A LOOK BEHIND THE NUMBERS

Home Lending in Cuyahoga County Neighborhoods

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KEY FINDINGS

Prior to the Great Recession, home mortgage application rates were significantly higher in Cuyahoga County's low- and moderate-income (LMI) neighborhoods compared to the county's non-LMI neighborhoods. As the Great Recession took hold, application rates fell sharply in these lower-income areas, dropping below rates in the non-LMI neighborhoods, a reversal of the pre-recession trend.

Application rates fell by 86 percent in low-income neighborhoods and by 75 percent in moderate-income neighborhoods from 2004 to 2015. Nationally, the trends were similar but the declines not as large: low-income neighborhoods' application rates fell by 75 percent and moderate-income neighborhoods' by 68 percent over this same time period.

Origination rates have increased in each neighborhood income group since the Great Recession. By 2015, origination rates had recovered from their low point in each neighborhood income group, and—with the exception of the low-income neighborhoods—these 2015 rates exceeded origination rates in the pre-Great Recession period.

Since the Great Recession, it appears homeowners living in high-income neighborhoods have been better able to take advantage of low interest rates to refinance their homes. As of 2009, more than half of all refinance originations in Cuyahoga County occurred in high-income neighborhoods; in 2015 the share fell to just below 50 percent.

We find white borrowers are proportionally more likely than black borrowers to get a home purchase loan in every year we examined. In 2005, there were 58 home purchase loans by white LMI borrowers for every 1,000 white LMI households compared to just 37 home purchase loans by black LMI borrowers for every 1,000 black LMI households. While the rates declined for both races from 2005 to 2010, these declines were significantly higher for black LMI borrowers than for white LMI borrowers: 72 percent compared to 53 percent. Home purchase loan rates did increase from 2010 to 2015 for both races, but the gains were considerably lower for black LMI and black non-LMI households compared to their white counterparts. Home purchase loan rates increased by 6 percent for black LMI households compared to 26 percent for white LMI households from 2010 to 2015.

The shares of home purchase loans made in LMI neighborhoods declined from 2005 to 2010 for both black and white borrowers. Declines were greater for black borrowers, dropping by 28 percentage points to 39 percent in 2010. By comparison, the shares fell just 7 percentage points to 11 percent for white borrowers in 2010. However, black borrowers regardless of income are more likely to purchase a home in an LMI neighborhood when compared to their white counterparts. The share of black borrowers purchasing in LMI neighborhoods is more than three times the share of white borrowers purchasing in LMI neighborhoods in each year examined.

OVERVIEW

In this series of reports, we examine home lending activity in the largest counties of the Fourth Federal Reserve District[1] using Home Mortgage Disclosure Act (HMDA) data. Enacted in 1975, the HMDA requires most mortgage lending institutions to report annually on their home mortgage lending activity via specific data that can be useful in identifying whether the institutions are meeting the housing finance needs of the communities in which they operate.[2] Lenders are required by law to provide information on the disposition of applications, including loan purpose and type, applicant income and race, and the geographic location of applications and originations. This rich dataset of application and loan-level data, which is distributed by the Federal Financial Institutions Examination Council (FFIEC), allows us to track application and origination trends across time and by neighborhood groups, by borrower income groups, and by race.

We begin our report on Cuyahoga County, home to the city of Cleveland, with a broad look at application and origination activity over the past 25 years (1990–2015), and then focus on the 12-year period from 2004 to 2015. Using maps and a series of figures and tables, we tell the story of mortgage lending over these time periods from both the neighborhood and borrower perspectives, with a particular focus on highlighting the differences observed in the pre- and post-Great Recession periods.

THE PAST 25 YEARS

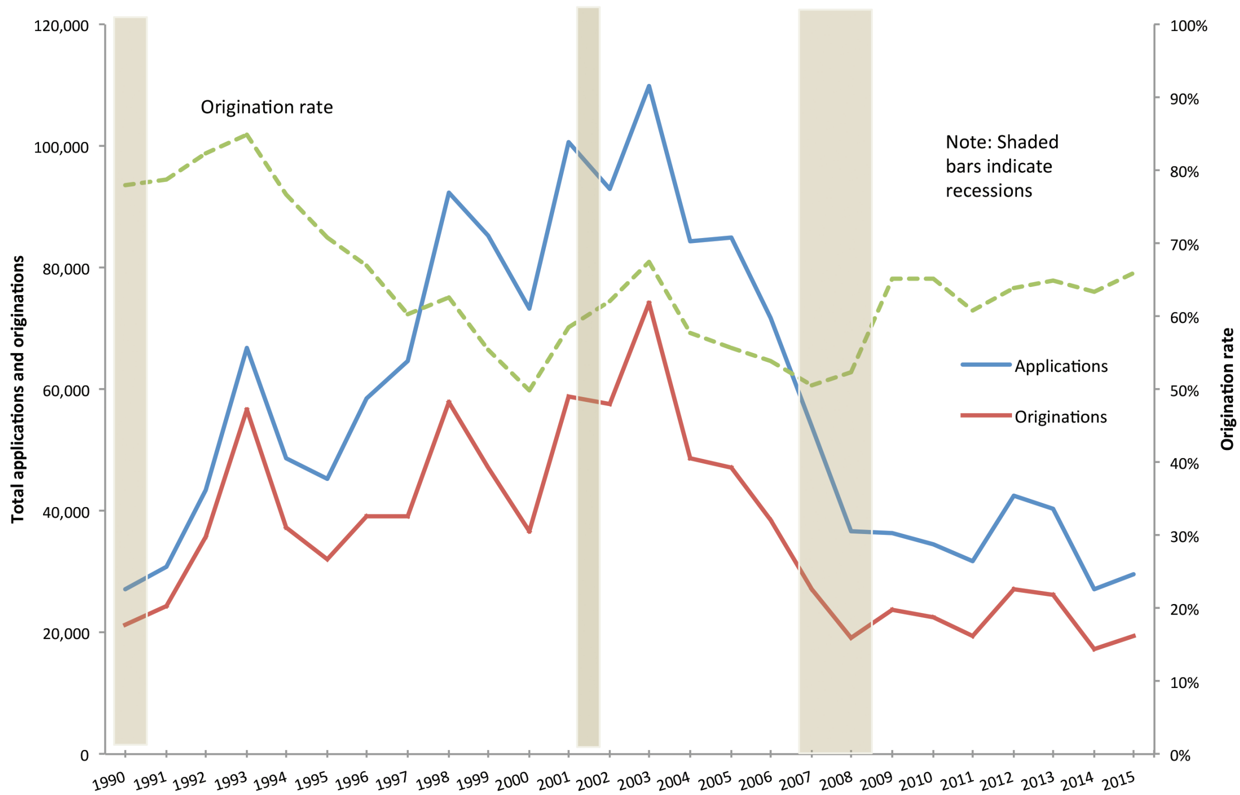
When looking at application and origination activity since 1990, it's easy to see the impact in Cuyahoga County of the Great Recession (December 2007 to June 2009). *Figure 1* shows applications and originations peaking in 2003 before falling sharply through 2008 as the Great Recession takes hold. Over that 6-year period, applications dropped by more than 73,000 and originations by nearly 56,000, declines of 67 percent and 74 percent, respectively. Since the end of the Great Recession in 2009, application and origination volumes have remained lower relative to the 25-year period we're looking at, aside from brief increases in both types of activity in 2012. Origination rates—the share of applications that were approved by the lender and accepted by the borrower—reached a high of 85 percent in 1993 and a low of almost 50 percent in 2000. Since 2009, origination rates have hovered around 65 percent in most years, with the exception of 2011, when these rates reached 61 percent.

To help us better understand what has driven these varying origination volumes, we separated out the loans by loan purpose: home refinance, home purchase, and home improvement. *Figure 2* illustrates three main points:

1. Refinancing activity drove the spikes in origination volumes. For example, in 2003 refinance originations reached a high of almost 52,000, which comprised 70 percent of all originations that year—the largest refinance share over the 25-year period. More recently, refinances increased by 14 percent from 2014 to 2015.
2. Interest-rate trends help to explain increasing and decreasing origination activity over this time period.
3. For many years home-purchase volume stayed relatively flat (1993–2006), then declined in both the lead-up to and the years during the Great Recession, with purchases rising again since 2011. While home purchases make up more than half of the originations (about 53 percent) in both 2014 and 2015—the highest share since 1990—this increase is primarily due to a drop in refinancing activity in recent years.

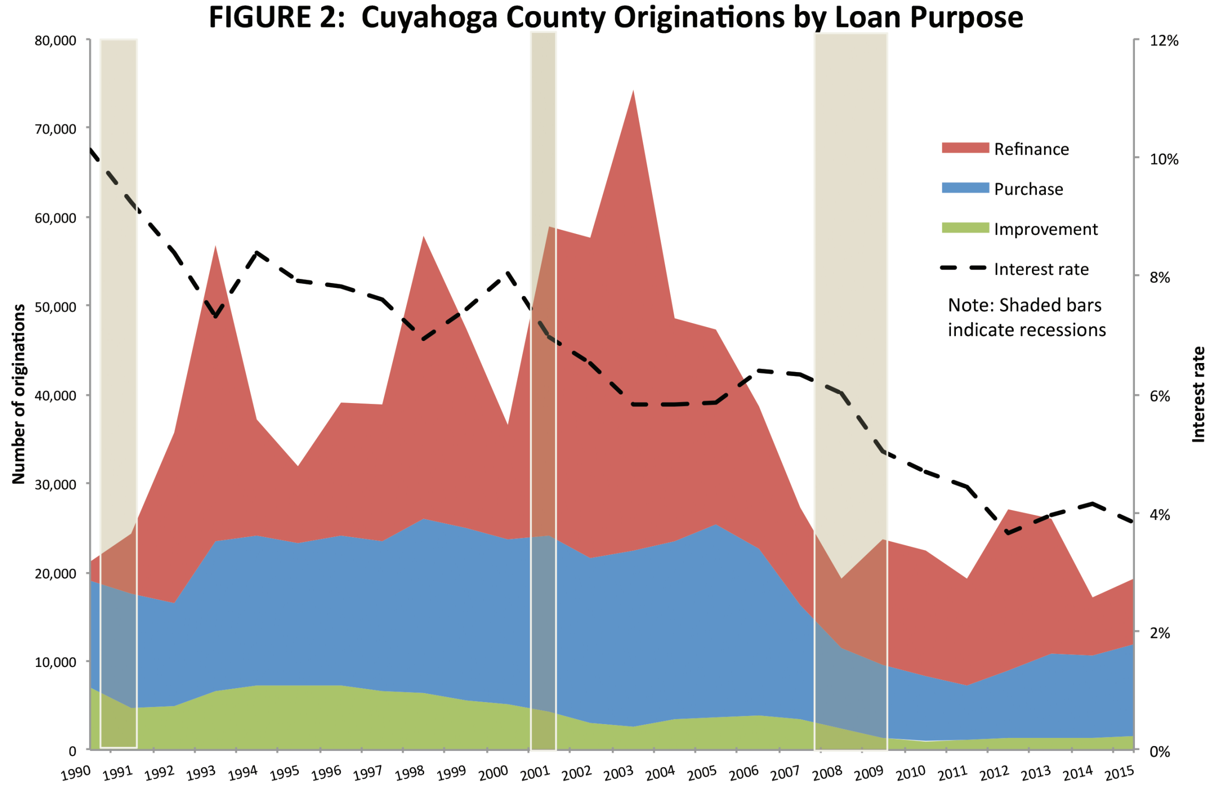
Taking our analysis a step further, we next looked at home purchases by loan type: conventional and FHA-insured. Here we learned that conventional loans comprised at least 80 percent of the originations from 1992 through 2007 before falling to 59 percent in 2008. In 2009 and 2010, FHA-insured loans comprised nearly 50 percent of home purchase originations. This increase in FHA-insured lending coincides with the Great Recession, which curtailed conventional lenders' origination activity. In the years since the Great Recession, as conventional lending increased, FHA-insured lending declined steadily, hitting 30 percent in 2015.

FIGURE 1: Cuyahoga County Application and Origination Activity



Source: Home Mortgage Disclosure Act (HMDA) data; includes applications and originations for owner-occupied, 1- to 4-family structures.
Prepared by the Community Development Department at the Federal Reserve Bank of Cleveland.

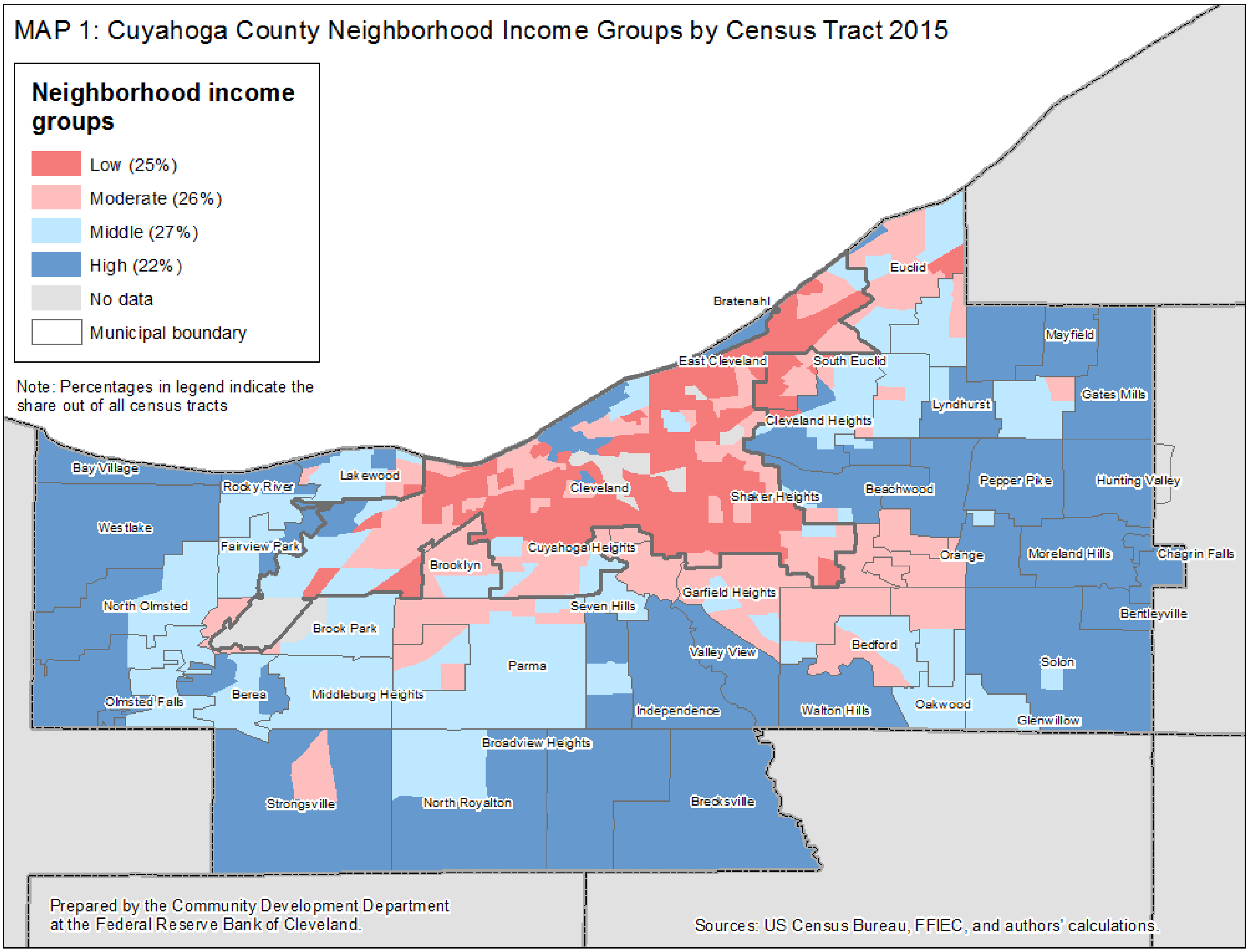
FIGURE 2: Cuyahoga County Originations by Loan Purpose



Sources: Home Mortgage Disclosure Act (HMDA) data and Freddie Mac Primary Mortgage Market Survey data (conventional, conforming 30-year fixed rate mortgages); includes originations for owner-occupied, 1- to 4-family structures.
Prepared by the Community Development Department at the Federal Reserve Bank of Cleveland.

CUYAHOGA COUNTY MAP OF NEIGHBORHOOD INCOME GROUPS

Map 1 shows the geographic distribution of neighborhood income groups across Cuyahoga County in 2015.[3] These groups are calculated by dividing the median family income of a census tract (a tract is also referred to as a neighborhood) by the median family income of the metropolitan statistical area (MSA). As shown in the map, most of the county's low- and moderate-income census tracts are located in Cleveland and its inner-ring suburbs. The upper-income areas can be found mainly in the outer-ring suburbs of the county.



A CLOSER LOOK AT APPLICATIONS BY NEIGHBORHOOD INCOME GROUPS

Applications per 1,000 owner-occupied housing units

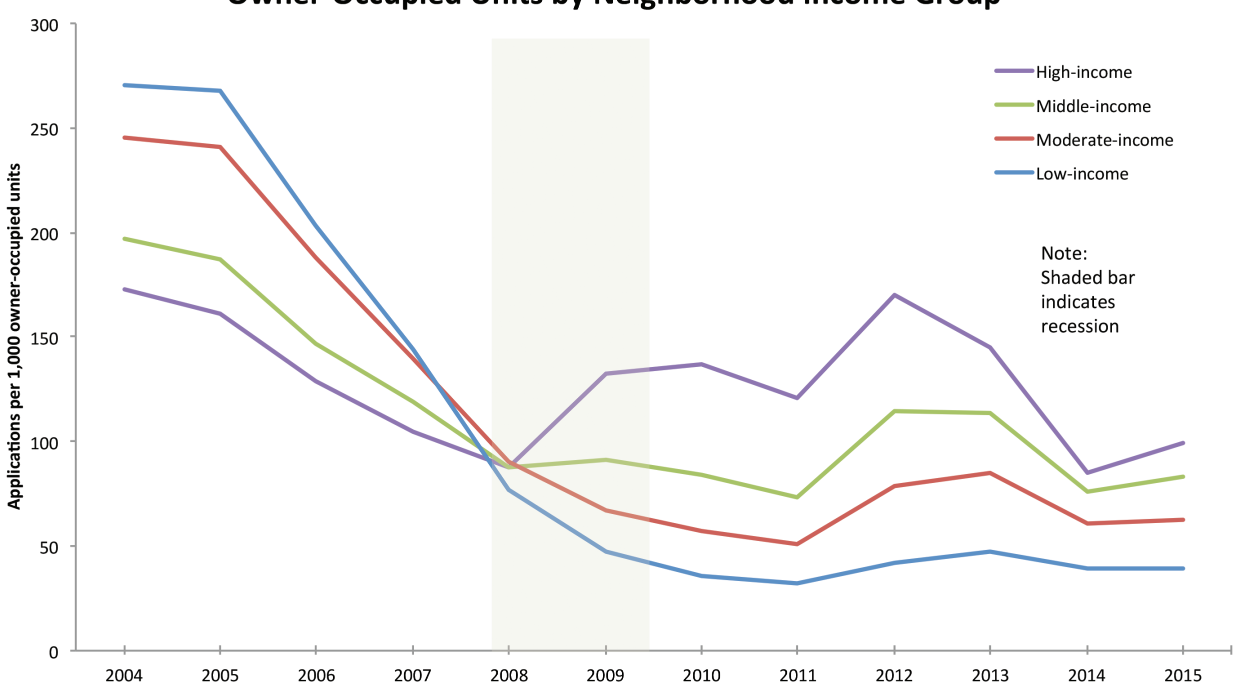
Here we look at application rates in Cuyahoga County from 2004–2015 by neighborhood income groups. In order to compare loan applications across time and income groups, we examine application *rates*, which we calculate as the number of applications per 1,000 owner-occupied housing units (*Figure 3*). This allows us to control for neighborhood size. In Cuyahoga County, applications for the purpose of refinancing a home comprise a larger share of total applications than do applications to purchase a home. This is true for nearly every neighborhood income group and year in our analysis. The application rate includes applications for home refinance loans, home purchase loans, and home improvement loans.

Prior to the Great Recession, application rates in low-income neighborhoods exceeded the rates in all of the neighborhood income groups in Cuyahoga County. In 2004, there were 270 loan applications for every 1,000 owner-occupied housing units in low-income neighborhoods, the peak rate in the low-income neighborhoods over the 12-year period from 2004 to 2015. Nationally, the application rate in low-income neighborhoods was even higher in 2004, with 291 loan applications per 1,000 owner-occupied units.[4] Application rates in the nation were higher across all neighborhood income groups compared to Cuyahoga County and in each year over the 12-year period.

As the Great Recession neared, application rates dropped sharply in all neighborhood income groups but more so in the LMI neighborhoods of the county. This was true nationally as well. Application rates in Cuyahoga County fell by 86 percent in low-income neighborhoods and by 75 percent in moderate-income neighborhoods from 2004 to 2015. In high-income neighborhoods, the application rates declined by 42 percent; in middle-income neighborhoods of the county, rates fell by 58 percent.

Between 2008 and 2010, as the Great Recession took hold and the nation moved into the post-recession period, application rates in the non-LMI neighborhoods of the county exceeded those in low- and moderate-income neighborhoods, a shift from the trend we observed prior to the Great Recession. Most apparent is the jump in applications per 1,000 owner-occupied housing units in the county's high-income neighborhoods; we see a similar increase, though to a lesser degree, in the moderate- and middle-income neighborhoods. These spikes are driven largely by increasing refinance applications, increases which coincide with lower interest rates during the post-Great Recession years. Application rates in the low-income neighborhoods, on the other hand, have remained relatively flat since 2009. Nationally, we see the same trends in the post-Great Recession period: increases in application rates as interest rates decline, with higher application rates in the non-LMI neighborhood income groups.

FIGURE 3: Cuyahoga County Loan Applications per 1,000 Owner-Occupied Units by Neighborhood Income Group



Sources: Home Mortgage Disclosure Act (HMDA) data and US Census Bureau; applications for first-lien, owner-occupied, 1- to 4-family units. Prepared by Community Development Department at the Federal Reserve Bank of Cleveland.

A CLOSER LOOK AT ORIGINATIONS BY NEIGHBORHOOD INCOME GROUPS

Origination rates

Looking at origination rates from 2004 to 2015, we see a marked increase in 2009 across all neighborhood income groups (*Figure 4*).Origination rates hit a low in 2007 for all neighborhoods except low-income neighborhoods, whose lowest rate occurred in 2008. By 2015, each neighborhood income group had recovered from its low point. With the exception of low-income neighborhoods, origination rates in 2015 exceeded the rates in the pre-Great Recession period.

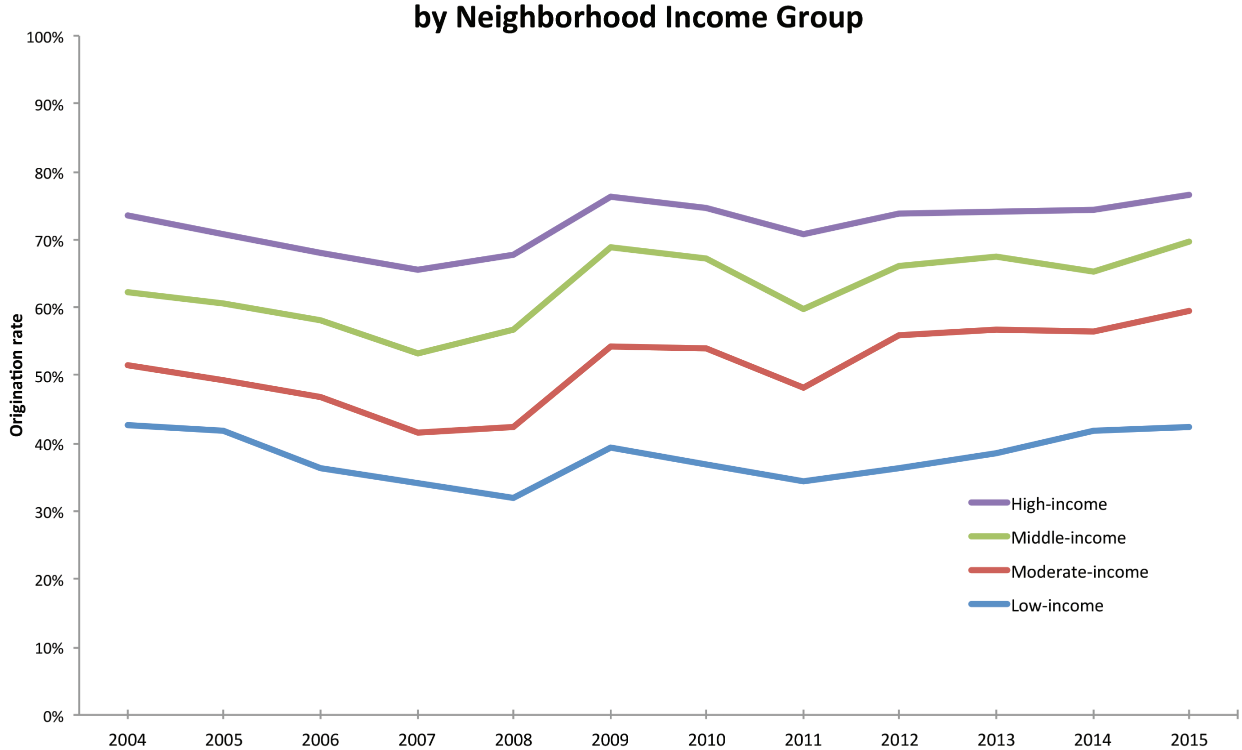
Nationally, origination rates tended to be higher across all neighborhood income groups compared to Cuyahoga County's. The largest differences are found when comparing origination rates in low-income neighborhoods. Beginning in 2011, the origination rates in the nation's low-income neighborhood groups exceeded those in Cuyahoga County's by at least 20 percentage points. In 2015, the origination rate in Cuyahoga County's low-income neighborhoods stood at 42 percent, compared to 63 percent in the nation's low-income neighborhoods.

Origination rates also vary depending on the loan purpose; for example, origination rates tend to be higher for home purchases than for home refinancing loans. Borrowers must meet loan-to-value standards, among other requirements, to refinance their homes—a threshold that may be particularly difficult to meet in areas with stagnant or falling home values. *Table 1* shows origination rates in Cuyahoga County by loan purpose for three years: 2005, a year prior to the Great Recession; 2010, the year immediately following the Great Recession; and 2015, the most current year of data available.

Home purchase origination rates increased from 2005 to 2010 and rose again in 2015 across all neighborhood income groups, with the largest increase occurring in the low-income neighborhoods, specifically between 2005 and 2010. Although the rising origination rates are a positive sign, the number of overall home purchases in the county from 2005 to 2010 declined by 62 percent before slightly rebounding in 2015 to a level that was still 46 percent lower than the volume of home purchase originations in 2005.

Refinance origination rates increased from 2005 to 2010 in every neighborhood income group except the low-income neighborhoods, where the rate fell from 36 percent to 26 percent. Conversely, only low-income neighborhoods experienced an increase in the refinance origination rate from 2010 to 2015. While the origination rates for refinances were lower in 2015 than in 2010, the 2015 rates exceeded those in 2005 in the moderate-income, middle-income, and high-income neighborhoods.

FIGURE 4: Cuyahoga County Origination Rates by Neighborhood Income Group



Sources: Home Mortgage Disclosure Act (HMDA) data and US Census Bureau; originations for first-lien, owner-occupied, 1- to 4- family structures. Prepared by the Community Development Department at the Federal Reserve Bank of Cleveland.

TABLE 1: Cuyahoga County Origination Rates by Loan Purpose and Neighborhood Income Group

	2005		2010		2015	
	Home purchase	Refinance	Home purchase	Refinance	Home purchase	Refinance
Low-income	55.2%	35.7%	68.9%	25.7%	70.6%	31.9%
Moderate-income	66.1%	41.7%	75.4%	44.5%	80.3%	43.3%
Middle-income	78.4%	50.2%	84.5%	60.3%	86.3%	55.1%
High-income	83.0%	61.0%	86.3%	71.2%	89.7%	65.7%

Sources: Home Mortgage Disclosure Act (HMDA) data and US Census Bureau; includes purchase and refinance originations for first-lien, owner-occupied, 1- to 4-family units. Prepared by the Community Development Department at the Federal Reserve Bank of Cleveland

A CLOSER LOOK AT ORIGINATIONS BY NEIGHBORHOOD INCOME GROUPS AND LOAN PURPOSE

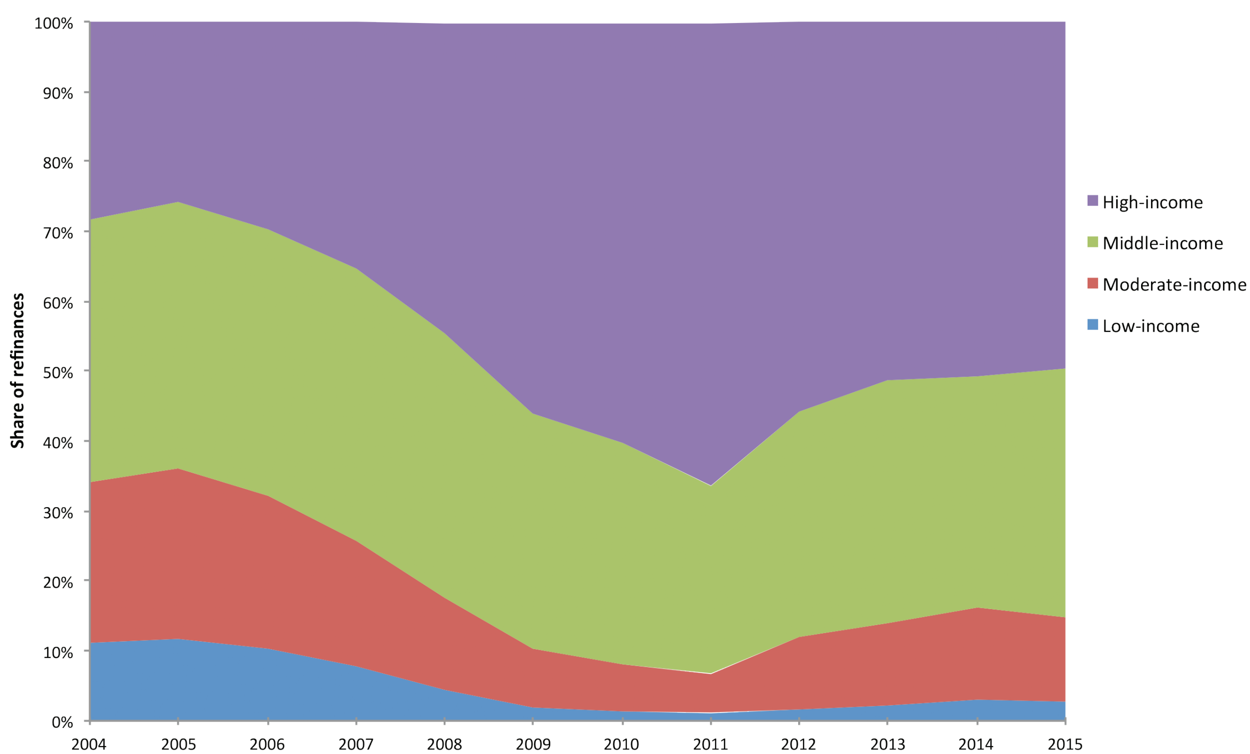
Refinances

Figure 5 shows the shares of home refinance originations in Cuyahoga County across neighborhood income groups. In the years preceding the Great Recession, the share of refinances in the low- and moderate-income (LMI) neighborhoods exceeded the share in the high-income neighborhoods. In 2005, 36 percent of all refinances in Cuyahoga County occurred in the LMI neighborhoods compared to 17 percent in the nation's LMI neighborhoods.[5] As the Great Recession took hold, the number of refinance originations declined dramatically (*Figure 2*), as did the refinance shares in LMI neighborhoods.

In the years immediately following the recession (2010 and 2011), high-income neighborhoods accounted for more than 60 percent of the refinance activity in Cuyahoga County. Tightening credit standards, coupled with falling or stagnant housing prices, may have impacted the ability of some homeowners to refinance, particularly in LMI areas within the county. Since 2011, however, the share of refinancing in high-income neighborhoods has declined, while the shares in the other income groups have increased or remained constant.

Following the Great Recession, the share of refinances in Cuyahoga County's LMI neighborhoods was more in line with the national refinance share. By 2015, about 15 percent of all refinances took place in the LMI neighborhoods of the county compared to 12 percent in the nation.[6]

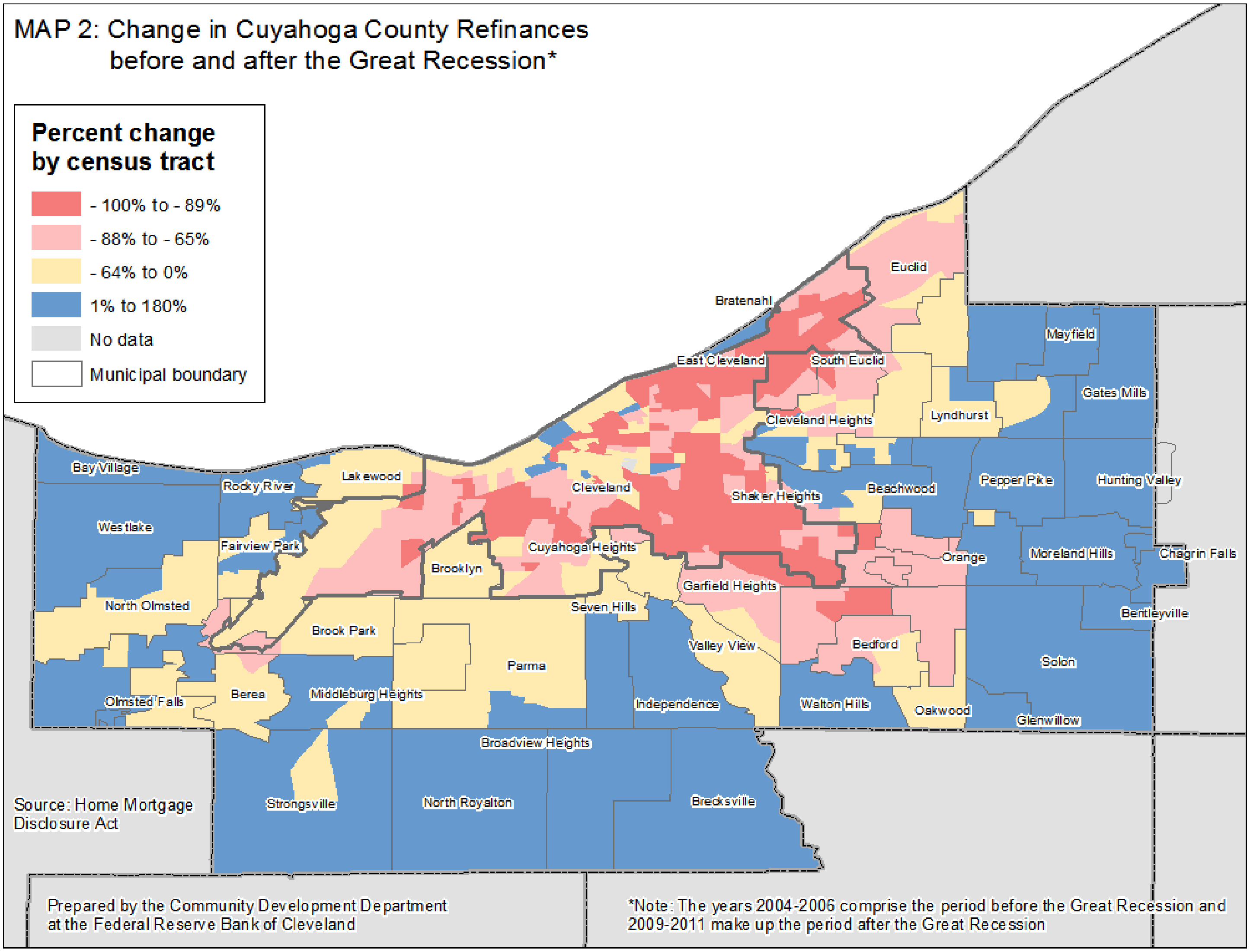
FIGURE 5: Share of Refinance Loans in Cuyahoga County by Neighborhood Income Group



Sources: Home Mortgage Disclosure Act (HMDA) data and US Census Bureau; refinance originations for first-lien, owner-occupied, 1- to 4-family structures. Prepared by the Community Development Department at the Federal Reserve Bank of Cleveland.

Map 2 displays the percent change in the number of refinance originations from the period right before the Great Recession and the period immediately following the Great Recession. As shown, refinancing activity increased mainly in the outer-ring suburbs. The east side neighborhoods of Cleveland and the east side inner-ring suburbs experienced the largest declines in refinances during this period.

MAP 2: Change in Cuyahoga County Refinances before and after the Great Recession*



HOME PURCHASES

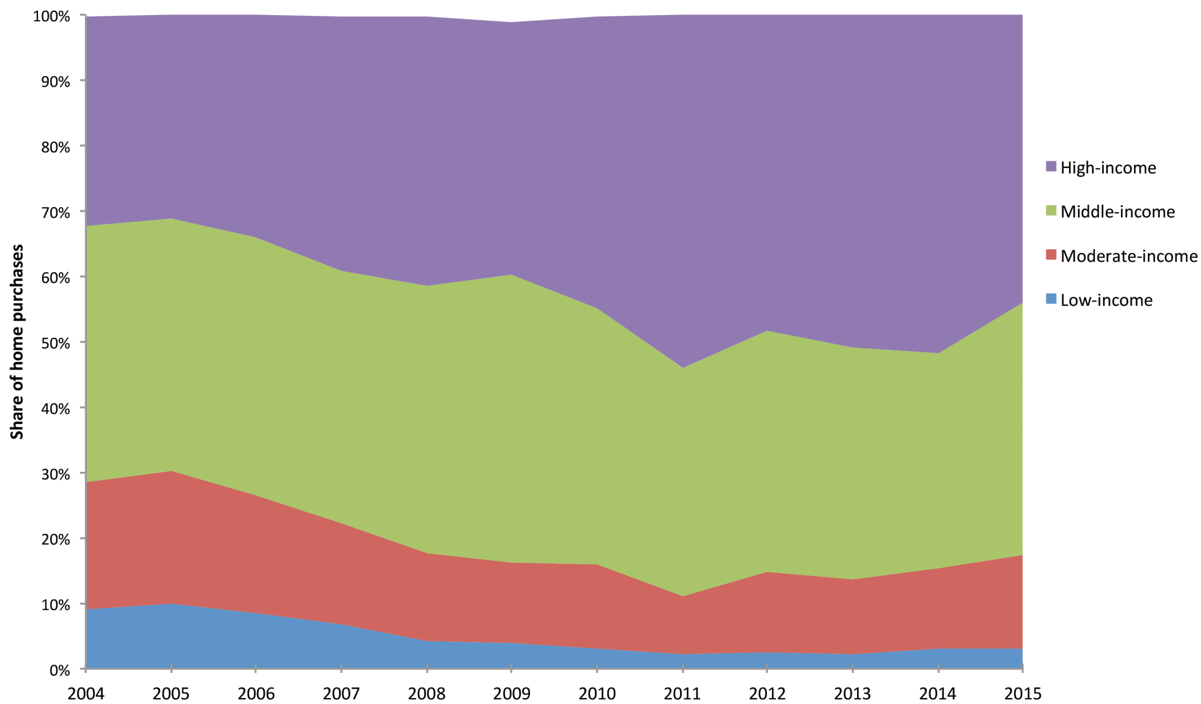
Figure 6 shows the shares of home purchase originations by neighborhood income group. During the 12-year period from 2004 to 2015, home purchase loan originations peaked in 2005 at close to 19,000 (see blue band in *Figure 2*). In low-income and moderate-income neighborhoods, home purchase origination shares reached their highest in 2005, at 30 percent. For comparison, the national share of home purchase originations in LMI neighborhoods was just 15 percent.

Like we observed with the refinance shares, the shares of home purchase originations in the years leading up to the Great Recession were much larger in the LMI neighborhoods of Cuyahoga County compared to the nation. Unlike in Cuyahoga County, the national share of home purchase originations in LMI neighborhoods remained relatively steady over the 12-year period. As the Great Recession was underway and in the post-recession period, the home purchase shares in the county's LMI neighborhoods were more in line with the national shares.

As home purchase loans declined sharply from their peak in 2005, so did the share of home purchase loans in the county's LMI neighborhoods. By 2011, the number of home purchases in Cuyahoga County had fallen to just over 6,000; more than half (54 percent) of the home purchase loans that year were in high-income neighborhoods. By 2015, home purchase loans in the county had risen to just over 10,000: 3 percent occurred in low-income neighborhoods, 14 percent occurred in moderate-income neighborhoods, 39 percent occurred in middle-income neighborhoods, and 44 percent occurred in high-income neighborhoods.

Map 3 displays the percent change in the number of home purchase loans from the pre-Great Recession period to the post-Great Recession period. Most areas in the county experienced declines in home purchase loans, with the largest declines occurring in the Cleveland's east side neighborhoods and in some of its west side neighborhoods.

FIGURE 6: Share of Home Purchase Loans in Cuyahoga County by Neighborhood Income Group



Sources: Home Mortgage Disclosure Act (HMDA) data and US Census Bureau; purchase originations for first-lien, owner-occupied, 1- to 4-family structures.
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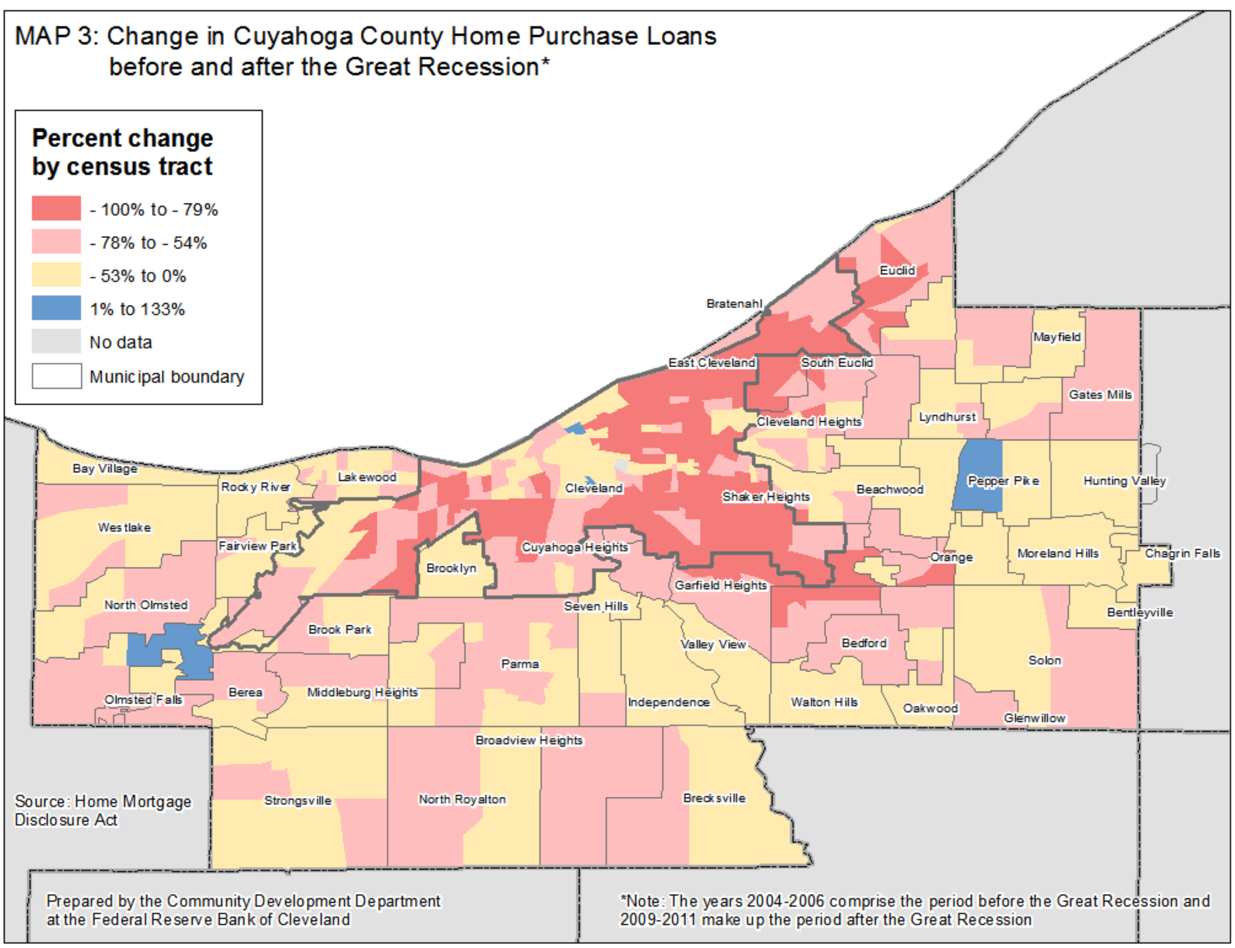


WHO'S PURCHASING AND WHERE

Next, we take a look at who is purchasing homes (with a loan) by borrower income and race and in what neighborhoods.[7] We look at 3 years for comparison: 2005, the peak year for home purchases prior to the beginning of the Great Recession; 2010, the year immediately following the Great Recession; and 2015, the most recent year of data in our analysis.

HOME PURCHASE LOAN RATES PER 1,000 HOUSEHOLDS

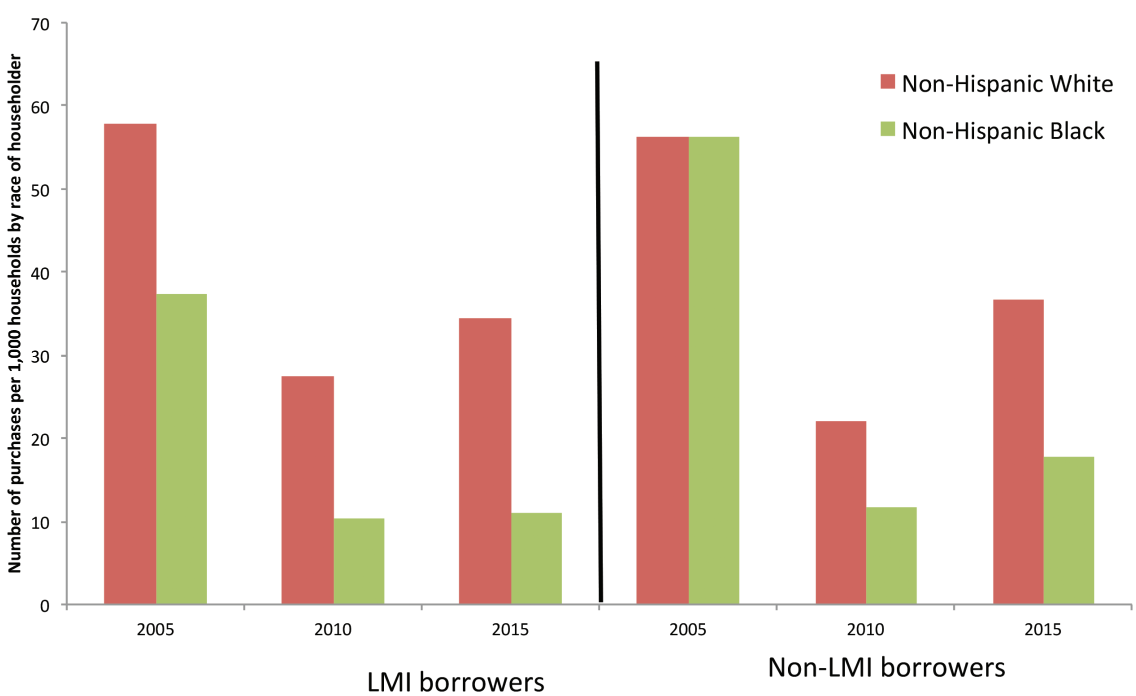
Figure 7 shows the home purchase loan rate for non-Hispanic white and non-Hispanic black borrowers by income.[8] We calculate the home purchase loan rate by dividing the number of home purchase originations by race and income group by the number of households with that same race and in that same income group. This allows us to compare differences across race and income categories while accounting for the size of the population in each of these groups. We focus on non-Hispanic white and non-Hispanic black borrowers only since they account for more than 90 percent of the home purchase loans originated in Cuyahoga County in every year in our analysis.

We see that white borrowers were proportionally more likely to get a home purchase loan than black borrowers, with the exception of non-LMI borrowers in 2005, when the home purchase rate was the same for both races. In 2005, there were 58 home purchase loans by white LMI borrowers for every 1,000 white LMI households compared to just 37 home purchase loans per 1,000 households for black LMI households. Home purchase loan rates declined from 2005 to 2010 for both races and income groups, but the declines were larger for black borrowers of all income levels compared to white borrowers. The home purchase loan rate for black LMI borrowers fell by nearly 72 percent in this time period compared to a 53 percent decline for white LMI borrowers.

The decline in home purchase loan rates from 2005 to 2010 is a result of the decline in home purchase application rates for these groups. Application rates for home purchase loans dropped by 77 percent for black LMI borrowers and by 56 percent for white LMI borrowers.

Home purchase loan rates, however, did increase from 2010 to 2015 for both LMI and non-LMI borrowers and for both races. But white borrowers experienced larger increases compared to their black counterparts for both income groups. White LMI borrowers experienced a 26 percent increase in their home purchase rate from 2010 to 2015 compared to an increase of just 6 percent for black LMI borrowers. The home purchase rate for black non-LMI borrowers was about 18 purchases per 1,000 households in 2015—up from nearly 12 purchases per 1,000 households in 2010—an increase of around 53 percent. For white non-LMI borrowers, the home purchase loan rate grew from 22 purchases per 1,000 households in 2010 to about 37 purchases per 1,000 households in 2015, an increase of nearly 66 percent.

FIGURE 7: Home Purchase Loans by Race and Income of Borrowers per 1,000 Households in Cuyahoga County



Sources: Home Mortgage Disclosure Act (HMDA) data and US Census Bureau; purchase originations for first-lien, owner-occupied, 1- to 4-family units.
Prepared by the Community Development Department at the Federal Reserve Bank of Cleveland.

HOME PURCHASE ORIGINATIONS BY RACE AND BORROWER INCOME AND NEIGHBORHOOD INCOME GROUPS

Here we look at origination rates for home purchases—the share of applications for home purchases that are approved by the lender and accepted by the borrowers—by race, borrower income, and neighborhood income groups. We see that origination rates have increased over time for LMI borrowers whether they are purchasing homes in LMI or non-LMI neighborhoods, an encouraging trend (*Table 2*). What we also observe is that origination rates are lower for black borrowers than for white borrowers, even within the same borrower income group and neighborhood income group. In 2015, for example, nearly 70 percent of the black LMI borrowers applying for a home purchase loan in an LMI neighborhood were approved for those loans, compared to an 82 percent approval rate for white LMI borrowers purchasing a home in an LMI neighborhood. It is not possible with the HMDA data to identify what might help explain these differences, since these data do not include information used in lending decisions, information such as a borrower's credit score, debt, and employment history.

We see a similar trend when looking at home purchase origination rates for non-LMI borrowers (*Table 2*). Origination rates are higher for white non-LMI borrowers, whether they are purchasing homes in LMI or non-LMI neighborhoods. The largest differences in the origination rates between races occurred in 2005. Nearly 73 percent of white non-LMI borrowers were approved for a home purchase in LMI neighborhoods compared to an approval rate of just 59 percent for black non-LMI borrowers purchasing in LMI neighborhoods, a difference of 14 percentage points. For home purchase originations in non-LMI neighborhoods, the differences in rates by race reached a high of 20 percentage points in 2005. By 2015, the gap in home purchase origination rates between white and black non-LMI borrowers had narrowed for purchases in both LMI and non-LMI neighborhoods, but white borrowers were still more likely to be approved for a home purchase loan.

TABLE 2: Home Purchase Origination Rates by Race, Income, and Location of Purchases in Cuyahoga County

	2005	2010	2015
LMI BORROWERS			
Home purchase origination rates in LMI neighborhoods			
Black LMI borrowers	56.8%	67.7%	69.5%
White LMI borrowers	71.8%	80.1%	81.6%
Home purchase origination rates in non-LMI neighborhoods			
Black LMI borrowers	58.2%	73.9%	74.9%
White LMI borrowers	82.7%	87.2%	86.2%
NON-LMI BORROWERS			
Home purchase origination rates in LMI neighborhoods			
Black non-LMI borrowers	58.7%	77.1%	78.1%
White non-LMI borrowers	72.8%	80.4%	83.7%
Home purchase origination rates in non-LMI neighborhoods			
Black non-LMI borrowers	64.2%	78.2%	82.9%
White non-LMI borrowers	83.9%	87.6%	88.5%

Sources: Home Mortgage Disclosure Act (HMDA) data and US Census Bureau; includes purchase originations for first-lien, owner-occupied, 1- to 4-family units.

Race categories include non-Hispanic white and non-Hispanic black borrowers

Prepared by the Community Development Department at the Federal Reserve Bank of Cleveland.

WHERE BORROWERS ARE PURCHASING HOMES

We take our analysis one step further and look at where LMI and non-LMI borrowers are using loans to purchase homes and how this activity has changed over time. Table 3 shows the share of home purchase loans in each neighborhood income group by race and income of the borrower from 2005 to 2015. The declines in home purchase originations were much higher for black borrowers than for white borrowers during this time period: Home purchase originations fell by 70 percent for black borrowers compared to just 41 percent for white borrowers. Although home purchase originations did increase in the period following the Great Recession from 2010 to 2015 for both races and borrower income groups, the gains were larger for white borrowers.

Looking at where borrowers are purchasing homes, we find that nearly 67 percent of all black borrowers in 2005, regardless of income, purchased homes in LMI neighborhoods. By 2010, this percent had dropped to 39 percent. White borrowers, on the other hand, purchased just 18 percent of their homes in LMI neighborhoods in 2005; this percentage dropped to 11 percent by 2010. Focusing specifically on LMI borrowers, we find that in 2005, only 22 percent of black LMI borrowers purchased homes in non-LMI neighborhoods, but this figure increased to 54 percent by 2010. For white LMI borrowers, shares of home purchase originations in non-LMI neighborhoods increased from 71 percent in 2005 to 83 percent in 2010.

Stagnant and falling housing prices following the Great Recession may have contributed to the increasing shares of home purchases in non-LMI neighborhoods by LMI borrowers. Home prices in Cuyahoga County fell by 11 percent from 2005 to 2009 and dropped an additional 4 percent from 2009 to 2010.[9] Such declines in prices likely made homes more affordable in the non-LMI neighborhoods of the county.

TABLE 3: Home Purchases in Cuyahoga County by Race and Income of Borrower and Location of Purchase

	2005	2010	2015	% Change 2005-2015	% Change 2010-2015
Home purchases by all Black Borrowers	3,721	932	1,126	-69.7%	20.8%
Purchases in LMI neighborhoods	66.6%	39.2%	40.9%		
Purchases in non-LMI neighborhoods	33.4%	60.8%	59.1%		
Home purchases by Black LMI Borrowers	2,279	615	642	-71.8%	4.4%
Purchases in LMI neighborhoods	77.6%	46.0%	48.3%		
Purchases in non-LMI neighborhoods	22.4%	54.0%	51.7%		
Home purchases by Black Non-LMI Borrowers	1,442	317	484	-66.4%	52.7%
Purchases in LMI neighborhoods	49.2%	26.5%	31.0%		
Purchases in non-LMI neighborhoods	50.8%	73.5%	69.0%		
Home purchases by all White Borrowers	12,233	5,166	7,266	-40.6%	40.7%
Purchases in LMI neighborhoods	18.2%	10.8%	12.9%		
Purchases in non-LMI neighborhoods	81.8%	89.2%	87.1%		
Home purchases by White LMI Borrowers	4650	2089	2428	-47.8%	16.1%
Purchases in LMI neighborhoods	29.2%	16.8%	20.1%		
Purchases in non-LMI neighborhoods	70.8%	83.2%	79.9%		
Home purchases by White Non-LMI Borrowers	7,583	3,077	4,838	-36.2%	57.2%
Purchases in LMI neighborhoods	11.6%	6.7%	9.3%		
Purchases in non-LMI neighborhoods	88.4%	93.3%	90.7%		

Sources: Home Mortgage Disclosure Act (HMDA) data and US Census Bureau; includes purchase originations for first-lien, owner-occupied, 1- to 4-family units.
Race categories include non-Hispanic white and non-Hispanic black borrowers
Prepared by the Community Development Department at the Federal Reserve Bank of Cleveland.

The first-time homebuyer tax credit enacted in 2008 and available through mid-2010 also may have impacted LMI borrowers' home purchase activity during this period. Researchers from the Board of Governors of the Federal Reserve System documented an increasing share of home purchase loans to LMI borrowers with a corresponding decrease in refinance activity from 2008 to 2009, the period when the first-time homebuyer tax credit program was in place. In the period immediately following the expiration of the program, they find the share of home purchase originations to LMI borrowers declined significantly.[10]

Turning our focus specifically to purchases made by non-LMI borrowers, we see that 69 percent of black non-LMI borrowers in 2015 purchased a home in a non-LMI neighborhood, up from 51 percent in 2005 (*Table 3*). Black middle- and high-income (non-LMI) borrowers, however, are less likely to purchase homes in non-LMI neighborhoods than are white LMI borrowers, a finding that is consistent for each of the 3 years of data we examined: 2005, 2010, and 2015. The majority of white middle- and high-income borrowers use loans to purchase homes in the high-income neighborhoods of the county in each of these years.

SUMMARY OF ANALYSIS

Over the past 25 years, the volumes of loan applications and loan originations have coincided with increases and decreases in mortgage interest rates and have been impacted by recessions, particularly the Great Recession that began in late 2007. Originations in Cuyahoga County reached their highest point over the 25-year period in 2003 and their lowest point in 2014. Peaks in both applications and originations over this time period are due mainly to refinancing activity, which in more recent years is taking place mostly in the higher-income areas of the county. Home purchase originations have been on the rise, for the most part, since 2011, exceeding refinance originations in 2014 for the first time in the post-Great Recession period.

The sharp declines in application rates leading into the Great Recession are evident in all neighborhood income groups but to much a greater degree in low-income neighborhoods. Application rates fell by 72 percent from 2004 to 2008 in low-income neighborhoods, and since the recovery, the rates in these neighborhoods have remained relatively flat. All neighborhood income groups experienced increasing origination rates in the post-Great Recession years, with all but low-income neighborhoods exceeding their 2004 rate by 2015.

Refinancing activity changed quite a bit over time and across the neighborhood income groups. Prior to the Great Recession, more than 30 percent of the refinance originations occurred in Cuyahoga County's LMI neighborhoods. In the post-Great Recession period, refinances did not rise above 15 percent in these neighborhoods. Homeowners living in high-income neighborhoods, in particular, were able to take advantage of low interest rates to refinance their homes. In 2011, 66 percent of refinance originations occurred in the high-income neighborhoods of the county.

Home purchase activity declined significantly from its peak in 2005. This was true across all neighborhoods, but declines were much larger in the LMI neighborhoods. As the Great Recession took hold, the shares of home purchase originations in LMI neighborhoods decreased even as they increased in non-LMI neighborhoods, particularly the high-income ones. While we do see increasing shares of home purchase originations in the LMI neighborhoods by 2015, the number of home purchase originations is still well below those in the years leading up and into the Great Recession.

When comparing lending activity across race and borrower incomes, we find white borrowers are proportionally more likely than black borrowers to obtain a home purchase loan; when they apply for a home purchase loan, white borrowers are approved at higher rates. Home purchase activity among all borrowers decreased dramatically following the Great Recession but to a much greater degree for blacks than for whites. While home purchases rose from 2010 to 2015 for both white and black LMI and non-LMI borrowers, the increases in home purchases were substantially larger for white borrowers. Finally, we did see higher shares of LMI borrowers purchasing homes in non-LMI neighborhoods post-Great Recession; this is true for both races but more so for white LMI borrowers.

DATA DETAILS AND CAVEATS

The data we used in the figures showing the 1990 to 2015 trends include applications and originations for owner-occupied and 1- to 4-family properties, and both first and junior liens. First liens are those that are in the first or priority position to receive proceeds from the liquidation of the collateral (the home) that secures the loan. The Consumer Financial Protection Bureau (CFPB) defines a junior lien "as a loan you take out using your house as collateral while you still have another loan secured by your house." Junior liens are subordinate to first liens in terms of receiving proceeds from liquidation. figures and tables focusing on the 2004 to 2015 time period also include owner-occupied units and 1- to 4-family structures; however, this subset includes only loans secured by a first lien. When we refer to *applications* we mean all of the following: loan applications that were approved by a financial institution and accepted by the applicant (i.e., originated); applications that were approved but not accepted by the applicant; and applications that were denied by a financial institution. When we refer to *originations*, we mean the loans that were approved by a lender and accepted by the applicant.

The data for 2004 to 2011 are based on a different set of census tracts than the data for 2012 to 2015 because of census tract boundary changes between decennial census years. While data from the earlier period are based on 2000 census tract boundaries, data from 2012 to 2015 are based on boundaries from the 2010 census. Therefore, caution should be used when comparing data from the earlier time period to current time period because differences *may* be attributable to changing tract definitions rather than to changing lending patterns.

In *Figure 3*, owner-occupied housing units are used in the application rate calculation. The housing unit counts we used in generating rates for the 2004 through 2011 time period are based on the 2000 census and the 2010 census. We use linear interpolation to obtain annual housing unit estimates between 2004 and 2011. For the years 2012 to 2015, we use the owner-occupied housing unit estimates from the 2010 to 2014 American Community Survey (ACS).

The tract median family income used to categorize the neighborhood income groups for the 2004 to 2011 years is obtained from the 2005 to 2009 ACS and is adjusted annually for inflation using the Bureau of Labor Statistics' consumer price index research series (CPI-U-RS). For the 2012 to 2015 years, the tract median family income is from the 2010 to 2014 ACS and is adjusted annually for inflation using the CPI-U-RS. The annual MSA median family income used in the neighborhood income group calculations is obtained from the FFIEC.

The estimates of households by income and race of householder used in the calculation of the home purchase loan rates (*Figure 7*) come from the Public Use Microdata Sample (PUMS) data. The PUMS data provides individual and household-level data with weights from the various Census Bureau surveys. The ACS 2005 to 2009 and 2010 to 2014 microdata was extracted from the IPUMS-USA, University of Minnesota, found at www.ipums.org. We used family income by race of householder and adjusted it annually for inflation as we did with the tract income described above. We then compared the inflation-adjusted family income to the MSA median family income in each year and grouped the households into the four income groups as we did with the neighborhood income groups.

NEIGHBORHOOD AND BORROWER INCOME GROUPS[11]

- **Low-income**: Median family income for the census tract (or borrower income) is less than 50 percent of the MSA's median family income
- **Moderate-income**: Median family income for the census tract (or borrower income) is greater than or equal to 50 percent but less than 80 percent of the MSA's median family income
- **Middle-income**: Median family income for the census tract (or borrower income) is greater than or equal to 80 percent but less than 120 percent of the MSA's median family income
- **High-income**: Median family income for the census tract (or borrower income) is greater than or equal to 120 percent of the MSA's median family income

[1] The Cleveland Fed serves the Fourth Federal Reserve District, which comprises Ohio, western Pennsylvania, eastern Kentucky, and the northern panhandle of West Virginia.

[2] For additional information about HMDA, see https://www.ffiec.gov/hmda/default.htm.

[3] See the data details section at the end of the report for a description of the neighborhood income groups.

[4] Author's calculations using the HMDA data (see data details section for more information).

[5] Neil Bhutta and Daniel R. Ringo (2016), "Residential Mortgage Lending from 2004-2015: Evidence from the Home Mortgage Disclosure Act Data." *Federal Reserve Bulletin*, vol. 102 (November), pp. 1-26.

[6] Ibid.

[7] This report includes only those home purchases for which the borrower took out a mortgage loan. Homes purchased with cash are not reflected in our analysis.

[8] It has been well documented that in the years prior to the Great Recession, some loan applications may have overstated the income of borrowers seeking to purchase or refinance a home. Therefore, it is possible that borrowers categorized as middle- and high-income borrowers in 2005 may have been misclassified.

[9] Author's calculations using Cuyahoga County House Price Index data from the US Federal Housing Finance Agency; extracted from https://fred.stlouisfed.org.

[10] Robert B. Avery, Neil Bhutta, Kenneth P. Brevoort, and Glenn B. Canner (2011), "The Mortgage Market in 2010: Highlights from the Data Reported under the Home Mortgage Disclosure Act," *Federal Reserve Bulletin*, vol. 97 (December), pp. 1-60.

[11] In 2015, the median family income in the Cleveland MSA was $66,100. Therefore a low-income neighborhood/borrower is one with a median family income of less than $33,050; a moderate-income neighborhood/borrower is one with a median family income of greater than or equal to $33,050 and less than $52,880; a middle-income neighborhood/borrower is one with a median family income of greater than or equal to $52,880 and less than $79,320; and a high-income neighborhood/borrower is one with a median income of greater than or equal to $79,320.