

The Effects of Maria Migrants on the Financial Health of the Residents of Central Florida

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ABSTRACT

The influx of climate migrants could challenge many communities in the coming decades. In this study, we estimate the effects of Puerto Rican migration on the financial health of residents in receiving communities after Hurricane Maria. On the one hand, migrants can compete for jobs or crowd out access to governmental safety net programs, contributing to declines in the financial health of residents of the hosting communities. On the other hand, migrants might fill labor market needs and increase the consumption of locally produced goods, helping to stimulate the community's economy. We find little evidence that Puerto Rican migrants negatively impacted the credit health outcomes – such as credit scores and delinquency rates - of residents in receiving communities, even three years after their arrival. On the contrary, existing homeowners in Hispanic communities in Central Florida improved their financial well-being after the arrival of migrants. To help explain this finding, we show suggestive evidence that homeowners might have financially benefited from an increase in their housing value after the arrival of migrants.

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I. Introduction

The Intergovernmental Panel on Climate Change (IPCC) has noted that the most significant single impact of climate change could be on human migration, predicting that shoreline erosion, coastal flooding, and agricultural disruption will displace approximately 200 million people by 2050 (IOM 2008). The influx of climate migrants to new areas could present a challenge for the people relocating and the residents of communities that will receive climate migrants in the coming decades.

This study focuses on the capacity of receiving communities to integrate climate migrants. More specifically, our goal is to estimate the impact of climate migrants on the financial well-being of residents in the receiving communities. On the one hand, climate migrants might compete with existing residents for jobs or crowd out their access to governmental or community-based safety net programs; job loss and delays in access to financial support programs, in turn, could lead to financial hardship within the receiving communities. On the other hand, climate migrants might fill labor market needs and increase the consumption of locally produced products and services, stimulating the community's economy. In addition, migrants might be more likely to be entrepreneurs and start their own businesses, increasing wages and employment among residents of receiving communities. The impacts of climate migration could also be heterogeneous, with adverse effects for some groups of residents and benefits for others.

To build evidence for these questions, this study exploits the effects of the migration of residents of Puerto Rico to Central Florida after Hurricane Maria in 2017. An estimated 133,500 people—almost 4 percent of the population—left Puerto Rico for the mainland United States after the hurricane (US Census Bureau 2019). The most common destination for these migrants was Central Florida, which hosted a large Puerto Rican community before 2017. We use data from a major credit reporting agency to i) identify adults who left Puerto Rico after Hurricane Maria; ii) characterize which areas in the US received the most significant influx of these Maria migrants; iii) measure changes in the financial health of residents of these receiving communities over time. We looked at how the credit scores and delinquencies in receiving communities changed after 2017 and compared these outcomes in similar communities that did not experience an influx of Maria migrants. Finally, we also explore whether residents of Central Florida left the area after the arrival of migrants.

Using an event study approach, we find little evidence that the climate migrants had a negative impact on the financial health outcomes of residents of Central Florida, even three years after their arrival. The influx of Maria migrants had small and not statistically significant effects on credit scores, mortgage delinquency rates, and the likelihood of having an unpaid bill sent to the collections of residents of the five Public Use Microdata Areas (PUMAs) that received the most Maria migrants in the inland US. This result suggests that - on average - Central Florida could accommodate the influx of climate migrants without adverse financial health effects for its residents. We also find little evidence that residents of Central Florida moved away from the region as a response to the influx of Maria migrants, corroborating the evidence that residents of Central Florida were not adversely affected by the arrival of Maria migrants.

We apply a couple of robustness checks to our findings by exploring alternative definitions of receiving and comparison communities. First, we defined the treatment group as all residents of the Orlando commuting zone in August 2017 and the comparison group as residents of synthetic control commuting zones used in Peri, Rury, and Wiltshire (2022).¹ Second, we define our treatment group as the ten zip codes that received the most migrants and compare them to similar zip codes that did not experience an influx of Maria migrants. The results of these robustness checks are generally consistent with our preferred specification, and we find little evidence that the influx of Maria migrants harmed the credit health outcomes of residents of receiving communities.

We also investigate whether the impacts of Maria's migration influx were heterogeneous. Evidence suggests that residents with characteristics similar to migrants could be more adversely affected by the influx of new arrivals (Borjas and Monras 2017). On the contrary, we do not find evidence that young consumers or residents of majority Hispanic neighborhoods in Central Florida were adversely affected by the influx of Puerto Rican migrants. If anything, we find that mortgage holders in the majority Hispanic zip codes in Central Florida – which received the most migrants - experienced a decline in their mortgage delinquency after the arrival of Maria migrants.

¹ We focus on the commuting zones in the donor pool with positive weights used in the log employment analysis in Peri, Rury, and Wiltshire (2022). We reweight the sample of consumers in the comparison group such that their commuting zones have the same representation as in the weights used to create the synthetic control. See section VI. B. for details.

Using Zillow housing value data, we further explore the reasons for the improvement in the financial well-being of mortgage holders in Hispanic communities in Central Florida. We show that areas that received the most migrants experienced an increase in home values after the arrival of Maria migrants. We interpret this result as suggestive evidence that homeowners in those areas might have benefited from the increase in housing demand associated with the influx of migrants.

This study contributes to a growing literature on the effects of climate migrants on receiving communities in the United States. Evidence suggests that climate migrants might have negative labor market impacts on workers more exposed to a labor supply shock (Kugler and Yuksel 2006 and McIntosh 2008) but also a positive effect in other sectors of the local economy (Peri, Rury, and Wiltshire 2022). In addition, neighborhoods receiving an influx of migrants might experience relative price declines after the natural disaster. For example, patterns of residential segregation and the devaluation of homes in communities of color could create price declines if the migration event is associated with further racial residential sorting (Daepf, Bunten, and Hsu 2023). Evidence on the effect of climate migrants on education achievement in receiving communities is mixed, with some research finding that the inflow of climate evacuees has little effect on education outcomes in receiving communities (Imberman, Kugler, and Sacerdote 2012), while other research finding persistent adverse effects of climate migrants on students' outcomes in the receiving communities (Özek 2023)

This study also adds to the broader literature on the overall impact of migrants on hosting communities. While extensive literature has investigated the effect of migrants on labor market outcomes, crime, and political choices of hosting communities (e.g., Verme and Schuettler 2021, Bianchi, Buonanno, and Pinotti 2012, and Halla, Wagner, Zweimüller 2017), to the best of our knowledge, no other study has looked at the impact of migrants on credit health outcomes of receiving communities. Credit health outcomes are important not only because they reflect the financial well-being of residents but also because a consumer's credit history affects their access to housing and employment (McGurran 2019 and Sato 2021). This research also adds to the migration literature by using unique credit bureau data where we can observe migrants and residents of hosting communities for years before and after the migration event. With such data, we can better characterize the destination of

migrants as well as investigate whether residents move away from the hosting communities as a response to the arrival of migrants. Finally, this study also identifies homeowners as potential beneficiaries of migration – suggesting that the influx of migrants is associated with increased home values.

II. Conceptual Framework

New arrivals of climate migrants to an area may produce mixed effects on the financial well-being of existing residents. Climate migrants might compete with current residents for jobs in the local labor market and adversely affect others' wages and employment, especially residents with similar skills (De Silva et al. 2010; Cohen-Goldner and Paserman 2011; Borjas 2017). Higher unemployment and lower wages of host residents could lead to financial hardship and the inability of some residents to pay their bills on time. Second, the influx of climate migrants might increase the demand for housing in these areas, which may bid up rent in the short term, contributing to higher living costs and more financial distress for renters (Saiz 2007; Depetris-Chauvin and Santos 2018). Finally, climate migrants may be in financial distress and have a high demand for safety net services, which could crowd out residents' access to these programs. Many social programs, such as housing assistance, are constrained in their capacity to serve the local population, and residents of receiving communities might lose access after the influx of migrants if the needs of those migrants are prioritized over others.

On the other hand, climate migrants can positively affect the financial well-being of residents in receiving communities. First, climate migrants might be more likely to start a business, increasing residents' employment and wages (Azoulay et al. 2022). Climate migrants might also fill labor shortages and create opportunities for current residents to pursue better-paid managerial jobs (Beerli et al. 2021). In addition, migrants might increase the consumption of locally produced goods and services, positively affecting the local economy (Peri, Rury, and Wiltshire, 2022). With more jobs and higher wages, residents of host communities could be better able to pay their bills on time. Second, climate migrants might positively affect local government finances if they are more likely to pay taxes than receive benefits (Orrenus 2017). In this case, the arrival of migrants might increase the resources of local safety net programs supporting financially distressed residents. Finally, the

increased demand for housing associated with the arrival of climate migrants might benefit homeowners, who could experience an increase in their net worth.

The impacts of climate migrants on the financial well-being of residents could also be heterogeneous, benefiting some groups of residents and adversely affecting others. Evidence shows that resident populations with characteristics like those of migrants tend to be more adversely affected by migration, while residents different from migrants tend to benefit from it (Borjas and Monras 2017). It is also possible that climate migrants can produce adverse effects in the short term as the provision of social services and local labor markets are disrupted. Still, these changes can turn positive in the medium term as local economies adjust to the supply of migrants. Finally, the increase in housing demand associated with the arrival of migrants might negatively affect renters but positively affect homeowners.

III. Puerto Rican Community in Central Florida and the Hurricane Maria

Puerto Rico is a U.S. territory, and all Puerto Ricans living on the island and the mainland have U.S. citizenship. Puerto Ricans can move and live in the United States freely. While living on the island, Puerto Ricans are not required to file federal income tax and do not have a voting representative in the U.S. Although some limitations exist for access to U.S. social welfare programs on the island, Puerto Ricans in the mainland U.S. have access to all federal safety net programs available to U.S. citizens, such as the supplemental security income program and the child tax credit.

While after World War II, the migration of Puerto Ricans was primarily directed to New York City and other northeastern cities of the United States, during the 1990s, Florida displaced New Jersey as the second largest concentration of stateside Puerto Ricans. Orange and Osceola in Central Florida became the two leading destinations for Puerto Rican migrants, displacing the Bronx and other counties in New York (Duany 2012). By 2010, Puerto Ricans represented the second largest Hispanic group in Florida, after Cubans, and the most numerous in Central Florida, particularly in the Orlando metropolitan area.

Hurricane Maria landed on Puerto Rico on September 20, 2017, as a category 4 hurricane, resulting in a still unknown number of deaths and the forced displacement of nearly 4 percent – around 133,500 people – of the island's population (US Census Bureau 2019). After Hurricane Maria, Florida became a receiving community for thousands of

Puerto Ricans. About 24,000 Puerto Ricans ended up in Orlando in March 2018, representing around 1 percent of Orlando's pre-hurricane population (Peri, Rury, and Wiltshire, 2022). Reasons for Puerto Rican migration to Central Florida after Maria were closely tied to existent family connections in the region (Ospina 2019).

IV. Data

The primary data source for this study is the annual Urban Institute longitudinal credit bureau dataset from August 2014 to August 2020.² These data consist of a random 2% sample of all consumers in the United States and its territories from a major credit bureau each year (about 5.5 million adults in each annual pull). The consumer panel is refreshed at each data pull to keep the sample representative at the national level.³ The credit bureau data include all consumers' geographic identifiers (zip code level) and ages. They also contain an array of information on consumers' credit profiles, including the amount of debt and delinquencies related to credit cards, auto loans, and mortgages. We also have consumers' credit scores, which are a composite indicator of overall financial health. All records were stripped of personally identifiable information.

Because the data follow consumers over time, we define our treatment and comparison groups based on their location of residence before Maria and follow these consumers after the disaster. The treatment group is defined as August 2017 residents of the areas in Central Florida that later received the highest influx of migrants. The comparison group –better described later - is defined as residents of areas that looked similar to Central Florida in August 2017 but did not receive a significant influx of Maria migrants.

The credit bureau data have a few limitations. First, these data exclude information on roughly 11 percent of U.S. adults with no credit file (Brevoort, Grimm, and Kambara 2015). Second, they do not contain consumer demographic and socioeconomic characteristics, such as race or ethnicity, gender, and income. We enrich the data using the 2013-2017 American Community Survey (ACS) to address the lack of demographic and socioeconomic

² Past work using the Urban Institute credit bureau data includes Caswell and Goddeeris (2020); Caswell and Waidmann (2019); and Braga and Oglesby-Neal (2023).

³ Consumers only leave the panel if they no longer have a credit record (e.g., due to being identified as deceased), but a nationally representative sample of consumers with new credit records is added to the panel at each new data pull.

information. We incorporate zip code–level information on the socioeconomic characteristics of locations where individuals live to assess heterogeneous policy effects across key groups. For example, we can obtain the share of residents in a ZIP Code Tabulation Area (ZCTA) with a college degree from the ACS. Using the zip code of residence from the credit bureau data, we classify adults with a credit record as residents of majority-Hispanic communities (at least 50 percent of the population identifies as Hispanic), low English proficiency rate communities (less than 50 percent of the adult population speaks English well), and lower (higher) education communities (less or more than 25 percent of the population 25 years old or older have at least an associate degree).

This study's geographic units of analysis are Public Use Microdata Areas (PUMAs). PUMAs are statistical geographic areas defined by the US Census Bureau for disseminating Public Use Microdata Sample data. These geographically contiguous units contain at least 100,000 people nested within states or equivalent entities. The choice of PUMAs over smaller-level geographic units, such as zip codes, ensures enough sample size to estimate the meaningful impacts of the influx of climate migrants.

Using the August 2017 snapshot of our 2 percent sample of credit bureau data, we identified 42,444 residents of Puerto Rico. Of these, 2,387 had moved to the continental United States by August 2019, with the most common destination being PUMAs in Central Florida (Figure 1). Using these data, we identified the top five PUMAs that received the most Puerto Rican migrants by 2019: Osceola County (west), Orange County (south central), Polk County (northeast), Orange County (southeast), and Osceola County (east). These five PUMAs are in Central Florida - around the Orlando metropolitan area- and received about 11 percent of all Maria migrants to the United States (Table 1). The arrival of Maria migrants represents a 1.0% to 2.6% increase in the number of consumers in these PUMAs compared to the number of consumers with a credit record in August 2017.

To evaluate the impact of the influx of migrants in the receiving community, we identified 15,817 consumers living in the five PUMAs in Central Florida in August 2017, representing the receiving communities in our study. Taking advantage of the panel structure of the data, we followed these consumers before and after the arrival of Maria migrants.

We compare the characteristics of the Maria migrants who moved to receiving communities in Central Florida in 2019 to those who moved elsewhere in the United States

and those who stayed in Puerto Rico (Table 2). We find that migrants to receiving communities in Central Florida and elsewhere in the US are younger and have worse credit scores than those staying in Puerto Rico. About half of the adult migrants to receiving communities were 40 years old or younger, and their average Vantage credit score was 650 – which is a near-prime credit score. However, Maria migrants do not appear to come from wealthier and more educated communities in Puerto Rico. We do not find that Maria migrants are more likely to come from zip codes with higher median income or individuals more likely to speak English well. Finally, we also compare the characteristics of Maria migrants to the residents of receiving communities in Central Florida in 2017. Maria migrants were slightly younger but had similar credit scores to those Central Florida residents. In addition, they were likely to come from zip codes with lower median income, higher poverty rates, and lower English proficiency than the zip codes they moved to.

We focus on three primary credit health outcomes: credit scores, mortgage delinquency, and debt in collections. Credit scores (Vantage scores) are a composite indicator of the overall financial health of consumers. Vantage scores between 300 and 499 are considered deep subprime, 500 and 600 are subprime, 601 and 660 are near prime, and above 660 are prime scores. A poor credit score can lead to limited options for financial products and high interest rates when borrowing money. Mortgage delinquencies are created for mortgage holders indicating that they have a mortgage account that is 30 days or more past due. This indicator captures homeowners' difficulty in remaining current with their mortgage payments. Debt in collections measures past-due credit lines that have been closed and charged off on the creditor's books and unpaid bills reported to credit bureaus that the creditor is attempting to collect and also indicates financial distress.

We also look at three secondary credit health outcomes: (1) auto and retail loan delinquency;⁴ (2) student loan delinquency; and (3) credit card utilization. Auto and retail loan delinquency is an indicator for auto & retail installment loan holders who are 60 or more days delinquent in their loans.⁵ Student loan delinquency is an indicator for student loan holders with student loans 60 days or more past due or in default. Credit card utilization is

⁴ Retail installment loans are retail trades with installment terms—for example, a loan from a retail store for a furniture purchase.

⁵ We cannot distinguish in our data whether a consumer is delinquent on an auto loan or a retail loan. Nonetheless, auto loans make up most of the auto & retail combination, with 77 percent of these consumers having auto loans or leases reported on their credit records. (McKernan, Ratcliffe, Hassani 2018).

the share of credit card limit used by credit card holders and is important because higher percentages could indicate difficulty paying bills.

Finally, we take advantage of the panel structure of the data to investigate whether residents move away from Central Florida as a response to the arrival of Maria migrants. For this purpose, we create an indicator for whether the consumer resided in a different PUMA from their PUMA of residence in August 2017 – our baseline data pull. Consumers might migrate to a different PUMA if they struggle to find a job or affordable housing.

To better characterize the PUMAs receiving Maria migrants and to find a suitable comparison group, we used data from the 2017 American Community Survey (ACS). For each PUMA in the United States, we obtained statistics from the ACS on median income, Hispanic population share, and workers employed in the entertainment, food and accommodation, and construction industries because of the importance of those sectors to Central Florida’s economy.

V. Empirical Method

We rely on an event-study research design, which assumes that those affected by treatment and the comparison group would have similar credit outcome trends in the absence of the arrival of Maria migrants. Using an event study, we can compare the credit outcomes trajectories of consumers living in five PUMAs in Central Florida in August 2017 with a suitable comparison group for each year before and after Hurricane Maria.⁶ We use August 2017 as the baseline year and identify the effects of the influx of climate migrants on the credit outcomes of residents of receiving communities for each year between 2018 and 2020.

A. Finding a Comparison Group

We use a propensity score method to find five communities that represent what would have happened in Central Florida without the influx of climate migrants (counterfactual). Because we use an event-study empirical strategy, differences in unobservable characteristics between the treatment and comparison communities might still exist after the matching as long as these unobservable characteristics remain relatively constant over the years.

⁶ We later provide robustness checks where we define the treatment groups as all residents of the Orlando commuting zone in August 2017 and the residents of the 10 zip codes that received the most Maria migrants.

We first restrict the pool of potential comparison communities to those PUMAs that received less than 0.1% of all Maria migrants to the US and had at least one thousand consumers in our data. Next, we use a propensity score matching based on baseline characteristics (before September 2017) on the share of the Hispanic population; the share of workers employed in entertainment, food and accommodation, and construction; and the share of subprime consumers. The choice of baseline characteristics - inspired by Peri, Rury, and Wiltshire (2022) - attempted to identify PUMAs that could experience similar economic shocks as the PUMAs in Central Florida without an influx of climate migrants. We use 1-to-1 nearest neighbor propensity score matching without replacement to find five comparison PUMAs.

Based on the propensity score method, our comparison communities constitute three PUMAs in the Las Vegas metro region, one PUMA in central Los Angeles, and one PUMA in Atlantic City (Table 1). These areas have a sizable Hispanic population, a high share of subprime consumers, and a significant share of the population employed in the entrainment industry and, therefore, subject to the same economic shocks as Central Florida. We identified 11,350 consumers living in these comparison communities in our August 2017 data.

Finally, we restricted the sample to consumers observed yearly in the data between 2014 and 2020. The final sample consists of 10,502 consumers in the treatment group and 7,323 in the comparison group. Table A1 shows that receiving communities and their comparison group have relatively the same share of the Hispanic population and the share of workers employed in the construction, accommodation and food, and entertainment industries in 2017. We also find that consumers in the receiving communities and comparison groups have relatively similar financial health outcomes.

B. Empirical Strategy

a. Event Study

In the event study, we compare the credit health outcomes of consumers in the treatment and comparison groups for each year before and after the arrival of Maria migrants to Central Florida. The underlying assumption is that treatment and comparison groups would have parallel outcome trajectories in the absence of Maria. The event study design allows us to

assess whether the influx of migrants has an immediate or delayed effect and provides a test for the parallel-trend assumption.

$$Y_{i,p,t} = \gamma_t + \delta_p + \sum_{\tau=-3}^{-1} \theta_{\tau} \text{Receiving}_p 1(EY = \tau) + \sum_{\tau=1}^3 \pi_{\tau} \text{Receiving}_p (EY = \tau) + \epsilon_{i,p,t}$$

In this model, $Y_{i,p,t}$ is the outcome of consumer i resident of PUMA p in August 2017 in year t ; γ_t include year fixed-effects; δ_p are PUMA fixed-effects; Receiving_p is an indicator for residence in August 2017 in one of the five PUMAs which received the most Maria migrants in the following years. EY is the number of years since 2017; θ_{τ} is a pre-trend test for 2013 and 2016; and π_{τ} is the effect of MLA expansion for each year between 2018 and 2020. Standard errors are clustered at the zip code of residence in August 2017 level.

b. Difference-in-Difference

Using a difference-in-difference model, we compare the credit outcomes of the treatment and comparison groups before and after the arrival of Maria migrants to Central Florida. The underlying assumption is once again that treatment and comparison groups would have parallel outcome trajectories in the absence of Maria. While we cannot estimate year-specific effects of the event, by grouping pre- and post-treatment, the difference-in-difference model entails more power to estimate a small effect of the treatment on credit outcomes. We use the following difference-in-difference model:

$$Y_{i,p,t} = \gamma_t + \delta_p + \beta \text{Receiving}_p \times \text{Post2017}_t + \epsilon_{i,p,t}$$

In this model, $Y_{i,p,t}$ is the outcome of consumer i resident of PUMA p in August 2017 in year t ; γ_t include year fixed-effects; δ_p are PUMA fixed-effects; Receiving_p is an indicator for residence in August 2017 in one of the five PUMAs which received the most Maria migrants in the following years. Post2017_t indicates whether the year is after Hurricane Maria; and β is the effect of climate migrants on outcome $Y_{i,z,t}$. Standard errors are again clustered at the zip code of residence in August 2017 level. The pre-Maria expansion period is defined as August 2014 to August 2017 and the post-period is August 2018 to August 2020.

VI. Results

A. Main Results

We do not find any evidence that the influx of migrants caused financial distress for the residents of receiving communities. First, we compare the credit scores of residents of receiving communities with those of the residents of comparison communities over time (Figure 2). More specifically, we estimate the average credit scores in the two communities each year of data before and after September 2017. We also compare the trend in this outcome with the US population.

Before September 2017, residents of Central Florida had a very similar credit score to those of comparison communities. In precise terms, the average credit score of consumers in the treatment group was 656 in August 2017 compared with 657 in the comparison group (figure 2, panel A). In addition, their credit scores were improving before the arrival of Maria migrants, following the national trend of improvements in credit health outcomes since the Great Recession. Nonetheless, the arrival of Maria migrants had no significant effect on the credit scores of residents of Central Florida with the comparison communities. In August 2020, the average credit score of consumers in the treatment group was 672, compared with 673 in the comparison group. In the event-study estimation (Figure 2, panel B), we do not find that the gap in the outcome between the treatment and control groups for the years 2018, 2019, and 2020 is statistically different from the gap in 2017. This result is confirmed in the difference-in-difference model, where we find a small (0.30) and not statistically significant increase in credit scores after the arrival of Maria Migrants to central Florida expansion (Table 3).

Next, we investigate the effect of the arrival of migrants on housing financial distress by estimating the share of mortgage holders in Central Florida and comparing communities that are delinquent in their mortgage payments over time. Again, we compare the trend in mortgage delinquency rate to the United States as a whole (Figure 3, panel A). We find that residents of Central Florida and the comparison communities have higher delinquency mortgage rates than the overall country during most of the period. In August 2017, 3.1 percent of mortgage holders in the treatment group were delinquent in their mortgage payments compared with 2.6 percent in the comparison group. In addition, their mortgage

delinquency rates scores decreased before the arrival of Maria migrants, following the national trend of improvements in credit health outcomes since the Great Recession.

Using an event-study approach, we find that the arrival of Maria migrants had no statistically significant effect on the downward trajectory of mortgage rate delinquency in Central Florida with the comparison communities (Figure 3, panel B). In August 2020, 1.1 percent of mortgage holders in the treatment group were delinquent in their mortgage payments compared with 1.4 percent in the comparison group. This result is confirmed in the difference-in-difference model, where we find a small (0.16 percentage points) and not statistically significant increase in mortgage delinquency after the arrival of Maria Migrants to central Florida expansion (Table 3). In other words, there is little evidence that climate migrants caused more housing financial distress in the receiving communities.

We also investigate the effect of climate migrants on the ability of residents to pay their bills on time by looking at the share of consumers with debt sent to collections in both Central Florida communities and the comparison group. Consumers in Central Florida are more likely to have debt sent to collections than the average American consumer but experienced improvements in this metric since 2014 (Figure 4, panel A). In August 2017, 44% percent of consumers in the treatment group had debt in collections compared with 39.7% percent in the comparison group. Most importantly, the event-study analysis shows no evidence of an increase in the share of residents in Central Florida with debt sent to collections after the arrival of Maria migrants with the comparison group (Figure 4, panel B). This result is confirmed in the difference-in-difference model, where we find a very small (0.19 percentage points) and not statistically significant increase in collections after the arrival of Maria Migrants to central Florida expansion (Table 3). In summary, the influx of new climate migrants did not make residents of Central Florida less able to bill their bills.

We also failed to find evidence that the arrival of climate migrants negatively affected our secondary financial health outcomes (Table 5). We do not find evidence of changes in auto and retail loan delinquency, student loan delinquency, and credit card use of the residents of central Florida after the arrival of Maria migrants in relation to the comparison communities. In the difference-in-difference model, we find small, negative, and not statistically significant treatment effects across all three secondary outcomes.

Finally, we investigate whether residents of Central Florida moved away from the region after the arrival of migrants (Figure 5). We find that 25 percent of the residents of the receiving communities in August 2017 moved to a different PUMA by August 2020, compared to 27 percent of the residents of the comparison communities (Panel A). In other words, residents of the receiving communities in Central Florida were less likely to move away from Central Florida after the arrival of the Maria migrants in relation to the comparison group. This result is confirmed in the event study, where we find negative but not statistically significant effects of Maria migrants on residential mobility (Panel B). We interpret this finding as further evidence that residents of Central Florida were not adversely affected by the arrival of Maria migrants.

B. Robustness Checks

To validate our results, we conduct two robustness checks exploring alternative definitions of receiving and comparison communities. First, following Peri, Rury, and Wiltshire (2022), we define our receiving community as the Orlando commuting zone.⁷ We identify 43,372 consumers living in the Orlando CZ in August 2017, from which 30,065 are observed in the data for every year between 2014 and 2020 and included in our analysis. Regarding comparison communities, we use the nine CZs from the donor pool with positive weights for Orlando's employment synthetic control in Peri, Rury, and Wiltshire (2022).⁸ We identified 146,455 residents in those nine CZs in August 2017, from which 105,233 were observed between 2014 and 2020. To implement their synthetic control method in our consumer-level panel, we apply sampling weights to the consumers in the comparison communities so that the geographic distribution of consumers in the comparison group replicates the weights received by their commuting zones in the Peri, Rury, and Wiltshire

⁷ Five counties comprise the Orlando CZ: Lake, Orange, Osceola, Seminole, and Sumter Counties. Four out of 5 receiving communities from our main specification are included in the Orlando CZ – the exception is Polk County (Northeast). In our data, the Orlando CZ received 16% of all Maria migrants by 2019, representing a 0.9% increase in their August 2017 consumer population.

⁸ These donor CZs and weights are respectively: Fort Walton Beach-Pensacola, FL (2.7%); Fresno-Visalia-Tulare-Parterville, CA (5.3%); Las Vegas, NV-AZ (6.5%); Boise City, ID (6.7%); El Paso, TX-Las Cruces, NM (7%); Nashville, TN (11%); Provo- Orem, UT (15.3%); Fayetteville-Springdale-Rogers, AR (18.6%); and Gainesville, GA (26.9%).

(2022) analysis.⁹ The intuition behind this method is to ensure that the comparison communities follow the same employment trajectory as the Orlando CZ before Hurricane Maria.

Consistent with the main specification, we do not find any evidence that the influx of migrants caused financial distress for the residents of Orlando CZ (Table 5, Panel A). There is a small and not statistically significant effect of the influx of Maria migrants on the credit scores and collections of Orlando residents after August 2017. If anything, we find evidence that Maria migrants decreased mortgage delinquency rates in Orlando CZ. In the difference-in-difference specification, we also do not find significant effects of the Maria migration on the likelihood of residents of Orlando CZ moving out of their PUMA after 2017. However, the event-study specification shows evidence of a divergent trajectory of this outcome in Orlando and comparison CZs before Hurricane Maria (Table A2, Panel A) – making us cautiously interpret the difference-in-difference result for PUMA mobility.

Second, we define the treatment group as the ten zip codes in the continental U.S. that received the most Maria migrants by August 2019.¹⁰ All ten receiving zip codes are in Central Florida, and only one is not included in the five receiving PUMAs from our main specification.¹¹ We identify 7,877 consumers living in these receiving zip codes in August 2017, from which 5,214 are observed in the data for every year between 2014 and 2020 and included in our analysis. We use the same propensity score matching method implemented in our preferred specification to find comparison zip codes.¹² This method identifies ten comparison zip codes: four in the Las Vegas metropolitan area, four in the Los Angeles metropolitan area, and two in New York City. There are 8,796 consumers living in these

⁹ For example, the 4,018 residents of Gainesville, GA in August 2017 represent only 3.8% of the consumers in the nine comparison CZs in August 2017. We apply sampling weights to these consumers in the difference-in-difference and event-study analysis such that they represent 26.9% of the consumers in the comparison group in those regressions.

¹⁰ In our data, these ten zip codes received 7.5% of all Maria migrants by 2019, representing a 2.3% increase in their August 2017 consumer population.

¹¹ The receiving zip code 32822 is located in the Orange County (North Central)

¹² We restrict the donor pool to zipcodes outside Florida, that received less than 0.01 percent of migrants with at least 300 consumers in the data. We use a propensity score matching based on baseline characteristics (before September 2017) on the share of the Hispanic population; the share of workers employed in entertainment, food and accommodation, and construction; and the share of subprime consumers. We use 1-to-1 nearest neighbor propensity score matching without replacement.

comparison zip codes in August 2017, from which 5,361 are observed in the data for every year between 2014 and 2020.

Looking at the residents of zip codes that received the most migrants and the comparison group, we also do not find any evidence that migrants caused financial distress for receiving communities (Table 5, Panel B). There is a small and not statistically significant effect of the influx of Maria migrants on the credit scores, mortgage delinquency, and collections of residents of receiving zip codes after August 2017. Consistent with our main specification, we also do not find significant effects of the Maria migration on the likelihood of residents of receiving zip codes moving out of their PUMA after 2017. We arrive at the same conclusion when looking at the results of the event-study specification (Table A2, Panel B). Overall, the findings of the robustness checks are generally consistent with our preferred specification, and we find little evidence that the influx of Maria migrants harmed the credit health outcomes of residents of receiving communities.

C. Heterogenous Effects

Because the arrival of Maria migrants may not affect all consumers equally, we repeat the difference-in-difference analysis for select subgroups of consumers. Specifically, we look separately at the effects for consumers who are younger adults (ages 18 to 40), are residents of a majority Hispanic community (zip codes where more than 50% of the population is Hispanic in 2017), or are residents of communities with a low English proficiency (zip codes where less than 50 percent of the population 18 years old or older either speak English at home or speaks English well or very well in 2017).¹³ These consumers are more similar to Maria migrants (Table 2) and, therefore, could be more adversely affected by the influx of Maria migrants. We also investigate whether the influx of migrants had a stronger effect on residents of lower (higher) education communities (zip codes with less (more) than 25 percent of the population 25 years old or older have at least an associate degree). Finally, we investigate whether the influx of Maria migrants had a more substantial impact on the consumers who stayed in their PUMA of residence after 2017.

We fail to find evidence that the influx of Maria migrants harmed the credit health outcomes of any subgroups of Central Florida residents (Figure 5). For all different

¹³ Even within Central Florida there was a significant concentration of Hispanic population in specific zip codes before Hurricane Maria (Figure A1).

subgroups, we find that the arrival of Maria migrants had a small and not statistically significant effect on credit scores and debt in collections (Panels A and C, respectively). These results contradict past evidence that resident populations with characteristics similar to those of migrants tend to be more adversely affected by migration (Borjas and Monras 2017). The only group impacted by the arrival of migrants were mortgage holders of majority Hispanic communities and residents of communities with a low English proficiency. Consumers in this group experienced a decline in mortgage delinquency after the arrival of migrants (Panel B). We observe a 3-percentage point decline in mortgage delinquency after 2017 for the residents of both communities (Table A2). This finding suggests an improvement in the financial well-being of mortgage holders in Hispanic communities in Central Florida.

VII. Why did mortgage holders in Hispanic communities improve their financial well-being?

To further investigate the enhanced financial well-being of homeowners within Hispanic communities in Central Florida, we pinpoint the specific zip codes within receiving areas that garnered the highest influx of migrants (see Figure 6, Panel A). Notably, our findings reveal that a significant proportion of Maria migrants gravitated towards zip codes with a majority Hispanic population before September 2017. This outcome aligns with anecdotal evidence suggesting that these migrants tend to relocate to areas where familial ties are already established (Ospina 2019). Furthermore, our analysis indicates a noticeable reduction in mortgage delinquency rates within zip codes that experienced the highest influx of Maria migrants.

Subsequently, we examine whether the influx of Maria migrants impacted the housing values within these communities. To accomplish this, we gather publicly available Zillow housing data encompassing home values at the zip code level from March 2014 to February 2021.¹⁴ In gauging home values, we utilize the Zillow Home Value Index (ZHVI), encompassing all types of homes, including single-family residences and co-ops, applying smoothing and seasonal adjustment. Our study focuses on zip codes within receiving and

¹⁴ We restrict the sample to time periods before the Covid-19 pandemic to avoid dealing with the heterogenous effects on Pandemic on housing prices around the country.

comparing Public Use Microdata Areas (PUMAs). Employing a difference-in-difference model, we estimate the effects of the influx of Maria residents on home values within the receiving communities following October 2017, with a specific interest in discerning whether the impact is more pronounced within Hispanic communities. We present results with and without incorporating weights, where the weights are derived from the number of mortgage holders in each zip code as indicated by credit bureau data from 2017.

Our analysis shows a notable 1.4 percent rise in home values within the receiving communities following the arrival of Maria migrants (see Table 6, unweighted specification). However, this effect is predominantly observed within zip codes where the Hispanic population is the majority, where home values experience a more significant 2.6% upswing after October 2017. Conversely, we identify negligible effects of Maria migrants on the housing values of non-Hispanic zip codes. These outcomes suggest that the surge of migrants within majority-Hispanic zip codes has stimulated heightened demand for housing within these locales. Although consistent with existing evidence indicating a positive impact of Maria migrants on the Orlando metropolitan area economy (Peri, Rury, and Wiltshire 2022), our findings diverge from prior research highlighting adverse housing price effects resulting from Katrina migrants in Houston (Daepf, Bunten, and Hsu 2023). Notably, the difference arises from the fact that, unlike the influx of Black migrants into White neighborhoods in Houston post-Katrina, most Maria migrants relocated to predominantly Hispanic neighborhoods in Central Florida. Consequently, the housing price dynamics in Central Florida are less susceptible to the preference for segregation observed in the Houston study.

Finally, our analysis underscores a correlation between the zip codes in Central Florida that experienced the most substantial decline in mortgage delinquencies and those that witnessed the most significant upswing in housing values (see Figure 6, Panel B). As wealth accumulates, mortgage holders within the majority Hispanic zip codes in Central Florida are less likely to face financial distress.

VIII. Conclusion

We do not find any evidence that the influx of Maria migrants caused financial distress for residents of receiving communities in Central Florida. There was no evidence of a decrease in credit scores or an increase in delinquencies or collections in the communities in

Central Florida three years after the arrival of Maria migrants. We also do not find evidence that residents of Central Florida moved away from the region after the arrival of migrants. Even when looking at consumers with similar characteristics of migrants – young and living in Hispanic communities – we do not find evidence of adverse financial effects from Maria's migration. If anything, we find that mortgage holders of Hispanic communities experienced improvements in their mortgage delinquency after the arrival of migrants. We show some evidence that this group of homeowners might have benefited from increased housing values associated with the arrival of migrants. Nonetheless, the increasing housing values in these neighborhoods might result in a greater barrier to homeownership for renters and new migrants.

There are some other aspects associated with the migration of Puerto Ricans to Central Florida after Maria to keep in mind when interpreting these results. First, while about 25,000 Puerto Ricans migrated to Central Florida after Maria, the migrant population represents less than 2 percent of the overall population in the Orlando metropolitan area. Receiving communities may experience a much more significant influx of migrants because of climate change in the following decades. Second, the existence of a large Puerto Rican community in Central Florida might have helped Maria migrants better adapt to their new circumstances and integrate into the community. Finally, while culturally different from the average resident of the mainland US, Maria migrants are American citizens and could access government social safety net programs. In the future, climate migration could span international borders, and accessing safety net programs will not be possible for migrants from other countries.

Future research could improve our understanding of the impact of climate migrants on the financial well-being of receiving communities in multiple ways. First, it could look at a broader range of natural disasters. Second, our analysis is restricted to the impact of climate migrants on communities in Central Florida. It is possible that receiving communities in other parts of the country might have different experiences – especially those not thriving economically. Third, it could incorporate data on credit-invisible consumers—those who do not have a credit report—who are not included in our credit bureau data analysis. The arrival of climate migrants may affect the well-being of this group of disadvantaged consumers differently. Finally, future research could provide credible evidence supporting measures to

better help communities integrate climate migrants, such as through disaster assistance for relocation or targeted financial assistance.

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Tables

TABLE 1

Receiving and Comparison Communities

PUMA Name	State	% of Maria Migrants	Maria Migrant as % of All Consumers in the PUMA
<i>Receiving Communities</i>			
Osceola County (West)	FL	5.2%	2.6%
Orange County (South Central)-Orlando City	FL	1.8%	1.0%
Polk County (Northeast)	FL	1.7%	1.1%
Orange County (Southeast)	FL	1.4%	1.7%
Osceola County (East)	FL	1.2%	2.2%
<i>Comparison</i>			
Clark County (Central)—Paradise (Northwest) and Winchester	NV	0.0%	0.0%
Clark County (Central)—Whitney, Sunrise Manor (South)	NV	0.0%	0.0%
Clark County (South)—Henderson (East) and Boulder Cities	NV	0.0%	0.0%
Atlantic County (East)—Atlantic City and Ventnor City	NJ	0.1%	0.1%
Los Angeles County (Central)—LA City (East Central/Central City)	CA	0.0%	0.0%

Source: 2017 and 2019 Urban Institute credit bureau data.

Notes: PUMA = Public Use Microdata Area. The table lists the five treated and five comparison communities used in the study. Treated communities are the five PUMAs that received the most migrants in the country. Comparison communities were chosen using a propensity score matching based on the following baseline characteristics: the share of the Hispanic population; the share of workers employed in entertainment, food and accommodation, and construction; and the share of subprime consumers. Percent of Maria migrants is the percentage of all migrants from Puerto Rico to the continental US from August 2017 to August 2019. Maria Migrant as % of all Consumers in the PUMA is the percent of Maria Migrants compared to the local population in August 2017.

TABLE 2

Characteristics of Consumers in August 2017 by Migration Status

	Puerto Rico Residents in August 2017			Residents of Receiving Communities in August 2017
	Migrant to Receiving Communities	Migrant to Elsewhere in the US	Stayed in Puerto Rico	
<u>Consumer-level characteristics</u>				
Average Credit Score	649.4	640.4	677.7	643.5
<u>Age</u>				
18-40	49%	60%	32%	40%
41-64	32%	28%	44%	41%
65+	19%	11%	25%	19%
<u>Zip code level characteristics</u>				
Median Income (\$)	21,784	21,106	21,090	46,903
Poverty Rate	43.0	44.5	44.6	19.0
% College Degree	34.7%	34.9%	34.8%	31.5%
% Speak English Well	6.1%	6.2%	6.0%	57.8%
# Consumers	269	2,118	35,078	15,817

Source: 2013-2017 American Community Survey and Urban Institute credit bureau data.

Notes: The sample of Puerto Rico Residents in August 2017 is restricted to consumers observed in the credit bureau data in 2017 and 2019. Migration status is defined by place of residence in August 2019. Receiving Communities are defined as the five PUMA that received the most Maria migrants (receiving communities): Osceola County (West), Orange County (South Central), Polk County (Northeast), Orange County (Southeast), and Osceola County (East). Credit scores are Vantage Scores. Median household income is the median income in the past 12 months (in 2021 inflation-adjusted dollars). The poverty rate is the percentage of the population below the poverty level. Percent with a college degree is the share of the population 25 years old or older with at least an associate degree. Percent who speak English well is the percentage of the population 18 years old or older who either speak English at home or speak English well or very well.

TABLE 3

The Effect of Maria Migrants on Main Credit Health Outcomes- Difference-in-Difference Specification

Dependent Variable	Credit Score	Mortgage Delinquency	Has Debt in Collections
Receiving Community x Post 2017	0.30 (0.84)	0.0016 (0.0065)	0.0019 (0.0051)
Observations	123,917	29,997	124,775
Mean Outcome, Comparison Group in 2017	657.5	0.026	0.397

Source: Urban Institute credit bureau data.

Notes: The sample is restricted to residents of receiving and comparison communities observed in the credit bureau data between 2014 and 2020. Consumers in the receiving and comparison communities are defined based on their residence in August 2017. Receiving communities are five PUMAs in Central Florida: Osceola County (West), Orange County (South Central), Polk County (Northeast), Orange County (Southeast), and Osceola County (East). Comparison communities are Clark County (Central)—Paradise (Northwest) and Winchester; Atlantic County (East)—Atlantic City and Ventnor City; Clark County (South)—Henderson (East) and Boulder Cities; Los Angeles County (Central)—LA City (East Central/Central City and Boyle Heights); and Clark County (Central)—Whitney, Sunrise Manor (South), and Paradise (Northeast). Credit scores are vantage scores. Mortgage delinquency is an indicator for mortgage holders with a mortgage 30 days or more past due. Debt in collections includes past-due credit lines that have been closed and charged off on the creditor's books and unpaid bills reported to credit bureaus that the creditor is attempting to collect. All models include PUMA of residence in 2017 fixed effects and year-fixed effects. Standard errors clustered at the zip code of residence in August 2017. *** p<0.01, ** p<0.05, * p<0.1

TABLE 4

The Effect of Maria Migrants on Secondary Credit Health Outcomes- Difference-in-Difference Specification

Dependent Variable	Auto/Retail Delinquency	Student Loan Delinquency	Credit Card Use
Receiving Community x Post 2017	-0.0066 (0.0044)	-0.0016 (0.0076)	-0.0022 (0.0047)
Observations	49,444	21,977	87,157
Mean Outcome, Comparison Group in 2017	0.052	0.055	0.348

Source: Urban Institute credit bureau data.

Notes: The sample is restricted to residents of receiving and comparison communities observed in the credit bureau data between 2014 and 2020. Consumers in the receiving and comparison communities are defined based on their residence in August 2017. Receiving communities are five PUMAs in Central Florida: Osceola County (West), Orange County (South Central), Polk County (Northeast), Orange County (Southeast), and Osceola County (East). Comparison communities are Clark County (Central)—Paradise (Northwest) and Winchester; Atlantic County (East)—Atlantic City and Ventnor City; Clark County (South)—Henderson (East) and Boulder Cities; Los Angeles County (Central)—LA City (East Central/Central City and Boyle Heights); and Clark County (Central)—Whitney, Sunrise Manor (South), and Paradise (Northeast). Auto and retail loan delinquency is an indicator for auto loan or lease or retail installment loan holders who are 60 or more days delinquent in their loans. Student loan delinquency is an indicator for student loan holders with student loans 60 days or more past due or in default. Credit card utilization is the share of credit card limit used by credit card holders. All models include PUMA of residence in 2017 fixed effects and year-fixed effects. Standard errors clustered at the zip code of residence in August 2017. *** p<0.01, ** p<0.05, * p<0.1

TABLE 5

The Effect of Maria Migrants on Credit Health Outcomes- Robustness Checks**Panel A –Peri, Rury, and Wiltshire (2022) synthetic cohort approach**

Dependent Variable	Credit Score	Mortgage Delinquency	Has Debt in Collections	PUMA Mobility
Orlando CZ x Post 2017	0.47 (0.54)	-0.0088*** (0.0022)	0.0009 (0.0027)	0.0038 (0.0065)
Observations	928,263	278,556	933,702	933,702
Mean Outcome, Control Group in 2017	682.6	0.017	0.320	0.0

Source: Urban Institute credit bureau data.

Notes: CZ = Commuting zone. The sample is restricted to residents of the Orlando CZ and the nine comparison CZs observed in the credit bureau data between 2014 and 2020. Consumers in the Orlando CZ and comparison CZs are defined based on their residence in August 2017. The comparison CZs and their respective weights in the sample are Fort Walton Beach-Pensacola, FL (2.7%); Fresno-Visalia-Tulare-Parterville, CA (5.3%); Las Vegas, NV-AZ (6.5%); Boise City, ID (6.7%); El Paso, TX-Las Cruces, NM (7%); Nashville, TN (11%); Provo- Orem, UT (15.3%); Fayetteville-Springdale-Rogers, AR (18.6%); and Gainesville, GA (26.9%). Credit scores are vantage scores. Mortgage delinquency is an indicator for mortgage holders with a mortgage 30 days or more past due. Debt in collections includes past-due credit lines that have been closed and charged off on the creditor's books and unpaid bills reported to credit bureaus that the creditor is attempting to collect. PUMA mobility is an indicator of whether the consumer resided in a different PUMA from their PUMA of residence in August 2017. All models include PUMA of residence in 2017 fixed effects and year-fixed effects. Standard errors clustered at the zip code of residence in August 2017. *** p<0.01, ** p<0.05, * p<0.1

Panel B –Receiving zip codes approach

Dependent Variable	Credit Score	Mortgage Delinquency	Has Debt in Collections	PUMA Mobility
Receiving Zip codes x Post 2017	0.30 (1.07)	-0.0097 (0.0086)	0.0083 (0.0064)	-0.0138 (0.0087)
Observations	73,424	15,510	74,025	74,025
Mean Outcome, Control Group in 2017	658.7	0.025	0.372	0.0

Source: Urban Institute credit bureau data.

Notes: The sample is restricted to residents of the ten zip codes that received the most Maria migrants and the ten comparison zip codes observed in the credit bureau data between 2014 and 2020. Receiving zip codes are the ten zip codes in the continental U.S. that received the most Maria migrants by August 2019. Comparison zip codes were chosen using a propensity score matching based on the following baseline characteristics: the share of the Hispanic population; the share of workers employed in entertainment, food and accommodation, and construction; and the share of subprime consumers. Consumers in the receiving and comparison zip codes are defined based on their residence in August 2017. Credit scores are vantage scores. Mortgage delinquency is an indicator for mortgage holders with a mortgage 30 days or more past due. Debt in collections includes past-due credit lines that have been closed and charged off on the creditor's books and unpaid bills reported to credit bureaus that the creditor is attempting to collect. PUMA mobility is an indicator of whether the consumer resided in a different PUMA from their PUMA of residence in August 2017. All models include PUMA of residence in 2017 fixed effects and year-fixed effects. Standard errors clustered at the zip code of residence in August 2017. *** p<0.01, ** p<0.05, * p<0.1

TABLE 6

The Effect of Maria Migrants on Housing Values by Hispanic Community Status

Dependent Variable	Ln (Home Value Index)			
Receiving Community x Post Aug 2017	0.0144*** (0.0046)	0.0048 (0.0050)	0.0019 (0.0043)	-0.0059 (0.0048)
Receiving Community x Post Aug 2017 x Majority Hispanic		0.0267*** (0.0053)		0.0187*** (0.0050)
Observations	2,592	2,592	2,592	2,592
Weights	No		Yes	

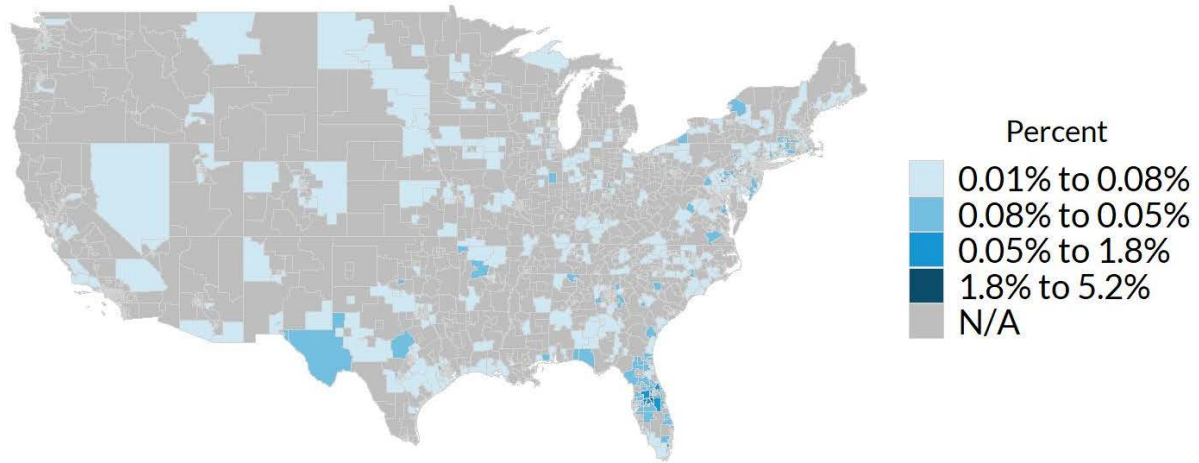
Source: Zillow monthly housing zip code data from March 2014 to February 2020.

Notes: The sample is restricted to zip codes of receiving and comparison communities between March 2014 and February 2020. Home Value Index is the Zillow Home Value Index (ZHVI) for all homes (single-family residences and co-op) smoothed and seasonally adjusted. Sample restricted to zip codes in receiving and comparison communities. The majority Hispanic zip codes are those where more than 50% of the population was Hispanic in 2017. Receiving communities are five PUMAs in Central Florida: Osceola County (West), Orange County (South Central), Polk County (Northeast), Orange County (Southeast), and Osceola County (East). Comparison communities are Clark County (Central)—Paradise (Northwest) and Winchester; Atlantic County (East)—Atlantic City and Ventnor City; Clark County (South)—Henderson (East) and Boulder Cities; Los Angeles County (Central)—LA City (East Central/Central City and Boyle Heights); and Clark County (Central)—Whitney, Sunrise Manor (South), and Paradise (Northeast). All models include zip code fixed effects and month-year fixed effects. Standard errors are reported in parentheses. Weights are the number of mortgage holders from the credit bureau data in each zip code in 2017. *** p<0.01, ** p<0.05, * p<0.1

Figures

FIGURE 1

Migrants in the Aftermath of Hurricane Maria are Concentrated in PUMAs in Central Florida



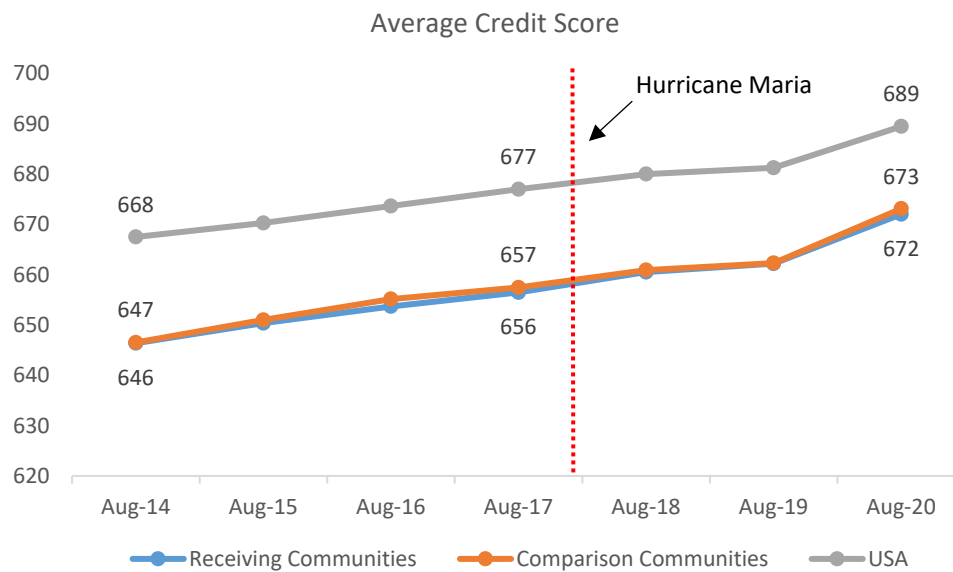
Source: Urban Institute credit bureau data.

Note: The map identifies at the PUMA level the percentage of migrants who were in Puerto Rico in August 2017 and moved to inland US by August 2019.

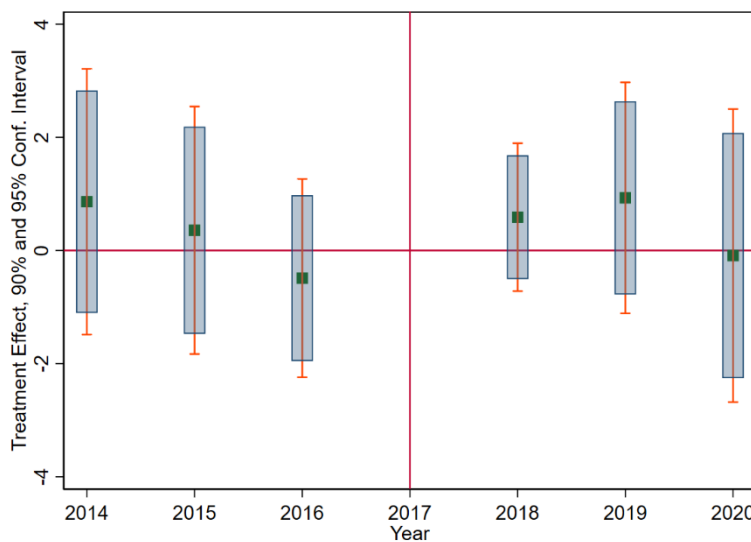
FIGURE 2

No Effect of Maria Migrants on the Credit Scores of Residents of Receiving Communities

Panel A: Average Credit Score – Receiving Communities and Comparison Group



Panel B: Event Study Estimates of the Influx of Maria Migrants on Credit Scores



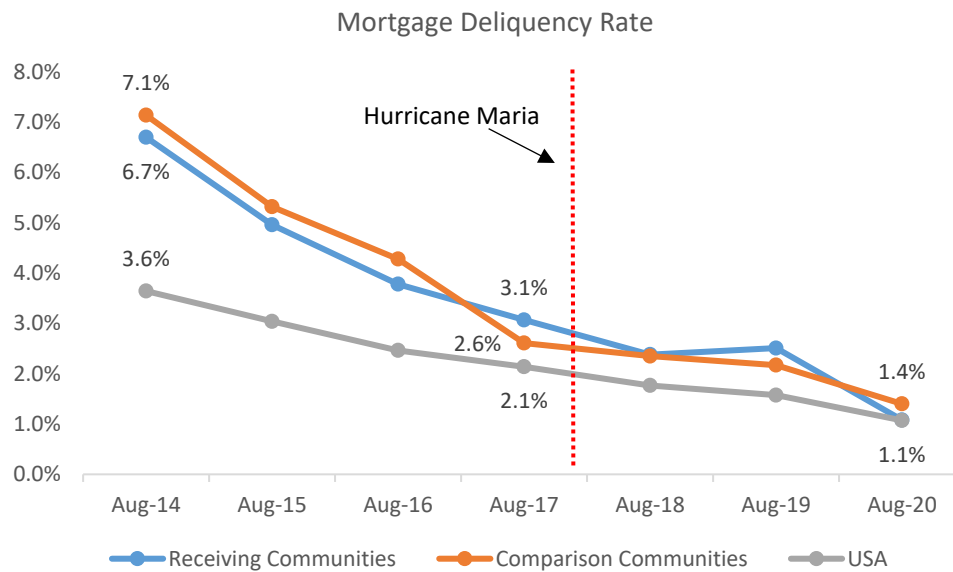
Source: Urban Institute credit bureau data.

Notes: The sample is restricted to residents of receiving and comparison communities observed in the credit bureau data between 2014 and 2020. Consumers in the receiving and comparison communities are defined based on their residence in August 2017. Receiving communities are five PUMAs in Central Florida: Osceola County (West), Orange County (South Central), Polk County (Northeast), Orange County (Southeast), and Osceola County (East). Comparison communities are Clark County (Central)—Paradise (Northwest) and Winchester; Atlantic County (East)—Atlantic City and Ventnor City; Clark County (South)—Henderson (East) and Boulder Cities; Los Angeles County (Central)—LA City (East Central/Central City and Boyle Heights); and Clark County (Central)—Whitney, Sunrise Manor (South), and Paradise (Northeast). In Panel B, 95% and 90% confidence intervals are reported based on standard errors clustered at the zip code of residence in August 2017.

FIGURE 3

No Effect of Maria Migrants on Mortgage Delinquency of Residents of Receiving Communities

Panel A: Mortgage Delinquency – Receiving Communities and Comparison Group



Panel B: Event Study Estimates of the Influx of Maria Migrants on Mortgage Delinquency



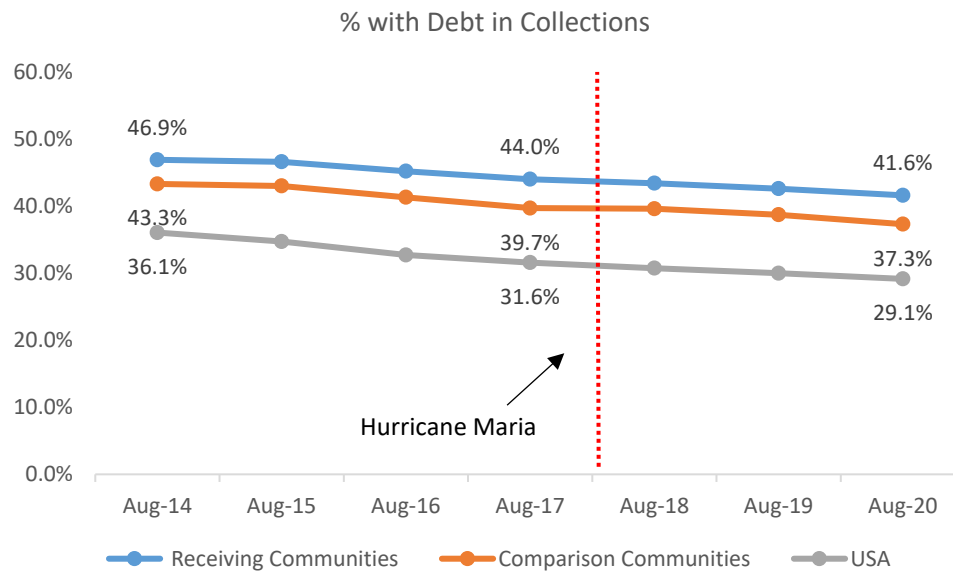
Source: Urban Institute credit bureau data.

Notes: The sample is restricted to residents of receiving and comparison communities observed in the credit bureau data between 2014 and 2020. Consumers in the receiving and comparison communities are defined based on their residence in August 2017. Receiving communities are five PUMAs in Central Florida: Osceola County (West), Orange County (South Central), Polk County (Northeast), Orange County (Southeast), and Osceola County (East). Comparison communities are Clark County (Central)—Paradise (Northwest) and Winchester; Atlantic County (East)—Atlantic City and Ventnor City; Clark County (South)—Henderson (East) and Boulder Cities; Los Angeles County (Central)—LA City (East Central/Central City and Boyle Heights); and Clark County (Central)—Whitney, Sunrise Manor (South), and Paradise (Northeast). Mortgage delinquency is the share of mortgage holders with a mortgage 30 days or more past due. In Panel B, 95% and 90% confidence intervals are reported based on standard errors clustered at the zip code of residence in August 2017.

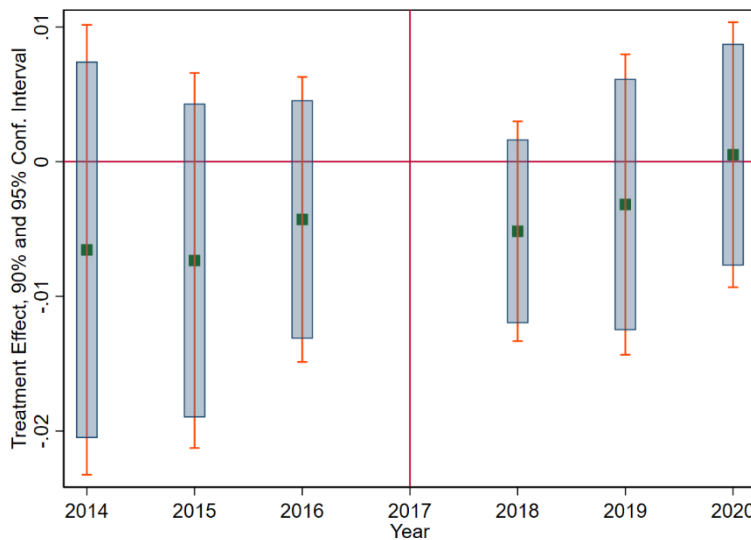
FIGURE 4

No Effect of Maria Migrants on Debt in Collections of Residents of Receiving Communities

Panel A: Collections – Receiving Communities and Comparison Group



Panel B: Event Study Estimates of the Influx of Maria Migrants on Collections



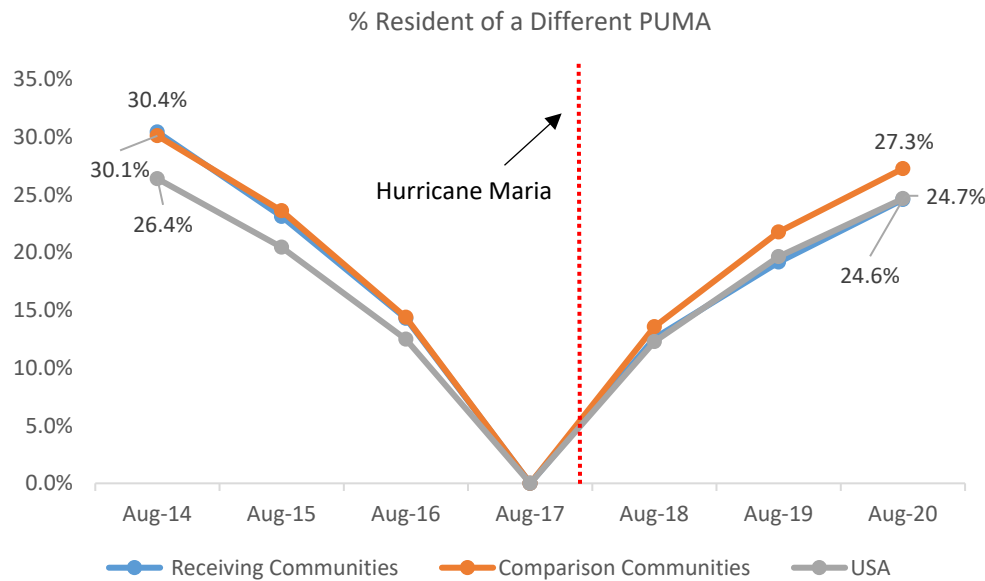
Source: Urban Institute credit bureau data.

Notes: The sample is restricted to residents of receiving and comparison communities observed in the credit bureau data between 2014 and 2020. Consumers in the receiving and comparison communities are defined based on their residence in August 2017. Receiving communities are five PUMAs in Central Florida: Osceola County (West), Orange County (South Central), Polk County (Northeast), Orange County (Southeast), and Osceola County (East). Comparison communities are Clark County (Central)—Paradise (Northwest) and Winchester; Atlantic County (East)—Atlantic City and Ventnor City; Clark County (South)—Henderson (East) and Boulder Cities; Los Angeles County (Central)—LA City (East Central/Central City and Boyle Heights); and Clark County (Central)—Whitney, Sunrise Manor (South), and Paradise (Northeast). Debt in collections includes past-due credit lines that have been closed and charged off on the creditor’s books, as well as unpaid bills reported to credit bureaus that the creditor is attempting to collect. In Panel B, 95% and 90% confidence intervals are reported based on standard errors clustered at the zip code of residence in August 2017.

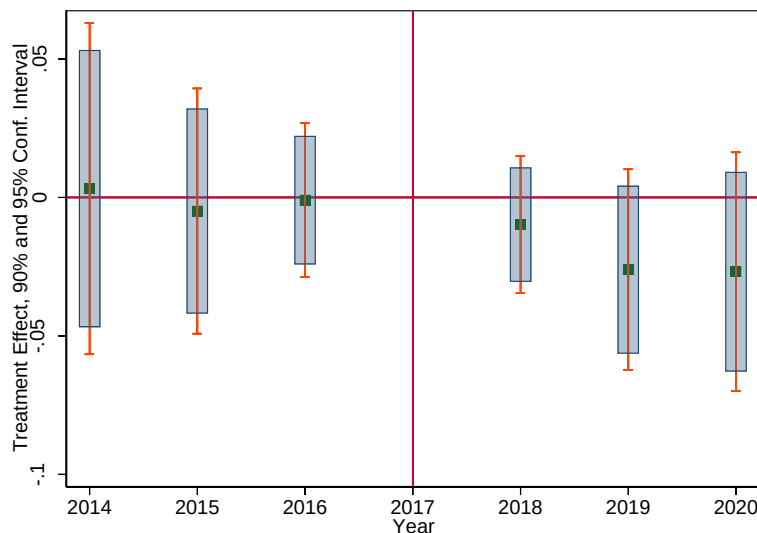
FIGURE 5

No Effect of Maria Migrants on Residential Mobility

Panel A: PUMA Mobility in comparison to August 2017 PUMA



Panel B: Event Study Estimates of the Influx of Maria Migrants on PUMA Mobility



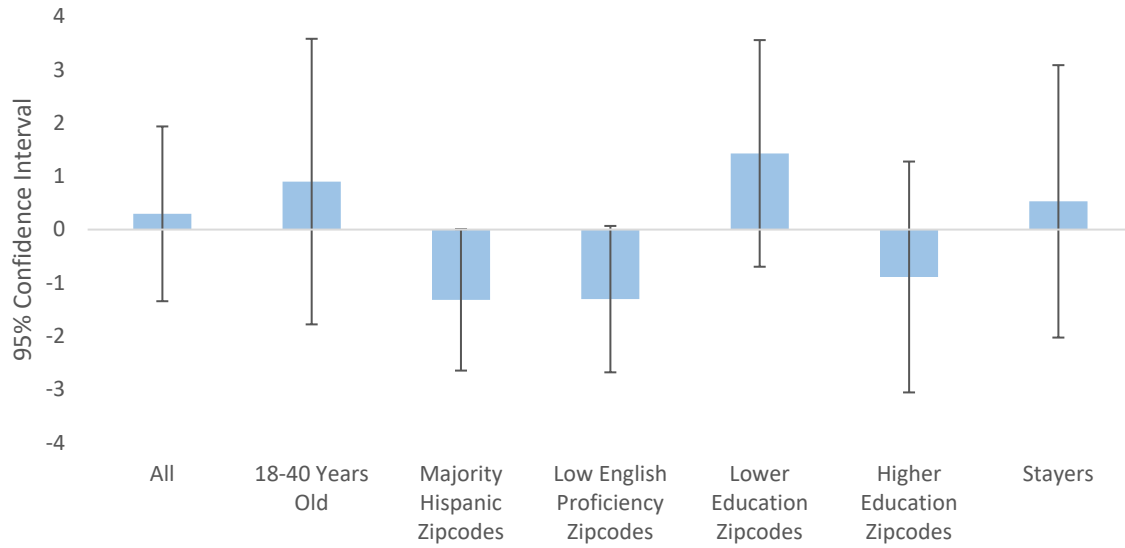
Source: Urban Institute credit bureau data.

Notes: The sample is restricted to residents of receiving and comparison communities observed in the credit bureau data between 2014 and 2020. Consumers in the receiving and comparison communities are defined based on their residence in August 2017. Receiving communities are five PUMAs in Central Florida: Osceola County (West), Orange County (South Central), Polk County (Northeast), Orange County (Southeast), and Osceola County (East). Comparison communities are Clark County (Central)—Paradise (Northwest) and Winchester; Atlantic County (East)—Atlantic City and Ventnor City; Clark County (South)—Henderson (East) and Boulder Cities; Los Angeles County (Central)—LA City (East Central/Central City and Boyle Heights); and Clark County (Central)—Whitney, Sunrise Manor (South), and Paradise (Northeast). Residential mobility is an indicator of whether the consumer resides in a different PUMA from their PUMA of residence in August 2017. In Panel B, 95% and 90% confidence intervals are reported based on standard errors clustered at the zip code of residence in August 2017.

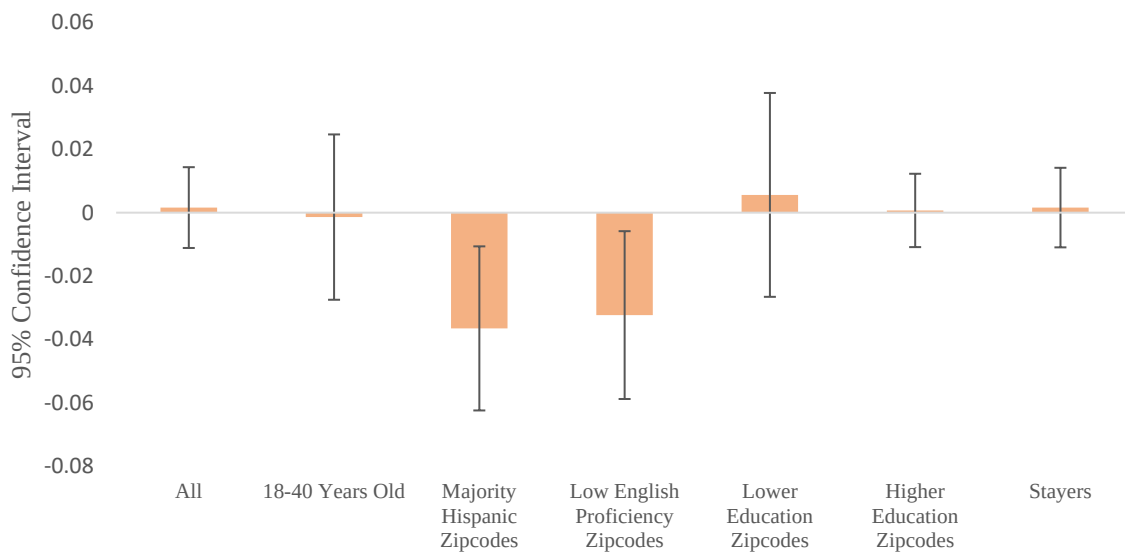
FIGURE 6

The Effect of Maria Migrants on Main Credit Health Outcomes by Group - Difference-in-Difference Specification

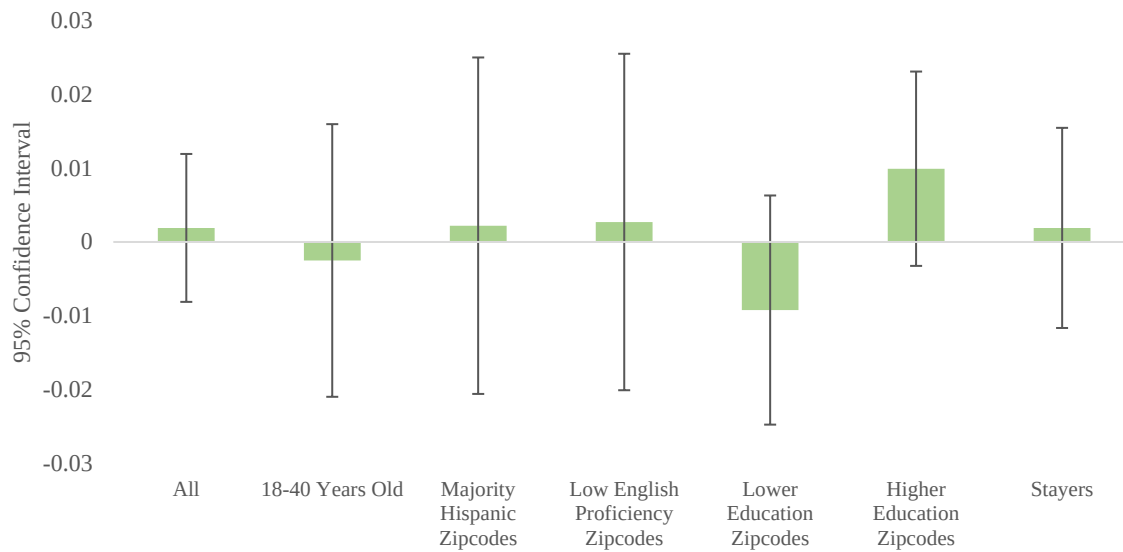
Panel A: Credit Scores



Panel B: Mortgage Delinquency



Panel C: Has Debt in Collections



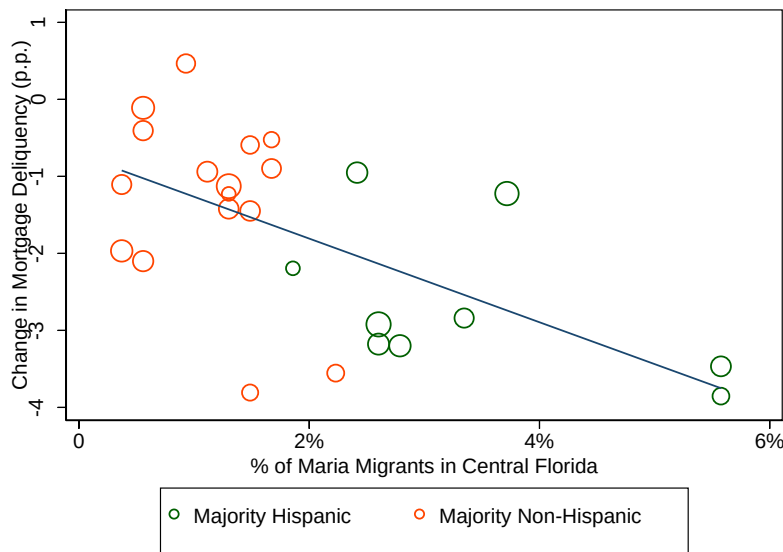
Source: 2013-2017 American Community Survey and Urban Institute credit bureau data.

Notes: The sample is restricted to residents of receiving and comparison communities observed in the credit bureau data between 2014 and 2020. Consumers in the receiving and comparison communities are defined based on their residence in August 2017. Credit scores are vantage scores. Mortgage delinquency is an indicator for mortgage holders with a mortgage 30 days or more past due. Debt in collections includes past-due credit lines that have been closed and charged off on the creditor's books, as well as unpaid bills reported to credit bureaus that the creditor is attempting to collect. Majority Hispanic zip codes are those where more than 50% of the population was Hispanic in 2017. Low proficiency zip codes are those where less than 50 percent of the population 18 years old or older either speaks English at home or speaks English well or very well in 2017. Lower (higher) education zip codes are those less (more) than 25 percent of the population 25 years old or older who have at least an associate degree. Stayers are consumers who reside in the same PUMA as the PUMA of residence in August 2017. We estimate difference-in-difference models and report the coefficient of the Receiving Community x Post 2017 variable in the bar chart. All models include PUMA of residence in 2017 fixed effects and year-fixed effects. 95% confidence intervals are based on standard errors clustered at the zip code of residence in August 2017. Regression tables are reported in Table A2.

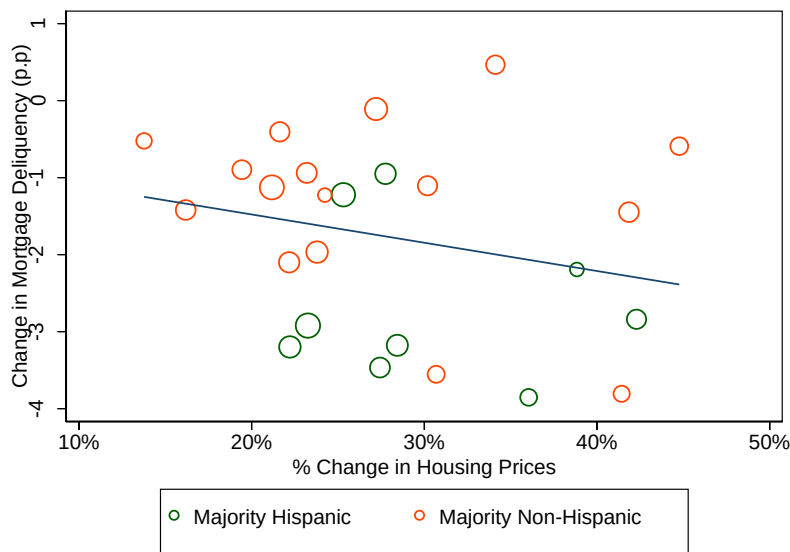
FIGURE 6

Maria Migrants and the Housing Market in Central Florida

Panel A: Migrant Influx and Change in Mortgage Delinquency at the Zip Code



Panel B: Change in Housing Price and Change in Mortgage Delinquency at the zip code



Source: 2013-2017 American Community Survey, Urban Institute credit bureau data, and Zillow monthly housing zip code data from March 2014 to February 2020.

Note: Each bubble represents a zip code in the receiving communities. Receiving communities are five PUMAs in Central Florida: Osceola County (West), Orange County (South Central), Polk County (Northeast), Orange County (Southeast), and Osceola County (East). The size of each bubble is proportional to the number of mortgage holders in that zip code in August 2017. The sample is restricted to zip codes with more than 50 mortgage holders. Change in mortgage delinquency is the percentage point difference in the mortgage delinquency rate between August 2015-2017 and August 2018-2020. Percent of Maria Migrants in Central Florida is the percent of Maria Migrants that each zip code received by 2019 in relation to all migrants to the receiving communities. Percent change in housing prices is the percentage difference in average housing values between August 2015-2017 and August 2018-2020.

APPENDIX

TABLE A1

Descriptive Statistics: Receiving and Comparison Communities in August 2017

	Receiving Communities	Comparison Communities
Community-level characteristics		
% Hispanic	42%	40%
% Employed in construction	7%	6%
% Employed in accommodation and food	15%	19%
% Employed in entertainment	9%	10%
Consumer-level characteristics		
% Subprime consumers	34%	33%
Mortgage delinquency rate	3%	3%
% With debt in collections	44%	40%
Number of consumers	10,502	7,323

Sources: 2017 American Community Survey and Urban Institute credit bureau data.

Notes: The sample is restricted to consumers observed in the credit bureau data between 2014 and 2020. Receiving communities are five PUMAs in Central Florida: Osceola County (West), Orange County (South Central), Polk County (Northeast), Orange County (Southeast), and Osceola County (East). Comparison communities are Clark County (Central)—Paradise (Northwest) and Winchester; Atlantic County (East)—Atlantic City and Ventnor City; Clark County (South)—Henderson (East) and Boulder Cities; Los Angeles County (Central)—LA City (East Central/Central City and Boyle Heights); and Clark County (Central)—Whitney, Sunrise Manor (South), and Paradise (Northeast). Subprime consumers have a vantage score below 600. Mortgage delinquency is the share of mortgage holders with a mortgage 30 days or more past due.

TABLE A2

The Effect of Maria Migrants on Credit Health Outcomes- Robustness Checks, Event Study**Panel A –Peri, Rury, and Wiltshire (2022) synthetic cohort approach**

Dependent Variable	Credit Score	Mortgage Delinquency	Has Debt in Collections	PUMA Mobility
<i>Before Hurricane Maria</i>				
Orlando CZ x 2014	0.3380 (0.5907)	0.0119*** (0.0040)	-0.0061* (0.0036)	0.0738*** (0.0088)
Orlando CZ x 2015	0.7623 (0.4842)	0.0087*** (0.0032)	-0.0044 (0.0031)	0.0582*** (0.0072)
Orlando CZ x 2016	0.1467 (0.3990)	0.0036 (0.0026)	0.0053* (0.0027)	0.0376*** (0.0052)
<i>Baseline 2017</i>				
<i>After Hurricane Maria</i>				
Orlando CZ x 2018	0.6980* (0.3931)	-0.0026 (0.0023)	-0.0070*** (0.0023)	0.0309*** (0.0075)
Orlando CZ x 2019	0.3546 (0.5920)	-0.0012 (0.0025)	0.0001 (0.0028)	0.0474*** (0.0092)
Orlando CZ x 2020	1.3010* (0.7589)	-0.0045* (0.0026)	0.0058* (0.0032)	0.0602*** (0.0104)
Observations	928,263	278,556	933,702	933,702
Mean Outcome, Control Group in 2017	682.6	0.017	0.320	0.0
Pre-trend F-test (p-value)	1.22	3.29	4.41	23.41

Source: Urban Institute credit bureau data.

Notes: CZ = Commuting zone. The sample is restricted to residents of the Orlando CZ and the nine comparison CZs observed in the credit bureau data between 2014 and 2020. Consumers in the Orlando CZ and comparison CZs are defined based on their residence in August 2017. The comparison CZs and their respective weights in the sample are Fort Walton Beach-Pensacola, FL (2.7%); Fresno-Visalia-Tulare-Parterville, CA (5.3%); Las Vegas, NV-AZ (6.5%); Boise City, ID (6.7%); El Paso, TX-Las Cruces, NM (7%); Nashville, TN (11%); Provo- Orem, UT (15.3%); Fayetteville-Springdale-Rogers, AR (18.6%); and Gainesville, GA (26.9%). Credit scores are vantage scores. Mortgage delinquency is an indicator for mortgage holders with a mortgage 30 days or more past due. Debt in collections includes past-due credit lines that have been closed and charged off on the creditor's books and unpaid bills reported to credit bureaus that the creditor is attempting to collect. PUMA mobility is an indicator of whether the consumer resided in a different PUMA from their PUMA of residence in August 2017. All models include PUMA of residence in 2017 fixed effects and year-fixed effects. The pre-trend F-test provides a statistical test for whether the coefficients of the interaction between Orlando CZ and the years prior to Hurricane Maria are jointly equal to zero. Standard errors clustered at the zip code of residence in August 2017. *** p<0.01, ** p<0.05, * p<0.1

Panel B – Receiving zip codes approach

Dependent Variable	Credit Score	Mortgage Delinquency	Has Debt in Collections	PUMA Mobility
<i>Before Hurricane Maria</i>				
Receiving Zip codes x 2014	-1.1103 (1.5555)	0.0134 (0.0156)	-0.0023 (0.0104)	0.0490 (0.0306)
Receiving Zip codes x 2015	0.8237 (1.3295)	0.0038 (0.0146)	-0.0120* (0.0064)	0.0283 (0.0257)
Receiving Zip codes x 2016	0.6313 (0.8768)	-0.0019 (0.0117)	-0.0100 (0.0075)	0.0193 (0.0154)
Baseline 2017				
<i>After Hurricane Maria</i>				
Receiving Zip codes x 2018	0.7594 (0.8336)	-0.0115* (0.0062)	-0.0006 (0.0049)	0.0108 (0.0144)
Receiving Zip codes x 2019	0.1666 (1.1952)	-0.0026 (0.0084)	-0.0007 (0.0059)	0.0110 (0.0197)
Receiving Zip codes x 2020	0.2321	-0.0043	0.0080	0.0092
Receiving Zip codes x 2014	(1.5791)	(0.0088)	(0.0074)	(0.0240)
Observations	73,424	15,510	74,025	74,025
Mean Outcome, Control Group in 2017	658.7	0.025	0.372	0.0
Pre-trend F-test (p-value)	1.01	0.81	2.50	5.16

Source: Urban Institute credit bureau data.

Notes: The sample is restricted to residents of the ten zip codes that received the most Maria migrants and the ten comparison zip codes observed in the credit bureau data between 2014 and 2020. Receiving zip codes are the ten zip codes in the continental U.S. that received the most Maria migrants by August 2019. Comparison zip codes were chosen using a propensity score matching based on the following baseline characteristics: the share of the Hispanic population; the share of workers employed in entertainment, food and accommodation, and construction; and the share of subprime consumers. Consumers in the receiving and comparison zip codes are defined based on their residence in August 2017. Credit scores are vantage scores. Mortgage delinquency is an indicator for mortgage holders with a mortgage 30 days or more past due. Debt in collections includes past-due credit lines that have been closed and charged off on the creditor's books and unpaid bills reported to credit bureaus that the creditor is attempting to collect. PUMA mobility is an indicator of whether the consumer resided in a different PUMA from their PUMA of residence in August 2017. All models include PUMA of residence in 2017 fixed effects and year-fixed effects. The pre-trend F-test provides a statistical test for whether the coefficients of the interaction between Receiving zip codes and the years prior to Hurricane Maria are jointly equal to zero. Standard errors clustered at the zip code of residence in August 2017. *** p<0.01, ** p<0.05, * p<0.1

TABLE A3

The Effect of Maria Migrants on Credit Health Outcomes by Group- Difference-in-Difference Specification

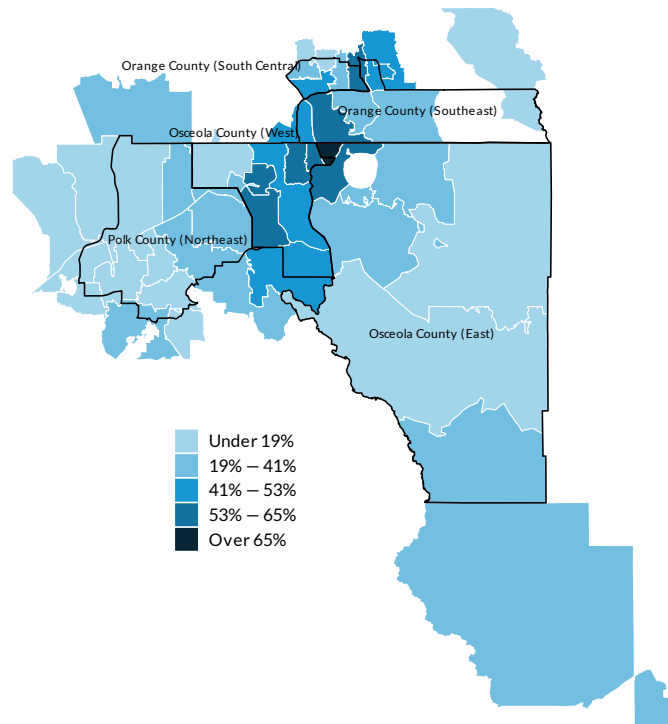
	Group						
	All	18-40 Years Old	Majority Hispanic Zip code	Low English Proficiency Zip code	Lower Education Zip code	Higher Education Zip code	Stayers
Dependent Variable: Credit Score							
Receiving Community x Post 2017	0.2954 (0.8369)	0.9006 (1.3675)	-1.3197* (0.6771)	-1.3058* (0.7010)	1.4293 (1.0852)	-0.8901 (1.1055)	0.5295 (1.3044)
Observations	123,917	43,760	39,440	38,284	47,707	76,210	101,506
Mean Outcome, Control Group in 2017	657.5	622.5	652.6	652.6	639.5	674.7	657.5
Dependent Variable: Mortgage Delinquency							
Receiving Community x Post 2017	0.0016 (0.0065)	-0.0014 (0.0133)	-0.0365** (0.0132)	-0.0323** (0.0135)	0.0056 (0.0164)	0.0007 (0.0059)	0.0052 (0.0064)
Observations	29,997	7,335	8,577	8,318	8,771	21,226	26,104
Mean Outcome, Control Group in 2017	0.026	0.025	0.014	0.014	0.027	0.026	0.026
Dependent Variable: Has Debt in Collections							
Receiving Community x Post 2017	0.0019 (0.0051)	-0.0025 (0.0094)	0.0022 (0.0116)	0.0027 (0.0116)	-0.0092 (0.0079)	0.0099 (0.0067)	0.0003 (0.0069)
Observations	124,775	44,122	39,774	38,612	48,160	76,615	102,167
Mean Outcome, Control Group in 2017	0.397	0.486	0.406	0.406	0.471	0.326	0.397

Source: 2013-2017 American Community Survey and Urban Institute credit bureau data.

Notes: The sample is restricted to residents of receiving and comparison communities observed in the credit bureau data between 2014 and 2020. Credit scores are vantage scores. Mortgage delinquency is an indicator for mortgage holders with a mortgage 30 days or more past due. Debt in collections includes past-due credit lines that have been closed and charged off on the creditor's books, as well as unpaid bills reported to credit bureaus that the creditor is attempting to collect. Majority Hispanic zip codes are those where more than 50% of the population was Hispanic in 2017. Low proficiency zip codes are those where less than 50 percent of the population 18 years old or older either speaks English at home or speaks English well or very well in 2017. Lower (higher) education zip codes are those less (more) than 25 percent of the population 25 years old or older who have at least an associate degree. Stayers are consumers who reside in the same PUMA as the PUMA of residence in August 2017. All models include PUMA of residence in 2017 fixed effects and year-fixed effects. Reported standard errors in parentheses clustered at the zip code level.

FIGURE A1

Percent of Hispanic Population in Receiving Communities before Hurricane Maria by zip code



Source: 2013-2017 American Community Survey.

Notes: Receiving communities are five PUMAs in Central Florida that received the most Maria Migrants in the US: Osceola County (West), Orange County (South Central), Polk County (Northeast), Orange County (Southeast), Osceola County (East).