Utah Economic and Business Review

BEBR
Bureau of Economic and Business Research
David Eccles School of Business | University of Utah

2013 | Volume 73, Number 2

Highlights

This preliminary study of the 2006–2011 Home Mortgage Disclosure Act data for Salt Lake County and Salt Lake City highlights disparities in mortgage application outcomes between non-Hispanic White and Hispanic applicants.

- The overall county-level Hispanic mortgage denial rate is 27.4 percent, compared with only 14.2 percent among non-Hispanic White applicants. The gap persists even when disaggregated by income levels. Non-Hispanic White applicants have approval rates near or above 70 percent for nearly all income levels, while Hispanic approval rates do not reach 60 percent—even for Hispanics at the highest income decile among all Salt Lake County applicants from 2006 to 2011 (greater than $173,000/year).
- Over 54 percent of all Salt Lake County mortgage applications from 2006 to 2011 were for homes in West Valley, unincorporated areas, West Jordan, and Salt Lake City. For Hispanic/Latino applicants, this cumulative percentage reaches nearly 79 percent. In fact, roughly three out of every ten Hispanic applicants who applied for Salt Lake County properties selected West Valley.
- As the overall application volume declined by 75 percent from 2006 to 2011, the Hispanic/Latino share of the total county applicant pool also decreased precipitously from roughly 15 percent during the housing boom from 2006 to 2007 to 7 percent in 2009 before stabilizing at 8 percent in 2010 and 2011.
- While Hispanic/Latino applicants represented 9.5 percent of all approved loans from 2006 to 2011, they received a disproportionate 22.8 percent of all high-interest loans.
- Prospective Salt Lake City non-Hispanic White applicants selected east-side neighborhoods at levels of 80 percent from 2006 to 2011, whereas nearly 80 percent of Hispanic applicants selected properties in the River District during this time period.
- The dramatic increase in the Hispanic approval rates in Salt Lake City from 36 percent in 2008 to 69 percent in 2010 was driven partly by the uptick in nonconventional loan applications. While only 2.7 percent of the 2006 Salt Lake City applications for Hispanics were nonconventional, this rate rose to a staggering 79 percent in 2009. When accounting for only conventional loan applications, the Hispanic approval rate in 2010 dropped to 60 percent.

Disparities in Salt Lake County and Salt Lake City Mortgage Outcomes and Lending Practices

Darius Li, Research Analyst

The Home Mortgage Disclosure Act,[1] which requires most financial institutions to report mortgage application data annually, provides an added data dimension when examining housing opportunity. De-identified applicant-level HMDA data is publicly available for analysis and evaluation of lending practices. This article is an adapted excerpt from the Salt Lake County Regional Analysis of Impediments prepared by the Bureau of Economic and Business Research for the HUD Sustainable Communities Grant.

The disparities in homeownership across racial and ethnic lines reflect only the symptoms of underlying impediments in the home mortgage application process. The HMDA data from 2006 to 2011 were compiled for Salt Lake County to better understand the barriers that members of the protected classes face in obtaining mortgages. For illustrative proposes, non-Hispanic White applicants were compared with Hispanic/Latino applicants for most metrics derived from the HMDA data. This study includes only home purchase loans, excluding home improvement loans and refinancings. Homeownership and housing stability are two dimensions of housing opportunity that can be assessed using HMDA data by examining mortgage application outcomes and high-interest lending practices.

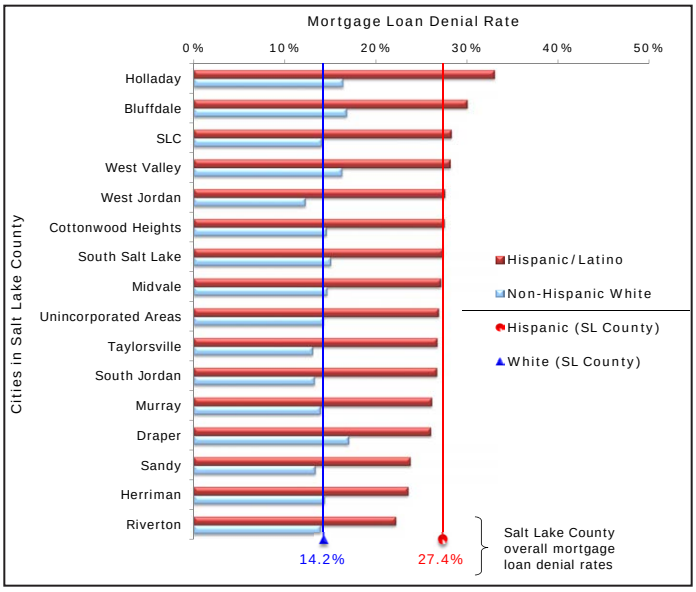
Mortgage Outcome Disparities by Race/Ethnicity and Income

Figure 1 shows the overall mortgage denial rates from 2006 to 2011 by race and ethnicity[2] for each city in Salt Lake County. The vertical reference lines in Figure 1 mark the overall county-level denial rates for non-Hispanic White and Hispanic/Latino applicants, which are 14.2 and 27.4 percent, respectively. Holladay

1. For all HMDA-related terms, please see Federal Financial Institutions Examination Council, HMDA Glossary; accessed 4 October 2012, http://www.ffiec.gov/hmda/glossary.htm.
2. For the purposes of this analysis, both the applicant and co-applicant must have reported their race as non-Hispanic White in order to be included in this classification. In cases of no co-applicants, only the primary applicants need to have reported their race as non-Hispanic White to be included in this category. The same classification procedure applied to Hispanic applicants. For brevity, the racial category White alone, not Hispanic is interchangeably referenced as White and non-Hispanic White in this article.

and Bluffdale have the highest Hispanic denial rates in the county, averaging over 30 percent. Note that the two cities account for only 0.6 percent of the total Salt Lake County mortgage applications for Hispanics. However, other cities with high mortgage application rates among Hispanics have similar denial rates. Salt Lake City and West Valley, which account for 45 percent of the county's Hispanic mortgage applications, have Hispanic denial rates slightly above the county average. In other words, while the Hispanic denial rates in southern and eastern cities in the county might deviate from the overall Hispanic denial rate due to low Hispanic application volume, the Hispanic denial rates are significantly higher than those among non-Hispanic White applicants for all cities in Salt Lake County.

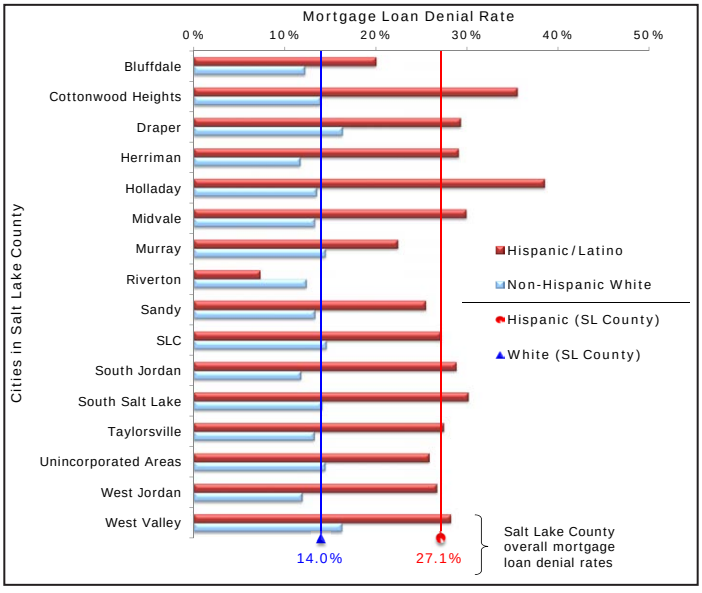
Figure 1
Percent of Mortgage Loan Applications Denied by Race/Ethnicity in Salt Lake County Cities, 2006–2011



Source: HMDA LAR raw data by MSA (2006–2011).

Despite the large gaps in denial rates between non-Hispanic White and Hispanic applicants shown in Figure 1, the inherent income differences between the two groups could be a contributing factor to this gap. However, the denial rate gap between the two groups persists even when the denial rates are disaggregated by income categories based on the median family income (MFI) in the Salt Lake Metropolitan Statistical Area (MSA), which includes Salt Lake, Summit, and Tooele counties. Figure 2 shows the denial rates among White and Hispanic applicants with reported incomes at or below 80 percent MFI (median family income), while Figure 3 shows the denial rates for applicants with reported incomes above 80 percent MFI. Note that the reported incomes for applicants from 2006 to 2011 are classified relative to the median family income for the year that they filed their mortgage applications.

Figure 2
Percent of Mortgage Loan Applications (At or Below 80% MFI) Denied by Race/Ethnicity in Salt Lake County Cities, 2006–2011



Source: HMDA LAR raw data by MSA (2006–2011).

The overall county-level denial rates do not change across groups. The Hispanic denial rate remains at levels above 27 percent, while the White denial rate is 14 percent—regardless of income bracket. At the city level, the denial rate gap between the two groups closely resembles that of the county level. The only anomaly is Riverton, which has a lower Hispanic denial rate than that of Whites in the income category at or below 80 percent MFI (Figure 2). However, note that Riverton had only 41 Hispanic applications during this six-year period with reported incomes at or below 80 percent MFI. Furthermore, over a fifth of these applications were withdrawn by the applicant. This withdrawal rate is twice as high as the countywide average for Hispanic applicants in this income bracket. Riverton's low Hispanic application volume and high application withdrawal rate could have contributed to the low Hispanic denial rate. Nonetheless, for applicants above the 80 percent MFI threshold, the denial rate gap in Riverton resurfaces.

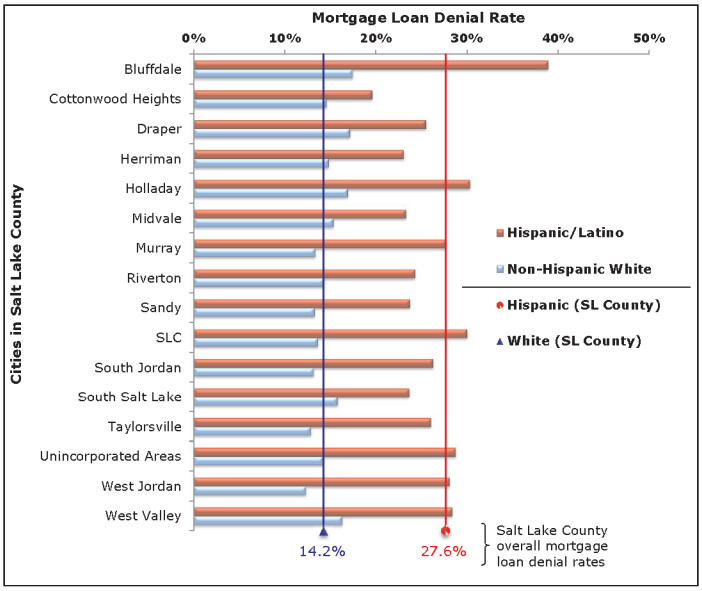
While the denial gap decreases from the low-income bracket (Figure 2) to the high-income bracket (Figure 3) for some cities, such as Cottonwood Heights, Holladay, and Draper, the overall county denial gap does not change between these two income brackets. In the case of Cottonwood Heights, Holladay, and Draper, these three cities accounted for 12.6 percent of the county's non-Hispanic White applications but only 2.9 percent of the total Hispanic applications. On the other hand, the denial gap persisted across the two income brackets in Salt Lake City and West Valley, which accounted for a quarter of the county's White applications and 45 percent of the total Hispanic applications. Thus, smaller cities might have some variability in denial rate gaps due to smaller application volumes, but the overall denial gap persists regardless of income bracket.

Given the small application volume for several cities in Salt Lake County, the reported income was only disaggregated to two

income brackets, using 80 percent MFI as the threshold. Figure 4, on the other hand, shows the overall county-level approval rates for both groups disaggregated by more income brackets to determine if the gap persists consistently at all income levels. The percentiles shown on the horizontal axis represent nominal dollars. The income levels are based on the income deciles of all Salt Lake County applicants in the HMDA data from 2006 to 2011.

Interestingly, the non-Hispanic White approval rates have increased from the housing boom peak in 2006 and 2007 (dotted blue line in Figure 4) to the subsequent housing bust (solid blue line) for all income deciles. The Hispanic approval rates have not systematically increased across these two housing periods, with the exception of those at the lowest two income deciles (below $42,000/year). Nonetheless, across all income levels, the approval rate gap persists between the two groups. Non-Hispanic White applicants have approval rates near or above 70 percent for nearly all income levels, while Hispanic approval rates do not reach 60 percent—even for Hispanics at the highest income decile (greater than $173,000/year).

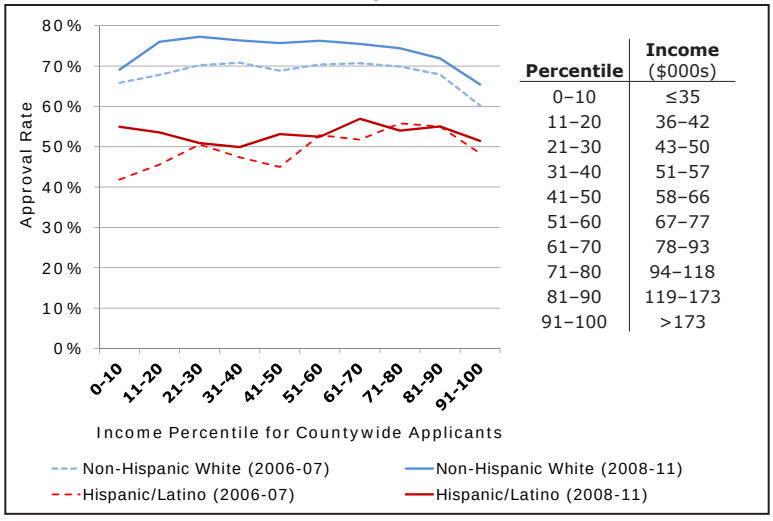
Figure 3
Percent of Mortgage Loan Applications (Above 80% MFI) Denied by Race/Ethnicity in Salt Lake County Cities, 2006–2011



Source: HMDA LAR raw data by MSA (2006–2011).

In addition to the approval rate gaps by income, the geographic distribution of Hispanic approved loans presents another dimension of disparity. Figure 5 maps the number of Hispanic approved loans in Salt Lake County by census tract from 2006 to 2011. The census tracts west of I-15 generally have more Hispanic approved loans than those on the east side of the county. This pattern partly stems from the neighborhood self-selection effect, since Hispanic applicants have generally gravitated toward the west side of the county, which has more affordable properties. Nonetheless, this geographic divide mirrors and perhaps intensifies the racial and ethnic segregation in Salt Lake County.

Figure 4
Approval Rates by Income Level and Race/Ethnicity in Salt Lake County, 2006–2011



Percentile	Income ($000s)
0–10	≤35
11–20	36–42
21–30	43–50
31–40	51–57
41–50	58–66
51–60	67–77
61–70	78–93
71–80	94–118
81–90	119–173
91–100	>173

Source: HMDA LAR raw data by MSA (2006–2011).

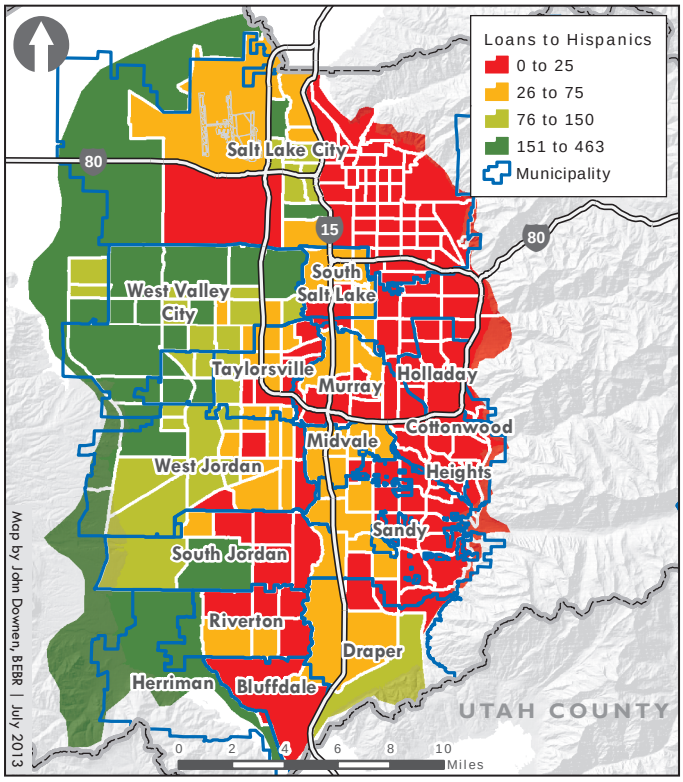
The disparities in application outcomes across racial and ethnic groups also need to be examined on the basis of income distributions. Figure 6 shows the cumulative percentage of total applications and denials across income levels by race/ethnicity and housing periods. The 45° dotted line is the baseline, meaning that curves that approach the shape of this baseline have distributions similar to the overall reported income distribution of all applicants in Salt Lake County in the HMDA dataset from 2006 to 2011. Cumulative application distributions for a subpopulation above the baseline suggest that this group has more applicants in the lower income deciles compared with the entire 2006 to 2011 Salt Lake County HMDA dataset. Likewise, cumulative application distributions below the baseline mean that the group has more applicants in higher income deciles.

The two panels in Figure 6 each overlay the cumulative application distributions (solid lines) with the corresponding cumulative denial distributions (dotted lines) for the two housing periods. For both non-Hispanic White and Hispanic/Latino applications, the distributions have skewed more to the lower income levels after the housing boom. Interestingly, the cumulative distributions of denials and total applications for Hispanics are nearly identical for both housing periods. This means that Hispanic applicants at the lowest income levels have not received a disproportionately high share of the total denied applications among Hispanics.

On the other hand, the cumulative denial distributions for non-Hispanic White applicants deviated slightly from the total cumulative application distributions. During the housing boom period, White applicants at the highest income level (earning more than $173,000/year) received a disproportionately higher share of denials than expected based on

the total income distribution of the White applicant pool. This is depicted in the left panel in Figure 6 at the point where the slope of the pink dotted line (cumulative denials) is steeper than the solid red line (cumulative applications) at the highest income decile. In fact, less than 14 percent of Whites are in the highest income decile but they account for 18 percent of the total denials among Whites. Similarly, during the housing bust period from 2008 to 2011, non-Hispanic White applicants at the lowest income levels accounted for a disproportionately higher share of denials than expected from the total White applicant income distribution. This is graphically shown in the left panel in Figure 6 at the interval where the dotted blue line (cumulative denials) is more concave than the solid blue line (cumulative applications).

Figure 5
Hispanic Approved Loans by Census Tract in Salt Lake County, 2006–2011

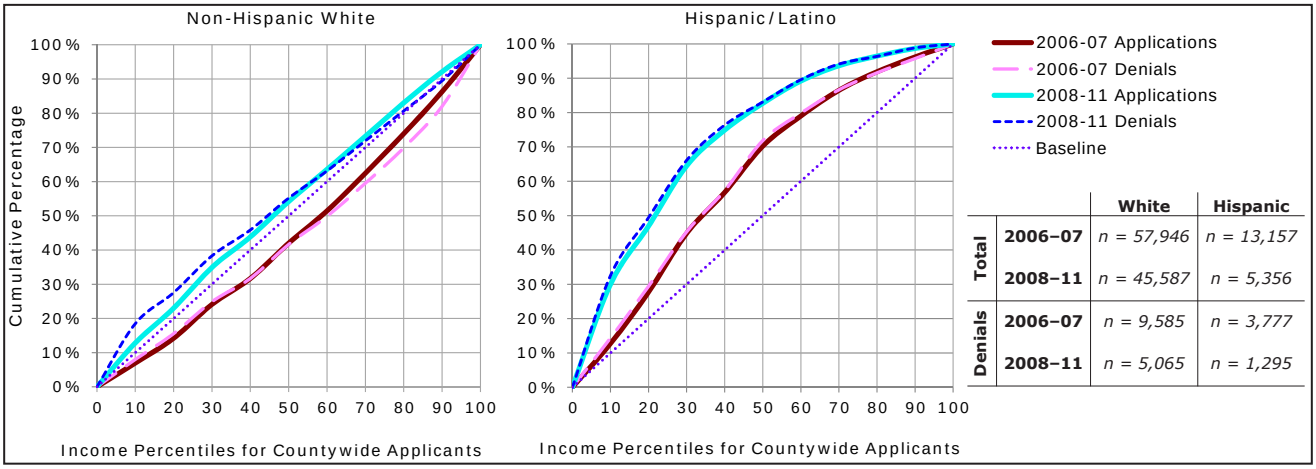


Source: HMDA LAR raw data by MSA (2006–2011); State of Utah, SGID.

Figure 7 shows the composition of denial reasons by race/ethnicity for all denied non-Hispanic White and Hispanic/Latino applicants from 2006 to 2011. While as many as three denial reasons may be reported, Figure 7 shows only the primary reason for the sake of simplicity. The bar graph component of Figure 7 shows the proportion of denied applications by race/ethnicity attributed to each denial reason. Note that 17 percent and 25 percent of the denials for White and Hispanic/Latino applicants, respectively, did not have a documented reason. In fact, the reporting of denial reasons is not mandatory except for institutions under the supervision of the Office of the Comptroller of the Currency or the Office of Thrift Supervision.[3]

The line graph component of Figure 7 represents the cumulative percentages for the denial reasons listed from left to

Figure 6
Cumulative Distribution of Applications and Denials Across Income Levels by Race/Ethnicity in Salt Lake County, 2006–2011



		White	Hispanic
Total	2006–07	*n* = 57,946	*n* = 13,157
	2008–11	*n* = 45,587	*n* = 5,356
Denials	2006–07	*n* = 9,585	*n* = 3,777
	2008–11	*n* = 5,065	*n* = 1,295

The income percentiles were determined from all applicants with reported incomes in the Salt Lake County HMDA dataset from 2006–2011. Thus, the income percentiles represent constant income levels for both groups. Please refer to Figure 4 on page 3 for the corresponding income levels in nominal dollar amounts.
Source: HMDA LAR raw data by MSA (2006–2011).

Since Hispanic applicants were not systematically denied mortgages on the basis of income, the large denial rate gaps between the two groups cannot be explained by the generally lower incomes among Hispanics. Other factors such as credit history could be the driving force behind the mortgage denials. Nonetheless, race and ethnicity could still be an explanatory factor for the existing approval and denial rate gaps.

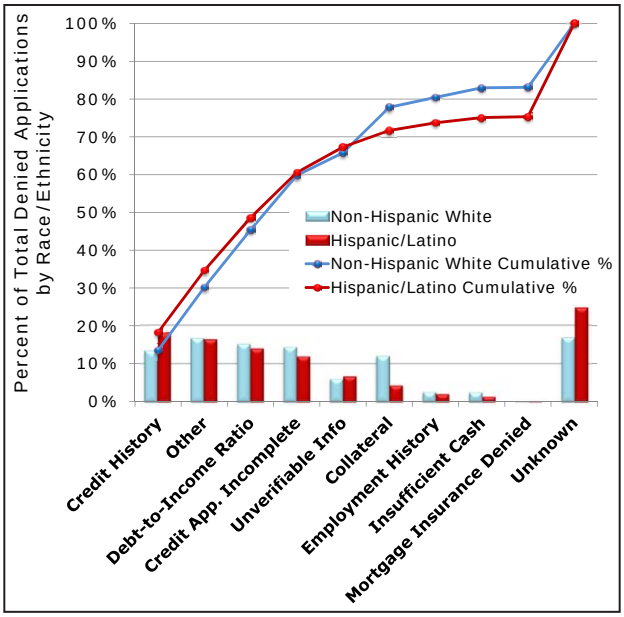
right. Over 40 percent of the denials among non-Hispanic White and Hispanic/Latino applicants are due to high debt-to-income ratios, poor credit history, and incomplete credit applications. However, given the large share of denied applications with no documented reasons and the lack of detailed credit history

3. HMDA Glossary; http://www.ffiec.gov/hmda/glossary.htm.

information, the HMDA data cannot conclusively reveal the reasons behind the denied mortgage applications.

Figure 6 disproves the notion that the high Hispanic denial rates may have stemmed from lower-income Hispanic applicants receiving a disproportionately large share of denials. Similarly, Figure 8 shows that high-income applicants do not receive the bulk of all mortgage approvals. In fact, the cumulative income distributions for approved and total applications are fairly comparable for both non-Hispanic Whites and Hispanics as shown in Figure 8. This means that approvals are not disproportionately concentrated among applicants in the higher income brackets. Thus, inherent income distribution differences between White and Hispanic applicants cannot explain the approval rate gaps.

Figure 7
Primary Denial Reason by Race/Ethnicity in Salt Lake County, 2006–2011



Source: HMDA LAR raw data by MSA (2006–2011).

The index of dissimilarity (Table 1) measures the extent to which the income distributions of approved and denied applicants differ from the income distribution of total applicants. The index values are interpreted as the proportion of applicants that must move to another income decile in order to make the overall distribution and the approval/denial distributions identical. (Please refer to the Appendix for a detailed explanation of this metric.)

Table 1
Indices of Dissimilarity for Denials & Approvals by Race/Ethnicity in Salt Lake County, 2006–2011

	Denials		Approvals	
	Boom	Bust	Boom	Bust
Non-Hispanic White	0.06	0.08	0.02	0.02
Hispanic/Latino	0.03	0.03	0.04	0.02

Source: HMDA LAR Raw Data by MSA (2006–2011).

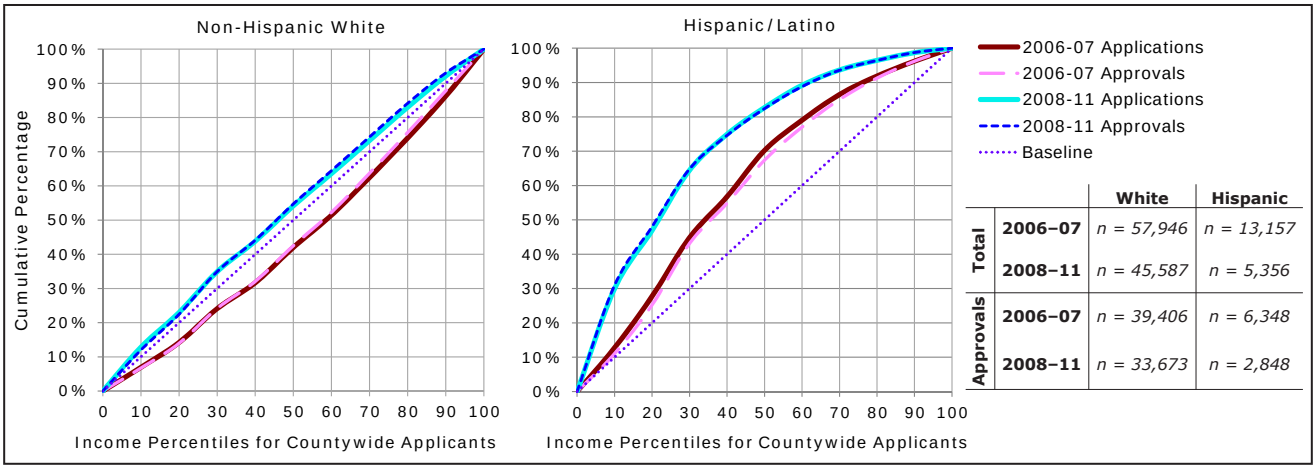
For both groups, the indices of dissimilarity for denials and approvals have not changed drastically across housing periods. The indices of dissimilarity between denials and total applications are slightly higher for Whites. This means that the distribution of approvals among White applicants deviates slightly from the overall White applicant pool. Thus, neither the indices nor the graphical representations of application outcomes by income distribution suggest that the low approval rates and high denial rates among Hispanic/Latino applicants are due to income disparities across racial and ethnic groups alone.

Geographic Self-Selection and Segregation

Figure 9 shows the applicant income distribution by race and ethnicity for each city in Salt Lake County. The income categories are based on the reported incomes as a percentage of the median family income in the Salt Lake MSA. Each reported income has been adjusted as a percentage of the median family income for the year that the mortgage application was submitted.

The applicant income distributions for Salt Lake City and Cottonwood Heights differ significantly between the two groups. While 48 percent of the non-Hispanic White applicants

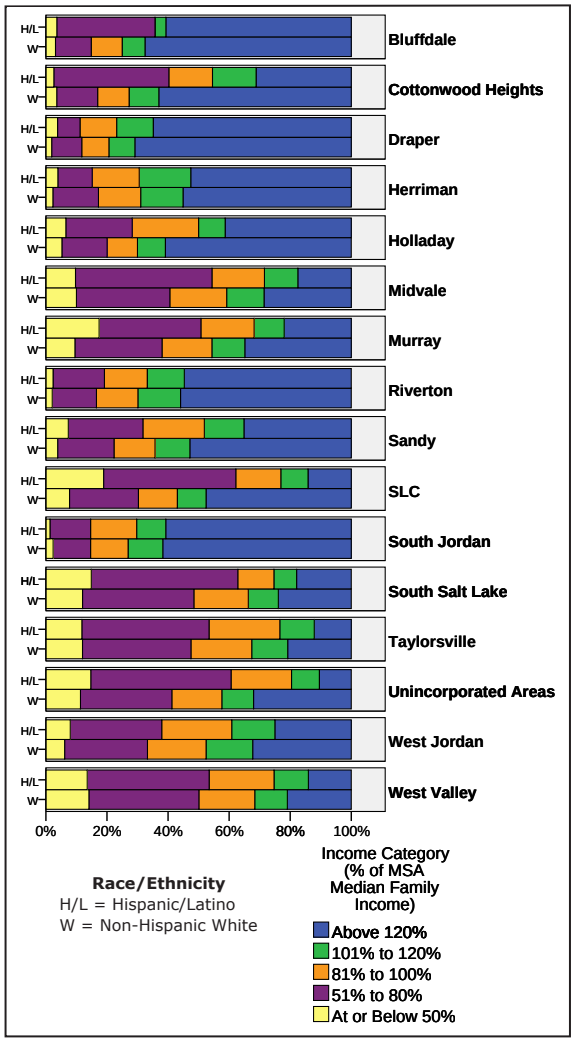
Figure 8
Cumulative Distribution of Applications and Approvals Across Income Levels by Race/Ethnicity in Salt Lake County, 2006–2011



		White	Hispanic
Total	2006–07	*n* = 57,946	*n* = 13,157
	2008–11	*n* = 45,587	*n* = 5,356
Approvals	2006–07	*n* = 39,406	*n* = 6,348
	2008–11	*n* = 33,673	*n* = 2,848

The income percentiles were determined from all applicants with reported incomes in the Salt Lake County HMDA dataset from 2006–2011. Thus, the income percentiles represent constant income levels for both groups. Please refer to Figure 4 on page 3 for the corresponding income levels in nominal dollar amounts.
Source: HMDA LAR raw data by MSA (2006–2011).

Figure 9
Applicant Income Distribution by Race/ Ethnicity in Salt Lake County Cities, 2006–2011



Source: HMDA LAR raw data by MSA (2006–2011).

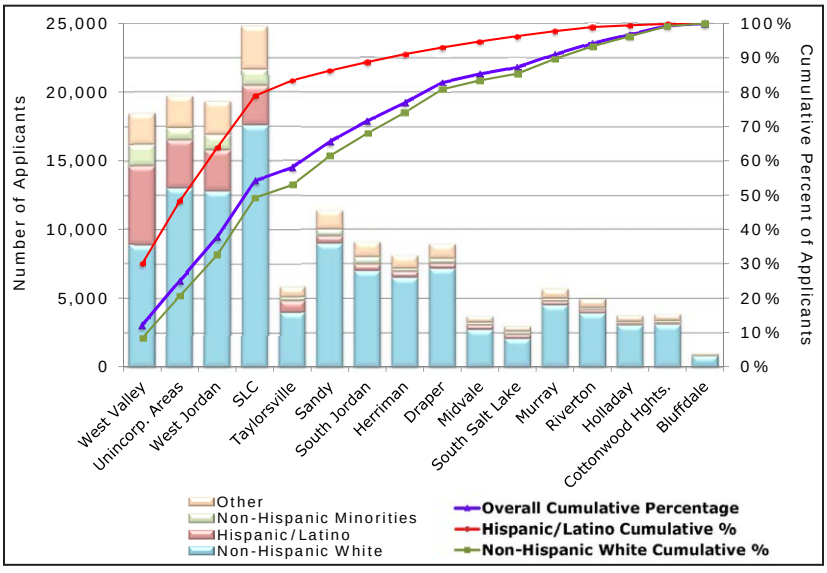
who selected Salt Lake City properties have incomes above 120 percent of the MSA median family income (MFI), only 14 percent of Hispanic applicants reported incomes in this bracket. Thus, the self-selection effect is particularly striking in Salt Lake City, where Hispanics mostly apply for the more affordable housing on the west side (known as the River District), while White applicants predominantly selected east-side properties.

Aside from Salt Lake City and Cottonwood Heights, the income distributions between the two groups are in fact more similar within cities than across cities. For instance, in West Valley roughly 14 percent of applicants from both groups reported incomes at or below 50 percent MFI. On the other hand, in southern cities such as Draper, Herriman, and Riverton, the share of applicants above the median family income was near or above 70 percent for both groups. Thus, more affluent applicants, regardless of race, have a tendency to apply for properties in the southern part of the county, whereas lower-income applicants tend to select West Valley, West Jordan, Taylorsville, and South Salt Lake. With the exception of Salt Lake City and Cottonwood Heights, the self-selection effect is more prominent across cities in the county than within cities. While Figure 9 shows that the differences in income distributions are larger across cities than between the two groups within each city, it does not show the self-selection effect via application volume.

Figure 10 shows the application composition for non-Hispanic White, Hispanic/Latino, and non-Hispanic minority applicants. The stacked bar graph also includes "Other" as a category, which encompasses all applications with co-applicants whose race/ethnicity is different from that of the applicant as well as any application with unspecified race/ethnicity from either the applicant or co-applicant. The bar graph component is ordered from left to right, starting with the city with the highest number of Hispanic/Latino applicants.

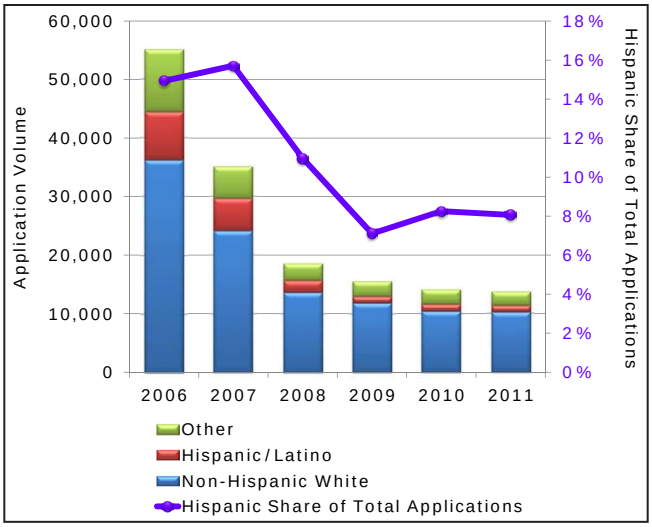
The line graphs in Figure 10 show the cumulative percentages for the total and the respective race/ethnic groups. The cumulative percentages aggregate the proportion of applicants, starting from the left with West Valley to the city that corresponds to a given point on the line graphs. The purple line in Figure 10 shows that 54 percent of all Salt Lake County applications were for homes in West Valley, unincorporated areas, West Jordan, and Salt Lake City. For Hispanic/Latino applicants, this cumulative percentage reaches nearly 80 percent. In fact, roughly three out of every ten Hispanic applicants who applied for Salt Lake County mortgages selected West Valley. On the other hand, the cumulative proportion of White applicants who applied in these four areas barely reached the halfway mark. Given the concentration of Hispanic/Latino applications in these four cities/areas, the red cumulative percentage line in Figure 10 is much more elevated than the total and White cumulative percentage lines. Thus, Figure 10 confirms that the self-selection effect in Salt Lake County is overwhelmingly concentrated in the northwest region.

Figure 10
Application Composition by Race/Ethnicity and Cities in Salt Lake County, 2006–2011



Source: HMDA LAR raw data by MSA (2006–2011).

Figure 11
Application Volume by Race/Ethnicity in Salt Lake County, 2006–2011



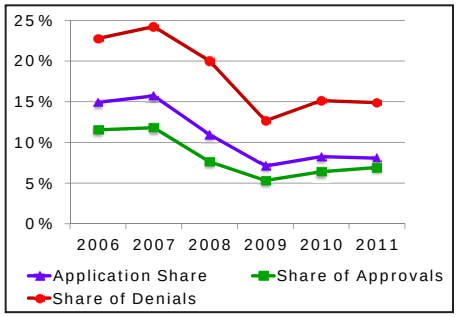
Source: HMDA LAR raw data by MSA (2006–2011).

Declining Mortgage Market Participation

While the self-selection effect in the mortgage application process signals the intensification of segregation in Salt Lake County, the HMDA data also reveal an even larger symptom of homeownership impediments. Figure 11 shows the drastic decline in mortgage application volume from 2006 to 2011. The application volume in fact declined by 75 percent from 55,103 in 2006 to 13,695 in 2011. The purple line in Figure 11 shows the Hispanic share of the total application volume. As the overall application volume decreased, the Hispanic share of the applicant pool also decreased precipitously from roughly 15 percent during the housing boom in 2006 and 2007 to 7 percent in 2009 before stabilizing at 8 percent in 2010 and 2011. The declining share of Hispanic applications in the face of overall declining applications from 2006 to 2011 suggests systemic barriers to participation in the mortgage application process. In other words, the declining Hispanic participation in the mortgage market could signal further declining Hispanic homeownership rates in the county.

The purple line in Figure 11, representing the Hispanic share of total application volume, is juxtaposed in Figure 12 with the Hispanic shares of total approved and denied applications in Salt Lake County from 2006 to 2011. With the purple line (Hispanic application share) as the baseline, Figure 12 shows that Hispanic/Latino applicants represent a disproportionately higher share of denials (red line) and a lower than expected share of approvals (green line). Interestingly, the gap between the application and approval shares appears to be closing from 2009 to 2011, meaning that the Hispanic share of total approvals is increasingly more commensurate with the Hispanic share of total applications. On the other hand, the differential between denial and application shares has persisted during this six-year period.

Figure 12
Hispanic Share of Mortgage Applications, Approvals, and Denials in Salt Lake County, 2006–2011



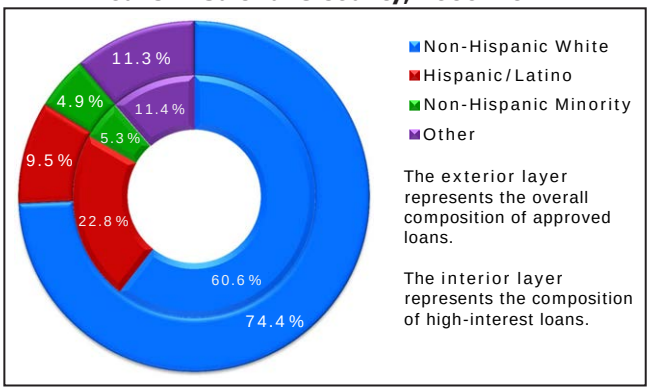
Source: HMDA LAR raw data by MSA (2006–2011).

High-Interest Lending Practices

In addition to the barriers that Hispanic applicants face in the mortgage application process, housing impediments persist following the approval process in the form of high-interest loans. Hispanic applicants receive a disproportionately high share of these loans.

For the purposes of this study, high-interest loans are defined as any loan with a reported rate spread that exceeds 3 percent for first liens and 5 percent for subordinate liens. This is the threshold that lenders have been required to disclose since 2004. The rate spread is the difference between the loan APR and the yield of comparable Treasury securities. The Federal Reserve Board selected this threshold with the intent that the rate spread for most subprime loans would be reported and that most prime loans would not require this disclosure.[4] Thus, the rate spread disclosure can serve as a proxy for subprime lending.

Figure 13
Composition of Approved Loans and High-Interest Loans in Salt Lake County, 2006–2011

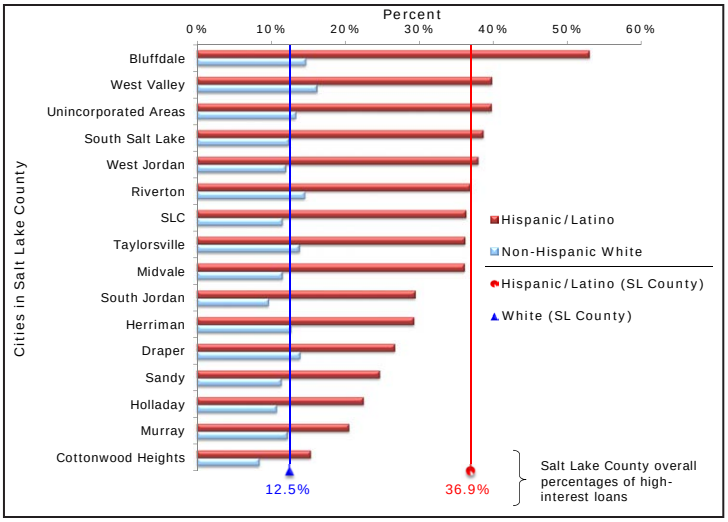


Source: HMDA LAR raw data by MSA (2006–2011).

Figure 13 shows the composition of approved loans versus that of high-interest loans by race/ethnicity. While Hispanic/Latino applicants (in red) represented 9.5 percent of all approved loans from 2006 to 2011, they received a disproportionate 22.8 percent of all high-interest loans. (Note that 92 percent of all high-interest loans in Salt Lake County from 2006 to 2011 were in fact given during the peak of the housing boom from 2006 to 2007.) This disproportionately high share of high-interest loans among Hispanic applicants could be a precursor to foreclosures and thus increased housing instability. Thus, even for Hispanics with approved mortgage loans, their greater tendency to receive high-interest loans still reflects an underlying housing impediment that could have repercussions for the group's long-term housing stability.

4. Avery, Robert B., Kenneth P. Brevoort and Glenn B. Canner. "Opportunities and Issues in Using HMDA Data," *Journal of Real Estate Research* 29.4 (2007).

Figure 14
Percent of High-Interest Loans among Approved Applicants by Race/Ethnicity in Salt Lake County Cities, 2006–2011



Source: HMDA LAR raw data by MSA (2006–2011).

The disproportionately high prevalence of high-interest loans among Hispanic applicants is apparent across all cities in Salt Lake County. Figure 14 shows the share of high-interest loans among non-Hispanic White and Hispanic/Latino applicants during the 2006–2011 period. At the county level, nearly 37 percent of Hispanic approved loans are considered high interest—nearly triple the rate among White applicants. The shares of high-interest loans for Hispanic applicants selecting South Jordan, Herriman, Draper, Sandy, Holladay, Murray, and Cottonwood Heights are significantly lower than the Hispanic county-level average. Nonetheless, the high-interest loan gap between the two groups still ranges from 7 to nearly 20 percentage points for these cities.

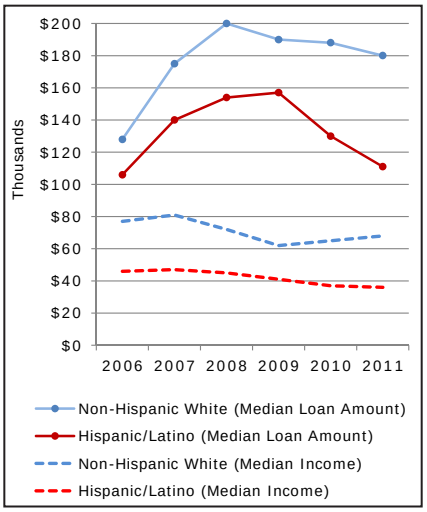
Salt Lake City

This final section includes a brief analysis of the 2006–2011 HMDA data for Salt Lake City. An analysis of housing opportunity in Salt Lake City is not complete without examining the disparities across both sides of the city. Interstate 15 demarcates the separation between the affluent east-side neighborhoods and the River District, which comprises several neighborhoods with ethnic minority-majorities, including Hispanic/Latino residents and refugee families. The Salt Lake City HMDA data reflect this deepening divide in strong neighborhood self-selection effects and disparities in mortgage outcomes.

Even without neighborhood disaggregation of the HMDA data, the median loan amount differences between White and Hispanic applicants suggest strong neighborhood selection effects. The applicant loan amount gap between the two groups widened from $33,000 in 2009 to $69,000 in 2011, mostly due to the rapid decrease in the Hispanic/Latino median loan amount from $154,000 in 2009 to only $111,000 in 2011 (Figure 15). During this same period following the housing market collapse, the White median loan amount decreased only slightly from $190,000 to $180,000.

The declining loan amounts could be a result of more stringent lending standards, lower home values, and declining income in the aftermath of the housing market collapse. The White applicant median income peaked in 2007 at $77,000 and then declined to $62,000 in 2009 with a slight rebound in the following years. Hispanic/Latino applicant median incomes gradually decreased from $46,000 in 2006 to $36,000 in 2011.

Figure 15
Median Loan Amount and Income of Total Applicants by Race/Ethnicity in Salt Lake City, 2006–2011

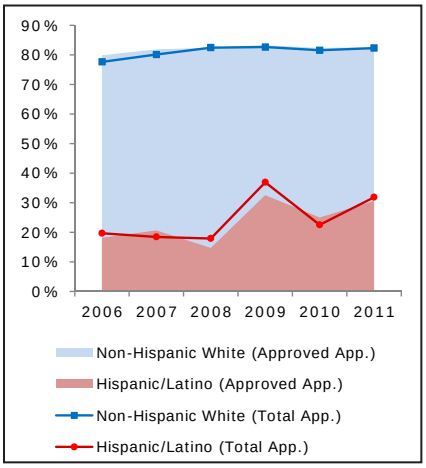


Source: HMDA LAR raw data by MSA (2006–2011).

The low median loan amounts within the Hispanic applicant pool over this six-year period suggests that prospective Hispanic homebuyers could be seeking properties in the River District, where home values are generally much lower than in east-side neighborhoods. In fact, the following figures with disaggregated neighborhood-level HMDA data corroborate the neighborhood selection effects in Salt Lake City.

Figure 16 shows the percent of SLC applications by race/ethnicity concentrated in the east-side neighborhoods. Prospective SLC non-Hispanic White applicants persistently chose east-side neighborhoods at levels of 80 percent from 2006 to 2011, whereas Hispanic/ Latino applicants overwhelmingly selected properties in the River District. In addition to the line graphs in Figure 16 that show the six-year self-selection trends for total applications, the non-cumulative layered area graphs show the proportion of SLC approved loans concentrated in neighborhoods east of I-15. In 2008 and 2009, the proportion of approved loans concentrated in east SLC for Hispanic/ Latino applicants was in fact lower than the corresponding proportion for total applications. This means that the mortgage approval process further widened the large disparity in the existing neighborhood self-selection effect.

Figure 16
Share of Salt Lake City Total and Approved Applications East of I-15 by Race/Ethnicity, 2006–2011

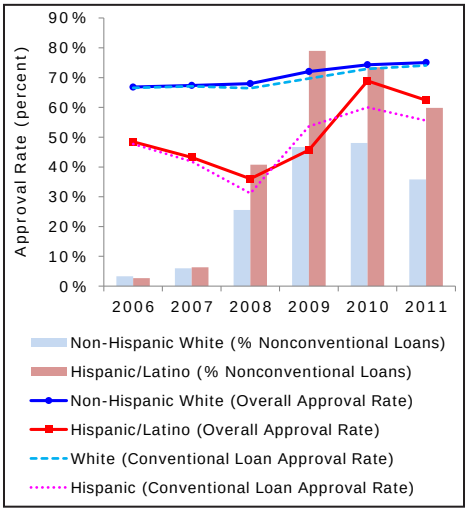


Source: HMDA LAR raw data by MSA (2006–2011).

While the racial and ethnic disparities in neighborhood selection remain high, the approval rate gap

in SLC between White and Hispanic applicants appeared to have nearly closed in 2010 (Figure 17). However, the dramatic increase in approval rates for Hispanic/Latino applicants that led to this gap closure could be driven by the corresponding increase in nonconventional loans after 2008. Nonconventional loans, which consist of FHA-insured, VA-guaranteed, and FSA/RHS loans, typically have higher approval rates and lower denial rates given the relaxed and preferential lending standards associated with such loans. Figure 17 shows that while only 2.7 percent of Hispanic loan applications in 2006 were nonconventional, this rate rose to a staggering 79 percent in 2009. Given that nonconventional loans have less stringent lending standards, part of the dramatic increase in Hispanic mortgage approval rates could be attributed to the increased presence of nonconventional loans in the applicant pool. When accounting for only conventional loan applications, the 69 percent overall Hispanic approval rate in 2010 drops to 60 percent. Interestingly, this volatility between overall approval rates and conventional loan approval rates does not exist for White applicants. Figure 17 shows that White conventional loan approval rates from 2006 to 2011 did not drop by more than a few percentage points from the corresponding overall approval rates.

Figure 17
Approval Rates by Race/Ethnicity with Loan Type Composition
Salt Lake City, 2006–2011



Source: HMDA LAR raw data by MSA (2006–2011).

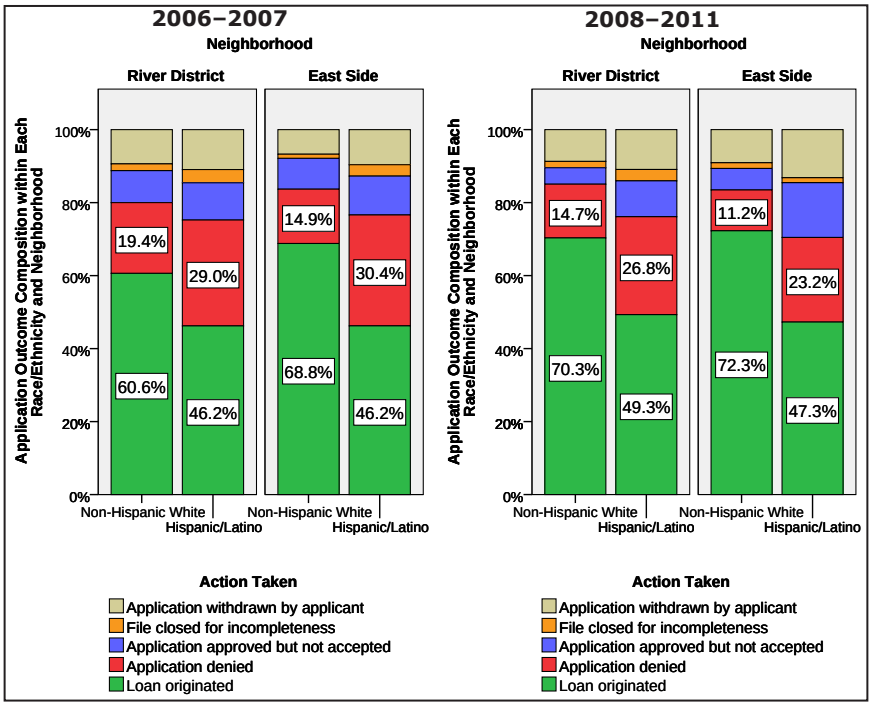
Figure 18 shows Salt Lake City application outcomes by race/ethnicity and neighborhood. The left-hand panel displays the outcomes in the 2006–2007 housing boom period, while the right-hand panel shows the outcomes in the ensuing housing bust from 2008 to 2011. The approval rates in all respective racial/ethnic categories by neighborhood have risen from the boom to bust period. However, the approval gap between White and Hispanic applicants widened across these two periods. Most significantly, the 14.4 percentage point approval gap in the River District between White and Hispanic applicants during the housing boom widened to 21 percentage points during the housing bust. The sustained approval and denial rate gaps between White and Hispanic applications shown in Figure 18 could potentially be due to the differences in income distributions by race/ethnicity.

However, Figure 19 depicts the approval rate gap even when disaggregated by countywide income deciles. The income levels are categorized by deciles (10 percent increments), using the entire Salt Lake County HMDA dataset from 2006 to 2011. The dashed lines in Figure 19 are the approval rates during the housing boom, whereas the solid lines are the approval rates during the housing bust. The approval rates for White applicants are fairly homogeneous across income deciles for both housing periods. In fact, White approval rates have shifted upward for nearly all income deciles from the housing boom to the bust. On the other hand, the approval rates in both housing periods were more volatile for Hispanic applicants. Interestingly, the approval rate trend is generally upward as income increases, except for the lowest and highest deciles.

Approval trends by income are also confounded by the neighborhood selection of these applications. Figure 20 shows the share of Salt Lake City applications for the more affluent east-side properties by income deciles. Both White and Hispanic applicants with higher incomes applied for east-side properties at increasingly higher rates. However, White applicants applied for east-side properties at higher rates than Hispanic applicants for all income deciles. Thus, the Hispanic applicants at the very lowest income deciles might have had relatively higher than expected approval rates given the higher tendency of selecting more affordable River District properties.

Figure 21 shows the cumulative distribution of applications and denials by race/ethnicity and housing period. The two panels each

Figure 18
Mortgage Application Outcomes in Salt Lake City by Race/Ethnicity, Neighborhood, and Housing Period

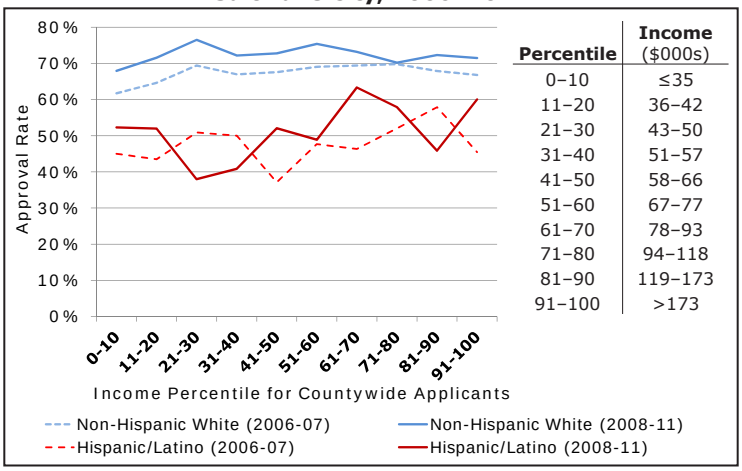


Source: HMDA LAR raw data by MSA (2006–2011).

overlay the cumulative application distributions with the corresponding cumulative denial distributions for the two housing periods. Most notably, the White application distribution changed from being convex below the baseline during the housing boom to approaching the baseline in the housing bust. The Hispanic cumulative application distribution became more concave above the baseline after the housing boom. This means that the White and Hispanic mortgage applicant pools have skewed more to the lower income brackets. Despite the changes in income distribution for both groups, the income distributions of denials have not deviated significantly from the overall application income distribution. Surprisingly, the only major deviation occurred at the lowest income decile for White applicants during the housing bust, as shown in the right-hand panel in Figure 21. While 13.2 percent of White applicants from 2008 to 2011 reported incomes at the lowest decile, 17.7 percent of the denials fell under this income category. On the other hand, Hispanic applicants were not denied mortgages solely on the basis of incomes even at the lowest income deciles.

Similarly, note that the cumulative distributions of applications and approvals are fairly comparable, as shown in Figure 22. While there appears to be a slight disproportionate uptick in approvals in the lowest income decile for Hispanic applicants during the housing bust, the gap between the application and approval cumulative distributions quickly closes before reaching the 30th percentile, meaning the Hispanic applicants in the 21st to 30th percentiles have disproportionately lower approvals based on their application volumes. In fact, the index of dissimilarity (Table 2) shows a slight increase from 0.04 during the boom period to 0.06 in the housing bust for Hispanic applicants. On the other hand, despite a fairly drastic change in White applicant income distributions in the two housing periods, the cumulative distributions of approvals for White applicants have nearly mirrored the cumulative application volume distribution in both housing periods. This similarity in both distributions is also reflected in the indices of dissimilarity between total applications and the approved subset, which were 0.01 for both the boom and bust for White applicants (Table 2). Thus, the similarities between the cumulative distributions of overall mortgage applications and the approved loans across income deciles show that inherent differences in income distributions between the White and Hispanic applicant pools cannot explain the disparities in mortgage outcomes.

Figure 19
Approval Rates by Income Level and Race/Ethnicity in Salt Lake City, 2006–2011



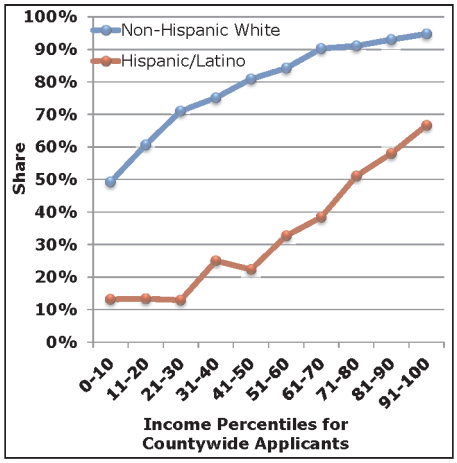
Percentile	Income ($000s)
0–10	≤35
11–20	36–42
21–30	43–50
31–40	51–57
41–50	58–66
51–60	67–77
61–70	78–93
71–80	94–118
81–90	119–173
91–100	>173

Source: HMDA LAR raw data by MSA (2006–2011).

Conclusion

Housing instability has implications in a larger context of differential access to opportunity. For instance, Hispanic families, faced with higher-interest loans, could be forced to move frequently, resulting in elevated school mobility rates for their children. Thus, housing instability could result in lower educational opportunities. This preliminary analysis of the Salt Lake County and Salt Lake City HMDA data serves to point out disparities in housing opportunities. However, the lack of other metrics in the HMDA data such as employment status and credit scores precludes any conclusive explanation regarding the racial and ethnic disparities in mortgage application outcomes. With the Dodd-Frank Act's amendment of HMDA reporting requirements, future annual releases of HMDA data will include credit scores, applicant age, and more detailed information on loan rates. Thus, future analyses and modeling of HMDA data could provide a more detailed understanding of the disparities in mortgage outcomes.

Figure 20
Share of Applications for Properties in Salt Lake City Neighborhoods East of I-15, 2006–2011



Source: HMDA LAR raw data by MSA (2006–2011).

Table 2
Indices of Dissimilarity for Denials & Approvals by Race/Ethnicity in Salt Lake City, 2006–2011

	Denials		Approvals	
	Boom	Bust	Boom	Bust
Non-Hispanic White	0.03	0.05	0.01	0.01
Hispanic/Latino	0.04	0.08	0.04	0.06

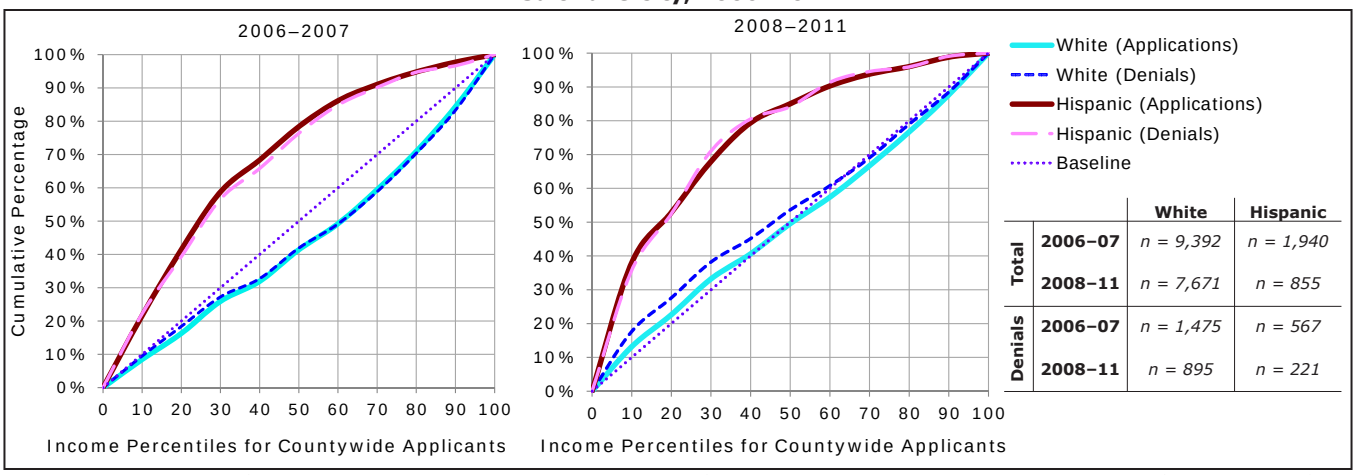
Source: HMDA LAR Raw Data by MSA (2006–2011).

Appendix

The degree of difference between two distribution curves can be calculated using the index of dissimilarity. The formula[4] for the index of dissimilarity Δ shown below is tailored specifically to describe the difference between the income

4. Shryock, Henry S., Jacob S. Siegel and Associates. *The Methods and Materials of Demography*, ed. Edward G. Stockwell, Condensed Edition. San Diego: Academic Press, 1976.

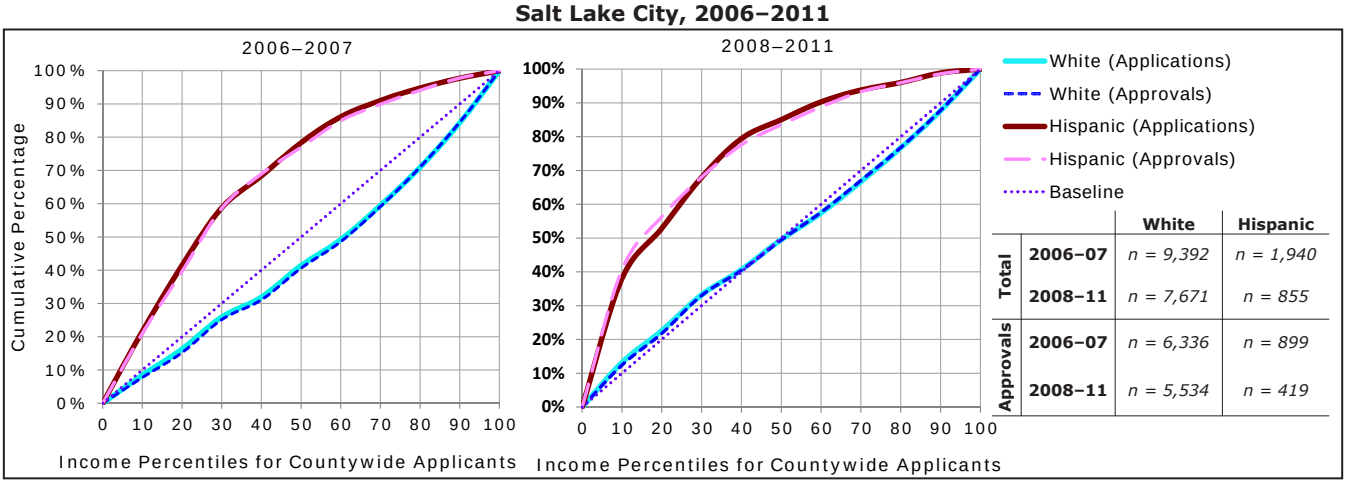
Figure 21
Cumulative Distribution of Applications and Denials Across Income Levels by Race/Ethnicity in Salt Lake City, 2006–2011



		White	Hispanic
Total	2006–07	*n = 9,392*	*n = 1,940*
	2008–11	*n = 7,671*	*n = 855*
Denials	2006–07	*n = 1,475*	*n = 567*
	2008–11	*n = 895*	*n = 221*

The income percentiles were determined from all applicants with reported incomes in the Salt Lake County HMDA dataset from 2006–2011. Thus, the income percentiles represent constant income levels for both groups. Please refer to Figure 19, opposite, for the corresponding income levels in nominal dollar amounts.
Source: HMDA LAR raw data by MSA (2006–2011).

Figure 22
Cumulative Distribution of Applications and Approvals Across Income Levels by Race/Ethnicity in Salt Lake City, 2006–2011



		White	Hispanic
Total	2006–07	*n = 9,392*	*n = 1,940*
	2008–11	*n = 7,671*	*n = 855*
Approvals	2006–07	*n = 6,336*	*n = 899*
	2008–11	*n = 5,534*	*n = 419*

The income percentiles were determined from all applicants with reported incomes in the Salt Lake County HMDA dataset from 2006–2011. Thus, the income percentiles represent constant income levels for both groups. Please refer to Figure 19, opposite, for the corresponding income levels in nominal dollar amounts.
Source: HMDA LAR raw data by MSA (2006–2011).

distribution of total mortgage applications and that of denied applications:

$$\Delta = \frac{1}{2}\sum_{i=1}^{k}\left|\frac{a_i}{A} - \frac{r_i}{R}\right|$$

where

a_i = the number of mortgage applications with reported incomes in the i^{th} income decile

A = the total number of mortgage applications

r_i = the number of denied applications with reported incomes in the i^{th} income decile

R = the total number of denied applications

The index of dissimilarity is interpreted as the percentage of one group that must move to other income deciles in order to create a distribution equal to that of the other group. For instance, in comparing the application volume and denial distributions across the countywide deciles, an index of dissimilarity of 0.03 means that 3 percent of the denied applicants would have to move to another income decile in order to match the overall application distribution. This index in itself cannot specify if approvals and denials are occurring disproportionately at certain income levels. Cumulative distribution curves of total applications and approved/denied applications can provide this information graphically.

BEBR

Bureau of Economic and Business Research
University of Utah
401 Business Classroom Building
1655 East Campus Center Drive
Salt Lake City, Utah 84112-8939

Address Service Requested

Utah Economic and Business Review

BEBR
Bureau of Economic and Business Research
David Eccles School of Business | University of Utah

2013 | Volume 73, Number 2