 8% |
| 1999 | 1,132,280 | 357,234 | 31% | 89,309 | 8% |
| 2000 | 911,369 | 350,604 | 38% | 87,651 | 10% |
| 2001 | 918,557 | 323,424 | 35% | 80,856 | 9% |
| 2002 | 1,046,072 | 343,530 | 33% | 85,883 | 8% |
| 2003 | 1,505,854 | 483,229 | 32% | 120,807 | 8% |
| 2004 | 2,219,547 | 876,721 | 40% | 219,180 | 10% |
| 2005 | 3,259,908 | 1,297,443 | 40% | 324,361 | 10% |
| 2006 | 3,219,749 | 1,416,690 | 44% | 354,172 | 11% |
| TOTAL '98-'06 | 15,175,609 | 5,741,887 | 38% | 1,435,472 | 9% |

[source: Center for Responsible Lending]

Role of Subprime Mortgages on Foreclosures

With the decline of housing prices and adjusting mortgages rates, homeowners were unable to honor their monthly payments and in most cases faced foreclosure. Nationally, 117,259 properties entered some stage of foreclosure in February, according to foreclosure-monitoring firm RealtyTrac, a figure that's up 68% from February 2005. At the state level, 23 states saw foreclosures increase more than 24 percent from the end of 2001 to the end of 2003, and 8 saw increases of more than 50 percent over the same period (FDIC 2004). Historically, the average default rate on conventional residential mortgage loans has been less than 1% per year but this number has risen sharply across the board especially for subprime mortgages. The length of time between failure to honor mortgage payments and foreclosure action may differ from state to state (ranges from 25 days to a year) hence it is difficult to estimate a national average until sufficient time has elapsed. At times, properties are simply abandoned by owners due to lack of price appreciation, neighborhood deterioration, or in lieu of property back taxes to shift losses to the lending institution. Foreclosures can be a costly proposition even for the

lender and it is beneficial for the lender to foreclose as soon as possible if they have to otherwise it is considered prudent to work with the homeowners to negotiate payment options (Phillips and VanderHoff, 2004).

However as mentioned above since subprime housing loans are targeted towards consumers that pose a high risk toward defaulting, such loans are likely to result in foreclosure given the negative trends in the overall housing market and depreciating prices. For the first three quarters of 2006, over 60% of loans entering foreclosure in the United States were subprime, up from approximately 30% in 2003, even though less than 13% of outstanding mortgages were subprime (Nassar, 2007). This anomaly of market share of subprime mortgages with higher incidences of foreclosures gives us an insight into dangers of expanding subprime loans to consumers who are unable or are not equipped to deal beyond the short-term expanding housing market conditions.

Recent housing studies analyzing such subprime loans and their foreclosure rates have concluded that subprime loans have foreclosure rates between 10 and 20 times the rate of prime loans, depending on how foreclosures and subprime loans are defined and measured (Immergluck & Smith, 2005; Quercia, Stegman, & Davis, 2005; Schloemer et al., 2006). Specifically with home purchase loans i.e. for first-time homeowners, subprime home purchase loans made in 2003 are more than twice as likely to end up in foreclosure compared to prime loans in the same year (Schloemer et al., 2006) that leads to the conclusion that such first-time home purchase subprime loans might be more risky and dangerous than refinanced subprime loans. Thus the argument for expanding homeownership using the tools and opportunities offered by subprime loans tends to fall flat especially in worsening economic times since the adverse effect on such already-vulnerable consumers is far worse than others. At the same time, loans with teaser rates that readjust to higher interest rates and other types of ARMs also are more likely to lead to foreclosure than standard fixed rate mortgages. More than 32% of the ARMs with teaser rates and at least 7% of market-rate ARMs will default and end up in foreclosure due to interest rate resets (Cagan, 2007). At the same time, properties with

ARMs were also likely to suffer from negative equity i.e. the home's value was less than the mortgage amount than regular fixed rate mortgages. According to NBC Nightly News, for the first time in more than 40 years, Americans have experienced a sharp drop in equity with the total mortgage holdings exceeding the home values across the nation. For ARMs originating in 2006, 23.9% had negative equity up from only 7.6% in 2004, and compared to only 10.3% of fixed rate borrowers (Cagan, 2007).

| Adjustable-rate borrowers have less equity | | |
|--|------------|-----------------|
| Equity level | Fixed-rate | Adjustable-rate |
| Less than -5% | 5.2% | 12.3% |
| Less than 0 | 7.2% | 17.0% |
| Less than 5% | 10.1% | 23.1% |
| Less than 10% | 14.0% | 30.6% |
| Less than 15% | 19.0% | 39.1% |
| Less than 20% | 24.9% | 47.8% |

Source: First American Real Estate Solutions

Foreclosures thus have risen more than 20% from the first half of 2006 to the first half of 2007 in almost all major metropolitan housing markets; a majority of them due to ARMs and subprime mortgages to risky and financially-unstable consumers (RealtyTrac, 2007). With each passing quarter, these rates of foreclosure will only increase as interest rates readjust and already-vulnerable borrowers will struggle to meet their financial obligations leading to default and subsequent foreclosure. As much as \$1 trillion in ARMs were subject to resetting interest rates in 2007, up from less than \$400 billion in 2006 and \$100 billion in 2005 (Frantantoni, 2005) and since most of these ARMs had longer initial interest rate periods to attract more consumers which are due to readjust sometime in 2008, the crisis is not yet past us or might even escalate. Some argue that hot housing markets may not feel the negative influences of foreclosures due to high turnover rate for example, California, Florida, and the Northeast which host the majority of the increases in foreclosures. But such turnovers may be short-lived due to

rapid depreciation of housing value and although foreclosure rates might continue to rise, home construction and sales will fall due to sliding demand especially with rising rates of negative equity.

These higher interest rates and rising incidences of foreclosures exert a strong negative influence on the already-sliding housing market depreciating housing values and imposing social costs on neighborhoods due to foreclosures and vacancy. Similar to abandoned properties, Simons, Quercia, and Maric (1998) estimated that average sales prices fell \$788 for each 1% increase in tax delinquencies within a one- to two block area of a residence. These costs extend beyond the immediate neighborhood. In examining Federal Housing Administration foreclosures, Moreno (1995) estimated average city costs of \$27,000 and neighborhood costs of \$10,000. However, these foreclosures may be due to variety of factors like tax delinquency but we are observing an increasing amount of foreclosure due to mortgage delinquency which is the target of this paper.

Differential Subprime Loan Grants and Effects of Foreclosures

The effect of home foreclosures however is not uniform across all neighborhoods and regions and might be observed to be differential depending on demographics, income levels, and location. Considering that subprime lending was targeted toward specific classes of consumers, the effect of foreclosures arising from such loans will also be proportionately higher for those consumers. Bolstered by the promises of homeownership and subsequent wealth-building, subprime loans were packaged as ideal tools for making housing affordable and within reach of individuals that were previously unable to do so. Primarily African-Americans and other minorities form this core constituency due to their high correlation with low incomes and hence were the targeted consumers for subprime loans; often at the cost of prime lending and increased probability for predatory or deceptive lending practices. African-Americans received 20.1 percent of all subprime loans originating in 2004 whereas only 5.5 percent of prime loans were issued to African-Americans homebuyers (NCRC, 2006). Even with similar income groups, African-Americans with subprime loans were 2.7 times greater than their white counterparts. Also in predominantly immigrant neighborhoods (more

than 50 percent foreign born), subprime loans accounted for 13 percent of home purchase loans (NCRC, 2006). Considering the share of owner-occupied housing, immigrant neighborhoods were also more than twice as likely to obtain subprime mortgage loans. In terms of deceptive or predatory lending, such demographic groups are also more likely to fall prey thus transferring wealth from the households to the lender. According to a study by Pennington-Cross, Yezer, & Nichols (2000), more than 300 families in the minority census tract have paid lenders \$15 million more than they would have if they had received prime loans for which they could have qualified. Avery et al. (2006) finds that in 2006, 53.7% of blacks, 46.6% of Hispanics, and 17.7% of whites received high-priced loans. In minority areas 46.6% obtained high-priced loans compared to 21.7% in white communities. In addition to differences in demographics, subprime lending is also observed to be concentrated in communities with high unemployment rates and declining housing values thus making them more vulnerable to foreclosures and preventing viable refinancing options (Pennington-Cross 2002).

Considering the skewed distribution of subprime loans to minority and low-income populations, it is highly likely that any downturn in the economy or depreciation of housing values or even readjustment of their individual mortgage interest rates makes them vulnerable to higher probability of foreclosures. Grover, Smith, and Todd (2008) use indicators of low income, minority population, or credit risk could have been used to identify neighborhoods with high foreclosure rates in advance wherein they find a strong association between two primary factors - a high percentage of adults with very low credit scores and an upward trend in the percentage of minority homeowners – with foreclosure rates. Given how the financial and lending market is structured, it may also be possible that low credit scores and percentage of minority homeowners may be related and attributable to mortgage denial rates also. Goldstein et al. (2005) found that income, average credit score, unemployment rate, owner-occupancy rate, and a number of other demographic factors all have predictable impacts on the foreclosure rate. Although the rate of foreclosures have risen dramatically across all kinds of neighborhoods, “in census tracts where less than 10 percent of the 2000 population

consisted of minorities, there was an increase of 215 percent, while in tracts where 90 percent or more of the population consisted of minorities, there was an increase of 544 percent” (Immergluck & Smith, 2005).

However, it remains to be seen if subprime lending trends in minority and low-income neighborhoods have had any significant impact on the rates of foreclosures in those neighborhood. There have been a few studies in recent years that seek such an association. In Baltimore, at least 45% of the foreclosure petitions were related to subprime loans at a time when subprime mortgages share in the city was at 21% in 1998; 57% for all foreclosures in African-American neighborhoods (U.S. Department of Housing and Urban Development 2000) and in Atlanta, foreclosures attributed to subprime lenders accounted for 36% of all foreclosures in predominantly minority neighborhoods in 1999 (Gruenstein and Herbert, 2000). The percentage of foreclosures attributed to subprime loans increased from 19% in 1995 to more than 30% in 2000 mostly in minority neighborhoods (Zimmerman, Wyly, and Botein 2002). More recently as the subprime mortgage crisis has worsened, studies reveal that the gap between prime and subprime lending’s role in foreclosure might be widening. At least 20.7 percent of the subprime refinanced loans originating in 1999 were subject to foreclosure by the end of 2003 which was more than 10 times the rate for prime loans (Quercia, Stegman, and Davis, 2005). Goldstein (2005) similarly cites a higher figure of 40 percent of subprime loans made in 1998 and 1999 ending up in foreclosure by 2003 compared to 3 percent for prime loans. Similarly Immergluck and Smith (2005) find the effect of subprime lending on foreclosure to be at least 20 to 30 times that of prime lending and “100 more subprime loans in a census tract over a five-year period led to almost eight foreclosures in a single year following this period.”

Research Plan

We can observe a correlation between subprime lending and minority and low-income households or neighborhoods as well as a relationship between rising numbers of foreclosures due to subprime lending. But there is a lack of evidence of a three-way relationship between subprime lending, foreclosures, and extent and location of such

foreclosures in minority and low-income neighborhoods. This study will attempt to bridge that gap in proving that subprime lending has targeted low-income and minorities by offering a false sense of hope toward wealth-building through homeownership and has resulted in large scale foreclosures that are spatially clustered in certain neighborhoods that in effect compound problems of economic instability and physical deterioration. Since such data on lending and foreclosures is proprietary in nature and available only at a premium, this study will restrict itself to constructing a research framework that would address the research questions thus raised in event of availability of data.

In this study we shall conduct a detailed analysis of subprime lending patterns in major metropolitan cities namely Atlanta, San Diego, Miami, Philadelphia, Chicago, Baltimore, and Denver as a representative sample of the nation's urban housing markets. These cities are included because of the high activity of subprime lending in their neighborhoods and the subsequent rise in property values in their respective housing markets and rise in the rate of homeownership. At the same time, these cities have also experienced sharp declines following the bursting of the housing bubble as well as high rates of foreclosures. The analysis will be conducted over the period between 1995 and 2006. Additionally, the study will also map the location and extent of foreclosures from subprime lending within these metropolitan areas and examine if these foreclosures are located primarily in low-income or minority neighborhoods. The research hypotheses for this study are as follows:

H1: Subprime lending is significantly higher in neighborhoods with low-income and minority populations.

H2: Rate of foreclosures is significantly higher in neighborhoods with higher incidences of subprime lending.

H3: Rate of foreclosures arising from subprime lending is significantly higher in neighborhoods with low-income and minority populations.

As observed in the studies mentioned in the literature review above, there have been sufficient incidences to suggest that subprime lending is targeted to low-income and minority populations either to promote homeownership through increased access to mortgage loans or through predatory or deceptive lending practices that encourage high-risk borrowers. This study although seeks to confirm previously tested hypotheses through the first two objective statements, the focus is on bridging the gap between foreclosures in minority and low-income neighborhoods that are caused by subprime lending through the third research hypothesis.

Data Sources and Operationalization

In order to analyze this relationship between subprime loans, foreclosures, and demographics we need data from lending institutions, housing data pertaining to foreclosures from local and county governments or lending institutions and census data. Considering that data from lending institutions will be hard to obtain either due to proprietary or privacy concerns, most of our subprime lending data will have to be derived from Home Mortgage Disclosure Act (HMDA) datasets. Conventional mortgages were defined as prime or subprime based on characteristics of the originating lender and although we are limited to using HMDA datasets, it still covers a significant portion of the mortgage market. We shall use the Department of Housing and Urban Development's (HUD) annual lists of HMDA-reporting lenders that specialize in subprime loans. Since lenders that have assets more than \$30 million are required to disclose information pertaining to mortgage loan applications, this data - type of loan, the purpose of the loan, the dollar amount of the loan, the Census tract where the home is located, and whether the application was approved or denied – will provide us useful information pertaining to our analysis. However, the loan if issued is not identified as prime or subprime. However for sake of our analysis, we shall consider any loan originated by a lender on the HUD list of subprime specialists as subprime and all other loans as prime. Any measurement errors arising either from ignoring lenders with assets less than \$30 million or not including lenders that originate in both – prime and

subprime – loans is considered unavoidable as per other foreclosure studies in the literature (Immergluck & Smith, 2005; Lax et al, 2000).

Foreclosure data from the metropolitan regions mentioned above shall be obtained from local and county governments and geocoded to the census tract level. Census tract level data for the neighborhood shall be obtained from the year 2000 census. As in the study by Calem, Hershaff, and Wachter (2004), neighborhood characteristics shall be obtained from a number of tract-level variables like median family income, percentage of individuals above 25 with a college degree, percentage of rental-occupied housing as part of economic variables as a proxy for low-income households. The minority aspect of neighborhood shall be similarly measured by variables like percentage of households headed African-Americans, Hispanic, and Asians. Critics against discriminatory lending argue that repayment behavior rather than race or income characteristics dictate foreclosure rates. Default and foreclosure rates are also related to both property risk and individual credit quality (Calem and Wachter, 1999). Thus, credit risk of the neighborhood can be operationalized by including variables like, percentage of households with very low credit scores, rate of denial of prime home purchase mortgage applications, number of subprime refinancing originations per census tract, and FHA originations per census tract (Grover, Smith, and Todd, 2008).

Methodology

In order to examine impact of location and extent of foreclosures caused by subprime lending, we need to combine quantitative methods like multivariate regression models with graphical methods like GIS mapping. Firstly, Subprime lending and foreclosure data geocoded earlier shall be mapped separately in order to get a better idea of the location of the effects. Change of rates of foreclosure from 1995 to 2006, as in Immergluck (2007), shall be mapped at the scale of census tract in order to pinpoint the locations of the highest change and if neighborhoods thus effected are primarily low-income or minority. Since the effect of foreclosures can be spatially autocorrelated within neighborhoods, tools of spatial statistics such as Moran's I and Geary's C shall be used to examine the extent of clustering. In case of high level of

positive spatial autocorrelations, spatial autoregressive models or conditional autoregressive models or mixed autoregressive models that correct for these correlations shall be used in accordance with the appropriate neighborhood structure.

Secondly, multivariate regression models using logit models shall be used to test the relationship between subprime lending, foreclosures, and economic & demographic variables. The dependent variable will be if the originating loan is subprime or not depending upon the lending institution and independent variables that include the ones described above and whether the properties were foreclosed in the period of the study. As necessary, interaction variables that combine demographic or economic variables shall be used to determine foreclosed properties that originated from subprime lending. Thus combined with graphical methods, spatial statistics, and multivariate regression analysis, we hope to understand the extent and location of foreclosed properties due to subprime lending. In order to analyze the effect of change in foreclosure rates due to change in neighborhood composition, structural equations models can be estimated to understand this process. Alternatively, Immergluck and Smith (2005) propose a negative binomial regression because of the probability of small number of tracts with foreclosures thus violating the normality assumption of the data.

Potential Solutions for Subprime Mortgage Crisis

The subprime mortgage housing crisis is not only influential in the downturn of the economy but is also leading to higher number of foreclosures and leading the already disadvantaged neighborhoods into decline. Policy makers, economists, and politicians are proposing a host of solutions that range from increasing regulations to allowing the market mechanisms to correct themselves. Given the highly polarized political situation in the United States today and the impending Presidential election, the impetus for interventionist actions to prevent home foreclosures is high. The current Presidential candidates are proposing a 90-day moratorium on foreclosures, freezing of the interest rates to prevent them from readjusting, and federal bailouts to the tune of \$30 billion to save the severely affected homeowners. The Senate proposes emphasizing federal support for community-based organizations aid families facing foreclosure in

form of prevention programs that would cost the taxpayer approximately \$3,300 per household, substantially less than the \$80,000 in estimated costs of foreclosure (U.S. Joint Economic Committee, 2007).

Predatory lending or subprime mortgage lending that tends to obfuscate terms and conditions for financially-unaware consumers is considered to be a pivotal factor in the current crisis. The Senate Report emphasizes strengthening of regulations of mortgage originations at a federal level by including mortgage brokers and lenders in non-bank companies that are currently monitored only by state regulation. These regulations could include licensing, minimum education and experience standards. In order to prevent predatory lending, legislators are considering bans on pre-payment penalties, stated income, and low documentation loans and “require all subprime loan borrowers to escrow property taxes and hazard insurance.” Enforcing a stricter standard before granting subprime mortgages will help assess a borrower’s risk better and prevent potential inability to honor mortgage payments and prevent foreclosure. Usually, ARMs are approved based on a borrower’s ability to pay off the loan only using the teaser rate period instead of the entire life of the loan. In such cases, the borrowers’ risk worthiness fails the test once the rate adjusts.

The Senate Report also emphasizes on effective communication regarding recent financial tools such as teaser rates, interest-only loans, pick-a-payment, etc. in order to better inform consumers regarding risks. Enhanced disclosure practices can include full payment schedule over the entire life of the loan, all fees associated with the loan, explanation of the alternative features (“negative amortization”) and risk associated with those features (U.S. Joint Economic Committee, 2007). In addition to emphasizing communication to borrowers, it is important to educate them especially recent immigrants regarding various intricacies of mortgage lending. The Federal Reserve Bank of Chicago has started a “Financial Access for Immigrants” program that brings together “organizations from across the Seventh Federal Reserve District and other parts of the country, to exchange information about helping immigrants achieve financial literacy” (Weicher, 2007). Although largely descriptive, the program is expected

to expand counseling to potential homeowners as well as homeowners that face foreclosures. Freddie Mac reports that those receiving counseling are less likely to default on their mortgage loans and counseled borrowers are more likely to avoid predatory or discriminatory lending terms on their mortgage (Hirad & Zorn, 2001).

Also, in addition to assessing risk worthiness, it is important to allocate costs pertaining to foreclosure equitably and risky borrowing in spite of adequate counseling can be prevented by addressing the walkaway loophole i.e. tendency of homeowners to walk away from their homes due to lack of enough equity invested in the home (Apgar & Duda, 2004). These foreclosed properties should also be sold or occupied immediately in order to prevent the social costs of foreclosed properties that included decline in neighborhood housing values. Although the Community and Reinvestment Act has been attributed with adding to the subprime mortgage crisis by forcing banks to lend to risky borrowers, banks can use the potential of this act by working with the community at a microlevel and identifying the credit needs of the community. Instead of solely focusing on loan originations, banks can in fact promote free and fair lending practices that emphasize transparency in mortgages even if they are subprime (Immergluck, 2007).

Apart from the government actions aimed at counseling borrowers, regulating subprime lenders, and creating transparency in the mortgage business, the housing market has offered some potential solutions as well since the high default rate and declining housing prices adversely affect the economics of doing business. Andrew Samwick, and Dean Baker in Golding, Green, and McManus (2008) propose allowing current homeowners to continue staying in their homes as long as they like, by paying fair-market rent. This fair-market rent can be determined by an independent appraiser and the homeowner can turn over the property to the mortgage lender. Under this program, the homeowners do not lose their home and the mortgage lenders get a return on their loan that far exceeds the costs of foreclosure. Of course, only homeowners with negative equity can choose to opt for this program and would be still responsible for maintenance in order to prevent the property from falling into disrepair as many foreclosed properties are prone to, negatively impacting the neighborhood.

Thus, solutions for the current subprime mortgage crisis involve increased regulation of the financial and mortgage markets, greater transparency and accountability, education and counseling for potential and current homeowners, and market solutions for mitigating losses arising from foreclosures. The costs of foreclosures are borne not only by the homeowners but also by the lending institutions and such foreclosures that are often spatially concentrated in minority or low-income neighborhoods can have an adverse impact on the social and economic health of communities.

Conclusion

The subprime mortgage market originated as an innovative financial tool intended to expand homeownership and expand credit to high-risk individuals. Devoid of regulation and aided by a housing bubble, subprime mortgages grew to comprise of nearly 15% of the housing mortgage market and expanded homeownership to nearly 69%. However, as housing prices began declining and interest rates readjusted consumers that were offered subprime mortgages defaulted leading to rising number of foreclosures that not only had serious repercussions on the economy but also impacted the social and cultural conditions of neighborhoods. Market imperfections fueled by information asymmetry, overestimation and transfer of risk, over-zealous expansion of credit to risky consumers, and even deceptive lending practices caused subprime lending to decline. Growing negative equity for households led to foreclosures that disproportionately affected low-income and minority neighborhoods.

This study has attempted to delineate the association between subprime lending to vulnerable and disadvantaged population and rising incidences of foreclosures. Laying out a research framework that would utilize a unique dataset of foreclosures that originated from subprime mortgages, it would be possible to examine the social inequities and financial shortcomings of populations that are most likely to use subprime mortgages for home purchase or refinancing purposes. It would be important to understand if foreclosures caused by subprime mortgages are spatially concentrated in certain neighborhoods and whether such neighborhoods constituted the bulk of

subprime mortgage originations in the first place. As seen in the literature cited, it is likely that vulnerable and disadvantaged populations are targeted by subprime lenders, it remains to be seen if a disproportionate number of such populations are also responsible for foreclosures.

Although several solutions are currently proposed both in the political and economic fields, it would be helpful to see if any solution thus implemented makes a difference in reducing foreclosures or at least reducing the chances of granting subprime ARMs to risky consumers. Although the subprime crisis has severely affected the housing market, it might be a short-term readjustment that may have been essential for the economy and strong demand for homeownership facilitated by robust prime mortgages and increasing level of awareness through advances in information technology will continue to bolster the economy. Negative effects of foreclosures if spatially concentrated although detrimental to the neighborhoods they occur in can help in isolating the crisis to certain submarkets and local regions.

References

- Apgar, W. C. and M. Duda (2005). *Collateral Damage: The Municipal Impact of Today's Mortgage Foreclosure Boom*. Minneapolis, MN, Homeownership Preservation Foundation.
- Cagan, C. (March 2007). Mortgage payment reset: The issue and the impact. Santa Ana, CA: First American CoreLogic, Inc. <<http://www.firstamres.com/MPR2007>> (accessed on March 20, 2008)
- Calem, P. S., J. E. Hershaff, et al. (2004). "Neighborhood Patterns of Subprime Lending: Evidence from Disparate Cities." *Housing Policy Debate* **15**(3): 603-622.
- Calem, P. S. and S. M. Wachter (1999). "Community Reinvestment and Credit Risk: Evidence from an Affordable-Home-Loan Program." *Real Estate Economics* **27**(1): 105-108.
- Center for Responsible Lending. (March 2007) *Subprime Lending: A Net Drain on Homeownership*. CRL Issue Paper No.14, Durham, NC.
- Chomsisengphet, S. and A. Pennington-Cross (2006). The Evolution of the Subprime Mortgage Market. *Federal Reserve Bank of St. Louis Review*. **88**: 31-56.
- Courchane, M. J., B. J. Surette, et al. (2004). "Subprime Borrowers: Mortgage Transitions and Outcomes." *The Journal of Real Estate Finance and Economics* **29**(4): 365-392.
- Federal Deposit Insurance Corporation. (April 2004) *Economic Conditions and Emerging*

- Risks in Banking. World Wide Web page
<<http://www.fdic.gov/deposit/insurance/risk/ecerb.pdf>> (accessed March 20, 2008).
- Frantantoni, M. (September 2005). Housing and mortgage markets: An analysis. Washington, DC: Mortgage Bankers Association.
<http://www.mortgagebankers.org/files/News/InternalResource/29899_HousingandMortgageMarkets-AnAnalysis.pdf> (accessed on March 20, 2008)
- Golding, Edward, Richard K. Green, and Douglas A. McManus. (February 2008). Imperfect Information and the Housing Finance Crisis, Joint Center for Housing Studies, Cambridge, MA: Harvard University.
- Gramlich, E. M. (2004). Subprime Mortgage Lending: Benefits, Costs, and Challenges. Financial Services Roundtable Annual Housing Policy Meeting, Chicago.
- Grover, M., L. Smith, et al. (2007). "Targeting foreclosure interventions: An analysis of neighborhood characteristics associated with high foreclosure rates in two Minnesota counties." Journal of Economics and Business **60**(1-2): 91-109.
- Gruenstein, D., and C. Herbert. (2000). Analyzing trends in subprime originations and foreclosures: A case study of the Atlanta metro area. Cambridge, MA: Abt Associates.
- Hirad, A. and P. M. Zorn (2001). A Little Knowledge is a Good Thing: Empirical Evidence of the Effectiveness of Pre-purchase Homeownership Counseling. Cambridge, MA, Joint Center for Housing Studies, Harvard University.
- Immergluck, D. (2007). "From the Subprime to the Exotic: Excessive Mortgage Market Risk and Foreclosures." Journal of the American Planning Association **74**(1): 1 - 18.
- Immergluck, D. and G. Smith (2005). "Measuring the Effect of Subprime Lending on Neighborhood Foreclosures: Evidence from Chicago." Urban Affairs Review **40**(3): 362.
- Kuttner, Robert, The Bubble Economy (2008). The American Prospect, September 24, 2007 <http://www.prospect.org/cs/articles?article=the_bubble_economy> (accessed March 20, 2008)
- Lax, H., M. Manti, et al. (2004). "Subprime Lending: An Investigation of Economic Efficiency." Housing Policy Debate **15**(3): 533-71.
- Leinberger, Christopher B. The Next Slum? The Atlantic. Volume 301 No. 2, March 2008 World Wide Web page
<<http://www.theatlantic.com/doc/200803/subprime>> (accessed March 20, 2008).
- Liebowitz, Stan. The Real Scandal - How feds invited the mortgage mess. New York Post
<http://www.nypost.com/seven/02052008/postopinion/opedcolumnists/the_real_scandal_243911.htm?page=0> (accessed March 20, 2008)
- Moreno, A. (1995). The cost-effectiveness of mortgage foreclosure prevention. Minneapolis, MN: Family Housing Fund.
- National Community Reinvestment Coalition (April 2006). The Opportunity Agenda, and

- Poverty & Race Research Action Council, Homeownership and Wealth Building Impeded.
- Nassar, J. (March 2007). Foreclosure, predatory mortgage and payday lending in America's cities. Testimony before the U.S. House Committee on Oversight and Government Reform.
<<http://oversight.house.gov/documents/20070322175553-40982.pdf>> (accessed on March 20, 2008)
- Nichols, J., A. Pennington-Cross, et al. (2005). "Borrower Self-Selection, Underwriting Costs, and Subprime Mortgage Credit Supply." The Journal of Real Estate Finance and Economics **30**(2): 197-219.
- Pennington-Cross, A. (2002). "Subprime Lending in the Primary and Secondary Markets." Journal of Housing Research **13**(1): 31-50.
- Pennington-Cross, A. (2003). "Credit History and the Performance of Prime and Nonprime Mortgages." The Journal of Real Estate Finance and Economics **27**(3): 279-301.
- Phillips, R. A. and J. H. VanderHoff (2004). "The Conditional Probability of Foreclosure: An Empirical Analysis of Conventional Mortgage Loan Defaults." Real Estate Economics **32**(4): 571-587.
- Quercia, R., Stegman, M. & Davis, W. (January 2005). The impact of predatory loan terms on subprime foreclosures: The special case of prepayment penalties and balloon payments. Chapel Hill, NC: Center for Community Capitalism at the University of North Carolina at Chapel Hill.
- RealtyTrac, Inc. (August 2007). Stockton, Detroit, Las Vegas post top metro foreclosure rates.
<<http://www.realtytrac.com/ContentManagement/pressrelease.aspx?ChannelID=9&ItemID=773&acct=64847>> (accessed March 20, 2008)
- Rohe, W. M. and L. S. Stewart (1996). "Homeownership and Neighborhood Stability." Housing Policy Debate **7**(1): 37-81.
- Rohe, W. M., S. Van Zandt, et al. (2002). Social Benefits and Costs of Homeownership. Low-income Homeownership: Examining the Unexamined Goal. N. P. Retsinas and B. E. S. Washington, D.C., Brookings Institution Press.
- Schloemer, E., Li, W., Ernst, K., & Keest, K. (2006). Losing ground: Foreclosures in the subprime market and their cost to homeowners. Washington, DC: Center for Responsible Lending < <http://responsiblelending.org/pdfs/FC-paper-12-19-new-cover-1.pdf>> (accessed on March 20, 2008)
- Simons, R. A., R. G. Quercia, et al. (1998). "The Value Impact of New Residential Construction and Neighborhood Disinvestment on Residential Sales Price." Journal of Real Estate Research **15**(1/2): 147-61.
- United States Department of Housing and Urban Development. (2000). Unequal burden in Baltimore: Income and racial disparities in subprime lending. Washington, DC.
- United States Joint Economic Committee, United States Senate (April 2007). Special Report: Sheltering Neighborhoods from the Subprime Foreclosure Storm, Washington, D.C.

<http://jec.senate.gov/Documents/Reports/subprime11apr2007revised.pdf>
(accessed from March 25, 2008).

Weicher, J. (2007). The Long and Short of Housing: The Home Ownership Boom and the Subprime Foreclosure Bust. Indiana State University, Networks Financial Institute.

Zimmerman, K., E. Wyly, and H. Botein. (2002). Predatory lending in New Jersey: The rising threat to low-income homeowners. Newark: New Jersey Institute for Social Justice.