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Painting the Whole Picture:
Foreclosure Rates among Asian American Ethnic Groups in Orlando, Florida, and Phoenix, Arizona

Jacob S. Rugh

Abstract

This article contributes to the literature on the stratification of Asian American homeowners by systematically measuring the foreclosure rates of multiple Asian American ethnic groups, Native Hawaiian and Pacific Islanders, and other racial groups in Orlando, Florida, and Phoenix, Arizona. Using novel data and methods, Korean and Vietnamese homeowners are estimated to experience foreclosure rates as high as those of blacks and Latinos, disparities hitherto obscured by more modest foreclosure rates among Asian American borrowers overall. The results suggest greater attention should be paid to the recent Sunbelt settlement of Korean and Vietnamese Americans to better understand why they were devastated by the housing crisis.

Introduction

In a society as large and diverse as the United States, national statistics sometimes do not tell the whole story. For instance, the best comprehensive data on foreclosure rates by race and ethnicity compiled by Bocian et al. (2012) show that 14 percent of Latinos, 11 percent of blacks, 8 percent of Asians, and 6 percent of non-Hispanic whites experienced foreclosure as of early 2012. Digging deeper, however, reveals how these averages obscure a great deal of variation. Stratification within the Latino population strongly suggests Mexican Americans and immigrant Latinos were hit hardest by the foreclosure crisis while Cuban Americans appear to have experienced much lower rates of foreclosure (Allen, 2011; Cahill and Franklin, 2013; Kuebler and Rugh, 2013; Rugh, 2015). In places with large Asian American and Native Hawaiian and Pacific Islander (NHPIs) populations, such as California and New York, prelimi-

nary estimates suggest Asian Indians, Koreans, NHPIs, and Southeast Asian homeowners likely faced higher foreclosure rates, depending on location, as much as four times as high as rates of Japanese and Chinese homeowners (Chhaya CDC, 2009; National CAPACD, 2011; Ong, Pech, and Pfeiffer, 2013; Pfeiffer et al., 2014).

These geographic and ethnic group estimates represent important first steps to grasping the impact of foreclosures on immigrant and Asian American and Pacific Islander (AAPI) communities. This article contributes to the incipient literature on the stratification of AAPI homeowners in the recent housing crisis by systematically measuring the foreclosure rates of multiple AAPI groups in two Sunbelt locations hit hard by the housing crash: Phoenix, Arizona, and Orlando, Florida (Glaeser, Gyourko, and Saiz, 2008). Foreclosure rates among Asian Americans in these regions are similar to rates among blacks or about twice the national average for Asian Americans (Bocian et al., 2011). Using two different types of approaches across multiple samples, the analysis demonstrates a range of foreclosure rates among different ethnic groups, such as Asian Indians, Chinese, Filipino, Japanese, Korean, NHPIs, and Vietnamese homeowners in both cities. Critically, this study includes blacks, Latinos, and non-Hispanic whites as well.

This study is the first to analyze foreclosure rates among AAPI homeowners in the Sunbelt using linked property parcel and mortgage loan data. Most prior work using linked parcel data has been based mainly in Boston (Gerardi and Willen, 2008), Cleveland (Coulton et al., 2008), and New York City (e.g., Chan et al., 2013). Only recently have scholars begun to undertake such detailed analyses of the housing crisis in Sunbelt places such as Tampa, Florida (Strom and Reader, 2013). Yet prior research has not analyzed or measured the variation in Asian American ethnic group foreclosure outcomes in fast-growing Sunbelt cities. Using county recorder data, the foreclosure rate in this article is based on whether a borrower ever received a foreclosure filing, regardless of the final outcome of the foreclosure process.

This study also employs multivariate statistical regression to assess the determinants of variation in foreclosure rates across several Asian American ethnic groups relative to NHPIs and other racial/ethnic groups. The surname imputation and matching methods used here are meant to aid other researchers studying the diversity of Asian American ethnic group outcomes and to provide updated data that includes more recent years. The descriptive analysis, statistical regressions, and the discussion are organized around three potential expla-

nations of variation in foreclosure rates among Asian American ethnic groups: 1) demographic differences in population characteristics such as nativity, migration, and household composition; 2) economic differences in incomes, self-employment, loan amounts, down-payment ratios, and rates of property investment; and 3) social dimensions such as language barriers, discrimination, and access to housing counseling and foreclosure relief.

This article attempts to reframe the narrative of the housing crisis to better incorporate the social stratification of AAPI homeowners. Specifically, the analysis here finds that Korean Americans and Vietnamese Americans experience foreclosure rates far higher than other Asian American ethnic groups, nearly as high as Latinos and higher than white or even black Americans in both study cities. The evidence presented here also shows other groups experienced foreclosure rates similar to or lower than those of whites. Multivariate analysis shows that while factors like high-cost subprime lending explain black-white disparities, higher rates of foreclosure among Latinos, Koreans, and Vietnamese are not readily explained and call for future research.

In sum, this article seeks to paint a more complete picture of the social distribution of the costs of the foreclosure crisis. This study does not attempt to offer a definitive answer for why some groups fared worse than others. The intent rather is primarily descriptive—to measure differences in foreclosure rates within the Asian American population for the first time in the two study-area cities. The aim is to contribute to the broader emerging scholarship on the role of race, nativity, and other social forces in structuring the fate of Asian American populations in the wake of the housing crisis (e.g., Lee, 2014; Painter and Yu, 2014; Pfeiffer et al., 2014).

Background

Across the United States, Asian Americans are playing a role in multiethnic suburbanization in the Sunbelt (Frey, 2014; Frey and Liaw, 2005), growth in smaller metro areas (Painter and Yu, 2010), and neighborhood integration among blacks and whites (Hwang, 2015; Logan and Zhang, 2010). In 1990, prior to the advent of subprime lending and the massive housing boom in the Sunbelt in the 2000s, the U.S. population was 75.6 percent non-Hispanic white, 11.8 percent black, 9.0 percent Latino, and 2.9 percent Asian American/NHPIs. As of 2013, the nation's population is 62.0 percent white, 12.3 percent black, 17.1 percent Latino, and 5.5 percent Asian American/NHPIs. The Asian American

population was the fastest-growing racial/ethnic group from 2000 to 2010. Much of that growth took place in emerging immigrant gateway cities such as Phoenix and Orlando (Painter and Yu, 2010; Singer, 2004).

Many AAPI Americans during the housing boom of the 1990s and 2000s migrated to the Sunbelt in the pursuit of the American dream of homeownership. Among all major racial/ethnic groups, only Asian Americans have recorded a net gain in homeownership since 2000 (Kuebler and Rugh, 2013). However, AAPI incorporation into the Sunbelt and homeownership may not follow the same path of prior immigrants (Painter and Yu, 2014). In contrast to the classic model of spatial assimilation (Massey, 1985), whereby immigrants who move up the social ladder move out and away from immigrant enclaves, recent Asian American settlement patterns have featured continued clustering of highly educated immigrants to metro areas with large Asian populations as well as spatial dispersion to new destinations in ways that do not map neatly onto socioeconomic status or assimilation. For example, one of the top five destinations for Vietnamese residents of Los Angeles and Orange counties was to Phoenix, Arizona; out-migration was greatest among those with the lowest levels of education (Frey and Park, 2011).

Using restricted census data, Frey and Park (2011) report that Asians with lower incomes and less education are more likely than more affluent and well-educated Asians to migrate to places with lower coethnic concentrations, such as Phoenix and Orlando, when departing traditional immigrant gateways, such as Los Angeles and New York. These patterns are consistent with earlier trends of multiethnic flight by Asians, blacks, Latinos, and whites from coastal metro areas with expensive home prices toward interior Sunbelt locations such as Atlanta, Dallas, Orlando, Riverside, California and Phoenix beginning in the 1990s (Frey and Liaw, 2005).

As of 2010, more than 85 percent of Asian Americans were either immigrants or the children of immigrants; this compares to only 64 percent of Latinos, most of whom are in fact native born (Frey, 2014). Los Angeles and New York remain two important regions for Asian settlement (Shih and De La Cruz-Viesca, 2012). Home to approximately one in three of the nearly fifteen million Asian Americans in the United States, Los Angeles and New York, respectively, are the leading sources of new Asian migrants to Phoenix and Orlando (Frey and Park, 2011).

Table 1 presents a profile of important population characteristics of Asian Americans, the six largest Asian ethnic groups, NHPIs, non-Hispanic white, non-Hispanic black, and Latinos in Orlando and Phoe-

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Table 1: Selected Population Characteristics by Race/Origin and by Metro Area

Orlando, FL Metro Area	Total Population (2010)	Foreign Born	Recently Moved	Own Home	Does Not Speak English Well	Self-Employed	Median Household Income ($)	Income Relative to Asian American
Asian American	83,167	71%	20%	72%	17%	13%	$55,000	100%
Asian Indian	26,105	73%	20%	72%	11%	14%	$60,000	109%
Chinese	11,705	73%	22%	75%	23%	16%	$50,200	91%
Filipino	14,411	53%	19%	74%	7%	6%	$66,900	122%
Japanese	2,707	67%	21%	68%	19%	7%	$49,000	89%
Korean	4,996	64%	27%	64%	24%	21%	$43,035	78%
Vietnamese	13,053	70%	21%	73%	32%	17%	$45,300	82%
Native Hawaiian/ Pacific Islander	1,655	20%	21%	58%	1%	9%	$39,200	71%
Non-Hispanic White	1,136,863	5%	21%	74%	6%	12%	$54,000	98%
Non-Hispanic Black	319,695	19%	26%	47%	11%	5%	$37,000	67%
Hispanic/Latino	538,856	29%	26%	54%	25%	8%	$40,000	73%
Phoenix, AZ Metro Area								
Asian American	134,415	64%	27%	62%	19%	10%	$65,000	100%
Asian Indian	31,203	73%	33%	59%	16%	9%	$77,500	119%
Chinese	23,053	66%	23%	71%	21%	11%	$62,500	96%
Filipino	27,117	61%	25%	67%	9%	5%	$65,000	100%
Japanese	6,056	44%	20%	68%	9%	13%	$57,000	88%
Korean	10,956	61%	26%	57%	24%	21%	$50,000	77%
Vietnamese	19,792	66%	24%	70%	31%	12%	$51,000	78%
Native Hawaiian/ Pacific Islander	8,212	18%	27%	44%	9%	6%	$45,000	69%
Non-Hispanic White	2,460,541	4%	23%	73%	6%	11%	$58,000	89%
Non-Hispanic Black	193,497	9%	33%	39%	10%	5%	$40,000	62%
Hispanic/Latino	1,235,718	38%	26%	52%	34%	7%	$39,550	61%

nix based on the most recent census data and pooled census microdata (Ruggles et al., 2010). In both cities, most Asian American ethnic groups are primarily foreign born, though the share is closer to half for Filipinos in Orlando and most Japanese Americans in Phoenix are native born. In contrast, the majority of NHPIs, whites, blacks, and Latinos are native born, with important variations for blacks and Latinos by metro area. The proportion that recently moved to their current home in the past five years is also similar across all groups and modestly higher in Phoenix than in Orlando. Homeownership overall tends to vary more across racial and ethnic groups than with the Asian American population and is substantially higher in Orlando than in Phoenix. Rates of homeownership are highest among Chinese Americans and lowest among Korean Americans in both cities, but not as low as the rates for NHPIs, black, and Latino residents.

Perhaps the most revealing comparisons in Table 1 concern differences in English-language ability, self-employment, and median household in absolute and relative terms compared to all Asian Americans. Among Vietnamese Americans in both cities and Latinos in Phoenix, about one in three report that they do not speak English well or at all; the same is true for nearly one in four Chinese, Koreans, and Latinos in Orlando. In contrast, self-reported rates of the inability to speak English well are much lower among Asian Indian, Filipino, NHPIs, Japanese, white, and black residents. These differences could be potentially important to navigating both the mortgage lending market as well as access to foreclosure relief and prevention. In terms of self-employment, Koreans stand out as the group most likely to be self-employed (21 percent) and the rate is also elevated in Orlando among Vietnamese (17 percent) and Chinese (16 percent) homeowners. These differences suggest that business income and earnings may be more embedded in ethnic and family ties and reliant on family savings among Korean Americans in ways that may make them vulnerable to fluctuations in business income and changes in home equity.[1] Finally, differences in median household income convey the sizeable variation among the AAPI population. The lower incomes among NHPIs, Korean, and Vietnamese households are 69 percent to 82 percent relative to the median of Asian American households while incomes are 100 percent to 122 percent higher for Asian Indians and Filipinos. Interestingly, while white median household income is close to parity with Asian Americans in Orlando, it is lower in Phoenix, and lowest of all among blacks and Latinos in both cities. These large differences illustrate the impor-

tance of controlling for income when estimating the sources of variation in housing outcomes like foreclosure.

National statistics on the stratification of Asian Americans confirm the trends in Orlando and Phoenix presented in Table 1. Nationwide, Vietnamese and Korean Americans experience poverty rates above the national average and higher than any other major Asian ethnic group (Frey, 2014). Moreover, more than half of Vietnamese Americans older than age five in the 2010 census reported that they "did not speak English well," more than any other major Asian ethnic group, and fewer than half of Koreans owned their own homes, substantially lower than other major Asian ethnic groups (Frey, 2014). Taken together with Table 1, these trends provide additional reasons to hypothesize that Korean and Vietnamese Americans may be more likely to experience foreclosure in the Sunbelt.

As far as temporal dimensions are concerned, although rates of homeownership declined among most native-born blacks and whites beginning in 2004, well before the peak of the housing boom, they continued to rise among Asians and Latinos until 2007, primarily due to increased immigration (Kochhar, Gonzalez-Barrera, and Dockterman, 2009; Kuebler and Rugh, 2013). Data from the Home Mortgage Disclosure Act Loan Application Register (HMDA LAR) (Federal Financial Institutions Examination Council, 2006, 2010, 2011) for all mortgage loans originated in the Orlando and Phoenix metro areas shows that among the 2004 to 2007 loans made to Asian Americans only about 15 percent were made in 2004 while the similar figure was 25 percent for whites. Because the risk of foreclosure was much lower before prices began to crash in 2006-7, these modest differentials also imply greater risk of foreclosure among Asian Americans. If Asian Americans were more likely to take out mortgages later in the housing boom, this suggests an additional reason to update foreclosure rates to include more recent years. Yet the HMDA data alone do not contain any information on Asian American ethnicity or loan outcomes. Additional data sets and methods are needed to understand what happened to different Asian American ethnic groups in the foreclosure crisis.

Data and Methods

To ascertain differences in foreclosure rates among Asian Americans, two major sources of data were combined on mortgage loans used for both purchase and refinance. First, data on 2004 to 2007 mortgages, borrower surnames, and associated foreclosure filings come from the

Orange County, Florida Recorder (Orlando, county seat) and the Maricopa County, Arizona Recorder (Phoenix, county seat). Each of these county recorders maintains sophisticated online repositories. In Orange County the data on foreclosure (Lis Pendens) filings are linked to mortgage loans and were collected as of December 2014 while the data on foreclosure (Notice of Trustee Sale) filings in Maricopa County were obtained from www.netvaluecentral.com on a subscription basis (Rugh and Allen, 2015). All of the data sources collected and combined in Orlando and Phoenix are shown in the flow chart diagram in the appendix (See Figure A.1).

The Phoenix sample design is based on all mortgage loans made in twelve zip codes in the Phoenix area (n = 80,654). These twelve zip codes are home to 30 percent of the total population, and its homeownership rate (59 percent) is representative of Phoenix (57 percent) as well as its vacancy rate (14 percent vs. 13 percent) and the Asian American proportion of the total population (3 percent vs. 3 percent). The Orlando sample (n = 7,414) is a countywide sample based on a two-stage design that includes all loans made by three of the largest lenders to borrowers of all races and ethnicities (n = 6,498) along with an oversample of Asian surname borrowers from all types of lenders to supplement the number of smaller Asian ethnic groups (n = 916).

In the Orlando area, mortgage document images were examined visually and all pertinent information was collected, including loan amounts, features, owner occupancy, property and borrower home address, and information on which type of identification the borrower used to establish their identity in the presence of a notary. While approximately 85 percent of borrowers presented a state driver's license, a nontrivial share presented a passport (U.S. or foreign national), permanent resident (green) card, consular ID card, military identification, state-issued photo ID, or no identification at all; a final subset indicated that they were "personally known" to the notary (an acceptable proof of identity under law and in the mortgage document templates). By recording the type of identification used, this field presents a unique proxy for nativity and citizenship status not used in previous research (see Rugh and Allen, 2015). The property address was geocoded using statistical software (StataCorp, 2013) and cross-referenced to census tracts and census block groups using geospatial software (Environmental Systems Research Institute, 2011).
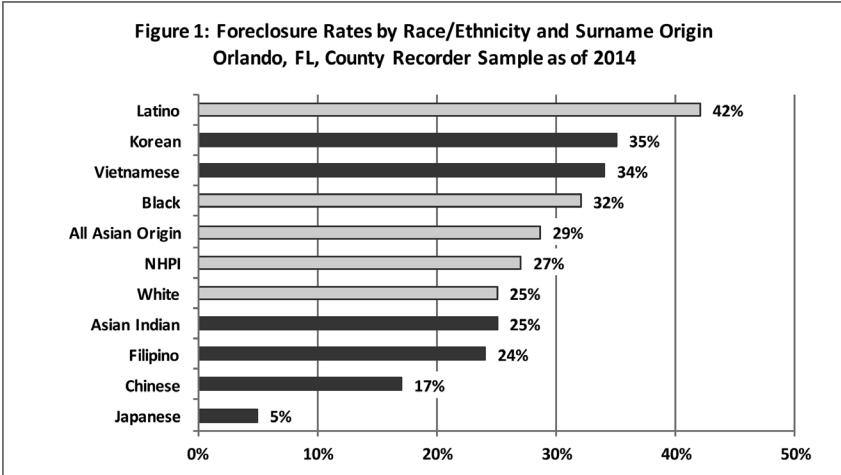
The county recorder loan data in both regions were merged to mortgage loans recorded in the second major data source, the HMDA

LAR (Federal Financial Institutions Examination Council, 2006, 2010, 2011). The match-merge was by county, census tract, amount, loan type, loan purpose, lien position, occupancy, and property type. HMDA requires lenders to collect data on applicant and coapplicant race, ethnicity, sex, and income as well as other fields such as the lender identification (which can be linked to lender name), lien position, loan type (Federal Housing Administration/Veterans Affairs/conventional), occupancy, loan purpose, secondary market destination (portfolio, Fannie Mae, Freddie Mac, private securitization, or a number of other options), and high-cost or subprime designation for loans that exceeded prevailing interest rates by 3 percentage points or more. After using information on the lender name, borrower sex, surname, and other fields to manually break ties among the matched records, 89 percent of Orlando sample records and 78 percent of Phoenix sample records were successfully matched. Both the county recorder and HMDA loans used in this article include loans for all purposes (purchase, rate/term refinance, and equity refinance). To avoid double-counting of individuals and properties, only first lien loans were matched to the county recorder samples. However, an indicator is retained for first lien loans with piggyback loans based on the county data. Prior research suggests that these loans with little or no down payments or larger cash-out refinancing amounts were more likely to end in default and foreclosure (Belsky and Richardson, 2010).

Surname Imputation

Surname imputation techniques were used to identify the six largest Asian ethnic populations in the data. A practice validated by several studies based in the United States and Canada, surname imputation employs lists of the most common last names that belong to individuals born in major Asian immigrant nations in order to infer ethnicity (Lauderdale and Kestenbaum, 2000; Shah et al., 2010; Shin and Yu, 1984). This current study uses the top surnames for the six largest Asian ethnic groups made available in Lauderdale and Kestenbaum (2000) and Shah et al. (2010) and the top names appearing among Asian homeowners in each metro area.[2] One advantage of surname imputation is its statistical reliability using a minimal number of surnames. For example, Kim et al. (2014) recently validated the work of Shin and Yu (1984), by showing that socioeconomic, demographic, and health characteristics with individuals with the top five Korean surnames closely resembles a random sample of all Korean Americans.

The procedure for surname imputation differed across locations. In Orlando, a supplemental sample of Asian borrowers was initially drawn by searching for the most common surnames among the six largest Asian ethnic groups (Asian Indian, Chinese, Filipino, Japanese, Korean, and Vietnamese) among all mortgages originated from 2004 to 2007 as recorded by the Orange County (Orlando, county seat), Florida

Figure 1: Foreclosure Rates by Race/Ethnicity and Surname Origin Orlando, FL, County Recorder Sample as of 2014

Group	Rate
Latino	42%
Korean	35%
Vietnamese	34%
Black	32%
All Asian Origin	29%
NHPI	27%
White	25%
Asian Indian	25%
Filipino	24%
Chinese	17%
Japanese	5%

Source: Matched county sample estimates for 2004–7 loans followed through December 2014. N = 7,414.

Figure 2: Foreclosure Rates by Race/Ethnicity and Surname Origin Phoenix, AZ, County Recorder Sample as of 2012

Group	Rate
Latino	38%
Vietnamese	38%
Korean	30%
All Asian Origin	26%
Black	25%
NHPI	21%
Filipino	21%
White	21%
Cambodian	19%
Asian Indian	19%
Chinese	17%
Taiwanese	15%
Japanese	9%
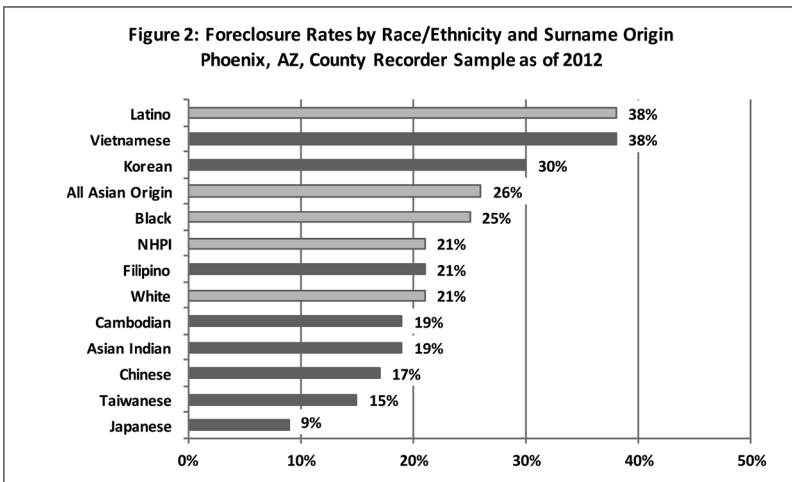
Source: Matched county sample estimates for 2004–7 loans followed through December 2012. N = 80,654.

County Recorder (n = 6,306).[3] A random sample of close to one out of six of these 6,306 mortgage document images were examined carefully, and all relevant fields described in the preceding text were collected from the mortgage document images (n = 916 Asian surname borrower loans). The resulting records were appended to the remaining sample described in the preceding text for a total of 7,414 first lien mortgages.[4]

In contrast to the Orlando area, in the Phoenix area, Asian surname imputation was more straightforward. Ethnic origin was inferred among the borrower surnames of those in foreclosure based on the existing data set. For Asian borrowers not in foreclosure, the existing property ownership records from the Maricopa County Assessor tax rolls were used to infer surname ethnic origin. These data were then examined using information on mortgages underlying the properties recorded by the Maricopa County Recorder and then geocoded and merged to HMDA data using the same criteria as in Orlando.[5]

Results

Figure 1 presents foreclosure rates as of the end of 2014 among borrowers in the Orlando sample by borrower race/ethnicity (light bars) and, for Asian borrowers, also by imputed surname ethnicity (dark bars). The variation in foreclosure rates is immediately obvious and especially startling. Korean and Vietnamese borrowers experience foreclosure rates of 35 percent and 34 percent, respectively. While not as high as the rate for Latinos (41 percent), these rates exceed those of any other racial, ethnic, or Asian ethnic group, including blacks (32 percent). NHPIs, whose self-reported racial identity comes directly from the matched HMDA data, experience a foreclosure rate (27 percent) in between the averages among Asians and whites. Asian Indians (25 percent), Filipinos (24 percent), and especially Chinese (17 percent) and Japanese (5 percent) borrowers are less likely to experience foreclosure than any other group.

Foreclosure rates as of the end of 2012 in the Phoenix sample are shown in Figure 2. Despite similarities to the pattern in Orlando, one difference is the incidence of foreclosure among Vietnamese borrowers (38 percent), the same level as Latinos. This also stands out because the Phoenix data end earlier than in Orlando, where the rate among Vietnamese two years later (Figure 1) is 32 percent. As in Orlando, Koreans are also hit harder (30 percent) than blacks (25 percent), whose rate is similar to that of Asian borrowers overall (26 percent). NHPIs, Filipino, Cambodian, and Asian Indian borrowers exhibit rates of fore-

closure close to that of whites (21 percent).[6] A familiar pattern emerges at the lower end of the spectrum; Chinese (17 percent), Taiwanese (15 percent), and Japanese (9 percent) borrowers all face notably lower foreclosure rates.

These tabulations in Figure 1 and Figure 2 represent one of the first systematic sets of estimated foreclosure rates across multiple cities and several Asian American ethnic groups alongside similarly contextualized rates of other racial/ethnic groups. Context and group status clearly matter. The experience of Vietnamese and Korean owners has diverged from national estimates for all Asians and from other Asian ethnic groups in these two Sunbelt regions. The trends support the hypotheses that Vietnamese and, to a lesser extent, Korean borrowers would experience the most adverse consequences of the foreclosure crisis due partly to socioeconomic and other disadvantages examined earlier in Table 1. While disadvantages faced by Vietnamese are well documented (Portes and Rumbaut, 2006), exactly why Koreans face elevated rates remains less clear. Understanding more about both groups merits further examination.

Before investigating the determinants of stratification in foreclosure, it is important to note the usefulness of these matched demographic characteristics in the merged county recorder-HMDA analysis data files. One obstacle of the surname imputation approach is that colonial legacies and other historical forces may affect the racial/ethnic distribution of surnames. This is especially true for Filipinos. By matching the data on Filipino surname with self- and lender-identified Hispanic ethnicity in the HMDA data, it becomes possible to sort out which borrowers with the surname De La Cruz, for example, self-identify as Latino, and which self-identify as Asian American. The distinction is critical to producing a more reliable estimate of foreclosure rates among Filipinos. Foreclosure rates are in fact much lower for those who self-identify as Asian and are presumably Filipino versus Latinos who share the same surname and in turn self-identify as Latino. The rate for Filipinos reported here equals the rate for borrowers with Filipino surnames and who also do not identify as Hispanic or Latino.[7] It should be noted here that using surname imputation does potentially affect the estimates presented here. Specifically, borrowers who self-identify as Asian American in the HMDA universe of all loans but do not have a surname in the imputation database form part of a residual "Other Asian American" borrower category. These Asian Americans are more likely to be native born and to be married across racial/ethnic lines, which may be expected to lower the odds of foreclosure.

Multivariate Regression Analysis

The current structure of the matched county recorder data file in the Orlando area sample allows for an analysis of the determinants of foreclosure by race and ethnicity while statistically controlling for other variables. Table 2 presents the results from a logistic regression that estimates the likelihood of foreclosure as a nonlinear function of the variables included in each model specification.[8] The likelihood or probability of foreclosure is reported as odds ratios. Ratios significantly greater than 1.0 indicate a variable predicts greater odds of foreclosure while ratios significantly less than 1.0 indicate lower odds, net of other factors.

In the uncontrolled model specification (1) reported in the first column, Korean, Vietnamese, black, and Latino borrowers all face statistically significantly higher odds of foreclosure compared to non-Hispanic whites. Latinos are about 2.1 times more likely and blacks 1.3 times more likely than whites to ever enter foreclosure; Koreans and Vietnamese are 1.7 and 1.5 times more likely, respectively, placing them between Latinos and blacks in terms of foreclosure risk, as expected. Compared to borrowers in 2004, those who took out a mortgage as home prices peaked in 2006 and began to decline in 2007 are 3.5 and 3.0 times more likely, respectively, to enter foreclosure; those in 2005 are 2.1 times more likely to enter foreclosure.

In model (2), variables that operationalize exposure to greater risk of foreclosure are added, including standard variables such as high cost, investor occupancy, and condominium property as well as novel variables such as an indicator for immigrants, foreign nationals, and others who used passports, permanent resident (green) cards, or no form of identification to establish their identity as recorded by the notary on the actual mortgage document. After adding these variables, the odds of foreclosure rise slightly but not significantly among Koreans and Vietnamese, to 1.8 and 1.7, respectively, while diminishing among Latino borrowers to the same magnitude, 1.7, and becoming insignificant among black borrowers.

As expected, borrowers with high-cost subprime loans, those with condo properties, and especially loans with simultaneous piggyback second lien loans are all more likely to enter foreclosure. The odds ratio for the variable representing possible fraud in investor ownership is significant and predicts greater foreclosure risk; this variable is equal to one for borrowers who state owner occupancy but maintain a different mailing address. Although the odds ratio for using alternative identifi-

Table 2: Logistic Regression Estimates of Foreclosure in Orlando, FL, 2004–14

	Odds Ratio	S. E.	Odds Ratio	S. E.	Odds Ratio	S. E.
	(1)		(2)		(3)	
Race/Origin						
Non-Hispanic White (reference)	--	--	--	--	--	--
Asian Indian	1.330†	(0.219)	1.301	(0.246)	1.159	(0.244)
Chinese	0.865	(0.176)	0.938	(0.208)	0.797	(0.192)
Filipino	0.826	(0.287)	0.847	(0.310)	0.914	(0.339)
Korean	1.733*	(0.388)	1.829*	(0.455)	1.712*	(0.441)
Vietnamese	1.511**	(0.197)	1.700**	(0.271)	1.507*	(0.260)
Other Asian/Pacific Islander	1.267	(0.184)	1.253	(0.191)	1.208	(0.197)
Black	1.265**	(0.111)	1.065	(0.100)	1.094	(0.112)
Latino	2.093***	(0.129)	1.704***	(0.111)	1.676***	(0.157)
Risk Variables						
Passport/Green Card/No IDa			1.612	(0.180)	1.948†	(0.770)
High-Cost Loan			1.948***	(0.119)	1.842***	(0.136)
Investor Owner			1.049	(0.099)	1.251†	(0.169)
Investor Owner Possible Fraud			1.152*	(0.081)	1.118	(0.095)
Condo Property			1.336***	(0.099)	1.426***	(0.136)
Has Piggyback Second Lien			1.574***	(0.098)	1.383***	(0.100)
Loan Amount (logged)					2.022***	(0.330)
No Cosigner on Loan					1.108	(0.072)
Cosigner Not Legal Spouse					1.073	(0.107)
(vs. spouse as co-cosigner)						
Census Block Group % Minority						
0%–24.99% (reference)	--	--	--	--	--	--
25%–49.99%					1.381***	(0.116)
50%–100%					1.407**	(0.150)
Year Loan Originated						
2004 (reference)	--	--	--	--	--	--
2005	2.06**	(0.513)	1.758*	(0.454)	1.735†	(0.514)
2006	3.584***	(0.865)	3.201***	(0.831)	2.940***	(0.871)
2007	3.017***	(0.931)	2.683**	(0.842)	2.56**	(0.927)
Extended Control Variables						
Loan Purpose, Type, Borrower Income, Other Characteristicsb			Yes			
Census Block Group Percent Foreign Born, Median Household Income			Yes			
Pseudo R2	0.03		0.07		0.09	
Number of Borrower Loans	6,649.0		6,643.0		6,131.0	

Note: Logistic regression odds ratios with robust standard errors in parentheses. Outcomes as of December 2014.

[a] Identification per notary record on mortgage (vs. driver's license/state photo ID/personally known to notary).

[b] Other characteristics: adjustable rate, interest-only amortization, and second home occupancy.

*** p < 0.001 ** p < 0.01 * p < 0.05 † p < 0.10

cation associated with those less likely to be U.S. citizens is not statistically significant in this specification, its magnitude and direction does suggest potential increased risk of foreclosure among these borrowers. Thus, although high-cost lending and other risk factors appear to fully explain black-white disparities in foreclosure and partly explain Latino-white disparities, these added factors do not appear to reduce the odds of foreclosure among Koreans and Vietnamese borrowers.

Model (3) reports the fully controlled estimate of foreclosure, including the year the loan was originated and a set of extended controls at the borrower, loan, and census block group level. In the full model, Koreans and Latinos remain 1.7 times more likely than whites to enter foreclosure and, Vietnamese, 1.5 times more likely; all three estimates are statistically significant. Among other groups, the odds of foreclosure are not significantly different from whites after controlling for other factors.

Borrowers using forms of identification more closely associated with noncitizens are about 1.9 times more likely to enter foreclosure, a marginally statistically significant estimate ($p < 0.08$). Based on the mailing address of borrowers listed in the county recorder PDF mortgage image files and matched HMDA loan purpose, many of these borrowers are higher income investors who maintain residences in places such as San Francisco, San Jose, New York, London, Caracas, and San Juan (some of the most common cities of investor owners). However, many more are in fact owner occupants more susceptible to foreclosure potentially owing to legal, language, and other potentially marginalized statuses (see Discussion section). These immigrant status attributes may be more relevant to explaining disparities among Koreans, Vietnamese, and Latinos than blacks, Asian Indians, or Japanese, who are more likely to speak English, be native born, or possess more secure immigration status.

The pattern of results among the set of risk variables conform to expectations and are noteworthy. High-cost subprime loans, potentially speculative loans on condo properties, larger loans for a given income, and especially leveraged loans with piggyback second liens all remain significant predictors of foreclosure. Investor owners face marginally higher odds of foreclosure. Compared to mostly white neighborhood census block groups (< 25 percent minority) the odds of foreclosure are significantly higher not only in majority-minority areas but also in relatively integrated block groups, consistent with recent research (Hall, Crowder, and Spring, 2015). While not shown, indicators for the percent foreign born and median household income are not statistically signifi-

cant. Borrowers who took out a mortgage as home prices peaked in 2006 and began to decline in 2007 remain 2.9 and 2.6 times more likely, respectively, to enter foreclosure.

Overall, the multivariate regression estimates confirm the disparities faced by Latino and Korean borrowers and suggest potential disparities faced by Vietnamese in Orlando as well. As confirmed by the extended models, although high-cost subprime lending appears to fully explain black-white disparities in foreclosure and partly explain Latino-white disparities, it does not appear to reduce the odds of foreclosure among Koreans and Vietnamese borrowers. These results strongly suggest that other, unobserved factors may be responsible for Korean and Vietnamese disparities, such as English-language ability, self-employment status, and access to foreclosure prevention counseling and other factors.

Discussion

This study demonstrates how national averages that place the experience of AAPI homeowners between that of blacks and whites mask tremendous variation by ethnicity and place. Updated foreclosure rates for Vietnamese and Korean borrowers in Orlando and Phoenix exceed those experienced by blacks. Roughly one in three or more of Korean and Vietnamese borrowers received a foreclosure filing, a rate that resembles more closely the experience of Latinos than that of other Asian American ethnic groups. Astonishingly, in the community-based Phoenix sample, the foreclosure rate among Vietnamese owners, nearly four in ten, equals the rate among Latinos. Elevated foreclosure rates among Vietnamese borrowers in particular are consistent with national evidence on exposure to foreclosure risk, which show that they face higher risk than any other major Asian American group (Lee, 2014).

In contrast, relatively advantaged Japanese, Chinese, and Taiwanese homeowners in both Orlando and Phoenix appear to have experienced relatively low foreclosure rates, lower than rates among non-Hispanic whites. For Asian Indians, Cambodians, Filipinos, and NHPIs, foreclosure rates are closer to the average for all AAPI groups. It should be noted, however, that rates for these groups exceed overall historical average foreclosure rates by at least a factor of ten and that relatively advantaged AAPI groups may still be reeling from the crisis. Additionally, because Vietnamese owners were hit harder in Phoenix, and Koreans and Vietnamese were hit harder in Orlando, local geography and migration history also appear to matter.

In a statistical model that controls for rival explanations in the Orlando area, foreclosure rates compared to whites were fully explained among blacks and most major AAPI groups, but appeared to remain significantly higher among Koreans, Vietnamese, and Latinos. These disparities—especially in tandem with the finding that borrowers who are more likely to be foreign nationals, legal permanent residents, or those without access to driver's licenses are more at risk of entering foreclosure (see Allen, 2011)—all invite further discussion regarding potential mechanisms that explain high foreclosure rates among some AAPI groups versus others.

One reason many AAPI groups may have fared worse in the housing crisis stems from the lack of access to housing counseling and foreclosure prevention relief, such as loan modifications. Lee (2014), Patraporn, Pfeiffer, and Ong (2010), and Pfeiffer et al. (2014) demonstrate the key role played by community-based organizations that serve Asian Americans, especially by helping underserved populations sustain homeownership. According to data tabulated on the number of housing counseling agencies approved by the Department of Housing and Urban Development (HUD) as of 2012 (Rugh, 2015), Asian immigrant populations are woefully underserved in both Orlando and Phoenix. Of seventeen Orlando area housing agencies, only one offers counseling services in Asian languages; in Phoenix, the same is true for only two in twenty-eight area agencies. By comparison, thirteen of seventeen agencies in Orlando and twenty-three of twenty-eight in Phoenix offer services in Spanish.

Because the growth of the Asian American population in Sunbelt regions like Orlando and Phoenix has taken place at such breakneck speed, the growth of organizations to help Asian immigrants obtain foreclosure relief has lagged. HUD certification also takes additional time (Lee, 2014). To compound matters, unlike their urban counterparts in Los Angeles and New York, Asian Americans in Sunbelt regions are far more likely to reside in a suburban setting where residences are far more isolated from social service providers. The HUD data also indicate that no Orlando or Phoenix agencies as late as 2012 were organized on a pan-Asian model, ready to serve multiple populations on a one-stop basis, underscoring a lack of linkages and capacity building across community-based organizations (De Leon, 2012; Huh and Hasegawa, 2003).

Access to intake agencies improves the odds of receiving assistance among distressed homeowners and reduces the odds of foreclosure (Collins and Schmeiser, 2013; Russell et al., 2014). Such agencies

help borrowers navigate the often frustrating loan modification paper-work requirements of national loan servicers, whose employees are often not trained to deal with loans on a case-by-case basis and whose rates of granting modifications vary significantly and widely (Been et al., 2013; Thompson, 2009). Recent surveys of housing counselors have suggested that these servicers and banks reject or destroy documents submitted in languages other than English (California Reinvestment Coalition, 2013). Even banks that offer translation services may not train personnel to be culturally competent (Lee, 2014; Pfeiffer et al., 2014).
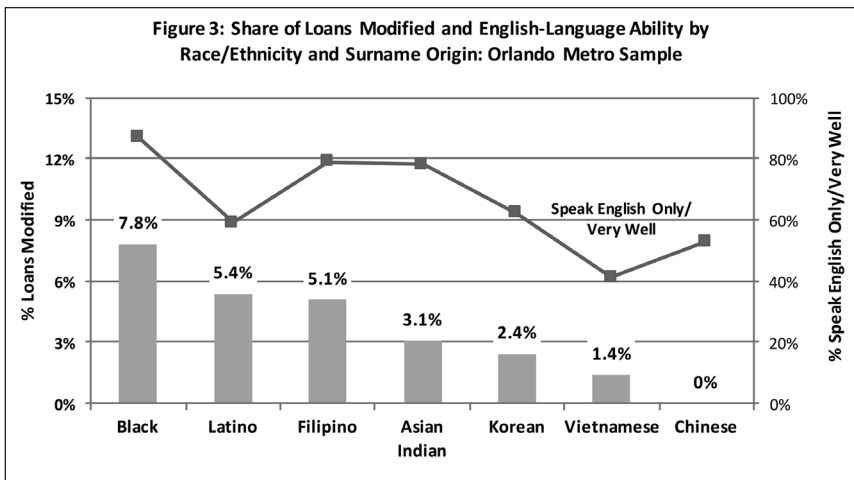
Figure 3 supports the notion that language ability and access to housing counseling combine to stratify Asian immigrant homeowners in the Orlando area. Rates of loan modification are lower among those with relatively fewer English speakers. AAPI groups with greater English fluency or relatively fewer immigrants such as Filipinos, NHPIs, and Asian Indians have higher rates of loan modification despite lower levels of overall mortgage distress. In contrast, Vietnamese and Korean homeowners are far less likely to receive loan modifications than would be expected given their high rates of foreclosure, which exceed those faced by blacks and approach the experience of Latinos. The role of nativity and language in depressing loan modification rates is also confirmed by the lower-than-expected rate among Latinos.

In terms of social/spatial dimensions, Zhou (2007) documents that in the Los Angeles region Koreans in dense urban enclaves like Koreatown as well as suburban corridors like the San Gabriel Valley often have a reservoir of social connections and social capital to generate upward mobility and increased opportunity. Koreans who migrate away from Los Angeles to less expensive but more socially isolated places like Phoenix are likely to have fewer assets and diminished social support. If so, they may find themselves at greater risk of foreclosure after home prices collapsed and options for refinancing or selling an underwater home became slim to none. Altogether, these glimpses at access to foreclosure counseling and loan modification rates suggest that language barriers may help explain why social networks have grown more important to sustaining homeownership among AAPI groups (see Painter and Yu, 2014).

Previous scholarship also documents how Korean Americans have relied heavily on entrepreneurship and self-employment to cement their economic incorporation (Sanders and Nee, 1996; Zhou and Kim, 2006). Korean Americans are more likely than whites, blacks, Latinos, and other Asian American groups to be self-employed, both in the

study areas here (Table 1) as well as nationally (Le, 2015; Yoo, 2013). Korean reliance on small business ventures is socially structured by dense ethnic and family ties and overwhelmingly dependent on personal savings (Moo Hurh, 1998; Yoo, 2013). Further, it is well documented that home equity is the greatest source of savings and wealth for most Americans of all races (Grinstein-Weiss, Key, and Carrillo, 2015). To the degree that Korean borrowers relied on home equity to support business entrepreneurship or fellow co-ethnics, they may have been more susceptible to the downturn in home prices. Likewise, to the extent that successful entrepreneurship depends on the economic well-being of surrounding neighbors, Koreans in hard hit integrated and minority areas may have suffered a double-blow to home equity and to business income. Future research should examine the frequency and amount of home equity borrowing to better understand this possible pathway to higher foreclosure rates.

Nativity, migration, household income, the relative lack of access to housing counseling in native languages, and reliance on self-employment and home equity financing may explain why Korean and Vietnamese homeowners face higher foreclosure rates. Potential discrimination may also play a role. Directly, the most recent comprehensive national audit of housing discrimination finds that Asian American homebuyers are informed of 19 percent fewer homes compared to whites, a statistically significant difference similar to the racial dispar-

Figure 3: Share of Loans Modified and English-Language Ability by Race/Ethnicity and Surname Origin: Orlando Metro Sample

Sources: Orange County, Florida, County Recorder and Matched Loan Modifications; Census Integrated Public Use Microdata Samples (Ruggles et al., 2010). N = 4,264.

ity estimated for black Americans (Turner et al., 2013). Recent evidence from an experiment in Australia suggests that while East Asians did not fare differently from whites, South Asian subjects were statistically significantly much more likely to have experienced racial discrimination in public services (Mujcic and Frijters, 2014). In the United States, several sociologists have argued that many Southeast Asian groups like Vietnamese Americans may be increasingly racialized in a three-tiered system of racial stratification similar to Latin American societies (e.g., Bonilla-Silva, 2014; Lee and Bean, 2007).

Indirectly, as Portes and Rumbaut report (2006), Vietnamese and Korean immigrants have historically been much more likely to live and transact business in close proximity with racialized black and Latino populations. Racial discrimination has been put forth as a prime reason Korean and other Asian Americans rely heavily on entrepreneurship and concentrate in certain professions in the first place (Lee and Zhou, 2014; Park, 2005; Poon, 2014). Prior research repeatedly documents how residence in segregated communities of color corresponds to adverse housing outcomes like high-cost lending, loan denials, foreclosures, and housing recovery (Hwang et al., 2015; Hyra et al., 2013; Kuebler, 2012; Pfeiffer and Molina, 2013; Rugh and Massey, 2010; Rugh, Albright, and Massey, 2015; Williams, Nesiba, and McConnell, 2005). In Phoenix, Vietnamese homeowners are vastly more likely than East Asian groups such as Chinese homeowners to reside in majority-Latino areas (Portes and Rumbaut, 2006; Hall, 2010).

Even among Koreans and Vietnamese who departed places of diminished opportunity during the housing boom, the census data in Table 1 strongly suggests that Koreans and Vietnamese in Orlando and Vietnamese in Phoenix have substantially lower household incomes and higher rates of self-employment relative to other groups. Future research should examine the possibility that the housing bust and foreclosure crisis brought a downward slide in assimilation among second-generation Koreans and Vietnamese similar to patterns of delayed assimilation among Mexican Americans (Agius Vallejo, 2010; Brown, 2007; Portes and Zhou, 1993; Telles and Ortiz, 2008).

Conclusion

In Orlando and Phoenix, Korean and Vietnamese homeowners endure foreclosure rates similar to the well-documented national disparities that have burdened blacks and Latinos. This shared fate with blacks and Latinos and the disproportionate burden on Koreans and Vietnam-

ese has hitherto been obscured by more modest overall foreclosure rates among all Asian borrowers. Previous scholarship on African Americans and Latinos has shown how changing patterns of racial settlement and the pursuit of suburban homeownership in California jeopardized these populations in ways that differ from other regions and other eras (Agius Vallejo, 2012; Molina, 2012; Pfeiffer, 2012; Rugh, 2015; Schafran and Wegmann, 2012). The results of this study call for greater attention to the recent Sunbelt migration and suburbanization among Korean and Vietnamese Americans in order to better understand why they were devastated by the housing crisis. The analysis here also begins to paint the outlines of a different, more nuanced, and, in some cases, more troubling picture of the Asian American and Pacific Islander search for the American dream of homeownership, wealth, and opportunity in the American Sunbelt.

Acknowledgements

Appendix

Table A.1: Asian American Ethnic Group Sample Sizes by Metro Area		
	Orlando	Phoenix
Asian Indian	1,489	545
Chinese	801	1,458
Filipino	150	180
Japanese	31	97
Korean	347	326
Vietnamese	2,661	899
Taiwanese	50	174
Other Asian/Pacific Islander	190	201
All Groups	**5,719**	**3,880**

Figure A.1: Diagram of Data Sources Collected and Merged to Analyze Foreclosure Rates by Race, Ethnicity, and Asian Origin Groups in Orlando and Phoenix Areas

Orlando Area

Orange County Recorder (OCR)
All mortgages by three top lenders in entire county
PDF files and linked 2004–14 foreclosure filings
Full mortgage loan information collected
N = 6,498 borrowers of all races, ethnicities

OCR online index Asian origin surname search
Most common surnames of six largest Asian origin groups N = 6,306 (2004–7) loans in entire county
OCR Asian borrowers subsample of loans
PDF image files and linked 2004–14 foreclosures
N = 916 Asian origin borrowers in entire county

Geocoding of property address
listed in PDF image of mortgage to census tract block group level
N = 7,414 loans

Match merge with 2004–7 HMDA by
-county -loan purpose
-census tract -lien position
-amount -occupancy
-loan type -property type
Manual tie-breaking: gender, surname, lender name, etc.

Orlando Area Analysis Data Set
N = 6,659 matched first lien mortgage loans in entire county
(N = 1,322 Asian origin borrowers based on matched race and surname imputation)
Full loan, borrower, foreclosure information

Surname imputation database
N = 1,474 surnames
Six largest groups
-Asian Indian (314)
-Chinese (190)
-Filipino (278)
-Japanese (114)
-Korean (95)
-Vietnamese (52)
Other groups
-Bangladeshi (61)
-Burmese (4)
-Cambodian (29)
-Laotian (77)
-Pakistani (256)
-Taiwanese (4)
Sources: Lauderdale and Kestenbaum (2000) and Shah et al. (2010), online databases.

Phoenix Area

All 2004–12 mortgage foreclosure filings
twelve Phoenix zip codes* (Rugh, 2013)
Borrower, property, original loan information
N = 27,443 properties with foreclosure filings
*Notice of trustee sale filings in 85017, 85019, 85020, 85021, 85028, 85031, 85033, 85040, 85041, 85042, 85051, 85339

Maricopa County Assessor (MCA) owners
Property owners with Asian origin surnames in twelve Phoenix zip codes from MCA (N = 1,808)
Maricopa County Recorder (MCR) loans
PDF image files of 2004–7 mortgage loans
Limited mortgage loan information collected
N = 1,035 Asian origin borrowers in twelve zip codes

Geocoding of property address
listed in PDF image OR listed in foreclosure to census tract level
N = 28,478 loans

Match merge with 2004–7 HMDA by
-county -loan purpose
-census tract -lien position
-amount -occupancy
-loan type -property type
Manual tie-breaking: gender, surname, lender name, etc.

Phoenix Descriptive Data Set
N = 80,654 matched and unmatched first lien mortgage loan records in twelve zip codes
(N = 3,880 Asian origin borrowers based on matched race and surname imputation)
Limited borrower information *only* for matched MCR and foreclosure filing records

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Notes

1. This possibility is revisited in the discussion of the results at the end of this article.

2. These sources were corroborated using peer-reviewed sources and Internet databases for some less common Asian surnames. The surname-Asian ethnic origin crosswalk file currently contains 1,556 unique last names for twelve origin groups. This data file will be made available in connection with this study freely to all interested researchers.

3. The surnames of the primary borrower contain many more names than the keyword search surnames, but the primary borrower generally contained a different surname (frequently also of Asian origin). As a result, about one in ten of the Asian primary borrower surnames are not among the original keyword search surnames. E.g., a search for the common Asian Indian surname SINGH would return results where SINGH was the surname of the coborrower but not the primary borrower, whose last name may be PATEL but also could be SMITH or ZHANG, etc. After eliminating condominium timeshares

and commercial mortgages, 7,286 mortgage records remained; after removing second lien loans home equity lines of credit mortgages subordinate to existing first lien mortgages and consumer home equity loans and lines of credit, 6,306 mortgages remained.

4. A second search of all initiated foreclosures (Lis Pendens filings) recorded in Orange County, Florida, using the key Asian origin surnames was used to validate and cross-match the foreclosures the county recorder search engine lists as "related documents" linked to the original mortgage. The data on property address were geocoded and cross-referenced to census tracts. Finally, the data were match merged to the HMDA LAR universe file by county, census tract, amount, loan type, lien position, occupancy, and property type. Using the detailed county recorder geocoded data and adjudicating any ties using lender name and borrower/coborrower information on race/ethnicity and sex, 93 percent of records were successfully matched.

5. Because the data collection process differed for the foreclosure and nonforeclosure records in the Phoenix area, the next section reports results of the multivariate regression only among Orlando area borrowers. See appendix Table A.1 for group sample sizes.

6. Given the small sample size of Cambodians, there exists a greater degree of potential sampling error versus other groups, however.

7. Interestingly, while few other sample Asian surname groups exhibited any variation in racial identification, a substantial share of Asian Indian surname borrowers, about one in five, appear to self-identify as white based on matched HMDA data fields. An analysis of foreclosure rates with the Asian Indian surname group by race, however, did not reveal any systematic differences among those who identified as white versus Asian.

8. Additional analyses that repeat these specifications, but that employ a multinomial logit or competing risk functional form that control for competing outcomes such as mortgage prepayment, tend to produce a similar pattern of results.

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