CASCADE FOCUS
FEDERAL RESERVE BANK OF PHILADELPHIA
DECEMBER 2018

IN THIS ISSUE

From 2015 to 2017, more than half (53.5 percent) of home improvement loan applications from low- and moderate-income (LMI) homeowners in the Third District were denied.

Among LMI homeowners, denial rates were highest for women with no coapplicants (57.4 percent) and nonwhite applicants (72.9 percent).

Denial rates were particularly high for applicants of any income residing in lower-income (58.9 percent) and majority-minority (69.0 percent) neighborhoods.

Although the causes of observed differences in denial rates could not be determined, this report provides insight into which groups are likely to have difficulty accessing home improvement financing in communities across the Third District.

Home Improvement Lending in the Third Federal Reserve District: Patterns by Income, Race, and Gender

BY ALIX CARLIN, RESEARCH INTERN, AND EILEEN DIVRINGI, COMMUNITY DEVELOPMENT RESEARCH ASSOCIATE, COMMUNITY DEVELOPMENT AND REGIONAL OUTREACH, FEDERAL RESERVE BANK OF PHILADELPHIA

INTRODUCTION

Historically, local, state, and federal policies in the U.S. have encouraged households of all backgrounds to pursue homeownership because of the various benefits of owning a home, such as wealth building, protection against housing cost inflation, and psychological well-being, among others.[1] Research has demon-

[1] Christopher E. Herbert and Eric S. Belsky (2006), *The Homeownership Experience of Low-Income and Minority Families: A Review and Synthesis of the Literature*, U.S. Department of Housing and Urban Development, Office of Policy Development and Research, available at https://www.huduser.gov/portal/Publications/PDF/hisp_homeown9.pdf.

strated that the financial, physical, and psychological benefits associated with owning a home have accrued to homeowners of all stripes.[2] However, LMI, minority, and elderly households often face financial barriers to sustaining homeownership over the long run.[3]

A common financial challenge for LMI homeowners is the expense of major and often unanticipated home repairs. One survey of low-income homebuyers who had participated in a prepurchase counseling course found that, of those who had purchased homes, nearly half experienced unexpected maintenance costs, and more than one-third still needed to make repairs but were unable to afford to do so.[4] LMI homeowners tend to have more critical home repair needs for a number of reasons. First, units that are affordable to lower-income purchasers may be older or in relatively poor condition.[5] Second, income and wealth constraints may lead LMI homeowners to defer the out-of-pocket costs of ongoing maintenance and small repairs. Allowing maintenance problems to continue unresolved often leads to larger, more serious issues, costing more money and adding to housing cost burdens.[6] In this context, home improvement loans can provide LMI homeowners with the much-needed capital to smooth the expense shock of major repairs.

This report describes the state of home improvement lending in the Third District using Home Mortgage Disclosure Act (HMDA) data from 2015–2017.[7] Lending institutions report a loan application as having a home improvement purpose if the loan, whether secured or unsecured, is to be used at least partially for "repairing, rehabilitating, remodeling, or improving a dwelling or the real property on which the dwelling is located."[8] Some data limitations should be noted so that readers may interpret the results with the appropriate caution. During the years analyzed in this report, financial institutions were not required to report applicants' credit scores, debt-to-income (DTI) ratios, loan-to-value (LTV) ratios, or several other variables commonly used in the underwriting process; therefore, this analysis could not control for credit risk when examining applicant outcomes.[9] Additionally, loans marked as "home improvement" do not necessarily account for all financing methods a household can use for home maintenance and repair work. For example, many households use cash savings, credit cards, cash-out refinancing, and other resources to cover costs, rather than applying for home improvement loans (see "Home Improvement Activity Among Lower-Income Homeowners" on page 5). Despite these limitations, the HMDA data set provides unique and useful insights into home improvement financing needs in the Third District.

This analysis sought to determine whether certain groups of applicants were less likely to access conventional home improvement loans based on individual characteristics or characteristics of the neighborhoods in which they lived. The analysis

[2] Herbert and Belsky, *The Homeownership Experience of Low-Income and Minority Families: A Review and Synthesis of the Literature.*

[3] Yahonnes Cleary and Ken Zimmerman (2006), *House Rich, Pocket Poor and Under Threat: Home Repair Financing and Homeownership Preservation in New Jersey*, New Jersey Public Policy Research Institute, New Jersey Institute for Social Justice, and LISC of Greater Newark and Jersey City, available at http://d3n8a8pro7vhmx.cloudfront.net/njisj/legacy_url/220/HomeRepairWhitePaperNJISJ.pdf?1478622784; Shannon Van Zandt, and William M. Rohe (2011), "The Sustainability of Low-Income Homeownership: The Incidence of Unexpected Costs and Needed Repairs Among Low-Income Home Buyers," *Housing Policy Debate,* 21:2, pp. 317–41; Jaclene Begley and Lauren Lambie-Hanson (2015), "The Home Maintenance and Improvement Behaviors of Older Adults in Boston," *Housing Policy Debate,* 25:4, pp. 754–81.

[4] William M. Rohe, Roberto G. Quercia, Shannon Van Zandt, and Gretchen Kosarko (2003), *Individual and Neighborhood Impacts of Neighborhood Reinvestment's Homeownership Pilot Program*, The Center for Urban and Regional Studies, University of North Carolina at Chapel Hill paper (2003), available at https://www.issuelab.org/resources/1761/1761.pdf.

[5] For example, Boehm and Schlottmann (2008) find that low-income and minority homeowners who had moved within the past year were much more likely to report that the structural quality of their units was "poor" than their higher-income and white counterparts. Thomas P. Boehm, and Alan Schlottmann (2008), "Housing Tenure, Expenditure, and Satisfaction Across Hispanic, African-American, and White Households: Evidence from the American Housing Survey," *Cityscape: A Journal of Policy Development and Research*, 10:2, pp. 95–158.

[6] Herbert and Belsky, *The Homeownership Experience of Low-Income and Minority Families: A Review and Synthesis of the Literature.*

[7] See Appendix A for more details on the data and methodology for this analysis.

[8] *A Guide to HMDA Reporting: Getting It Right!* (2013), Federal Financial Institutions Examination Council (FFIEC), available at https://www.ffiec.gov/hmda/pdf/2013guide.pdf.

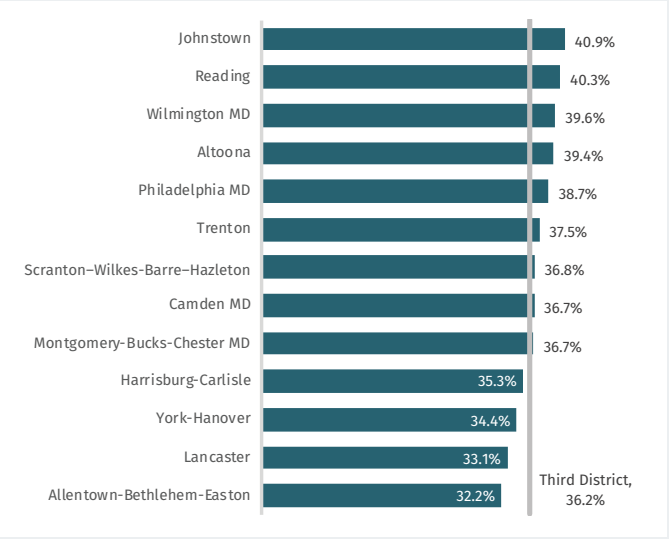
[9] As part of the Dodd-Frank Act of 2010, institutions covered by HMDA were to begin reporting 14 new data fields, including credit score and debt-to-income ratio, in 2018. However, the Economic Growth, Regulatory Relief, and Consumer Protection Act of 2018 exempted many institutions from these new requirements. For more information, see https://www.ffiec.gov/hmda/pdf/2018guide.pdf.

examines HMDA data from the Third District holistically, as well as 13 specific metropolitan statistical areas and metropolitan divisions within the district to highlight regional differences.[10] To enhance the analysis, several regression models were developed to tease out the effects of these characteristics after controlling for other available variables.[11] Using the results of these models as well as descriptive analysis,[12] this report summarizes findings that address the following three questions:

1. What are the characteristics of homeowners in the Third District who have applied for home improvement loans?
2. How does access to home improvement loans vary across applicant groups?
3. How does access to home improvement financing vary by neighborhood characteristics?

FIGURE 1

Share of Home Improvement Loan Applicants with Low or Moderate Income by Metro Area, 2015–2017



Source: Authors' calculations using 2015–2017 HMDA data

What are the characteristics of homeowners in the Third District who have applied for home improvement loans?

BORROWER CHARACTERISTICS

During the study period, the share of primary applicants[13] for home improvement loans in the Third District who were LMI was 36.2 percent. Applicants were categorized as LMI if their income was less than 80 percent of the median family income (MFI) in their respective region (see Appendix A for details). The share of LMI applicants across the metropolitan statistical areas and metropolitan divisions[14] included in the analysis ranged from 32.2 to 40.9 percent. All but four metro areas had larger shares of LMI applicants than the Third District[15] overall (Figure 1).

The overall share of nonwhite applicants in the Third District was 18.8 percent,[16] although this varied considerably by region. As shown in Figure 2, several metro areas had higher shares of nonwhite applicants: Philadelphia (50.5 percent), Trenton (35.3 percent), Reading (24.2 percent), Camden (22.6 percent), and Wilmington (22.5 percent). These patterns are generally reflective of the variation in the demographic composition of these metro areas.

The breakdown between male and female applicants in the Third District was 57.5 percent and 35.9 percent, respectively.[17] Additionally, 46.6 percent of male applicants

[10] See Appendix A for a list of the 13 metropolitan statistical areas and metropolitan divisions chosen for this report.

[11] Results from all regression models can be viewed in Appendix B.

[12] Tables containing descriptive statistics can be viewed in Appendix C.

[13] Henceforth, "primary applicants" will be referred to simply as "applicants." Primary applicants may or may not have coapplicants. The report will specify when findings for coapplicants are discussed.

[14] Henceforth, "metropolitan statistical areas and metropolitan divisions" will be referred to as "metro areas" for simplicity. Metropolitan divisions are denoted by "MD" in the figures and tables.

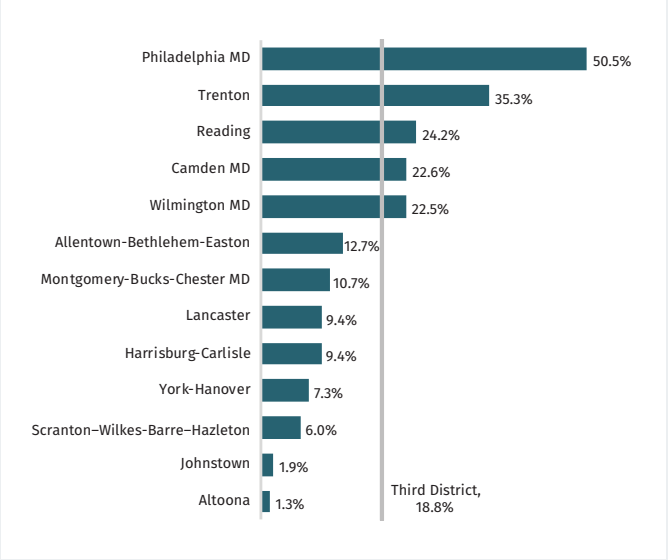
[15] Here and throughout the remainder of the report, Third District statistics represent data from all 60 counties within the Third Federal Reserve District, including nonmetropolitan areas.

[16] Classified by the race/ethnicity of primary applicants.

[17] Classified by the sex of the primary applicant. In 6.6 percent of applications in the data, primary applicant sex data were unavailable.

FIGURE 2

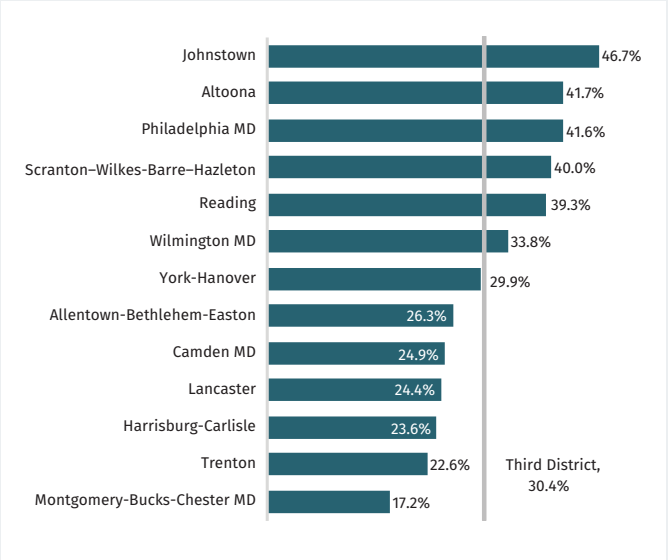
Share of Nonwhite or Hispanic Home Improvement Loan Applicants by Metro Area, 2015–2017



Source: Authors' calculations using 2015–2017 HMDA data

FIGURE 3

Share of Applications for Home Improvement Loans Less Than or Equal to $10,000 by Metro Area, 2015–2017



Source: Authors' calculations using 2015–2017 HMDA data

had coapplicants, compared with only 31 percent of female applicants. Coapplicants may be spouses, relatives, or other interested parties included on the loan to improve the application's credit profile or to qualify for a larger loan amount. A larger share of male applicants than female applicants had coapplicants in each metro area analyzed. The overwhelming majority of applications with coapplicants were made up of two white applicants (79 percent of Third District applications with coapplicants). Philadelphia had the smallest share of applications with coapplicants where both the primary and coapplicant were white (57.2 percent).

LOAN CHARACTERISTICS

Loan applications for amounts of $10,000 or less made up 30.4 percent of all Third District applications. Johnstown had the highest share of these applications, at 46.7 percent, and Montgomery-Bucks-Chester had the lowest share, at 17.2 percent (Figure 3). The median loan amounts applied for in an area ranged from $14,000 in Johnstown to $40,000 in Montgomery-Bucks-Chester. These figures likely reflect Johnstown having the lowest overall median home value ($91,200) and Montgomery-Bucks-Chester having the highest ($299,100).[18] See Appendix C, Table 2 for median applied-for loan amounts for each metro area included in this analysis.

In addition to loan size, variations in lien status provide important context for this analysis. The HMDA data set denotes one of three lien statuses for each application: not secured by a lien, secured by a first lien, or secured by a subordinate lien. In the Third District, 51.1 percent of LMI applications were not secured by a lien, compared with 41.5 percent overall. Unsecured loans are by definition riskier for lenders, suggesting that the higher prevalence of this lien status among LMI applicants contributes to their higher overall denial rate. Although variations in lien status are not explored in depth in this analysis, lien status is included in all regression models and is strongly associated with the odds of application denial, denial based on credit history, and the size of loans applied for and received (Appendix B).

[18] 2016 American Community Survey (ACS) five-year estimates, Table B25077.

HOME IMPROVEMENT ACTIVITY AMONG LOWER-INCOME HOMEOWNERS

To provide context for the analysis in this report, this section summarizes data on home improvement activities and expenditures from the 2015 American Housing Survey, focusing on the Mid-Atlantic region. For this analysis, homeowners were divided into three groups based on annual income. Those in the lowest income group had an annual household income below $30,000, those in the middle group had an annual income of $30,000–$60,000, and those in the highest income group had an annual income of more than $60,000. [19]

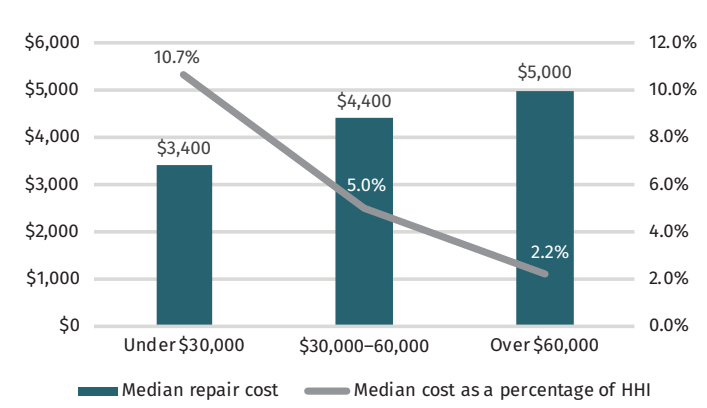
Roughly half of homeowners from the lowest income group (50.5 percent) had undertaken a home improvement project in the prior two years, compared with 55.0 percent of those in the middle group and 62.5 percent of those in the highest income group. Those in the lowest income group that undertook home improvement projects spent the least in absolute dollars; however, these households spent more relative to their income than households in the middle and highest income groups (Figure 4).

In each of the three income categories, homeowners reported using cash savings as the primary source of funding for roughly three-quarters of projects undertaken in the previous two years (Table 1). For homeowners from the lowest and middle income groups, credit cards were the most common financing method for home improvement projects (4.4 percent and 7.1 percent, respectively). It is worth noting that credit cards typically carry significantly higher interest rates than home equity loans, the most common financing method for households in the highest income group.

[19] Because of data availability in the American Housing Survey, these differ from the income categories used elsewhere in this report. See Appendix A for details.

FIGURE 4

Median Total Home Improvement Expenditures over Prior Two Years by Income Level (Left Axis) and Median Expenditures as a Percentage of Household Income by Income Level (Right Axis), Mid-Atlantic Region, 2015



Source: Authors' calculations using the American Housing Survey 2015 Public Use File

TABLE 1

Main Source of Funding for Home Improvement Projects over the Past Two Years by Income Level, Mid-Atlantic Region, 2015

Main Source of Funding	Income Group		
	Under $30,000	$30,000–$60,000	Over $60,000
Cash from savings	72.3%	73.3%	76.2%
Credit card or retail store charge card	4.4%	7.1%	4.8%
Home equity loan	3.5%	5.2%	6.7%
Homeowner's insurance settlement	2.6%	2.9%	2.4%
Contractor-arranged financing	2.0%	1.2%	0.8%
Cash from refinancing home	0.5%	2.1%	2.0%
Other/not reported	14.7%	8.2%	7.1%

Source: Authors' calculations using the American Housing Survey 2015 Public Use File
Note: Figures may not sum to 100 percent because of rounding.

TABLE 2

Share of Primary Applicants Living in Majority-Minority Neighborhoods and LMI Neighborhoods by Metro Area, 2015–2017

Metro Area	Applicants in LMI Neighborhoods	Applicants in Majority-Minority Neighborhoods
Third District	19.5%	14.7%
Allentown-Bethlehem-Easton	18.8%	6.7%
Altoona	9.8%	N/A
Camden MD	17.0%	13.2%
Harrisburg-Carlisle	16.3%	5.8%
Johnstown	10.4%	N/A
Lancaster	10.4%	5.0%
Montgomery-Bucks-Chester MD	19.8%	2.6%
Philadelphia MD	41.0%	56.0%
Reading	20.7%	19.0%
Scranton–Wilkes-Barre–Hazleton	13.6%	1.5%
Trenton	25.1%	32.7%
Wilmington MD	21.6%	15.2%
York-Hanover	8.6%	3.3%

Source: Authors' calculations using 2015–2017 HMDA data

NEIGHBORHOOD CHARACTERISTICS

The share of applicants living in LMI census tracts varied greatly across the metro areas analyzed in this report, from 8.6 percent in York-Hanover to 41 percent in Philadelphia. In addition to Philadelphia, as shown in Table 2, the following metro areas had higher shares of applicants living in LMI neighborhoods than the Third District overall: Trenton (25.1 percent), Wilmington (21.6 percent), Reading (20.7 percent), and Montgomery-Bucks-Chester (19.8 percent).

At the census tract level, 14.7 percent of Third District applicants lived in majority-minority neighborhoods. For the metro areas included in the analysis, the share ranged from 1.5 percent to 56 percent.[20] Metro areas with higher concentrations of applicants living in majority-minority tracts were Philadelphia, Trenton, Reading, and Wilmington (Table 2).

The age of applicants' housing units was not available in the HMDA data; the best available proxy was to examine the age of the owner-occupied housing stock in applicants' neighborhoods. The owner-occupied housing stock in the Third District overall is relatively old; the median year built preceded 1970 in 56.3 percent of neighborhoods in the region, compared with only 42.6 percent of neighborhoods nationwide.[21] There is a high level of correlation between a neighborhood's demographic characteristics and the age of its housing stock: 90 percent of applicants living in majority-minority neighborhoods lived in areas where the median year built was prior to 1970, along with 84.2 percent of applicants living in LMI neighborhoods. This has implications for the demand for home improvement financing, since older homes typically experience higher routine maintenance and repair costs because of older systems or physical deterioration.[22]

[20] Excludes the Altoona and Johnstown metro areas, which had no majority-minority tracts.

[21] 2016 ACS five-year estimates, Table B25037.

[22] Lucy Acquaye, (2011) "Low-Income Homeowners and the Challenges of Home Maintenance," *Community Development,* 42:1, pp. 16–33.

TABLE 3

Loan Characteristics by Applicant Characteristics, Third District, 2015–2017

	All Applicants	LMI Applicants	Nonwhite Applicants
Number of Applications	125,965	45,648	23,679
Denial Rate	41.3%	53.5%	66.2%
Applied-For Loan Amounts			
Median	$25,000	$15,000	$15,000
25th–75th Percentile	$10,000–$60,000	$6,000–$40,000	$6,000–$35,000
Originated Loan Amounts			
Median	$30,000	$18,000	$20,000
25th–75th Percentile	$12,000–$88,000	$7,000–$50,000	$10,000–$56,000

Source: Authors' calculations using 2015–2017 HMDA data; median loan amounts reported in HMDA are rounded to the nearest $1,000

How does access to home improvement financing vary across applicant group?

Overall, applicants had more difficulty accessing home improvement financing if they were LMI, nonwhite, or female, or had no coapplicant. Although the analysis was not able to control for applicants' credit scores, DTI ratios, or LTV ratios, higher denial rates among these groups persisted after accounting for the available variables of interest in this analysis (Appendix B).[23] Appendix C summarizes denial rates and median loan amounts applied for by applicants' demographic and neighborhood characteristics for each metro area included in the analysis.

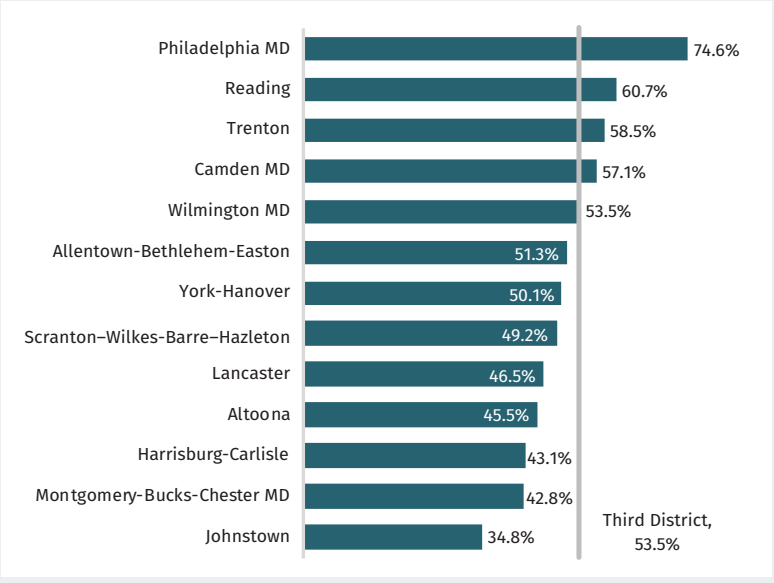
LMI APPLICANTS

As shown in Table 3, the denial rate for LMI applicants was more than 12 percentage points higher than that of applicants overall in the Third District. LMI denial rates varied greatly across the metro areas included in this analysis. Several metro areas had higher rates of denial for LMI applicants than the Third District, including Philadelphia (74.6 percent), Reading (60.7 percent), Trenton (58.5 percent), and Camden (57.1 percent). However, the majority of metro areas had lower LMI denial rates than the Third District overall, such as Johnstown (34.8 percent), among others (Figure 5). Controlling for other available variables, an applicant's odds of denial decreased greatly as income level increased (Appendix B, Model 1).

[23] Recent research that has incorporated measures of credit quality into an analysis of HMDA purchase loan data has found that racial disparities considerably narrow, although do not disappear, when these factors are taken into account. See Laurie Goodman and Bing Bai (2018), "Traditional mortgage denial metrics may misrepresent racial and ethnic discrimination," *Urban Wire*, Urban Institute, available at https://www.urban.org/urban-wire/traditional-mortgage-denial-metrics-may-misrepresent-racial-and-ethnic-discrimination.

FIGURE 5

Denial Rates for LMI Home Improvement Loan Applicants by Metro Area, 2015–2017



Source: Authors' calculations using 2015–2017 HMDA data

Across the Third District, the median loan amount originated to LMI borrowers was $18,000, whereas the overall median amount originated was 66.7 percent higher, at $30,000. Controlling for all other available variables, applied-for and originated loan amounts had statistically significant positive relationships with the applicant's relative income level. Relative to a successful LMI applicant, a successful middle-income applicant typically applied for a loan that was over $12,000 higher and received a loan that was nearly $16,000 higher (Appendix B, Models 3 and 4).

NONWHITE APPLICANTS

In the Third District, the denial rate for nonwhite LMI applicants was 28.6 percentage points higher than the rate for white LMI applicants. Moreover, nonwhite upper-income applicants experienced higher rates of denial than white LMI applicants in the Third District (Figure 6), as well as in the Lancaster, Reading, Scranton–Wilkes-Barre–Hazleton, and Wilmington metro areas. Controlling for all other available variables, race had a statistically significant effect on an applicant's chance of denial (Appendix B, Model 1). Interestingly, in the conditional analysis, white applicants applied for and received somewhat smaller loans than nonwhite applicants (Appendix B, Models 3 and 4), which may indicate that white applicants had less intensive home repair needs or relied less on financing for home improvement projects.

Additionally, race/ethnicity was associated with whether or not an applicant was denied, at least in part, because of credit history (Appendix B, Model 2). This highlights the importance of credit scores, which were unfortunately not available in this data set, for assessing applicant outcomes, as significant differences across applicant groups are known to exist,[24] and historic and persistent racial disparities in access to credit and wealth-building opportunities have been extensively documented.[25]

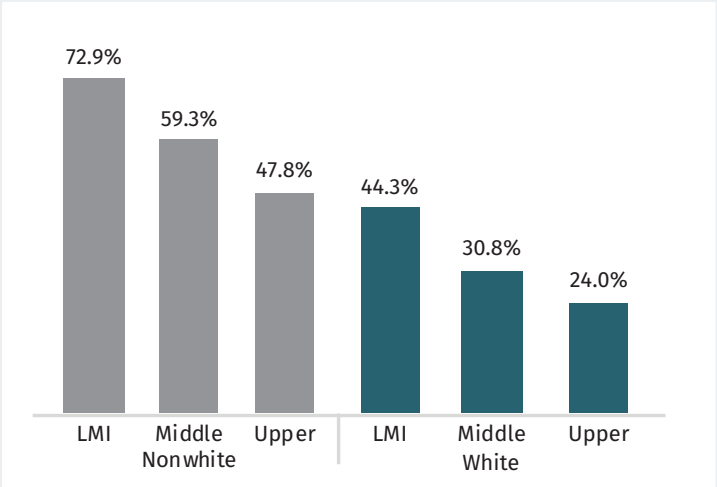
APPLICANT SEX AND COAPPLICANT STATUS

In the Third District overall, LMI female applicants were denied 56.5 percent of the time, compared with only 49.6 percent for LMI male applicants. Trenton was the only metro area analyzed where LMI female applicants were denied less frequently than LMI male applicants (55.4 percent and 60.2 percent, respectively). Philadelphia had the most similar denial rates between LMI males and LMI females, as LMI females were denied only 1.7 percentage points more often than LMI males. All else equal, male applicants were more likely to be approved for home improvement loans than females, and when they were denied, males were less likely than females to have credit history reported as a reason for denial (Appendix B, Models 1 and 2). Additionally, male applicants typically applied for and received larger loan amounts (Appendix B, Models 3 and 4).

Those who applied with a coapplicant had higher approval rates than those without coapplicants. Across the Third District, the denial

FIGURE 6

Denial Rates for Nonwhite and White Applicants by Income Level, Third District, 2015–2017



Source: Authors' calculations using 2015–2017 HMDA data

[24] Wei Li and Laurie Goodman (2014), *A better measure of mortgage application denial rates*, Urban Institute, available at https://www.urban.org/sites/default/files/publication/33501/2000031-A-Better-Measure-of-Mortgage-Application-Denial-Rates.pdf.

[25] For a recent, highly relevant analysis, see Daniel Aaronson, Daniel Hartley, and Bhash Mazumder (2018), "The Effects of the 1930s HOLC 'Redlining' Maps," Federal Reserve Bank of Chicago Working Paper 2017-12, available at https://www.chicagofed.org/publications/working-papers/2017/wp2017-12.

TABLE 4

Denial Rate by Primary Applicant Sex and Coapplicant Status for LMI Primary Applicants, Third District, 2015–2017

	Coapplicant	No Coapplicant
LMI Female	49.2%	57.4%
LMI Male	36.1%	54.0%

Source: Authors' calculations using 2015–2017 HMDA data

TABLE 5

Denial Rate for White and Nonwhite LMI Female Primary Applicants by Coapplicant Status, Third District, 2015–2017

	Coapplicant	No Coapplicant
Nonwhite LMI Female	68.5%	74.8%
White LMI Female	44.1%	47.2%

Source: Authors' calculations using HMDA 2015–2017 HMDA data

rate for LMI applicants without coapplicants was 15.5 percentage points higher than that of LMI applicants with coapplicants. The controlled results supported this finding, with those with coapplicants being significantly less likely to be denied (Appendix B, Model 1). Interestingly, when controlling for other variables, those with coapplicants applied for slightly larger loans but received slightly smaller loans than those without coapplicants (Appendix B, Models 3 and 4) — although it is worth noting that this negative effect is much smaller than the positive effect of applicant income, which may also increase because of the inclusion of a coapplicant.

Of the sex by coapplicant status combinations, LMI females without coapplicants had the highest denial rate. LMI males without coapplicants experienced a slightly lower denial rate, but males with coapplicants were approved much more often than females with coapplicants (Table 4).

In nearly every metro area analyzed, at least two-thirds of LMI applications with coapplicants reported the primary and coapplicant as white. Since white applicants had higher approval rates overall compared with nonwhite applicants, this analysis further breaks out these results for LMI female applicants based on whether they are white or nonwhite. Across the Third District, nonwhite LMI females with and without coapplicants were denied at considerably higher rates than white LMI females with similar coapplicant statuses (Table 5).

These findings suggest that nonwhite LMI female heads of household had more difficulty accessing home improvement financing than households with higher income levels, two householders, and even white LMI female heads of household.

SMALL LOAN AMOUNT APPLICATIONS

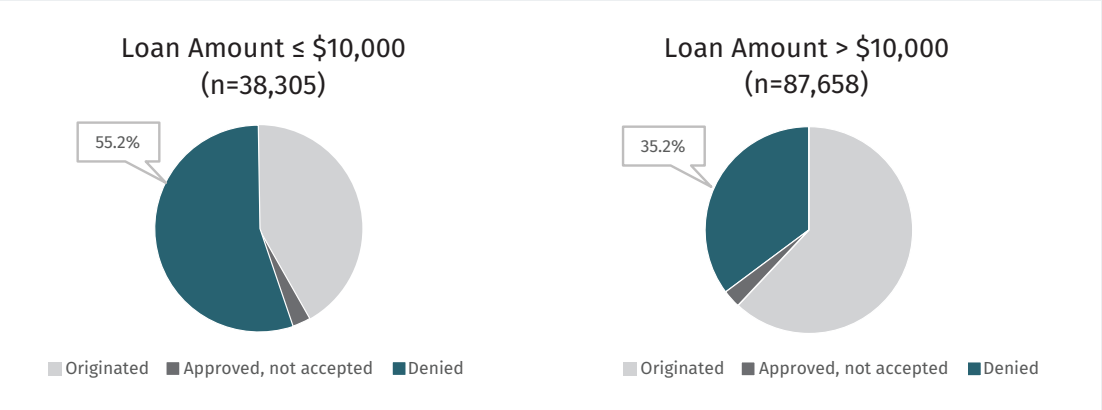
In this analysis, small loans were defined as those where the requested loan amount was $10,000 or less. Whereas more affluent homeowners may be able to cover moderate-cost repairs out of pocket, LMI homeowners may have a greater need for these smaller loans as a result of a lack of cash savings or other affordable financing options. Applicants for small loans had a median applicant income-to-MFI ratio of 71.2 percent, whereas applicants for all loans had a median income-to-MFI ratio of 98.4 percent. Smaller loan amounts were denied 55.2 percent of the time, while larger loan applications had a denial rate of 35.2 percent (Figure 7).

Interestingly, when controlling for other variables of interest, applications for small loans were actually less likely to be denied (Appendix B, Model 1), indicating that the characteristics of applicants — who were disproportionately lower income — are more likely to be driving the higher observed denial rate. Furthermore, denied applications for smaller loans are also more likely to cite credit history as a denial reason (Appendix B, Model 2). These results suggest that many lower-income homeowners with weaker credit profiles are struggling to access relatively small home improvement loans.

In every metro area analyzed, the median originated loan amount was higher than the median applied-for loan amount; in other words, applications for smaller loans were denied more frequently than those for larger loans in every metro area. In the Third District overall, there was a 20 percent difference between originated and applied-for median loan amounts.

FIGURE 7

Action Taken for Applications for $10,000 or Less (left) and Applications Greater than $10,000 (right), Third District, 2015–2017



Source: Authors' calculations using 2015–2017 HMDA data

This may represent a gap in access for homeowners seeking financing for relatively small but necessary home repair and maintenance jobs, which could lead to them using credit cards or other more costly means to fund these projects. These patterns mirror recent findings in the purchase loan arena, where the difficulty accessing smaller mortgages has made it more challenging for lower-income buyers to purchase relatively low-cost homes. Researchers have attributed this in large part to the slow recovery from the Great Recession and heightened post-recession costs of originating loans, which make smaller loans less lucrative for financial institutions.[26] These factors, compounded by applicants' lower incomes and likely weaker credit profiles, may also reduce the willingness of financial institutions to extend relatively small home improvement loans.

How does access to home improvement financing vary by neighborhood characteristics?

Similar to borrower groups, there were observable differences in denial rates by neighborhood-level characteristics. Applicants faced higher denial rates for home improvement loans if they lived in neighborhoods that had lower income levels, majority-minority populations, older housing stock, or lower home values. Applicants were slightly more likely to be denied, at least in part, because of credit history if they lived in neighborhoods with lower income levels, majority-minority populations, or lower home values (Appendix B, Model 2).

LMI NEIGHBORHOODS

Without controlling for individual borrower characteristics, as shown in Table 6, Third District applicants living in LMI neighborhoods experienced higher denial rates (58.9 percent) than applicants overall (41.3 percent). Holding all other available application characteristics constant, applicants living in middle-income neighborhoods were somewhat less likely to be denied than those in LMI neighborhoods (Appendix B, Model 1), but there was no statistically significant association between denial rates and applicants in upper-income neighborhoods.

[26] Alanna McCargo, Bing Bai, Taz George, and Sarah Strochak, (2018) *Small-Dollar Mortgages for Single-Family Residential Properties*, Urban Institute, available at https://www.urban.org/sites/default/files/publication/98261/small_dollar_mortgages_for_single_family_residential_properties_0.pdf.

TABLE 6

Loan Characteristics by Applicant Neighborhood Characteristics, Third District, 2015–2017

	All Applicants	LMI Neighborhoods	Majority-Minority Neighborhoods
Number of Applications	125,965	24,504	18,578
Denial Rate	41.3%	58.9%	69.0%
Applied-For Loan Amounts			
Median	$25,000	$15,000	$10,000
25th–75th Percentile	$10,000–$60,000	$6,000–$35,000	$5,000–$30,000
Originated Loan Amounts			
Median	$30,000	$20,000	$17,000
25th–75th Percentile	$12,000–$88,000	$10,000–$50,000	$8,000–$47,000

Source: Authors' calculations using 2015–2017 HMDA data; median loan amounts reported in HMDA are rounded to nearest $1,000

Across the Third District, the median loan amount originated in upper-income neighborhoods ($43,000) was 115 percent higher than the median amount in LMI neighborhoods ($20,000). However, once other variables of interest were controlled for, the effect of neighborhood income level on loan amount received was reversed. Applicants in middle-income neighborhoods, when approved, received an average of about $1,500 less than applicants in LMI neighborhoods. Further, applicants in upper-income neighborhoods received an average of about $2,600 less than applicants in LMI areas (Appendix B, Model 3). This may reflect applicants from LMI neighborhoods living in homes that needed more extensive repairs or applicants from more affluent neighborhoods being less dependent on financing. It is worth noting that these coefficients are much smaller than those attributable to applicant income, which likely drive the higher loan amounts and lower denial rates among applicants from more affluent neighborhoods in the unconditional estimates.

MAJORITY-MINORITY NEIGHBORHOODS

There were also differences in denial rates and loan amounts originated between applicants living in majority-white neighborhoods and those living in majority-minority neighborhoods. Similar to the findings for white and nonwhite applicants, applicants from majority-minority, upper-income tracts experienced higher denial rates than those in majority-white LMI tracts in the Third District. Denial rates in Camden followed this pattern, but rates in Philadelphia and Trenton did not; instead, applicants from upper-income, majority-minority tracts experienced lower denial rates than applicants from LMI, majority-white tracts.[27]

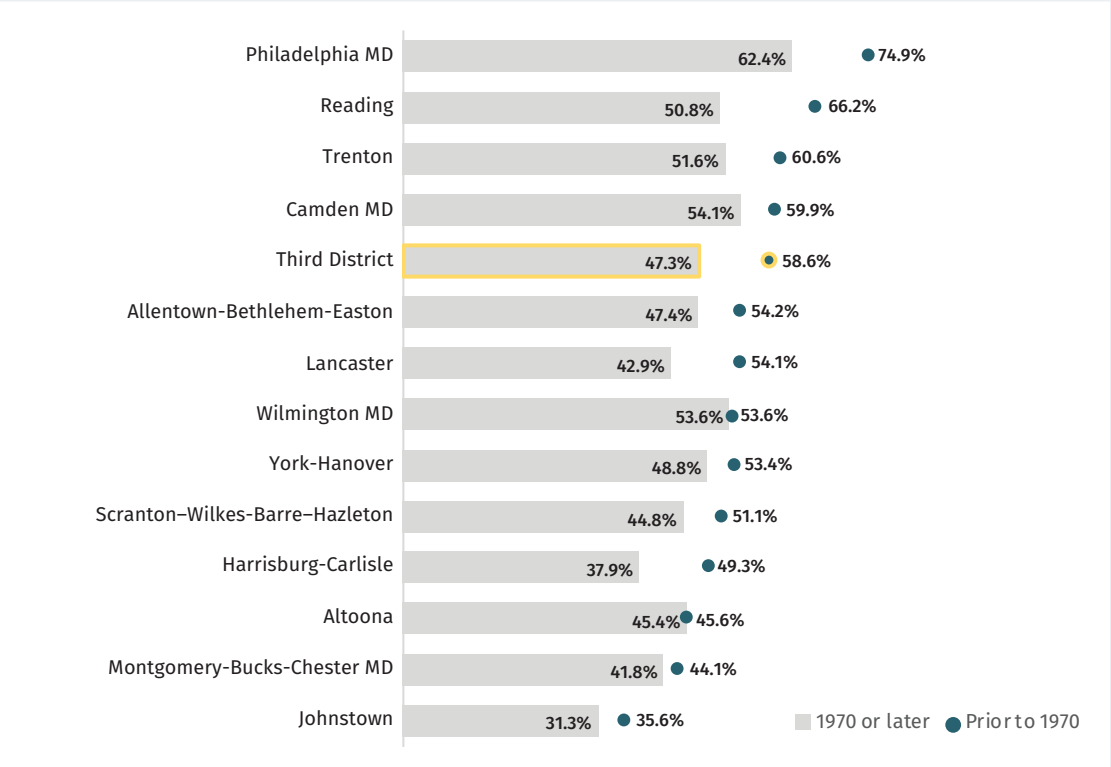
This trend was also evident for various applicant groups. For example, white applicants living in majority-minority neighborhoods experienced higher denial rates than white applicants overall, while nonwhite applicants in majority-white neighborhoods were more likely to be approved than nonwhite applicants overall.

Controlling for the other available variables, an applicant living in a majority-minority neighborhood was significantly more likely to be denied than an applicant in a majority-white neighborhood (Appendix B, Model 1). Despite higher odds of being denied for home improvement loans, when other applicant and neighborhood characteristics were taken into consideration, applicants living in majority-minority neighborhoods applied for and received larger loan amounts than those living in majority-white neighborhoods (Appendix B, Models 3 and 4), which again may be attributable to more extensive home improvement needs among homeowners in these neighborhoods or greater reliance on debt financing.

[27] Similar comparisons were limited for other metro areas, as there were fewer than 100 applicants in one or more of the neighborhood income/majority-minority status bins.

FIGURE 8

Denial Rates for LMI Applicants by Median Year Built of Owner-Occupied Units in Census Tract by Metro Area, 2015–2017



Source: Authors' calculations using 2016 ACS five-year estimates; 2015–2017 HMDA data

NEIGHBORHOODS WITH OLDER HOUSING STOCK

In addition to neighborhood demographics, observed denial rates varied based on the age of the housing stock in applicants' neighborhoods. LMI applicants who lived in neighborhoods where the median year built for owner-occupied housing units was before 1970 were denied more often than LMI applicants in neighborhoods with newer housing stock in nearly every metro area (Figure 8). In the Third District overall, the difference in denial rates was 11.3 percentage points. When controlling for all other variables, odds of denial are slightly higher for applicants residing in neighborhoods where the median year built for owner-occupied housing units was earlier than 1970 (Appendix B, Model 1).

In the regression analysis, the age of neighborhood housing stock had no statistically significant association with loan amounts applied for or originated (Appendix B, Models 3 and 4). This finding is somewhat unexpected in light of prior research finding a sharp increase in repair and maintenance costs when a home reaches 25 to 30 years of age.[28] However, controlling for applicant income may mute this association, since more affluent owners of older homes are more likely to have invested in ongoing maintenance that reduces long-term costs and may be less reliant on financing.

NEIGHBORHOOD MEDIAN HOME VALUES

The relationship between census tract median home value and odds of denial was statistically significant, with the odds of denial decreasing as median home values rose (Appendix B, Model 1). There was also substantial association between neighborhood median home values and loan amounts. For every $100,000 in-

[28] Acquaye, "Low-Income Homeowners and the Challenges of Home Maintenance."

crease in median home value, the average applied-for loan amount increased by more than $18,000, and the average loan amount received increased by more than $21,000 (Appendix B, Models 3 and 4). Applicants from neighborhoods with higher-value homes likely had more home equity to tap into, which may have contributed to this effect.

IMPLICATIONS

While it is important to keep in mind the limitations of this analysis, including the inability to control for important factors such as credit score, DTI ratios, and LTV ratios, the findings do indicate meaningful differences in denial rates for home improvement loans among applicant groups. From 2015 to 2017, a majority of applicants from specific applicant subgroups and neighborhoods were denied home improvement loans. Although this analysis cannot determine causality, these observed disparities have significant implications for whether these individuals and communities are able to invest in needed home improvements. Historically, policymakers have largely focused on facilitating access to home purchase loans for LMI and minority households; in light of these patterns, perhaps more attention to home improvement loan accessibility is warranted.

Given that credit history was the most commonly cited reason for application denials, community development–oriented lenders hoping to fill these gaps will likely need to have a higher tolerance for credit risk to better serve households with unmet home improvement needs. For example, at the time of this report's writing, the Philadelphia Redevelopment Authority (PRA) was in the process of developing a program to extend loans to income-qualified homeowners with credit scores as low as 580.[29]

Some homeowners in need of home repairs may simply not have sufficient or consistent enough income to finance improvements with conventional financial tools. These households may be better served by alternatives such as grants or shared-equity products that are due when the property is sold. The City of Philadelphia has also announced plans to extend additional funding to existing home repair grant programs that target LMI homeowners, programs for which there had been prolonged waitlists due to high demand and limited resources.[30]

Finally, local housing counseling agencies could enhance existing outreach, education, and counseling efforts to better serve households that may be in need of home repairs, particularly in areas with older housing stock. Many first-time homebuyers, particularly those with lower income levels, report unexpected costs within the first few years of homeownership.[31] Prepurchase counseling could prepare prospective owners to anticipate such costs and incorporate these considerations into their budgets. Programs targeting both future and current homeowners could teach participants how to perform relatively minor repairs on their own, reducing their reliance on more costly contractor services and preventing problems from worsening over time.

In order to realize homeownership's financial and psychological benefits, homeowners must have access to the resources and information they need to maintain their homes in good condition. This report suggests that access to home improvement financing is more difficult to secure for some homeowners and in some neighborhoods, and it offers ideas for expanding access in an effort to make homeownership more sustainable in the long run.

ACKNOWLEDGEMENTS

The authors would like to thank Keith Wardrip, Lauren Lambie-Hanson, Ann Carpenter, Anna Tranfaglia, and the entire Community Development and Regional Outreach Department at the Federal Reserve Bank of Philadelphia for insights and guidance throughout the process of completing this report. The views expressed in this report are those of the authors and do not necessarily reflect the views of the Federal Reserve Bank of Philadelphia or the Federal Reserve System.

[29] Caitlin McCabe (2018). "New Philadelphia Loan Program Offers Hope to Residents with Homes in Disrepair," *Philly.com,* January 18.

[30] McCabe, "New Philadelphia Loan Program Offers Hope to Residents with Homes in Disrepair."

[31] Van Zandt and Rohe, "The Sustainability of Low-Income Homeownership: The Incidence of Unexpected Costs and Needed Repairs Among Low-Income Home Buyers."

Appendix A: Methodology

RESEARCH DESIGN

The analysis in this report was motivated by existing literature that suggests individual demographics and neighborhood characteristics may influence a household's likelihood of undertaking home improvement or repair projects.[32] Given that LMI homeowners are likely to face liquidity constraints, access to affordable financing options may be a key factor in their ability to undertake needed repairs. Taking applications for home improvement loans as an indication of homeowners' need or desire to invest in their homes, the authors examine three areas of interest: the characteristics of home improvement loan applicants in selected regions within the Third District; the individual characteristics of applicants in relation to application outcomes, such as denial and loan amounts; and the characteristics of applicants' neighborhoods in relation to those same application outcomes. Although this is a descriptive analysis that cannot and does not assert causation, this research offers insight into potential gaps in access to home improvement financing, particularly among LMI homeowners.

The analysis primarily examines data from all 60 counties within the Third Federal Reserve District. In addition, the report looked specifically at 13 metropolitan statistical areas and metropolitan divisions within the Third District to highlight regional differences throughout the District: Allentown-Bethlehem-Easton, Altoona, Camden, Harrisburg-Carlisle, Johnstown, Lancaster, Montgomery-Bucks-Chester, Philadelphia, Reading, Scranton–Wilkes-Barre–Hazleton, Trenton, Wilmington, and York-Hanover.

REGRESSION MODELS

Regression models were developed to strengthen the analysis of the relationships between applicant characteristics and application outcomes. Models 1 and 2 are logistic regressions examining the odds of (1) application denial, and (2) credit history being a reason for an application denial based on individual and neighborhood characteristics. Models 3 and 4 are OLS regression models examining the effects of the variables of interest on (3) originated loan amounts and (4) applied-for loan amounts. While this analysis does not seek to causally explain gaps in home improvement lending in the Third District, the regression models enable the authors to tease out the relative effect sizes of applicant and neighborhood characteristics. Full results for all regression models can be viewed in Appendix B.

AMERICAN HOUSING SURVEY

The American Housing Survey (AHS) is conducted biennially by the U.S. Census Bureau under sponsorship of the U.S. Department of Housing and Urban Development (HUD). It is a comprehensive survey providing information on housing unit characteristics and householder demographics in the United States. This analysis mainly focused on the core home improvement subject from the 2015 AHS.[33]

The AHS analysis in the inset box at the beginning of the report used data from the Mid-Atlantic Census Division only (Pennsylvania, New York, and New Jersey). These data exclude Delaware, which is part of the Third District, and include New York, which is not part of the Third District, but still provided a fairly close approximation of the Third District's housing stock.

HOME MORTGAGE DISCLOSURE ACT (HMDA) 2015–2017

The primary data set used in this analysis is Home Mortgage Disclosure Act (HMDA) data. HMDA was enacted in 1975 to make the mortgage lending activities of financial institutions more transparent.[34] The data set used in this analysis is restricted to applications for loans designated as having a home improvement purpose for units that are owner-occupied as a principle dwelling. HMDA defines home improvement loans as secured or

[32] Herbert and Belsky, *The Homeownership Experience of Low-Income and Minority Families: A Review and Synthesis of the Literature.*

[33] United States Census Bureau, American Housing Survey (2016), available at https://www.census.gov/programs-surveys/ahs/about.html.

[34] Neil Bhutta, Steven Laufer, and Daniel R. Ringo, (2017) "Residential Mortgage Lending in 2016: Evidence from the Home Mortgage Disclosure Act Data," *Federal Reserve Bulletin, 103*:6 (2017), available at https://www.federalreserve.gov/publications/files/2016_hmda.pdf.

unsecured loans with the purpose of being used at least partially for "repairing, rehabilitating, remodeling, or improving a dwelling" or the land on which the dwelling sits. Institutions may choose whether or not to report a home equity line of credit (HELOC) as a home improvement loan if it is known to have a home improvement purpose. Loans that are both home purchase and home improvement are reported as home purchase, whereas loans that are both refinancing and home improvement are reported as home improvement.[35]

INDIVIDUAL-LEVEL VARIABLES (SOURCE: 2015–2017 HMDA DATA)

APPLICANT INCOME LEVEL

Applicant income was reported in the HMDA data, rounded to the nearest $1,000. The rounded income was divided by the U.S. Department of Housing and Urban Development's metro area median family income (MFI) for the year in which the application was reported to determine applicant income level. For non-MSA applicants in the Third District, applicant income was divided by the MFI in the nonmetropolitan portion of the respective state for the appropriate year. Applicants earning less than 80 percent of the corresponding regional MFI were categorized as low- or moderate-income (LMI), those earning 80 to 119 percent were labeled middle-income, and those earning 120 percent or above were labeled upper-income. It is worth noting that HMDA data only capture applicant income, rather than total household income. Further, HMDA requires that institutions report only the income used when making the credit decision. For example, if an institution considered an applicant's salary and bonus to evaluate creditworthiness, both forms of income would be reported. In other scenarios, the institution might only rely on an applicant's salary and would thus only report that amount for applicant income. Further, when there is a coapplicant, the income field may or may not combine the primary applicant's and coapplicant's incomes.

APPLICANT RACE/ETHNICITY

HMDA data allow a user to report up to five races plus Hispanic or non-Hispanic ethnicity. For the purposes of this analysis, anyone who reported ethnicity as Hispanic or Latino was categorized as Hispanic or Latino, regardless of race. Those not of Hispanic or Latino origin listing white, black or African American, or Asian as their only race were labeled as either white, black or African American, or Asian, respectively. Where statistics are reported for nonwhite applicants, they reflect the combined experiences of applicants classified as Hispanic/Latino or any race other than white.

COAPPLICANT RACE/ETHNICITY

These were categorized the same way as applicant race and ethnicity. Then, categories of coapplicant groupings were created based on the race/ethnicity of both applicants. Categories included both white, different minorities, one minority and one white, and same minority. Demographic information was missing for some coapplicants.

APPLICANT SEX

Applicants were reported as either male or female, or they did not disclose the information, in which case the field was marked "NA."

LOAN AMOUNT

An amount was reported in the HMDA data for all applications. This is the amount applied for in each application, rounded to the nearest $1,000.

DENIAL RATE

The denial rate was calculated by dividing the total number of denied applications by the sum of all applications that resulted in a denial, a loan origination, or an approval that was not accepted.

DENIAL REASONS

HMDA reporters can list up to three reasons for denying an application, and all three fields are weighted equally. Possible reasons for denial include collateral, credit application incomplete, credit history, debt-to-income ratio, employment history, insufficient cash, mortgage insurance denied, other, and unverified information.

[35] FFIEC, *A Guide to HMDA Reporting: Getting It Right!*

NEIGHBORHOOD-LEVEL VARIABLES (SOURCE: 2015–2017 HMDA DATA)

NEIGHBORHOOD INCOME LEVEL

Neighborhood income level ratios are provided in the HMDA data set as the ratio of a census tract MFI to the associated metro area MFI. For applicants living in nonmetro areas, tract MFIs are compared with the MFI in the nonmetropolitan portion of the respective state for the appropriate year. Neighborhoods with ratios less than 80 percent were labeled as LMI, those with ratios of 80 to 119 percent were labeled as middle-income, and those at 120 percent or more were labeled as upper-income.

MINORITY POPULATION

The HMDA data set provides the percentage of minority population at the census tract level. Majority-minority neighborhoods were those census tracts with minority populations greater than 50 percent. Because there were no majority-minority tracts in Altoona and Johnstown, these areas were excluded from analyses involving race/ethnicity at the neighborhood level.

AMERICAN COMMUNITY SURVEY

The American Community Survey (ACS) is an ongoing survey conducted by the U.S. Census Bureau to provide timely information on the economic, demographic, and housing characteristics of the country. The five-year 2016 estimates for two neighborhood-level variables were matched to the HMDA data set at the census tract level.

NEIGHBORHOOD-LEVEL VARIABLES (SOURCE: ACS 2016 FIVE-YEAR ESTIMATES)

NEIGHBORHOOD HOUSING STOCK AGE

ACS table B25037 provided census tract–level estimates of the median year owner-occupied housing units were built to provide an overall sense of housing stock age in applicants' neighborhoods, given that the year built for applicants' housing units is not reported in the HMDA data set.

MEDIAN HOME VALUE

Similarly, ACS table B25077 provided census tract–level estimates of the median home value for owner-occupied units. Although median value is not a perfect proxy for the values of applicants' homes, it provides a sense of home values in applicants' neighborhoods.

Appendix B: Regression Results

TABLE 1

Predicting the Likelihood of Having a Home Improvement Loan Application Denied (Model 1) and Being Denied, At Least in Part, Because of Credit History (Model 2) (Odds Ratios and Standard Errors of Coefficients from a Binary Logistic Regression Model)

	Model 1: Denial			Model 2: Credit History Denial		
	Odds Ratio	Standard Error		Odds Ratio	Standard Error	
Individual Characteristics						
Applicant income level (low/moderate is reference)						
Middle	0.608	0.011	***	1.213	0.034	***
Upper	0.461	0.009	***	1.347	0.041	***
Applicant race (nonwhite is reference)						
White	0.511	0.011	***	0.756	0.023	***
Applicant sex (female is reference)						
Male	0.897	0.013	***	0.891	0.020	***
Coapplicant present	0.775	0.012	***	1.112	0.030	***
Loan amount ≤$10,000	0.863	0.016	***	1.418	0.039	***
Lien status (unsecured is reference)						
Loan secured by first lien	0.388	0.008	***	0.272	0.008	***
Loan secured by subordinate lien	0.572	0.011	***	0.248	0.007	***
Neighborhood Characteristics						
Neighborhood income level (low/moderate is reference)						
Middle	0.920	0.021	***	0.911	0.031	***
Upper	0.951	0.030		0.931	0.046	
Majority-minority neighborhood	1.105	0.033	***	1.097	0.046	**
Median year home built before 1970	1.034	0.018	*	0.978	0.028	
Median home value ($100,000s)	0.863	0.000	***	0.800	0.000	***
Cox and Snell R^2		0.343			0.390	
Observations		106,891			41,819	

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Notes: Models incorporate metro area fixed effects. Model 2 is conditional on an application being denied by the institution. While the neighborhood characteristic variables were correlated, regression diagnostic statistics suggested that multicollinearity was not an issue in these models.

Applicant income levels are defined as follows: low/moderate – applicant income less than 80 percent of regional MFI; middle – applicant income 80 to 119 percent of regional MFI; and upper – applicant income 120 percent of regional MFI or greater.

Neighborhood income levels are defined as follows: low/moderate – tract income less than 80 percent of regional MFI; middle – tract income 80 to 119 percent of regional MFI; and upper – tract income 120 percent of regional MFI or greater.

The top 1 percent of values for median home value and loan amount are removed from regression because of extreme values.

Source: Authors' calculations based on 2015–2017 HMDA data and 2012–2016 ACS data

TABLE 2

Predicting Originated (Model 3) and Applied-For (Model 4) Loan Amounts (Coefficients and Standard Errors from OLS Regression Models)

	Model 3: Loan Amount Originated			Model 4: Loan Amount Applied For		
	Coefficient	Standard Error		Coefficient	Standard Error	
Individual Characteristics						
Applicant income level (low/moderate is reference)						
Middle	15,770.7	627.2	***	12,062.9	424.2	***
Upper	34,873.9	625.3	***	28,706.5	430.7	***
Applicant race (nonwhite is reference)						
White	-2,831.9	842.7	***	-2,014.5	514.0	***
Applicant sex (female is reference)						
Male	9,084.6	490.1	***	6,675.3	335.9	***
Coapplicant present	-1,785.8	520.3	***	1,228.3	374.0	***
Lien status (unsecured is reference)						
Loan secured by first lien	104,673.8	570.7	***	99,124.9	389.6	***
Loan secured by subordinate lien	9,216.7	624.5	***	9,029.2	423.4	***
Neighborhood Characteristics						
Neighborhood income level (low/moderate is reference)						
Middle	-1,516.5	824.0	*	-1,794.4	542.0	***
Upper	-2,628.2	1,072.4	**	-2,404.7	735.5	***
Majority-minority neighborhood	5,052.8	1,169.5	***	4,262.5	709.9	***
Median year home built before 1970	-341.2	556.5		-291.9	399.5	
Median home value ($100,000s)	21,047.3	478.0	***	18,277.4	339.7	***
Observations	62,033			106,891		
Adjusted R2	0.501			0.502		

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Note: Models incorporate metro area fixed effects. Model 3 is conditional on an application being approved and loan being originated by the institution. While the neighborhood characteristic variables were correlated, regression diagnostic statistics suggest that multicollinearity was not an issue in these models.

Applicant income levels are defined as follows: low/moderate – applicant income less than 80 percent of regional MFI; middle – applicant income 80 to 119 percent of regional MFI; and upper – applicant income 120 percent of regional MFI or greater.

Neighborhood income levels are defined as follows: low/moderate – tract income less than 80 percent of regional MFI; middle – tract income 80 to 119 percent of regional MFI; and upper – tract income 120 percent of regional MFI or greater.

The top 1 percent of values for median home value and loan amount are removed from regression because of extreme values.

Source: Authors' calculations based on 2015–2017 HMDA data and 2012–2016 ACS data

Appendix C: Descriptive Statistics

TABLE 1

Denial Rates by Primary Applicant Characteristics and Geographic Location

	All Applicants	LMI Applicants							LMI Neighborhoods	Majority-Minority Neighborhoods
		All	White	Black or African-American	Hispanic or Latino (Any Race)	Asian	Male	Female		
Third District	41.3%	53.5%	44.3%	73.5%	73.6%	66.7%	49.6%	56.5%	58.9%	69.0%
Allentown-Bethlehem-Easton	37.1%	51.3%	45.0%	*	74.7%	*	48.3%	54.1%	49.2%	61.1%
Altoona	32.6%	45.5%	45.0%	*	*	*	44.1%	46.6%	45.3%	N/A
Camden MD	47.4%	57.1%	49.4%	68.1%	74.7%	70.9%	54.9%	59.2%	60.4%	66.1%
Harrisburg-Carlisle	29.4%	43.1%	37.2%	72.0%	*	*	40.6%	43.9%	45.1%	61.4%
Johnstown	27.3%	34.8%	34.0%	*	*	*	31.4%	36.7%	37.1%	N/A
Lancaster	31.5%	46.5%	43.0%	*	66.7%	*	42.9%	51.4%	49.3%	57.2%
Montgomery-Bucks-Chester MD	31.9%	42.8%	38.2%	58.1%	58.5%	59.7%	40.1%	44.3%	42.9%	55.7%
Philadelphia MD	59.7%	74.6%	61.3%	77.0%	80.6%	74.0%	73.4%	75.1%	74.3%	72.4%
Reading	43.4%	60.7%	47.0%	*	75.8%	*	56.8%	64.5%	70.7%	72.8%
Scranton–Wilkes-Barre–Hazleton	36.6%	49.2%	45.9%	*	76.1%	*	46.5%	51.1%	49.0%	54.7%
Trenton	47.8%	58.5%	45.0%	68.0%	68.0%	*	60.2%	55.4%	68.1%	61.7%
Wilmington MD	44.2%	53.5%	46.1%	70.0%	63.4%	*	50.8%	55.3%	56.7%	61.8%
York-Hanover	35.5%	50.1%	46.3%	*	*	*	45.9%	53.1%	52.1%	64.4%

Source: Authors' calculations based on 2015–2017 HMDA data; denial rates calculated as the number of applications that are denied divided by the sum of applications that are denied, originated, or approved but not accepted.
* Denial rates not reported for cells based on fewer than 100 applications

TABLE 2

Median Loan Amount Applied For by Primary Applicant Characteristics and Geographic Location

	All Applicants	LMI Applicants							LMI Neighborhoods	Majority-Minority Neighborhoods
		All	White	Black or African-American	Hispanic or Latino (Any Race)	Asian	Male	Female		
Third District	$25,000	$15,000	$15,000	$10,000	$10,000	$20,000	$15,000	$12,000	$15,000	$10,000
Allentown-Bethlehem-Easton	$25,000	$15,000	$17,000	*	$10,000	*	$18,000	$14,000	$15,000	$12,000
Altoona	$15,000	$10,000	$10,000	*	*	*	$10,000	$7,500	$10,000	N/A
Camden MD	$25,000	$20,000	$20,000	$15,000	$15,000	$25,000	$20,000	$20,000	$20,000	$18,000
Harrisburg-Carlisle	$25,000	$18,000	$20,000	$12,000	*	*	$20,000	$16,000	$20,000	$15,000
Johnstown	$14,000	$8,000	$8,000	*	*	*	$8,000	$8,000	$7,000	N/A
Lancaster	$25,000	$15,000	$18,000	*	$10,000	*	$19,000	$15,000	$15,500	$12,500
Montgomery-Bucks-Chester MD	$40,000	$25,000	$25,000	$16,000	$20,000	$25,000	$25,000	$25,000	$24,000	$25,000
Philadelphia MD	$15,000	$10,000	$15,000	$10,000	$10,000	$20,000	$10,000	$10,000	$10,000	$10,000
Reading	$18,000	$10,000	$12,000	*	$10,000	*	$10,000	$10,000	$10,000	$10,000
Scranton–Wilkes-Barre–Hazleton	$16,000	$10,000	$10,000	*	$10,000	*	$10,000	$10,000	$10,000	$10,000
Trenton	$30,000	$20,000	$25,000	$10,000	$20,000	*	$16,500	$25,000	$15,000	$17,000
Wilmington MD	$20,000	$14,000	$15,000	$10,000	$10,000	*	$15,000	$12,000	$12,000	$12,000
York-Hanover	$21,000	$13,500	$15,000	*	*	*	$15,000	$12,000	$12,000	$10,000

Source: Authors' calculations based on 2015–2017 HMDA data; loan amount reported in HMDA data rounded to the nearest $1,000
* Median loan amounts not reported for cells based on fewer than 100 applications

Federal Reserve Bank of Philadelphia

www.PhiladelphiaFed.org | @PhiladelphiaFed