REFINANCE LOAN TRENDS IN TENNESSEE:

ANALYSIS FROM 2018-2021 HOME MORTGAGE DISCLOSURE ACT (HMDA) DATA

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EXECUTIVE SUMMARY

Because homeownership is one of the primary means of accumulating and transferring wealth by generation, lower rates of uptake among minority and LMI homeowners could limit their ability to save money and build wealth over time. The consequences of these disparities are far reaching. To close this gap, policymakers can offer low cost refinance programs targeted towards Black and LMI borrowers. Additionally, greater financial education about refinance options as well as its benefits and costs might be valuable. We use data from the Home Mortgage Disclosure Act (HMDA) for Tennessee from 2018 to 2021 to explore rates of refinancing, its disparate effects, and the implications before and during the COVID-19 pandemic in Tennessee.

Refinancing one's home may offer many benefits to homeowners. It may help smooth consumption to address income fluctuations, and even allow for investments in education, new business ventures, or other assets. Furthermore, refinancing one's existing mortgage can yield better terms and conditions, lower monthly payments, and modify the repayment period.

Despite the benefits of refinancing one's mortgage, we find that racial and ethnic disparities persist. Refinance loan originations were significantly lower for Black and low or moderate income (LMI) homeowners than their counterparts. In 2021, despite a recent slowdown, refinance mortgage loan originations increased nearly fourfold from 2018. Although denial rates are higher for refinance loan applications compared to purchase loans, refinance mortgage denial rates declined for all race and income categories.

Yet, the rates of refinance mortgage applications from Black and LMI homeowners did not grow as fast as the rates of individuals from other racial and income backgrounds. Refinance mortgage applications for all homeowners more than tripled from 2018 to 2021 (212%). In comparison, applications from Black homeowners increased by 131%, and 118% from LMI borrowers.

Refinance loan originations increased significantly in all Tennessee MSAs between 2018 and 2021. The bulk of the growth in origination volume happened in 2020 for all MSAs and the state. For the Clarksville MSA, however, 2019 was also a year of high refinance loan volume yielding a two-fold increase from the prior year. Refinance loan denial rates varied by MSA between 2018 and 2021.

While there were significant areas of progress, the disproportionate rates of refinance applications, denials, and ultimately, originations by race, ethnicity, and income are indicative of long-standing inequities in how the benefits of homeownership are extolled.

INTRODUCTION

Tennessee experienced a nearly 300% increase in refinance loan originations from 2018 to 2021. As a response to the potential economic downturn resulting from the COVID-19 pandemic, the Federal Reserve Bank eased monetary policy by lowering federal funds rate, quantitative easing and more (Milstein and Wessel, 2021). These actions lowered interest rates in the markets, stimulating mortgage activity for both home purchases and refinances.

There are several benefits to refinancing one's mortgage. Homeowners may want to take advantage of declining interest rates, improve their terms and conditions or use the equity for other purposes. In a traditional rate and term refinance, homeowners convert their existing mortgage to a new mortgage with a lower interest rate and/or better terms, which could lower their monthly payments. Homeowners may want to convert their adjustable rate mortgage (ARM) to a new mortgage with fixed rate[1] or they might want to shorten or expand the repayment period to either pay off the loan sooner or lower the monthly payment amount to lower the cost burden, respectively. In a cash-out refinance, homeowners use the built-up equity in their homes for various purposes including home improvements, paying off other debt, or financing education. Low interest rates and expected higher future interest rates are important factors in stimulating refinance demand as are personal factors such as improvements in incomes and credit scores, or a need for immediate cash.

In particular, refinancing is a good option for homeowners with older originated loans with higher interest rates. For mortgage loans with recent originations, even the relatively low interest rates of the last few years may not generate enough savings to compensate for the associated closing costs. In mid-2021, 40% of the nation's borrowers with a 30-year mortgage funded by Freddie Mac could have saved $100 or more in their monthly payments by refinancing. Among Black and Hispanic borrowers, 49 and 47.2% could have saved $100 or more (Khater, McManus, and Liu, 2021).

While changes in interest rates are important to consider when making a decision about whether to refinance, homeowners must also consider closing costs, expected future interest rates, the length of time they are planning to stay in the home, and tax implications. For cash-out refinancing, it is also important to consider housing market conditions and the current value of home relative to the purchase price (available equity). For example, borrowers in areas with low appreciation may find it difficult to cash-out refinance since the value of their home may not increase enough. For both types of refinancing, borrowers' current income, credit score and loan balance could also affect the outcome. For example, a borrower with an adjustable rate mortgage or unfavorable terms because of a low credit score or income could increase their credit score and income over time, which would allow them to refinance their existing mortgage with better terms.

Despite the important benefits to refinancing an existing mortgage, significant variations among racial and ethnic groups persist (Gerardi, Lambie-Hanson, and Willen, 2021; Conklin, Gerardi, and Lambie-Hanson, 2022; Gerardi, Willen, Zhang, and Hao, 2021). Research also shows that risk factors such as low credit scores, high loan-to-value (LTV) and debt-to-income (DTI) ratios, and low equity and income impede refinancing possibilities of Black, Hispanic and Low-to-Moderate Income (LMI) homeowners, while White and Asian borrowers respond more strongly to reductions in interest rates (Gerardi, Lambie-Hanson, and Willen, 2021).

This brief aims to evaluate discrepancies in refinance loan applications, originations, and denials for applicants by race, ethnicity, and income. We consider the potential reasons for differential utilization rates among groups, including disparities in denial rates, submission of refinance loan applications. We also explore how refinance loan applications, originations and denials vary by geography, particularly among Tennessee's Metropolitan Statistical Areas (MSAs) and large counties. We focus on trends from 2018 to 2021 (the most recent year available for HMDA data) to demonstrate how the COVID-19 pandemic affected trends that existed in the two years prior to the start of the pandemic.

[1] It is also possible that the borrowers convert their current fixed rate mortgage to an ARM. Interest rate on adjustable rate mortgages usually start lower than fixed rate mortgage. If the borrower is considering to sell the home in near future, it might be a better option to lower the monthly cost.

FINDINGS

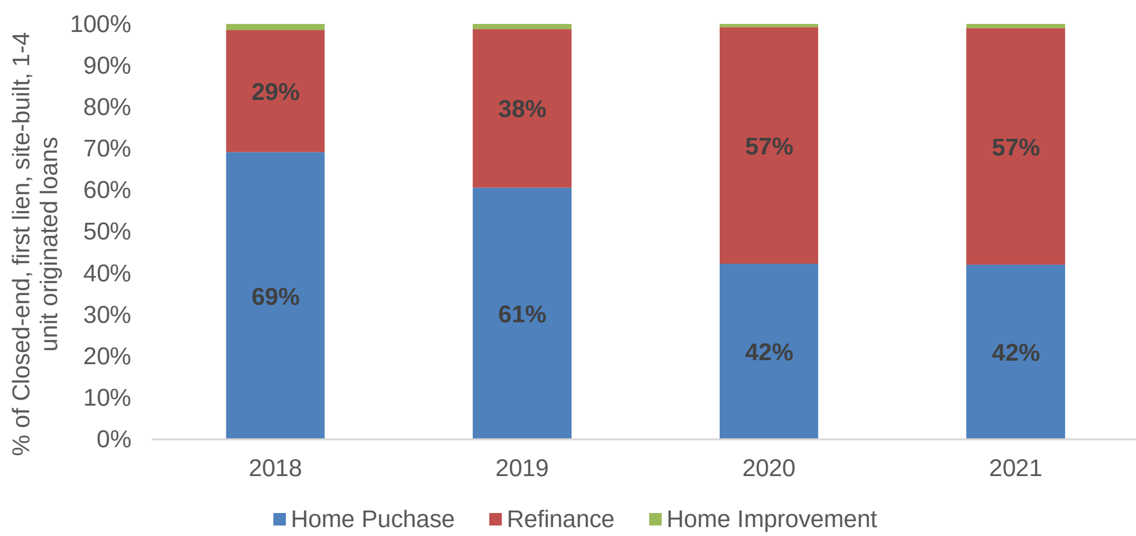
In 2021, nearly 950 financial institutions originated nearly $39 billion in 160,000 loans for residential homes, which are defined as closed-end first-lien refinance loans for site-built 1-4 unit properties.[2] The table below displays the various actions reported for refinance mortgage loans between 2018 and 2021.

Table 1: Action Taken, refinance Loans, 2018-2021

Action Taken (Closed-end, first-lien, site-built, 1-4 unit)	2018	2109	2020	2021	Percent Change				
					18-19	19-20	20-21		18-21
Loan originated	40,826	64,691	153,694	160,227	58%	138%	4%		292%
Application approved but not accepted	2,011	2,770	6,690	7,415	38%	142%	11%		269%
Application denied by financial inst.	18,394	18,005	25,541	29,070	-2%	42%	14%		58%
Application withdrawn by applicant	15,417	21,293	39,184	38,290	38%	84%	-2%		148%
File closed for incompleteness	5,253	7,659	15,912	20,748	46%	108%	30%		295%
Loan purchased by the inst.	8,785	14,906	27,552	28,526	70%	85%	4%		225%
Total Recorded	90,686	129,324	268,573	284,276	43%	108%	6%		213%

As Figure 1 illustrates, while home purchase loan originations dominated mortgage activity in 2018 and 2019, refinance loan originations dominated in 2020 and 2021. The share of refinance loans as a part of total loans originated increased from 29 and 38% in 2018 and 2019, respectively, to 57% in 2020 and 2021.

Figure 1: First Lien Mortgage Loans Originated for 1-4 Family, Site-Built Dwellings, 2018-2021, Tennessee



[2] The Consumer Financial Protection Bureau (CFPB) defines closed-end mortgages as an extension of credit that is secured by a lien on a dwelling and that is not an open-end line of credit. A closed-end loan, such as a mortgage or car loan, is taken out for a specific period, during which the consumer makes regular payments. In a closed-end mortgage, the borrower receives the entire loan amount upfront and cannot redraw after that. In contrast, open-end credit, such as a credit card or home equity line of credit, is not tied to a specific use. A borrower can continue to take cash out up to the maximum credit amount and, as they pay down the balance, can draw again up to the same limit. In HMDA, a financial institution is required to report information for actions taken on applications for covered loans (a closed-end mortgage loan or open-end line of credit; an excluded transaction cannot be a covered loan), originations of covered loans, and purchases of covered loans. If a financial institution receives an application and that application results in the origination of a loan, the financial institution reports the origination of the covered loan, and does not separately report the application. For more information about reported actions, please see “A Guide to HMDA Reporting: Getting It Right” at https://www.ffiec.gov/hmda/guide.htm

Racial and Ethnic Distribution of Refinance Loans in Tennessee

Although the absolute volume of refinance mortgage loan originations grew significantly among minority and LMI borrowers, their proportionate share of overall loan originations differed by group, as Table 2 shows. The share of Black refinance mortgage borrowers as a part of overall loans actually declined over this period from 8.5% in 2018 to 7.2% in 2021. This trend was similar for Low-to-Moderate-Income (LMI) refinance mortgage borrowers, declining from 29% to 21% over this period. Meanwhile, Hispanic and Asian borrowers for refinance loans grew at the fastest rates among groups. The share of Hispanic borrowers for refinance mortgages increased from 2.5% to 3.1%. Similarly, Asian borrowers represented 1% of all refinance mortgage originations in 2018 and 2% in 2021.

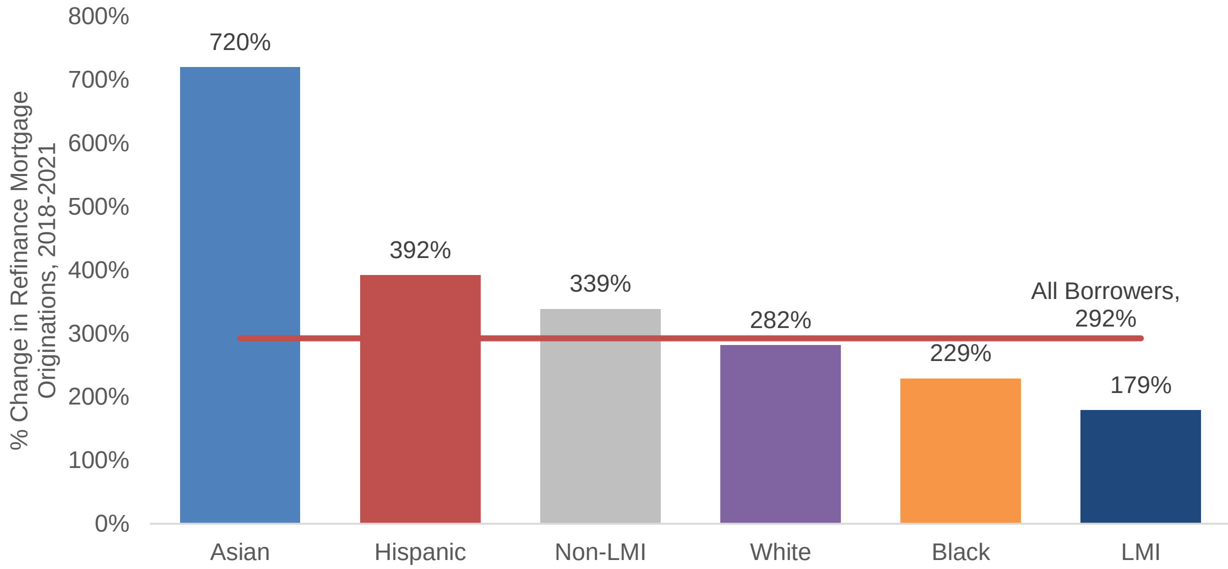
Table 2: Refinance Loan Origination Volume and Share in Total by Race, Ethnicity and Income, 2018-2021

	Refinance Loan Origination Volume				% Of Total Refinance Loans Originated				Growth
RACE	2018	2019	2020	2021	2018	2019	2020	2021	(18-21)
White	31,020	48,256	118,157	118,417	76.0%	74.6%	76.9%	73.9%	282%
Race NA	5,393	9,685	21,253	24,464	13.2%	15.0%	13.8%	15.3%	354%
Black	3,481	4,923	8,797	11,467	8.5%	7.6%	5.7%	7.2%	229%
Asian	388	830	3,117	3,183	1.0%	1.3%	2.0%	2.0%	720%
Other Race	544	997	2,370	2,696	1.3%	1.5%	1.5%	1.7%	396%
ETHNICITY									
Not Hispanic	34,287	53,368	127,479	130,413	84.0%	82.5%	82.9%	81.4%	280%
Hispanic	1,016	1,685	4,417	4,998	2.5%	2.6%	2.9%	3.1%	392%
Ethnicity NA	5,523	9,638	21,798	24,816	13.5%	14.9%	14.2%	15.5%	349%
LMI									
High Income	16,359	26,930	69,169	68,740	40.1%	41.6%	45.0%	42.9%	320%
Moderate Income	9,574	13,199	29,197	33,767	23.5%	20.4%	19.0%	21.1%	253%
LMI	11,891	13,511	24,672	33,189	29.1%	20.9%	16.1%	20.7%	179%
Income NA	3,002	11,051	30,656	24,531	7.4%	17.1%	19.9%	15.3%	717%
Total	***40,826***	***64,691***	***153,694***	***160,227***	***100.0%***	***100.0%***	***100.0%***	***100.0%***	***292%***

Growth rates of refinance mortgage originations by race, ethnicity, and income were uneven, as Figure 2 illustrates.[3] From 2018 to 2021, refinance mortgage originations in Tennessee increased by nearly 300%, but refinances among Black and LMI borrowers only grew by 229%. Asian homeowners experienced the largest refinance loan origination increase with over 700% followed by Hispanic borrowers.

[3] In the figure, the race, ethnicity and income categories are not mutually exclusive. For example, a Hispanic borrower could be any race or income level.

Figure 2: Percent Growth in Number Refinance Mortgage Loans Originated by Borrower Characteristics, Tennessee, 2018 to 2021



The growth rate of the volume of refinance loans between 2018 and 2021 was even more prominent in nominal dollars, e.g. not adjusted for inflation, increasing from $8 billion to $39 billion over the period, over 400% increase. Yet, significant differences by race persist. The total dollar value of refinance mortgages originated for Black borrowers increased from $500 million in 2018 to $2.4 billion in 2021, a 330% increase, compared to the almost 500% increase for all borrowers and 400% for White borrowers.

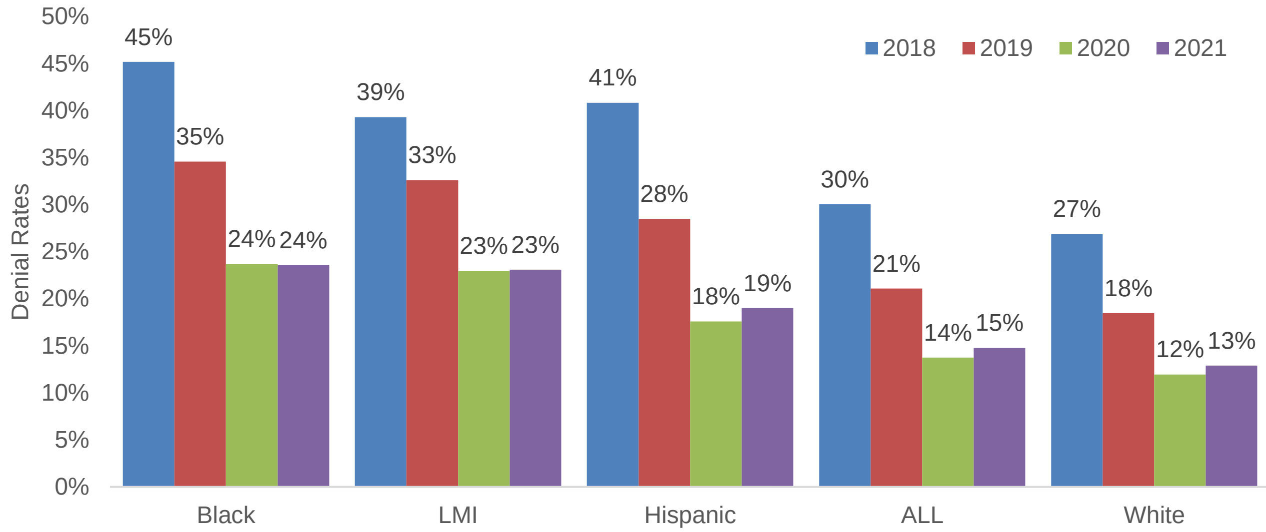
High denial rates and low application numbers could be contributors to low growth rates of refinance mortgage loan originations for Black and LMI borrowers (DeMaria, 2022). Black and LMI homeowners' refinance mortgage origination rates were behind others either because they faced increasing denial rates or they did not apply as much as the others. In the following section, we explore both aspects as they relate to mortgage origination disparities among White, Black, and LMI homeowners.

a. Denial Rates[4] for Refinance Loan Applicants by Race, Ethnicity and Income

Although denial rates of refinance loans declined significantly during the pandemic compared to pre-pandemic rates for all racial and ethnic groups, lenders still denied refinance mortgage applicants more often than home purchase loan applicants. Lenders denied 30% of all refinance loan applicants in 2018 and 15% in 2021. In comparison, 9% of home purchase loans were denied in 2018 and 8% in 2021. Although minority and low-income refinance mortgage applicants were denied more often than white and higher-income applicants during this period, these rates improved significantly. There was nearly a 25 percentage points decline in denial rates for Black applicants, from 45% to 24% over this period. During this period, the denial rate for White refinance mortgage applicants declined from 27% to 13%.

[4] The denial rate is calculated as the ratio of application denied by financial institution to the sum of "originated," "approved but not accepted" and "denied applications". This calculation excludes the purchased loans, application withdrawn by applicant and the application files closed for incompleteness.

Figure 3: Refinance Mortgage Denial Rates by Race, Ethnicity and income, 2018-2021, Tennessee



Credit history was the most often cited reason for all denied refinance applicants regardless of race and income levels during the 2018-2021 period.[5] In 2020, for all racial groups except Black applicants, "incomplete credit application" superseded credit history, as the primary reason for denial. Applicants' credit history was listed as a denial reason for 36% of denied Black refinance mortgage applicants in 2018, compared to 28% of all applicants. Applicants from LMI backgrounds were mostly denied for their high debt-to-income (DTI) ratio, followed by credit history. Hispanic applicants were also denied predominantly for their lack of credit history followed by their high DTI ratio. In contrast, among home purchase loan applicants, DTI was the most cited reason for denials followed by credit history and collateral in all years between 2018 and 2021.

Table 3: Percent of Refinance Applicants Denied for Various Reason by Race, Ethnicity, Ethnicity and Income Level, 2021

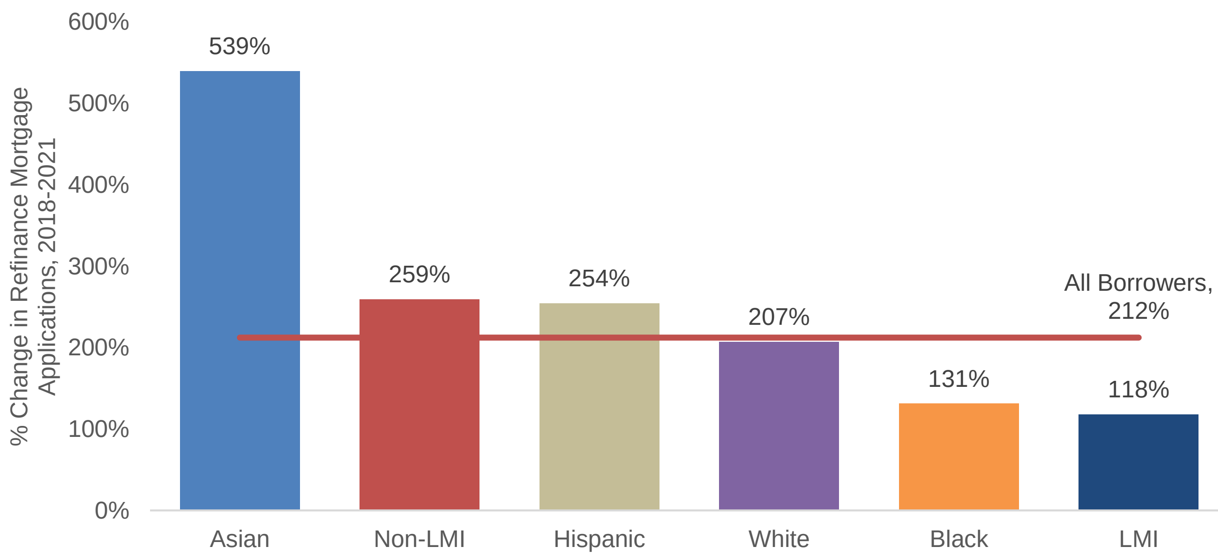
Denial Reasons, 2021	ALL	Asian	Black	NA	White	Other	Hispanic	Not Hispanic	LMI	Moderate	High
Credit History	25%	13%	33%	19%	25%	27%	23%	26%	22%	26%	24%
Credit Application Incomplete	24%	28%	19%	30%	23%	19%	21%	23%	17%	23%	29%
Debt-to-Income Ratio (DTI)	22%	31%	21%	22%	22%	23%	26%	22%	35%	21%	14%
Other	11%	11%	13%	10%	11%	15%	15%	11%	9%	10%	11%
Collateral	9%	6%	8%	10%	10%	8%	8%	9%	9%	11%	12%
Unverifiable Information	5%	7%	4%	5%	5%	4%	4%	5%	4%	5%	7%
Insufficient Cash (downpayment, closing costs)	2%	1%	2%	2%	1%	1%	1%	2%	2%	2%	2%
Employment History	1%	2%	1%	1%	1%	2%	1%	1%	1%	1%	1%
Exempt	1%	2%	1%	0%	1%	0%	0%	1%	1%	1%	1%
Mortgage Insurance Denied	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

[5] In HMDA, reporting institutions can provide up to four reasons to explain their decision for denying an applicant. 2015 HMDA rule made this a required field while it was optional before this rule. Therefore, starting with 2018 data, institutions provide at least one reason for denied applicants. In our analysis, we only looked at "denial reason 1," which is populated for all denied applications. We did not make an attempt to include the additional denial reasons, if they were provided.

b. Refinance Loan Application[6] Growth by Race, Ethnicity and Income

While minorities and lower-income applicants both benefited from declining denial rates between 2018 and 2021, growth rates in refinance loan applications among groups varied, just as origination growth rates did. Overall, the demand for refinance mortgages among Black and LMI homeowners in Tennessee was not as high as it was for White homeowners. Once again, refinance loan applications by Hispanic homeowners exceeded all other race categories. Refinance mortgage applications for all homeowners, regardless of race, ethnicity and income, more than tripled from 2018 to 2021. For Black homeowners, applications increased by 131%, and 118% for LMI homeowners. Essentially, origination growth for Black and LMI applicants was relatively suppressed in comparison to other racial and income groups.

Figure 4: Percent Growth in Refinance Mortgage Applications by Borrower Characteristics, Tennessee, 2018 to 2021



Despite the benefits of refinancing in an environment with declining interest rates, Black and LMI homeowners did not apply for refinance mortgages at the same rate as other groups. Minority homeowners who have gone through the home buying process and experienced difficulty and/or discrimination, may fear similar experiences (Allen, 2021). Especially after the 2008 housing crisis, fear and mistrust of the banking system might have held them from seeking refinance options (Luna, 2021). Additionally, a lack of access to liquid assets to cover closing costs (Kather, Magnus and Liu, 2021), and a lack of clarity about the process, available options, and possible benefits of refinancing may have further limited their demand for refinancing. Finally, income and employment challenges[7] are also likely deterrents for Black and LMI homeowners to seek refinancing when there are opportunities.

Geographic Distribution of Refinance Loans in Tennessee

Refinance loan originations increased significantly in all MSAs between 2018 and 2021. Table 4 below illustrates that the Clarksville MSA led the state with nearly a 500% increase in refinance loan originations. While the bulk of the growth in origination volume happened in 2020 for all MSAs and the state, for the Clarksville MSA, refinance loan originations more than doubled in 2019. The Memphis and Nashville MSAs followed with 324% and 307% increases, respectively.

[6] Applications exclude loans purchased by financial institutions during the calendar year.

[7] For example, Agarwal et al. (2021) argues that low income borrowers fell behind higher income borrowers for reasons such as lenders' solicitation of applications from higher income borrowers, borrowers' limited financial literacy, low income borrowers' tendency toward inaction and their forbearance status.

Table 4: Refinance Loan Originations by MSA, 2018-2021

MSA/State	2018	2019	2020	2021	% Change 18-19	% Change 19-20	% Change 20-21	% Change 18-21
Chattanooga	2,577	3,844	9,350	9,988	49%	143%	7%	288%
Clarksville	1,169	2,388	5,959	6,707	104%	150%	13%	474%
Cleveland	664	974	2,141	2,416	47%	120%	13%	264%
Jackson	581	1,019	2,170	2,464	75%	113%	14%	324%
Johnson-City	966	1,318	3,112	3,502	36%	136%	13%	263%
Kingsport-Bristol	1,065	1,344	2,901	3,372	26%	116%	16%	217%
Knoxville	5,281	8,121	19,977	21,513	54%	146%	8%	307%
Memphis	4,348	6,873	17,480	18,620	58%	154%	7%	328%
Morristown	606	1,045	2,025	2,431	72%	94%	20%	301%
Nashville	16,263	27,945	68,659	66,235	72%	146%	-4%	307%
Balance of State	7,306	9,820	19,920	22,979	34%	103%	15%	215%
Total	40,826	64,691	153,694	160,227	58%	138%	4%	292%

Refinance loan denial rates also varied by MSA, but this was more noticeable in 2018 than in later years. In 2018, denial rates ranged from 26% to 38%, with the Nashville and Clarksville MSAs, respectively. In that year, 37% of refinance loan applicants were denied in the Memphis MSA. In contrast, both the overall rates and the range for denials fell in 2021. The Nashville MSA had the lowest denial rate of 13% and the Jackson MSA had the highest denial rate of 21% in 2021.

Table 5: Denial rates by MSA, 2018-2021

MSA/State	2018	2019	2020	2021
Chattanooga	31%	22%	14%	15%
Clarksville	38%	26%	15%	16%
Cleveland	34%	23%	15%	15%
Jackson	32%	25%	19%	21%
Johnson-City	32%	24%	16%	16%
Kingsport-Bristol	34%	26%	18%	18%
Knoxville	28%	20%	12%	13%
Memphis	37%	25%	15%	17%
Morristown	36%	26%	17%	16%
Nashville	26%	18%	12%	13%
Balance of State	32%	24%	17%	17%
Total	30%	21%	14%	15%

The pandemic did not affect which counties had the highest volume of refinance loan originations. Shelby and Davidson Counties led the top ten prior to and during the pandemic, and made up 60% or more of the state's total refinance loan origination volume throughout the period. In each of the top ten counties, 2021 originations more than tripled 2018 originations. Williamson County saw the largest change over this period, experiencing nearly a 500 % increase. The fast growing refinance loan origination volume of 2019 and 2020 slowed down in 2021 in these counties and in the state. Montgomery County also experienced strong refinance loan origination growth of 455%. Furthermore, unlike Williamson County, which experienced a decline between 2020 and 2021, Montgomery County's refinance loan origination volume grew continuously from 2018 to 2021.

Table 6: Refinance Loan Originations among the 10 Highest Volume Counties, 2018-2021

County/State	2018	2019	2020	2021	% Change 18-19	% Change 19-20	% Change 20-21	% Change 18-21
Davidson	5,551	8,347	20,433	20,719	50%	145%	1%	273%
Shelby	3,780	5,848	14,928	15,970	55%	155%	7%	322%
Knox	2,680	4,499	11,708	12,504	68%	160%	7%	367%
Williamson	1,994	4,546	13,628	11,715	128%	200%	-14%	488%
Rutherford	2,902	5,218	11,708	11,269	80%	124%	-4%	288%
Hamilton	2,249	3,436	8,670	9,226	53%	152%	6%	310%
Sumner	1,758	3,075	7,371	7,106	75%	140%	-4%	304%
Montgomery	1,169	2,293	5,760	6,490	96%	151%	13%	455%
Wilson	1,265	2,444	6,119	5,703	93%	150%	-7%	351%
Blount	852	1,382	3,347	3,643	62%	142%	9%	328%
Balance of State	16,626	23,603	50,022	55,882	42%	112%	12%	236%
Total	40,826	64,691	153,694	160,227	58%	138%	4%	292%

Conclusion

Refinancing a mortgage loan may offer many benefits to homeowners including better terms and conditions, lower monthly payments, and a modified repayment period. We used HMDA data between 2018 and 2021 (the most recent year available for HMDA data) to demonstrate how the COVID-19 pandemic affected mortgage refinancing trends that existed in the two years prior to the start of the pandemic. While home purchase loan originations dominated overall mortgage activity in 2018 and 2019, refinance loan originations dominated in 2020 and 2021. The share of refinance loans as a part of total loans originated increased from 29 and 38 % in 2018 and 2019, respectively, to 57% in 2020 and 2021.

Especially in 2020, mortgage holders took advantage of declining interest rates, and increased their demand for refinance loans. However, refinance loan origination growth rates were significantly lower for Black and low or moderate income (LMI) homeowners than their counterparts. Two possible factors that may be contributing to lower origination growth include either higher denial rates or lower applications (or a combination of the two). The HMDA data indicate that in the period after the pandemic, all refinance loan applicants, including those who are Black and LMI, benefited from declining denial rates, even though the rates were higher than for home purchase loans. Therefore, denial rates alone are not a sufficient explanation of the racial disparities in refinance loan originations.

Refinance loan applications by Black and LMI homeowners did not grow as fast as those of other races and those of higher incomes. Refinance mortgage applications for all homeowners, regardless of race, ethnicity and income, more than tripled from 2018 to 2021 (212%). In comparison, Black homeowners increased their demand for refinance mortgages by 131%, and LMI borrowers by 118%. Economic conditions such as low credit scores, lower incomes, high debt-to income ratios, and a lack of knowledge about available options (financial education) as well as discrimination in lending can explain some of these racial and ethnic disparities.

The HMDA data can be used to identify lenders that may have violated fair lending laws. However, limitations within HMDA data complicate this matter. The data do not include information on the credit risks of mortgage borrowers, which may limit the public’s and regulators’ capacity to identify lenders most likely to be engaged in discriminatory practices. Credit history is one of the most cited reason for refinance application denial, but the data do not provide applicants’ credit scores. Debt-to-income ratio (DTI), which is also an important determinant for loan approval, is disclosed as actual value if it is greater than or equal to 40% but less than 50%, and in discrete intervals otherwise (less than 20%, 20% to less than 30%, 30% to less than 40%, and 50% to less than 60%). These omissions and concealing of important data points limit the HMDA data’s usefulness for determining the reasons for disparities.

METHODOLOGY AND DATA

Data and Coverage

The HMDA data are the most comprehensive source of publicly available information on the mortgage market. The data are used to determine whether financial institutions are serving the housing needs in their communities and to identify possible discriminatory lending patterns. Many depository and non-depository lenders are required to collect and disclose information about housing-related loans (including home purchase, home improvement and refinancing) and applications for those loans in addition to applicants' and borrowers' income, race, ethnicity and gender. The law governing HMDA was enacted in 1975, initially falling within the regulatory authority of the Federal Reserve Board. In 2011, regulatory authority was transferred to the Consumer Financial Protection Bureau (CFPB). Whether an institution is required to report depends on its asset size, its location, and whether it is in the business of residential mortgage lending. Because some institutions are exempt from HMDA reporting requirements HMDA data do not include all residential loan applications.

In 2017, depository institutions that originated fewer than 25 covered closed-end mortgages in either of the preceding two years were exempt from HMDA reporting. This coverage threshold of 25 loans increased to 100 loans in May of 2020 by the 2020 HMDA rule, and became effective on July 1, 2020.

Before 2017, depository institutions were required to make a modified (to protect applicant and borrower privacy) version of their Loan Application Registers (LARs), available to members of the public on request. With these changes, the Consumer Financial Protection Bureau has collected and made available on its website the modified LAR file for each institution that has filed 2017 HMDA data. The loan-level data provided to the public with modified LAR files will be updated with resubmissions and/or late submissions.

The Dodd-Frank Act of 2010 made reporting open-end lines of credit (OLCs)[8] mandatory. In this report, unless otherwise specified, the open-end lines of credit (except reverse mortgages) and loans for purposes other than home purchase, refinance and home improvement are excluded.

In previous HMDA reports, we used 10 years of data to identify longer-term trends. This 10-year lookback was especially useful in the years following the housing market crisis to determine if markets recovered. Because the mortgage markets recovered fully from these events and to take advantage of new and improved data present in 2018 data and onwards, we decided to analyze HMDA data for 2018 through 2021 (a four-year trend). This also allows us to both consider a depth of issues not possible before as well as the impact of COVID-19 on mortgage markets.

HMDA data includes applications for open-end and closed-end mortgages; for home purchase, refinance, home improvement and other purposes; for first and second lien; for owner occupancy, second residence and investment properties; single and multifamily residences; and for manufactured and site-built homes. In this brief, we focused on selected closed-end mortgages for first lien, owner-occupied, 1-4 family site-built homes.

"Refinance" and "Cash-out Refinance" Loans

The Dodd-Frank Act of 2010 modified the definitions and values of some existing data points, and required reporting of 27 new data points. Refinance loans were separated into "refinance" and "cash-out refinance," a nuance that was not available in previous years. Refinancing is either a closed-end mortgage loan or open-end line of credit in which a new dwelling-secured debt obligation satisfies and replaces an existing dwelling-secured debt obligation by the same borrower.[9] A financial institution reports a covered loan or an application as a cash-out refinancing if the financial institution considered it to be a cash-out refinancing when processing the application or setting the terms under its or an investor's guidelines. A reason for considering a loan to be a cash-out refinance involves the amount of cash received by the borrower at closing or account opening. If a financial institution does not distinguish between cash-out refinancing

[8] Open-end lines of credit secured by a dwelling (excluding reverse mortgages) are called home equity lines of credit (HELOCs).

[9] See 2018 Guide to HMDA Reporting (page 58) for more detail.

and refinancing under its own guidelines, sets the terms of all refinancing without regard to the amount of cash received by the borrower at loan closing or account opening, and does not offer loan products under investor guidelines, the institution reports all refinancing as refinancing, rather than cash-out refinancing.[10] Cash-out refinance borrowers use the equity in their homes for other purposes, while non-cash-out refinance borrowers aim to take advantage of lower rates or adjust the length of their mortgage (change to longer term to reduce the monthly payments or to shorter term to pay off the mortgage sooner while lowering the rate).

Missing Demographic Information

Missing race and ethnicity data within HMDA has been and continues to be a concern. The percentages of applicants without race information (Race is NA) were consistent each year of the 2018 to 2021 period, such that approximately 22% to 24% of applicants were missing racial information each year. The average and median incomes for those without race information are consistently higher than for White and Black applicants, and lower than Asian applicants. The loan amount for applicants with missing race, on average, was higher than White and Black applicants, but lower than Asian applicants, except 2019 and 2020 when the average loan amount of the applicant with missing race was slightly higher than White applicants. Median loan-to-value ratio (LTV) of the applicants with missing race information was very close to the LTV of Asian applicants.

Given these issues, as a component of data validation, we compared the characteristics of applicants whose race or ethnicity was missing (either left blank or coded as NA) with other applicants to determine the extent of potential bias. For this analysis of missing data, we compare income, loan amounts, and loan-to-value ratios. Although we wanted to compare their debt-to-income ratios (DTI) as well, in the publicly available HMDA data, DTI is provided as a range rather than actual value, which makes comparison difficult. Furthermore, we apply this analysis to the base sample of this report, which includes closed-end mortgages for first lien 1-4 family site-built homes. The following tables provide this information separated by years to consider both the extent and persistence of these trends over time.

[10] See 2018 Guide to HMDA Reporting (page 59) for more detail.

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