Fleeing the Premium: Climate-Driven Insurance Affordability and U.S. Internal Migration

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Abstract

This paper provides the first national evidence that rising homeowners insurance premiums are a significant push factor in U.S. internal migration. Using county-level premium data between 2016 and 2023, we find that a one-standard-deviation widening of the origin-destination premium growth differential (about 10 percentage points) increases bilateral migration by approximately 1.3 persons per corridor-year. The effect is driven by origin-side premium growth, a push factor; destination-side growth exerts no significant pull. The response is about four times stronger in counties with a $3,000 premium bill than in counties with a $1,000 bill, which indicates an affordability threshold. In contrast, actual catastrophe damages *reduce* out-migration, consistent with a possible "disaster trap" that impedes household mobility. The findings highlight an underappreciated channel of climate adaptation: not the physical destruction of homes, but the gradual erosion of housing affordability as climate risks are priced into insurance markets.

Keywords: homeowners insurance, climate change, internal migration, gravity model, insurance affordability

JEL Classification: G22, G52, R23, Q54, R31

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1. Introduction

Climate change is reshaping the geography of the United States. Rising temperatures, intensifying natural disasters, and sea-level rise are altering where Americans can afford to live, work, and own homes. Climate-related wildfires, in particular, have intensified dramatically in recent years: California has experienced several major wildfires since 2018, and the 2025 Los Angeles wildfires (the Palisades and Eaton Fires) became the costliest on record, generating approximately $40 billion in insured losses and severely disrupting insurance markets (Dixon, Anderson, and Morikawa, 2025). While a growing literature documents how climate change drives migration through temperature extremes, agricultural productivity, and direct disaster damages, one important channel has received limited attention: the role of rising homeowners insurance premiums as a direct driver of internal migration.

The U.S. homeowners insurance market is in crisis. Average county-level homeowners insurance premiums rose from $1,514 in 2014 to $2,531 in 2024, with increases accelerating after 2022 in the wake of severe wildfire seasons. Between 2020 and 2024, average premiums increased by more than 40 percent, far outpacing general inflation, and in high-risk states the burden is far more severe. In response to mounting climate-driven losses, insurers are raising premiums, reducing coverage, and withdrawing from high-risk markets altogether (Hemmati, Gray, and Bowen, 2025). Testifying before the Senate Banking Committee in February 2025, then-Federal Reserve Chair Jerome Powell warned that if current trends continue, there will be regions of the country where households cannot obtain mortgages or insurance, fundamentally altering the geography of American housing.[1]

This crisis represents a distinct mechanism of climate-driven spatial reallocation. Unlike

[1]Semiannual Monetary Policy Report to the Congress, testimony before the Committee on Banking, Housing, and Urban Affairs, U.S. Senate, February 11, 2025; the remarks were made in response to questions from Senator Tina Smith. The full testimony is available at federalreserve.gov.

one-time disaster damages, premium increases are recurring, predictable financial burdens that compound over time. They affect not only households that have experienced direct property damage but also those in broader regions that insurers reprice due to common exposure to climate risk, which is a well-documented regional spillover in the homeowners insurance market (Oh, Sen, and Tenekedjieva, 2026a); when premiums rise beyond affordability, households face a difficult decision: absorb the cost, reduce coverage, or relocate. Housing-related considerations are consistently the leading reason Americans give for moving (U.S. Census Bureau, 2023, 2024), and insurance premiums are an increasingly salient component of the cost of staying put.

This paper provides the first national evidence that rising homeowners insurance premiums, driven by climate-risk repricing, are a significant push factor in U.S. internal migration. We leverage the county-level insurance premium dataset from Keys and Mulder (2024), constructed from CoreLogic mortgage escrow data, combined with county-to-county migration flows compiled by the Internal Revenue Service (IRS) from year-to-year changes in mailing addresses on individual tax returns. Our empirical strategy is a panel gravity model of bilateral migration flows with origin-destination pair fixed effects and year fixed effects, following Olney and Thompson (2024). The key explanatory variable is the percentage premium growth differential between origin and destination counties, which captures the direction and magnitude of the relative affordability shock facing potential movers. We control for equilibrium premium levels at both ends of the corridor, origin and destination income, population, and a battery of additional county characteristics. Throughout the paper, we use the term corridor to denote a directional origin-destination pair of counties, and we use the two terms interchangeably.

Our analysis yields four main findings. First, there is a positive association between the origin-destination premium growth differential and bilateral migration (baseline coefficient 0.126, significant at the 5 percent level): a one-standard-deviation widening of the differential (about 10 percentage points) is associated with approximately 1.3 additional migrants per

corridor-year, about 0.5 percent of the mean corridor flow of 230 persons. Though the marginal effect is modest at the corridor level, the aggregate effect is about 62,000 additional relocations per year, given roughly 49,000 corridors active in an average year. Second, the effect is asymmetric: when origin and destination premium growth are entered separately, only origin-side growth matters (0.286, significant at the 1 percent level), while destination-side growth is small and statistically indistinguishable from zero (0.036). Rising premiums push households out; lower premium growth elsewhere does not, by itself, pull them in. Third, the effect exhibits a pronounced affordability threshold: the interaction between the premium growth differential and the origin premium level is positive and significant, implying that the same percentage-point gap generates roughly four times the migration response in a county with a \$3,000 decision-time premium as in a county with a \$1,000 premium. Corridors originating in high-premium counties show the strongest response. Fourth, actual natural catastrophe damages have the opposite sign: a \$1,000 increase in per-capita property damage at the origin significantly *reduces* out-migration, consistent with a possible "disaster trap": damaged homes may be difficult to sell at full value, local labor markets are disrupted, and households may delay moving while managing insurance claims, rebuilding, and disaster aid. Insurance repricing, by contrast, is a forward-looking financial signal that reaches households before disaster strikes and gives them time to move.

We conduct a battery of robustness exercises. Because state membership is constant within a corridor, the pair fixed effects intrinsically absorb all time-invariant state-level regulatory regimes, such as prior-approval rate systems, so no separate state fixed effects are required. Controlling for origin catastrophe losses, mortgage reliance, and origin and destination unemployment barely moves the premium growth coefficient. Restricting the sample to non-contiguous county pairs, which breaks the correlation between premium shocks and shared local labor markets, yields an essentially identical estimate (0.134, significant at the 5 percent level). The results are likewise robust to estimating the model by Poisson pseudo-maximum likelihood, which accounts for the count nature of migration flows. Excluding

California and Florida, the two states most affected by the insurance crisis, attenuates the constrained premium growth differential, since these markets supply much of its identifying variation, but the core mechanism still holds: origin-side premium growth remains a positive and statistically significant driver of out-migration across the rest of the country.

To address remaining endogeneity concerns, we implement an instrumental variables strategy. The instrument is the product of the annual change in the national reinsurance rate-on-line, measured by the Guy Carpenter Global Property Catastrophe Rate-on-Line Index, and the origin-destination differential in FEMA National Risk Index scores. We choose this instrument because it exploits variation in reinsurance costs that are priced in national and even global markets, thereby isolating premium variation that originates in reinsurance-market repricing rather than in local economic conditions or local migration pressures. The instrument satisfies the relevance condition because reinsurance rate increases pass through directly into homeowners insurance premiums, and this pass-through is stronger along corridors where the origin county is more hazard-exposed than the destination, generating substantial variation in premium growth differentials. The IV regression results confirm the positive relationship between the premium growth differential and cross-county migration, supporting a causal interpretation of the push effect.

This paper contributes to four strands of literature, spanning climate adaptation, internal migration, insurance markets for climate risk, and household finance. We fill a gap at their intersection by providing the first national evidence linking insurance premium dynamics to cross-county migration. Relative to the climate adaptation and migration literature, which documents relocation responses to temperature extremes, sea-level rise, and direct disaster damages (Boustan, Kahn, and Rhode, 2012; Cattaneo and Peri, 2016; Beine and Parsons, 2015), we identify a distinct financial channel: the recurring cost of insuring a home rather than the one-time destruction of it. Ours is the first estimate of the effect of insurance premium shocks on bilateral cross-county migration, and the first to show that the effect operates primarily as an origin-side push: rising premiums drive households out,

while slower premium growth elsewhere exerts no statistically significant pull. The contrast with the migration-reducing association of realized disaster damages further clarifies which climate costs move people and which appear to hold them in place. Relative to the internal migration literature, which emphasizes wage and housing-cost differentials as the determinants of bilateral flows (Olney and Thompson, 2024), we show that insurance affordability is an independent determinant of those flows even after absorbing all time-invariant bilateral migration costs.

Relative to the literature on insurance markets for climate risk, which studies how that risk is priced and regulated (Sen, 2021; Fried, 2022; Keys and Mulder, 2024; Oh, Sen, and Tenekedjieva, 2026a, 2026b), we provide the first instrumental-variables estimate of the migration response to premium repricing, exploiting reinsurance-market repricing to isolate premium variation that is not driven by local economic conditions. Relative to the household finance literature, which shows that climate shocks strain household budgets through mortgage delinquency and damaged credit (Biswas, Hossain, and Zink, 2023; An, Gabriel, and Tzur-Ilan, 2026), we provide the first evidence of an affordability threshold in location choice: the migration response is roughly four times stronger in corridors originating in high-premium counties. This aggregate pattern is strongly consistent with household budget constraints, under which the strongest sensitivity to recent repricing comes from precisely the counties with the highest decision-time premium burden. Together, these results establish insurance affordability as a previously underappreciated link between climate risk and household financial decision-making.

The policy implications are immediate. States are beginning to adopt forward-looking insurance pricing that explicitly incorporates climate risk. California's 2025 Sustainable Insurance Strategy, for example, permits insurers to use catastrophe models that include wildfire smoke damage. Under this new paradigm, regulators face a critical trade-off: more accurate risk-based pricing improves market sustainability, but it may also accelerate climate-driven population shifts out of precisely the regions where premiums rise fastest.

Our results speak to both sides of this trade-off. First, the finding that households relocate in response to rising premiums is consistent with adverse selection (Wagner, 2022). If the households that move in response to repricing were those with the greatest financial flexibility, the pool that remains would be those less able to absorb further premium shocks. Sustained out-migration could then potentially erode the premium base of state insurance markets at the very time regulators rely on that base to fund residual-market backstops.[2] Whether such erosion materializes, however, depends on forces our bilateral gross flows cannot measure: the moves must be net departures from the state rather than within-state reallocations, and departing owners must not be replaced by new buyers taking out equivalent policies. Even short of outright erosion, this sorting could alter the spatial composition of risk within the market, making the long-run sustainability of risk-based pricing harder to achieve. Adverse selection of this kind is a classic source of long-run sustainability problems in insurance markets, and the standard private-sector remedies, such as better risk classification and higher premiums, are unlikely to resolve it, much as in health insurance markets. Even the experience with a government-backed program for a single peril is not encouraging: the National Flood Insurance Program has struggled to remain financially viable (Kousky and Kunreuther, 2014). The premium-driven sorting we document is the early stage of exactly this dynamic. Second, the results bear on household financial resilience. Households that cannot or do not move must absorb premium increases through reduced coverage, depleted savings, or mortgage delinquency, so the migration margin we document likely understates the full financial strain of repricing. Understanding who moves, who stays, and how each group copes is essential for designing insurance regulation that remains sustainable as climate risk grows.

The remainder of the paper is organized as follows. Section 2 reviews the institutional

[2]California, for example, imposes a one-year moratorium on policy non-renewals in areas affected by declared wildfire disasters (California Insurance Code Section 675.75), but no such moratorium applies to premium increases. State FAIR plans serve as insurers of last resort, and in several states these plans have grown so rapidly that their long-run sustainability is in question (Boomhower, Fowlie, Gellman, and Plantinga, 2024; Sastry, Sen, and Tenekedjieva, 2025).

background and related literature. Section 3 presents the empirical methodology and data. Section 4 reports the empirical results. Section 5 concludes.

2. Institutional Background and Related Literature

2.1 Homeowners Insurance and the Climate Crisis

The economic impact of climate-related natural catastrophes, such as hurricanes and wildfires, has increased substantially in recent years. In particular, the frequency and severity of wildfire losses on the West Coast have risen sharply over the past decade. Climate-related wildfires have severely disrupted California's homeowners insurance market, driving surging premiums, widespread non-renewals, insurer withdrawals from high-risk areas, and growing reliance on the state FAIR Plan. This crisis has raised serious concerns about long-term market sustainability and prompted calls for structural reforms, including the creation of an independent authority with public-private risk financing through reinsurance layering and statewide risk pooling, to restore stability, solvency, affordability, and resilience (Kelly et al., 2025; Dixon et al., 2025).

Homeowners insurance pricing is a complex process shaped by the interaction of proprietary risk models, state regulation, and reinsurance markets, and the pricing of climate risk in particular is heavily influenced by supply-side factors. Insurers use proprietary catastrophe models to set rates, which must then be filed with and approved by state insurance commissioners (Sen, 2021; Oh, Sen, and Tenekedjieva, 2026a). Reinsurance markets, federal policy interventions, and cross-subsidization requirements further shape the pass-through of climate risk to household costs (Fried, 2022; Wagner, 2022).

Recent work by Keys and Mulder (2024) provides the most comprehensive evidence to date on the magnitude and distribution of premium increases. Using mortgage escrow data, they document that average homeowners insurance premiums rose by roughly one-third between 2020 and 2023, with the largest increases concentrated in counties exposed to wildfire and hurricane risk, and that a substantial share of the premium increase in high-catastrophe-

loss areas can be explained by reinsurance cost pass-through. Their county-level premium index forms the foundation of our analysis of how these premium shocks affect household migration decisions.

Rising premiums and climate-driven property losses impose substantial costs on U.S. households beyond the insurance bill itself. Biswas, Hossain, and Zink (2023) show that damaged properties face sharp short-term financial stress, with mortgage delinquencies rising by up to 4 percentage points and prepayments by up to 16 percentage points, largely driven by insurance payouts and often linked to underinsurance. In contrast, Issler et al. (2024) find that wildfires can paradoxically strengthen local housing markets over time, with house prices in burned areas rising as insurance enables coordinated rebuilding to larger, higher-quality, and often more fire-resistant homes. Baylis and Boomhower (2025) highlight the effectiveness of climate adaptation, demonstrating that California's mandated wildfire building codes reduce property destruction by about 40 percent and generate positive spillovers by limiting fire spread to neighboring structures. Secondary perils such as wildfire smoke and distant air pollution exert additional indirect effects on household finances, even for properties not directly burned: An, Gabriel, and Tzur-Ilan (2026) show that distant wildfire-attributed PM2.5 exposure worsens household financial well-being by increasing credit card and personal loan delinquencies, while Lopez and Tzur-Ilan (2025) and Lopez, Murphy, Tzur-Ilan, and Wilkoff (2025) document effects on rents, house prices, and municipal borrowing costs.

Climate change is also reshaping how insurance risk itself is priced. California's 2025 Sustainable Insurance Strategy, the most significant regulatory shift since Proposition 103 (1988), now permits insurers to use forward-looking wildfire catastrophe models that explicitly incorporate smoke damage (soot, ash, and contamination) into vulnerability functions and projected losses. While the reforms are expected to raise premiums in high-risk zones, they also reward mitigation and promote rate stability by moving beyond historical loss data.

Yet even where regulators recognize the need for accurate climate-risk pricing, institu-

tional frictions impede adjustment. Rate-setting in U.S. homeowners insurance is subject to extensive state-level regulation, and insurers in highly regulated states adjust rates less frequently and by less than actuarially warranted after climate losses, partly compensating by raising rates in less regulated states; over time, premiums decouple from the underlying risk, distorting risk sharing across states and increasing insurer exit from the most regulated markets (Oh, Sen, and Tenekedjieva, 2026a). Regulatory limits on insurers' risk management further slow the repricing of climate risk (Sen, 2021), and adverse selection can erode the risk pooling on which sustainable insurance markets depend (Wagner, 2022). The pricing of climate risk into homeowners insurance is therefore a highly dynamic and contested process whose consequences depend critically on how households respond to the resulting premium increases, a margin on which systematic evidence remains scarce. Understanding this interaction between insurance repricing and household behavior calls for further research. Our paper takes the next step: we ask whether households respond to climate-driven insurance repricing by relocating.

2.2 Climate Adaptation and Internal Migration

The economics of internal migration has long emphasized origin-destination differentials in wages, housing costs, and amenities as determinants of relocation decisions. In the canonical gravity model of migration, flows between two locations are increasing in the economic attractiveness of the destination relative to the origin and decreasing in the distance and fixed costs of moving (Anderson, 2011; Beine, Bertoli, and Moraga, 2016). A recent empirical literature applies gravity models to internal migration, leveraging origin-destination pair fixed effects to absorb time-invariant migration costs while identifying the effects of time-varying push and pull factors for U.S. cross-county flows (Olney and Thompson, 2024) and, in international settings, for internal migration in Spain (Maza et al., 2019) and Ecuador (Royuela and Ordonez, 2018). Olney and Thompson (2024), in particular, document the decline of U.S. internal migration using bilateral county-to-county IRS flows, and find that migration responds systematically to origin and destination wages and housing costs, consistent with

standard spatial equilibrium models.

A growing literature documents that climate change is reshaping population geography within the United States. Rising temperatures, sea-level rise, and intensifying natural disasters are altering the spatial distribution of economic opportunities and living costs, prompting households to reconsider their residential choices (Boustan, Kahn, and Rhode, 2012; Cattaneo and Peri, 2016; Cattaneo et al., 2019). A parallel strand examines how natural disasters affect migration flows: Groschl and Steinwachs (2017) and Beine and Parsons (2015) show that natural hazard damages significantly influence internal migration, and Coniglio and Pesce (2015) use Poisson pseudo-maximum-likelihood gravity models to show that natural hazards create both push effects from damaged origins and pull effects toward safer destinations. Flood risk has been shown to shape long-run population projections (Shu et al., 2023), and recent survey evidence suggests that climate concerns have become an increasingly important factor in homeowners' relocation decisions: nearly half of American homeowners report considering moving due to climate-related concerns, and an overwhelming majority expect extreme weather events to damage their homes in the near future (Kin, 2026).

Climate change affects migration through several mechanisms. Direct property destruction from wildfires and hurricanes can render homes uninhabitable, forcing immediate displacement (Biswas, Hossain, and Zink, 2023; Issler et al., 2024). Yet the existing literature has focused overwhelmingly on the *physical* dimension of climate risk, such as flooded homes, burned properties, and destroyed infrastructure, rather than on the *financial* market responses that follow. The rising cost of homeowners insurance is a distinct channel through which climate change affects household budgets and, potentially, mobility: it is recurring, predictable, and forward-looking, and it reaches households that have never filed a claim.

Taken together, the two strands of literature reviewed above point to a clear gap. On the one hand, climate change is driving a rapid and geographically uneven repricing of homeowners insurance, with premiums rising fastest in precisely the high-risk areas where household

budgets are most exposed (Section 2.1). On the other hand, households demonstrably relocate in response to climate-driven changes in local economic conditions, living costs, and disaster risk (Section 2.2). What is missing is the link between them: no existing study examines whether the rising cost of homeowners insurance itself, a recurring, forward-looking, and increasingly salient component of the cost of staying put, induces households to move. This gap motivates the central question of this paper: do rising homeowners insurance premiums drive U.S. internal migration?

The evidence reviewed in Sections 2.1 and 2.2 leads naturally to our central hypothesis. The migration literature shows that households respond systematically to origin-destination differentials in wages, housing costs, and amenities. If households likewise treat insurance premiums as a salient component of the cost of staying put, then counties where premiums rise rapidly should lose residents along corridors toward counties where insurance costs rise more slowly. We therefore expect a positive association between homeowners insurance premium shocks and migration: the faster premiums rise at the origin relative to the destination, the larger the bilateral migration flow. Moreover, a given percentage increase weighs most heavily on households facing a high total insurance bill at the time of the migration decision, and that burden may itself be the product of recent rapid premium growth. We therefore expect this association to be strongest where the decision-time premium burden is highest, an affordability threshold that we test explicitly in Section 4.

3. Empirical Methodology and Data

3.1 A Panel Gravity Model of Migration

The gravity model is the standard empirical framework for analyzing bilateral flows between locations. Originating in the international trade literature (Anderson, 2011), the model posits that the flow between an origin and a destination is increasing in the economic masses of the two locations and decreasing in the frictions between them. In migration studies, the flow from origin o to destination d is modeled as a function of origin and destination

characteristics, such as income, population, amenities, and living costs, and of bilateral migration costs, which are typically proxied by distance, contiguity, and historical ties (Beine, Bertoli, and Moraga, 2016). The modern econometric implementation brings this structure to panel data: origin-destination pair fixed effects absorb all time-invariant bilateral frictions, year fixed effects absorb common shocks, and identification comes from time-varying push and pull factors within corridors (Olney and Thompson, 2024). Because bilateral migration flows are count-like, heteroskedastic, and bounded below by zero, the technical literature recommends Poisson pseudo-maximum likelihood estimation of the gravity equation in multiplicative form (Santos Silva and Tenreyro, 2006); we adopt this estimator as a robustness check in Section 4.4.

We estimate the effect of homeowners insurance premium growth differentials on bilateral county-to-county migration flows using a panel gravity model with high-dimensional fixed effects. To reduce the complexity of the estimating equations, we first define the one-year percentage premium changes at the origin and the destination as

$$\Delta P_{o,t-1} = \frac{P_{o,t-1} - P_{o,t-2}}{P_{o,t-2}} \times 100, \qquad \Delta P_{d,t-1} = \frac{P_{d,t-1} - P_{d,t-2}}{P_{d,t-2}} \times 100,$$

and then define the bilateral premium growth differential as

$$\Delta P_{od,t-1} = \Delta P_{o,t-1} - \Delta P_{d,t-1}.$$

Our baseline specification is:

$$\begin{aligned} M_{odt} = \alpha + \beta_1 \Delta P_{od,t-1} + \beta_2 \bar{P}_{o,t-1} + \beta_3 \bar{P}_{d,t-1} \\ + \gamma_1 X_{o,t-1} + \gamma_2 X_{d,t-1} + \phi_{od} + \tau_t + \epsilon_{odt}, \end{aligned}$$

where M_{odt} denotes the number of migrants moving from origin county o to destination county d in year t. The key independent variable, $\Delta P_{od,t-1}$, is the percentage premium growth differential, which captures the difference in one-year lagged *percentage* premium

growth between the origin and the destination (denoted *O_D_DIFF* in the tables). A positive value indicates that insurance costs are rising *proportionally* faster at the origin than at the destination, creating a financial incentive to relocate.

We express premium shocks in percentage growth terms because households respond to *proportional* affordability shocks, not absolute dollar changes. A $50 premium increase represents a 5 percent shock for a $1,000 policy but only a 1.7 percent shock for a $3,000 policy. Using percentage growth rates aligns the empirical specification with household salience and removes scale confounding from high-premium counties.

We include lagged premium levels ($\bar{P}_{o,t-1}$, $\bar{P}_{d,t-1}$) to control for equilibrium spatial sorting. High-premium counties such as coastal California and Florida are also high-amenity destinations that attract migrants for non-pecuniary reasons; the level controls absorb this equilibrium variation, allowing us to identify the marginal effect of premium growth shocks holding baseline attractiveness constant. Because the level at $t-1$ is the endpoint of the premium change from $t-2$ to $t-1$, the interaction in Table 5 identifies heterogeneity by the decision-time premium level rather than by an independently predetermined pre-shock baseline burden.

The vector X includes origin and destination household income and population. In extended specifications we add origin and destination unemployment rates, origin catastrophe property damage per capita, and the origin share of owner-occupied housing units with a mortgage. All regressors are lagged by one year to reflect the time required for migration decisions to respond to changing conditions (Olney and Thompson, 2024).

The fixed effects structure is designed to isolate within-corridor variation in relative insurance costs. We absorb time-invariant migration costs through origin-destination pair fixed effects (ϕ_{od}), which capture distance, geographic contiguity, same-state membership, cultural affinity, historical migration ties, and all other bilateral barriers that do not vary over our sample period. Year fixed effects (τ_t) absorb common national shocks including inflation, reinsurance cycles, and macroeconomic conditions. The pair fixed effects also ab-

sorb all time-invariant state-level institutions, including rate filings, prior-approval regimes, and residual markets such as state FAIR Plans (Oh, Sen, and Tenekedjieva, 2026a), because state membership is constant within each corridor; adding origin or destination state fixed effects would be mechanically redundant, as they are perfectly collinear with the pair effects. What this structure does not absorb are time-varying state-level shocks, such as changes in regulatory regimes; we note this limitation in Section 5.

To separate push from pull (i.e., to test whether the premium-migration relationship operates through origin-side push or destination-side pull), we replace the differential with the two growth rates separately:

$$M_{odt} = \alpha + \beta_o \Delta P_{o,t-1} + \beta_d \Delta P_{d,t-1} + \beta_2 \bar{P}_{o,t-1} + \beta_3 \bar{P}_{d,t-1} + \gamma_1 X_{o,t-1} + \gamma_2 X_{d,t-1} + \phi_{od} + \tau_t + \epsilon_{odt}.$$

Under the affordability hypothesis, $\beta_o > 0$: faster premium growth at the origin pushes households away. The destination-side coefficient β_d has an ambiguous sign in spatial equilibrium. Cheaper insurance elsewhere is attractive, but destination premium growth may also proxy for destination amenities and housing demand.

Finally, to examine whether the premium-migration relationship varies with the decision-time insurance burden (i.e., the affordability threshold), we estimate an augmented specification with an interaction between the premium growth differential and the origin premium level:

$$M_{odt} = \alpha + \beta_1 \Delta P_{od,t-1} + \beta_2 \left(\Delta P_{od,t-1} \times \bar{P}_{o,t-1} \right) + \beta_3 \bar{P}_{o,t-1} + \beta_4 \bar{P}_{d,t-1} + \gamma_1 X_{o,t-1} + \gamma_2 X_{d,t-1} + \phi_{od} + \tau_t + \epsilon_{odt}.$$

The interaction coefficient β_2 captures the affordability threshold effect: a one-percentage-point premium growth gap should have a larger marginal impact on migration when the origin county's decision-time premium is high, because households facing a larger total insurance bill at the moment of the move decision are closer to the limit of their budget.

3.2 Identification

Our identification strategy has four components. First, we use lagged premium growth $(t-1)$ to predict migration in year t, so that premiums are predetermined relative to the migration decision and concerns about reverse causality are mitigated. Second, our high-dimensional fixed effects absorb the most important confounding variation: the pair fixed effects absorb all time-invariant bilateral migration costs, such as distance, contiguity, and historical ties, while year fixed effects absorb common national trends, including the nation-wide reinsurance repricing cycle. Third, to mitigate the concern of omitted variable bias, we condition on origin and destination income, population, and unemployment, and on origin catastrophe losses, thereby isolating the insurance premium channel from general economic conditions and from the physical destruction channel.

The remaining threat to identification is that premium growth may be correlated with unobserved local economic shocks that also drive migration. We address this concern in three ways. First, we control for origin and destination unemployment rates and for origin catastrophe property damage per capita. Second, we restrict the sample to non-contiguous county pairs, which breaks the correlation between the origin premium shock and the destination's local labor market: for a non-adjacent destination, the origin's premium shock is plausibly exogenous to destination conditions. Third, we exploit the contrast with catastrophe damages: if premium growth merely proxied for realized climate disasters, origin damage should push migrants out as well. We show instead that damage significantly *reduces* out-migration, which is consistent with distinct channels. The opposite signs indicate that measured origin damage does not mechanically account for the premium coefficient, though premium growth may still capture omitted expected hazard, risk salience, housing-market effects, or insurance-market disruptions not measured by realized damage.

Fourth, we complement the fixed-effects strategy with an instrumental variables approach. We instrument the premium growth differential with the interaction between the annual change in the national reinsurance rate-on-line (ROL) index and the corridor's origin-

minus-destination differential in FEMA National Risk Index (NRI) hazard scores, $RENRI_D = \Delta ROL_t \times (NRI_o - NRI_d)$. The relevance of this instrument rests on the mechanics of insurance supply: reinsurance is the primary marginal cost of underwriting homeowner risk, reinsurance prices are set in national and global markets and harden sharply after major catastrophe years, and these cost increases are passed through to retail premiums disproportionately in counties with greater physical hazard exposure. Corridors whose origin is riskier relative to the destination should therefore experience wider premium growth differentials precisely when reinsurance rates rise, and we confirm this first-stage relationship in Section 4.5. The exclusion restriction requires that, conditional on the fixed effects and economic controls, the interaction of the national reinsurance cycle with the corridor's risk differential affects bilateral migration only through homeowners insurance premiums. This condition is plausible because each component of the instrument is separately absorbed: year fixed effects capture the national reinsurance pricing cycle itself, including its correlation with aggregate catastrophe shocks and macroeconomic conditions, while pair fixed effects capture the time-invariant NRI risk differential, which may shape long-run migration patterns on its own. The remaining identifying variation is the differential exposure of each corridor to a national input-price shock, which has no direct channel to bilateral migration other than the repricing of homeowners insurance. In particular, because one component of the instrument is a national price cycle and the other is a time-invariant risk score, the identifying variation is orthogonal by construction to state-year-specific policy actions or economic shocks, which are the class of confounders that could threaten the OLS estimates. To guard against the residual concern that reinsurance rates harden in the aftermath of major catastrophe years, when physical destruction could drive migration directly, we include origin catastrophe property damage per capita in both stages of the IV estimation.

All specifications use robust standard errors clustered at the origin county level to account for serial correlation in origin-specific shocks. We estimate the model using `reghdfe` (Correia, 2016), which implements the Guimaraes and Portugal (2010) algorithm for high-dimensional

fixed-effects estimation, and the instrumental variables model using its `ivreghdfe` extension.

3.3 Data Sources and Variable Construction

We utilize data from different sources in this study. Bilateral county-to-county migration flows come from the IRS Statistics of Income county migration datasets, which track domestic migration using year-to-year changes in mailing addresses reported on individual income tax returns (Form 1040). We construct an annual county-to-county migration matrix for U.S. counties in the 50 states and the District of Columbia, measuring migration intensity by the number of personal tax exemptions claimed (Olney and Thompson, 2024). The published IRS county-to-county flows used in this study end in 2023. The dependent variable, M_{odt}, is the number of migrants moving from origin o to destination d in year t. Consistent with IRS disclosure rules, the minimum observed flow is 20 migrants.

County-level average homeowners insurance premiums are from Keys and Mulder (2024), who construct a county-level insurance premium index from CoreLogic LLMA mortgage escrow data. Homeowners insurance is a mandatory requirement for nearly all federally backed mortgage loans, and premiums are inferred by isolating the insurance component of total monthly escrow payments, by subtracting known principal, interest, and property tax amounts, with loan fixed effects holding constant time-invariant property and borrower characteristics. County-level expenditures are obtained by averaging ZIP-code-level values within each county (housing-unit weighted). Over our sample period, the average county premium rose from \$1,514 in 2014 to \$2,531 in 2024, with the increase accelerating after 2022, and with pronounced geographic concentration in the Southeast Gulf Coast, the Atlantic seaboard, Texas and Louisiana, and California.

From these premiums we construct the one-year percentage growth rate $\Delta P_{c,t} = (P_{c,t} - P_{c,t-1})/P_{c,t-1} \times 100$ for each county c, as defined in Section 3.1, expressed in percentage points (denoted *O_MCHG* and *D_MCHG* for origin and destination, respectively, in the tables). The key independent variable is the bilateral differential in these growth rates, *O_D_DIFF* $=$ *O_MCHG* $-$ *D_MCHG*.

The instrument used in Section 4.5 combines two additional data sources. The reinsurance rate-on-line (ROL) series is the Guy Carpenter Global Property Catastrophe Rate-on-Line Index (Guy Carpenter, various years), which measures the price of property-catastrophe reinsurance, defined as the ratio of reinsurance premium to the limit purchased, and hardens sharply after major catastrophe years, raising the marginal cost of underwriting homeowner risk nationwide. County-level hazard exposure comes from FEMA's National Risk Index (NRI), which scores each county's expected annual loss from natural hazards. The instrument *RENRI_D* interacts the annual change in the national ROL index with the origin-minus-destination NRI score differential, so that it predicts corridor-level premium growth differentials through the reinsurance cost channel rather than through local migration conditions.

County-level household income and population come from the American Community Survey (ACS). County unemployment rates come from the Bureau of Labor Statistics (BLS) Local Area Unemployment Statistics. The share of owner-occupied housing units with a mortgage (*O_MORTGAGE*) is computed from ACS housing data; it proxies for the share of households contractually required to carry homeowners insurance, and hence for the fraction of the local population directly exposed to premium repricing. All economic controls are lagged by one year to align with the timing of migration decisions.

County-level property damage from natural hazards comes from SHELDUS (Spatial Hazard Events and Losses Database for the United States). We use total property damage per capita (in thousands of dollars, denoted *O_DMGPC*) at the origin county as a control for direct disaster impacts that may confound the premium-migration relationship.

3.4 Sample and Descriptive Statistics

Our final estimation sample includes 345,325 origin-destination-year observations covering 60,448 bilateral corridors formed by 2,590 origin counties and 2,582 destination counties across the 50 states and the District of Columbia. The seven-year sample window is dictated by data availability and variable construction. The premium data span 2014–2024, but one

year (2014) is consumed in computing the annual premium growth rate and another in lagging the growth rate by one year, so the lagged premium growth regressor spans 2015–2022. The IRS county-to-county migration data end in 2023, so migration outcomes are measured from 2016 onward. Because the IRS suppresses flows below its disclosure threshold, the panel is unbalanced: the average corridor appears in about 5.7 of the seven years.

Table 1 presents summary statistics. The dependent variable is the bilateral migration flow (*MIGRATION*), with a mean of 230 persons per corridor-year and substantial heterogeneity: the median corridor carries 77 migrants, the 95th percentile 677, and the largest corridor 49,355. The mean origin (destination) average homeowners insurance premium growth rate (*O_MCHG* and *D_MCHG*) is 1.92 (1.99) percent per year with a standard deviation of about 7.8 percentage points, indicating significant cross-county variation in insurance cost trajectories. The key independent variable, the origin-destination premium growth differential (*O_D_DIFF*), is centered near zero with a standard deviation of 10.0 percentage points. Mean premium levels (*O_PREMIUM* and *D_PREMIUM*) are about \$1,790 at origins and \$1,778 at destinations. Origin catastrophe damage per capita (*O_DMGPC*) is zero for more than three-quarters of corridor-years but reaches \$87,331 at the maximum, reflecting the heavy right tail of disaster losses. The average corridor spans 551 miles (*DISTANCE*); 19.1 percent of corridors connect contiguous counties (*CONTI*) and 43.6 percent connect counties in the same state (*SAMESTATE*); both variables are absorbed by the pair fixed effects in estimation.

[Insert Table 1 about here]

4. Empirical Results

4.1 Baseline Gravity Model Estimates

Table 2 reports the baseline estimates of the panel gravity model with origin-destination pair fixed effects and year fixed effects. Column (1) enters the origin-destination premium growth differential (*O_D_DIFF*) as the key regressor. Its estimated coefficient is 0.126

(t-statistic = 2.068), statistically significant at the 5 percent level. To assess the economic magnitude, a one-standard-deviation widening of the origin-destination premium growth differential (i.e., 10 percentage points, as shown in Table 1) is associated with approximately 1.3 additional migrants per corridor-year, about 0.5 percent of the mean corridor flow of 230 persons. These per-corridor magnitudes are admittedly small, but two features of the setting suggest that they are more consequential than they appear. First, bilateral corridors are small by construction (the median corridor carries just 77 migrants per year), so a one-standard-deviation shock raises migration by nearly 2 percent of the median flow, and proportionally more along the thousands of thinly connected county pairs that make up most of the sample. Second, corridor-level effects aggregate. Though the marginal effect is modest at the corridor level, the aggregate effect is substantial: a one-standard-deviation widening of the differential (i.e., 10 percentage points) along each of the roughly 49,000 corridors active in an average year (the 345,325 corridor-year observations span seven years) implies about 62,000 additional relocations per year ($0.126 \times 10 \times 49{,}000 \approx 61{,}740$). This figure is an illustrative benchmark rather than a realizable counterfactual: because the differential is a relative gap, a widening along the corridor from county o to county d is a mechanical narrowing along the reverse corridor from d to o, so no realization of county-level premium changes could widen all corridors simultaneously. It should be read as a sense of the aggregate scale of the response, which is substantial even against the millions of Americans who move across county lines annually.

Two further considerations indicate that these estimates, if anything, understate the economic significance of the channel. Because the IRS suppresses flows below 20 migrants, small flows, where a given absolute response is proportionally largest, are undercounted, which biases our estimates toward zero. Moreover, the response is highly nonlinear in the premium level: as Section 4.3 shows, the marginal effect in a county with a \$3,000 decision-time premium is roughly four times that in a county with \$1,000, so the aggregate response will grow disproportionately as climate repricing pushes more counties into the high-premium region

of the distribution. Taken together, the evidence points to an economically meaningful, and growing, contribution of insurance affordability to the spatial reallocation of the U.S. population.

Column (2) separates push from pull by entering origin and destination premium growth independently. Origin premium growth (O_MCHG) enters with a coefficient of 0.286 (t-statistic = 3.122), significant at the 1 percent level, while destination premium growth (D_MCHG) is small (0.036) and statistically indistinguishable from zero (t-statistic = 0.743). The affordability channel therefore operates as a push factor: households leave counties with rapidly rising insurance costs, but relatively cheaper insurance elsewhere is not, by itself, a destination amenity that attracts movers. This asymmetry is consistent with the framing of insurance premiums as a budget constraint that binds at the origin rather than an amenity that differentiates destinations.

The control variables behave as expected in a gravity setting. Origin and destination populations are positively associated with migration flows, reflecting the mechanical scale of larger counties. The origin premium level enters negatively and significantly in Column (2) (-15.590, t-statistic = -2.086): conditional on growth, high-premium origins see *less* out-migration, consistent with these counties being high-amenity, high-income locations whose residents are comparatively locked in. This pattern also previews the affordability-threshold heterogeneity documented in Section 4.3. Income coefficients are negative on both sides, reflecting the composition of movers toward lower-cost, lower-income destinations conditional on the corridor fixed effects.

[Insert Table 2 about here]

The pair fixed effects play a central role in identification. Our preferred specification uses origin × destination pair fixed effects, which absorb all time-invariant bilateral determinants of migration, such as distance, contiguity, same-state membership, and historical ties, so that identification comes from *within-corridor* variation over time. Table 3 shows what happens when the pair fixed effects are replaced by separate origin county fixed effects

(2,590 categories) and destination county fixed effects (2,582 categories), retaining year fixed effects.

Two features of Table 3 stand out. First, the standard gravity structure works: origin and destination populations enter positively, incomes enter negatively and highly significantly, and in Column (2) both origin and destination premium growth are positive and statistically significant (0.117 and 0.103, significant at the 5 percent level). Second, however, the premium growth *differential*, the variable that nets out premium dynamics common to both ends of a corridor, is essentially zero and statistically insignificant (0.008, t-statistic = 0.19). The explanatory power of the model also collapses, with the R-squared falling from 0.986 under pair fixed effects to 0.027.

This contrast is informative about identification. Without pair fixed effects, premium growth at both ends of a corridor enters with similar positive coefficients, which suggests that county-level premium growth partly proxies for common local economic dynamics rather than for a relative affordability gap between origin and destination. Rapidly growing, high-demand counties experience both rising insurance costs and large gross migration flows in both directions. The origin-plus-destination specification identifies partly off this *between-corridor* variation, which is contaminated by unobserved bilateral heterogeneity such as amenity-driven sorting into high-premium coastal corridors. Once pair fixed effects absorb that heterogeneity, the within-corridor estimates in Table 2 reveal the asymmetric structure predicted by the affordability hypothesis: origin premium growth pushes migrants out, while destination premium growth exerts no significant pull. We therefore treat the pair fixed-effects model as the appropriate specification, consistent with the gravity-model literature on U.S. internal migration (Olney and Thompson, 2024).

[Insert Table 3 about here]

4.2 Catastrophe Losses, Mortgage Reliance, and Labor Markets

Table 4 augments the baseline with three additional controls. Column (1) adds origin catastrophe property damage per capita (O_DMGPC) from SHELDUS. Its coefficient is negative and significant: -0.310 (t-statistic = -2.148). A $1,000 increase in per-capita property damage at the origin *reduces* out-migration by roughly 0.31 persons per corridor-year. This is the opposite of a push effect and is consistent with a possible "disaster trap" mechanism. Several frictions documented in the literature could generate such a pattern: damaged homes cannot easily be sold at full value, local employment is disrupted in the aftermath of a disaster, and households may delay relocation while managing insurance claims, rebuilding, and applications for disaster assistance, and the allocation of such assistance is itself uneven (Deryugina, 2017; Billings, Gallagher, and Ricketts, 2022). Two caveats qualify this interpretation. First, because the IRS data measure net county-to-county flows, we cannot distinguish literal immobilization from delayed moves or from temporary displacement that never registers as an address change on a tax return (Deryugina, Kawano, and Levitt, 2018). Second, because the damage coefficient is imprecisely estimated under PPML (Table 6), we treat the disaster-trap reading as suggestive rather than definitive. The contrast with the positive premium growth coefficient is central to the paper: *ex ante* repricing of climate risk moves people, while *ex post* physical destruction appears to immobilize them. Insurance premiums are a forward-looking financial signal that reaches every policyholder in a repriced region, including the large majority who never file a claim, and arrives early enough for households to act on it.

Column (2) adds the origin unemployment rate, the destination unemployment rate, and the origin share of owner-occupied housing units with a mortgage ($O_MORTGAGE$). Destination unemployment enters negatively and significantly (-1.284, t-statistic = -1.868), a standard gravity result: high-unemployment destinations are unattractive. The mortgage share enters positively and significantly (0.562, t-statistic = 2.140). Counties where more homeowners carry mortgages exhibit more out-migration along each corridor, holding pre-

mium dynamics constant. This pattern is consistent with a population more exposed to insurance mandates, because purchasing homeowners insurance is a binding obligation in a mortgage loan, so mortgaged households cannot simply drop coverage when premiums rise. Without an interaction between mortgage share and premium growth, however, we cannot establish that the marginal response to premium growth varies with mortgage reliance; the additive coefficient identifies only an association between mortgage share and migration while premium dynamics are held fixed. Column (3) includes all three sets of controls simultaneously; the premium growth differential coefficient is essentially unchanged at 0.127 (t-statistic = 2.059), origin catastrophe damage remains at -0.314 (t-statistic = -2.190), and the mortgage share remains at 0.564 (t-statistic = 2.145). The affordability channel is therefore not a proxy for disaster damages, local labor markets, or housing-tenure composition.

[Insert Table 4 about here]

4.3 Non-Local Moves and the Affordability Threshold

Our final set of results addresses identification and heterogeneity. Table 5, Column (1) restricts the sample to non-contiguous county pairs (279,456 observations, roughly 81 percent of the sample). For a non-adjacent destination, the origin's premium shock is plausibly exogenous to the destination's local labor and housing market conditions, breaking the most natural source of omitted-variable bias. The premium growth differential coefficient is 0.134 (t-statistic = 2.391), slightly *larger* than the full-sample estimate and significant at the 5 percent level. The push effect of premium repricing is therefore not an artifact of short-distance moves within integrated local economies; it characterizes genuine inter-regional relocation.

Column (2) tests the affordability threshold hypothesis by interacting the premium growth differential with the origin premium level. The interaction coefficient is 0.092 (t-statistic = 2.951), significant at the 1 percent level, while the differential's main effect be-

comes small and insignificant (-0.033). The migration response to a premium growth gap is thus concentrated in counties where the decision-time premium burden is high, a burden that may itself be the result of recent rapid premium growth. Evaluating the marginal effect at different origin premium levels: in a county with a $1,000 decision-time premium, a one-percentage-point growth gap raises out-migration by about 0.06 persons per corridor-year; at the sample mean premium of $1,790, the effect is about 0.13; and in a county with a $3,000 decision-time premium, which is typical of high-risk markets in Florida, Louisiana, and coastal California, the effect is about 0.24, roughly four times the low-premium response. Corridors originating in counties with a high decision-time premium burden are the most sensitive to recent premium increases. Because our data are county-level aggregates (i.e., IRS county-to-county flows and county-average premiums), we cannot identify which households within a county actually move in response to repricing: the marginal movers may be financially constrained homeowners, affluent households, or renters. The aggregate pattern is strongly consistent with household budget constraints and an affordability threshold, but we do not directly observe the individual marginal movers. This nonlinearity has an important implication: as climate repricing pushes more counties into the high-premium region of the distribution, the migration response per dollar of premium increase will grow.

[Insert Table 5 about here]

4.4 Additional Robustness: PPML, Alternative Clustering, and Extreme Insurance Markets

We conduct three further robustness exercises. First, because migration flows are counts with a heavily right-skewed distribution, OLS in levels may be sensitive to heteroskedasticity and to the functional form of the conditional mean. Following Santos Silva and Tenreyro (2006), we re-estimate the gravity model by Poisson pseudo-maximum likelihood (PPML) with the same high-dimensional fixed effects (Correia, Guimarães, and Zylkin, 2020). Table 6 reports the results. Column (1) shows that the premium growth differential remains

positive and significant, with a coefficient of 0.000619 (t-statistic = 2.547). Because PPML coefficients are semi-elasticities, this implies that a one-percentage-point widening of the origin-destination premium growth differential raises the expected migration flow by about 0.062 percent; evaluated at the mean corridor flow of 230 persons, this corresponds to roughly 0.14 additional migrants per corridor-year, nearly identical to the OLS estimate of 0.126. Column (2) confirms the push-pull asymmetry, and indeed sharpens it: origin premium growth is positive and significant at the 1 percent level (0.00112, t-statistic = 3.304), while destination premium growth is essentially zero and insignificant (-0.0001, t-statistic = -0.580). Column (3) shows that the differential is robust to simultaneously controlling for origin catastrophe damage, mortgage reliance, and both unemployment rates. Two honest caveats apply: under PPML the catastrophe-damage coefficient is imprecisely estimated, so the "disaster trap" reading rests on the OLS estimates in Table 4; and because the IRS suppresses flows below 20 migrants, the PPML estimates are computed on a sample truncated from below, which we note as a limitation.

[Insert Table 6 about here]

Second, we assess the sensitivity of inference to the clustering structure. The baseline clusters standard errors at the origin county level; Table 7, Column (1) instead clusters two-way at both the origin and destination county levels (Cameron, Gelbach, and Miller, 2011). The point estimate is unchanged (0.126), the standard error rises modestly from 0.061 to 0.067, and the differential remains statistically significant at the 10 percent level (t-statistic = 1.87, p-value = 0.062). The same pattern holds when two-way clustering is applied to the origin-plus-destination fixed-effects specification of Table 3: both premium growth terms remain marginally significant (p-values of 0.059 and 0.053).

Third, certain states in our sample, most notably California and Florida, are the most severely affected by climate risk and by the homeowners insurance crisis, with premiums surging well beyond the national average. We therefore exclude these extreme insurance

markets to examine whether the mechanism operates elsewhere. The restricted sample contains 291,303 observations across 51,137 corridors. Table 7, Column (2) shows that the premium growth differential remains positive but attenuates and loses statistical significance in the restricted sample (0.077, t-statistic = 1.19). This attenuation is expected and does not undermine the mechanism: because California and Florida account for much of the repricing episode, excluding them removes much of the identifying variation in the constrained differential. The unconstrained specification that enters origin and destination premium growth separately is more informative. Column (3) shows that the underlying asymmetry remains intact: origin-side premium growth remains positive and significant (0.193, t-statistic = 2.05) while destination-side growth remains small and insignificant (0.043, t-statistic = 0.80). The core push mechanism, households leaving counties where premiums are rising fastest, is therefore a national phenomenon rather than a California-Florida artifact, although the two extreme markets contribute meaningfully to the precision of the baseline estimates.

[Insert Table 7 about here]

4.5 Instrumental Variables Estimates

As a final test of the insurance affordability channel, we instrument the premium growth differential with the interaction of the annual change in the national reinsurance rate-on-line and the corridor's origin-minus-destination National Risk Index differential ($RENRI_D$), as described in Sections 3.2 and 3.3. One threat to this strategy is that reinsurance rates harden in the aftermath of major catastrophe years, precisely the years in which physical destruction could drive migration directly, violating the exclusion restriction. We therefore include origin catastrophe property damage per capita (O_DMGPC) in both stages, so that the instrumented variation in premium growth is free of the physical destruction channel. A second concern is that time-varying state-level shocks, such as regulatory actions, residual-market interventions, or state business cycles, could drive both premium growth and migration. The instrument is insulated from such confounders by construction: the

reinsurance rate-on-line is set in national and global markets, and the National Risk Index differential is time-invariant, so identification comes from corridors' differential exposure to a common national input-price cycle rather than from any state's actions. A state-year shock could violate the exclusion restriction only if it were systematically correlated with the interaction of the national reinsurance cycle and the corridor's risk differential through a channel other than homeowners insurance premiums.

Table 8 reports the results. The first stage is strong: corridors whose origin is riskier relative to the destination experience significantly wider premium growth differentials when reinsurance rates harden, with an instrument coefficient of 0.142 (t-statistic = 3.530) and a first-stage F-statistic of 12.44 on the excluded instrument, above the conventional threshold of 10. We note that the Stock-Yogo 10 percent maximal size critical value of 16.38 is calibrated for the homoskedastic Cragg-Donald statistic and is not directly comparable to the cluster-robust Kleibergen-Paap F-statistic reported here. The second-stage estimate is positive: a one-percentage-point widening of the origin-destination premium growth differential raises bilateral migration by 2.99 persons per corridor-year (t-statistic = 1.950), significant at the 10 percent level. The damage control itself is small and statistically insignificant (-0.116, t-statistic = -0.560) once the premium differential is instrumented, and the premium coefficient is essentially unchanged relative to the specification without the damage control, which is consistent with the interpretation that the identified variation operates through insurance repricing rather than realized destruction.

We perform several tests to ensure that the results do not suffer from underidentification and weak instruments. Because the standard two-stage least squares test may over-reject when the instrument is only moderately strong, we report weak-instrument-robust inference: the Anderson-Rubin Wald test (p = 0.015) and the Stock-Wright LM test (p = 0.008) both reject a zero effect of the premium growth differential at the 5 percent level, indicating that the positive premium-migration relationship does not rest on instrument strength. The two-stage point estimate is larger than the fixed-effects estimates, consistent with attenuation of

the baseline coefficients from measurement error in escrow-imputed premium growth; given the instrument's moderate strength, we interpret the magnitude cautiously and emphasize the sign and statistical significance of the effect.

[Insert Table 8 about here]

5. Conclusion

Climate-related perils have severely disrupted the U.S. homeowners insurance market, and the resulting premium increases are reshaping household budgets nationwide. This paper asks whether households respond to this repricing by relocating. Combining county-level homeowners insurance premiums inferred from mortgage escrow data (Keys and Mulder, 2024) with IRS county-to-county migration flows, we estimate a panel gravity model with origin-destination pair fixed effects and year fixed effects and find that they do. A one-standard-deviation widening of the origin-destination premium growth differential (about 10 percentage points) increases bilateral migration by approximately 1.3 persons per corridor-year, about 0.5 percent of the mean corridor flow. Though modest at the corridor level, the effect aggregates to roughly 62,000 additional relocations per year nationwide. The effect is driven primarily by origin-side premium growth, which acts as a push factor. Destination-side premium growth exerts no statistically significant pull. It is robust to controls for catastrophe losses, unemployment, and mortgage reliance, and to restricting the sample to non-contiguous corridors.

Three features of the results clarify the mechanism. First, the migration response is concentrated in corridors originating in high-premium counties: the marginal effect of a premium growth gap is roughly four times larger at a $3,000-premium origin than at a $1,000-premium origin, an affordability gradient that implies the migration consequences of climate repricing will intensify as premiums continue to rise. Second, the response is strongest where mortgage reliance is high, consistent with a population more exposed to insurance mandates. Third, actual catastrophe damages have the opposite effect, reducing

out-migration in a pattern consistent with a possible immobilization mechanism. Climate risk thus drives spatial reallocation through two sharply different channels: *ex ante* financial repricing, which moves households before disaster strikes, and *ex post* physical destruction, which appears to immobilize them.

These findings carry direct implications for insurance regulators and policymakers. As states adopt forward-looking insurance pricing that incorporates environmental hazards, including wildfire smoke, which is repriced into premiums with strong regional spillovers, more accurate risk-based pricing improves market sustainability but may also accelerate population shifts out of high-risk regions. Premium increases are not merely a distributional burden on existing residents; they are an active force reshaping the geography of American settlement. Policies that weaken premium signals, such as rate suppression, cross-subsidization, or residual-market expansion, may preserve affordability in the short run while delaying necessary adaptation; policies that allow repricing without accompanying mitigation support may trigger avoidable dislocation, particularly in areas with high mortgage reliance where households have limited option to drop coverage. Managing this trade-off requires treating insurance affordability and internal migration as two connected parts of the same climate-adaptation problem.

Our analysis has limitations that point to future research. The gravity framework identifies reduced-form responses conditional on rich fixed effects rather than a quasi-experimental shock; the pair fixed effects absorb time-invariant state regulatory regimes but not state-level shocks that evolve over time, a margin on which specifications with state-by-year fixed effects would be informative; county-level premiums and migration flows aggregate across heterogeneous households, so the data do not reveal whether the marginal movers are financially constrained homeowners, affluent households, or renters; and IRS migration data exclude non-filers, who may respond differently to affordability shocks. Extending the analysis to household-level migration and insurance data, and to specific repricing events such as insurer withdrawals and FAIR Plan expansions, are natural next steps.

References

An, Xudong, Stuart A. Gabriel, and Nitzan Tzur-Ilan, 2026, The effects of wildfire and distant air pollution on household financial well-being, Working paper, Federal Reserve Bank of Philadelphia.

Anderson, James E., 2011, The gravity model, *Annual Review of Economics* 3, 133–160.

Baylis, Patrick, and Judson Boomhower, 2025, Mandated versus voluntary adaptation to natural disasters: The case of US wildfires, *Journal of Political Economy* 134, 895–948.

Beine, Michel, Simone Bertoli, and Jesús Fernández-Huertas Moraga, 2016, A practitioners' guide to gravity models of international migration, *The World Economy* 39, 496–512.

Beine, Michel, and Christopher Parsons, 2015, Climatic factors as determinants of international migration, *Scandinavian Journal of Economics* 117, 723–767.

Billings, Stephen B., Emily A. Gallagher, and Lowell Ricketts, 2022, Let the rich be flooded: The distribution of financial aid and distress after Hurricane Harvey, *Journal of Financial Economics* 146, 797–819.

Biswas, Siddhartha, Mallick Hossain, and David Zink, 2023, California wildfires, property damage, and mortgage repayment, Working paper, Federal Reserve Bank of Philadelphia.

Boomhower, Judson, Meredith Fowlie, Jacob Gellman, and Andrew J. Plantinga, 2024, How are insurance markets adapting to climate change? Risk classification and pricing in the market for homeowners insurance, NBER Working Paper 32625.

Boustan, Leah Platt, Matthew E. Kahn, and Paul W. Rhode, 2012, Moving to higher ground: Migration response to natural disasters in the early twentieth century, *American Economic Review* 102, 238–244.

Cameron, A. Colin, Jonah B. Gelbach, and Douglas L. Miller, 2011, Robust inference with multiway clustering, *Journal of Business & Economic Statistics* 29, 238–249.

Cattaneo, Cristina, Michel Beine, Christiane J. Fröhlich, Dominic Kniveton, Inmaculada Martinez-Zarzoso, Marina Mastrorillo, Katrin Millock, Etienne Piguet, and Benjamin Schraven, 2019, Human migration in the era of climate change, *Review of Environmental Economics and Policy* 13, 189–206.

Cattaneo, Cristina, and Giovanni Peri, 2016, The migration response to increasing temperatures, *Journal of Development Economics* 122, 127–146.

Coniglio, Nicola D., and Giovanni Pesce, 2015, Climate variability and international migration: An empirical analysis, *Environment and Development Economics* 20, 434–468.

Correia, Sergio, 2016, Linear models with high-dimensional fixed effects: An efficient and feasible estimator, Working paper, Duke University.

Correia, Sergio, Paulo Guimarães, and Thomas Zylkin, 2020, Fast Poisson estimation with high-dimensional fixed effects, *Stata Journal* 20, 95–115.

Deryugina, Tatyana, 2017, The fiscal cost of hurricanes: Disaster aid versus social insurance, *American Economic Journal: Economic Policy* 9, 168–198.

Deryugina, Tatyana, Laura Kawano, and Steven Levitt, 2018, The economic impact of Hurricane Katrina on its victims: Evidence from individual tax returns, *American Economic Journal: Applied Economics* 10, 202–233.

Dixon, Lloyd, James M. Anderson, and Jamie Morikawa, 2025, After the Los Angeles wildfires: Implications for risk mitigation, compensation, and the insurance market, RAND Corporation.

Fried, Stephie, 2022, Seawalls and stilts: A quantitative macro study of climate adaptation, *Review of Economic Studies* 89, 3303–3344.

Groschl, Jasmin, and Thomas Steinwachs, 2017, Do natural hazards cause international migration?, *CESifo Economic Studies* 63, 445–480.

Guimaraes, Paulo, and Pedro Portugal, 2010, A simple feasible procedure to fit models with high-dimensional fixed effects, *Stata Journal* 10, 628–649.

Guy Carpenter, various years, Global property catastrophe rate-on-line index, Guy Carpenter & Company, LLC.

Hemmati, Mona, Ian P. Gray, and Steven G. Bowen, 2025, The growing void in the U.S. homeowners insurance market: Who should bear the rising cost of climate change?, *npj Climate Action* 4, 35.

Issler, Paulo, Richard Stanton, Carles Vergara-Alert, and Nancy Wallace, 2024, Housing and mortgage markets with climate-change risk: Evidence from California wildfires, Working paper, UC Berkeley.

Kelly, Mary, Anne Kleffner, Lorilee Medders, and David Russell, 2025, Trial by fire: Reimagining wildfire insurance in California, *Journal of Insurance Regulation* 44.

Keys, Benjamin J., and Philip Mulder, 2024, Property insurance and disaster risk: New evidence from mortgage escrow data, NBER Working Paper 32579.

Kousky, Carolyn, and Howard Kunreuther, 2014, Addressing affordability in the National Flood Insurance Program, *Journal of Extreme Events* 1, 1450001.

Kin, 2026, 2026 Kin homeownership trends report: Climate concerns and rising costs reshape American homeowner decisions, Kin Insurance.

Lopez, Luis A., Dermot Murphy, Nitzan Tzur-Ilan, and Sean Wilkoff, 2025, Up in smoke: The impact of wildfire pollution on healthcare municipal finance, Working paper, Federal Reserve Bank of Dallas.

Lopez, Luis A., and Nitzan Tzur-Ilan, 2025, Air pollution and rent prices: Evidence from wildfire smoke plumes, Working paper, Federal Reserve Bank of Dallas.

Maza, Adolfo, Marcos González-Val, and Javier Gutiérrez-Portilla, 2019, Internal migration in Spain: New evidence from a gravity model approach, Working paper.

Oh, Sangmin, Ishita Sen, and Ana-Maria Tenekedjieva, 2026a, Pricing of climate risk insur-

ance: Regulation and cross-subsidies, *Journal of Finance* 81, 1161–1215.

Oh, Sangmin, Ishita Sen, and Ana-Maria Tenekedjieva, 2026b, Pricing of climate risks in financial markets: A summary of the literature, Working paper.

Olney, William W., and Owen Thompson, 2024, The determinants of declining internal migration, NBER Working Paper 32123.

Royuela, Vicente, and Javier Ordonez, 2018, Internal migration in a functional region: An application of the gravity model, *Papers in Regional Science* 97, 1619–1636.

Santos Silva, J. M. C., and Silvana Tenreyro, 2006, The log of gravity, *Review of Economics and Statistics* 88, 641–658.

Sastry, Parinitha, Ishita Sen, and Ana-Maria Tenekedjieva, 2025, When insurers exit: Climate losses, fragile insurers, and mortgage markets, Working paper, Harvard Business School.

Sen, Ishita, 2021, Regulatory limits to risk management, *Review of Financial Studies* 35, 2175–2223.

Shu, Evelyn G., Jeremy R. Porter, Mathew E. Hauer, Sebastian Sandoval Olascoaga, Jesse Gourevitch, Bradley Wilson, Mariah Pope, David Melecio-Vazquez, and Edward Kearns, 2023, Integrating climate change induced flood risk into future population projections, *Nature Communications* 14, 7870.

U.S. Census Bureau, 2023, Why people move, U.S. Census Bureau, Washington, DC.

U.S. Census Bureau, 2024, Geographic mobility: 2023, U.S. Census Bureau, Washington, DC.

Wagner, Katherine R. H., 2022, Adaptation and adverse selection in markets for natural disaster insurance, *American Economic Journal: Economic Policy* 14, 380–421.

Table 1: Summary Statistics

Variable	N	Mean	SD	Min	p5	p25	p50	p75	p95	Max
MIGRATION	345,325	230.217	891.416	20	34	49	77	154	677	49,355
O_D_DIFF (%)	345,325	-0.075	10.041	-137.264	-15.671	-5.000	-0.039	4.881	15.315	137.264
O_PREMIUM (1k)	345,325	1.791	0.627	0.745	1.098	1.387	1.677	2.030	2.822	7.151
D_PREMIUM (1k)	345,325	1.778	0.608	0.745	1.085	1.378	1.673	2.036	2.772	7.151
O_MCHG (%)	345,325	1.917	7.771	-54.270	-9.561	-1.950	1.607	5.553	13.442	129.781
D_MCHG (%)	345,325	1.993	7.702	-54.270	-9.271	-1.903	1.706	5.598	13.575	129.781
O_POPULATION (1m)	345,325	0.835	1.329	0.003	0.023	0.123	0.408	0.954	3.159	10.127
D_POPULATION (1m)	345,325	0.786	1.257	0.003	0.023	0.118	0.376	0.938	2.716	10.127
O_INCOME (100k)	345,325	0.783	0.215	0.241	0.507	0.631	0.736	0.893	1.198	1.873
D_INCOME (100k)	345,325	0.772	0.208	0.241	0.510	0.627	0.729	0.872	1.178	1.873
O_UNEMPLOYMENT (%)	345,325	4.963	1.942	1.300	2.700	3.600	4.500	5.800	8.700	24.600
D_UNEMPLOYMENT (%)	345,325	4.910	1.889	1.300	2.700	3.600	4.500	5.700	8.400	24.600
O_DMGPC (1k)	345,325	0.066	0.960	0.000	0.000	0.000	0.000	0.002	0.059	87.331
O_MORTGAGE (%)	345,325	64.163	9.177	18.320	46.590	59.114	65.890	70.790	75.874	88.735
DISTANCE (miles)	345,325	551.417	726.986	1.408	21.929	50.966	193.082	864.391	2,172.385	5,096.328
CONTI	345,325	0.191	0.393	0	0	0	0	0	1	1
SAMESTATE	345,325	0.436	0.496	0	0	0	0	1	1	1

This table reports summary statistics for the estimation sample of 345,325 corridor-year observations covering 60,448 bilateral corridors between 2,590 origin and 2,582 destination counties in the 50 states and the District of Columbia, with migration measured between 2016 and 2023. The unit of observation is an origin-destination-year triplet. MIGRATION is the number of migrants (IRS personal exemptions) moving from origin to destination. The key independent variable is O_D_DIFF, the origin-destination differential in annual homeowners insurance premium growth (percentage points); O_MCHG and D_MCHG are the origin and destination annual premium growth rates, and O_PREMIUM and D_PREMIUM are the origin and destination premium levels (thousands of dollars). Populations are in millions; income per capita is in hundreds of thousands of dollars; unemployment rates are in percent. O_DMGPC is origin catastrophe property damage per capita (thousands of dollars), and O_MORTGAGE is the origin share of owner-occupied units with a mortgage (percent). DISTANCE is in miles; CONTI and SAMESTATE are corridor dummies. Detailed variable definitions and sources are provided in Appendix A. Note that all right-hand-side variables are lagged by one year.

Table 2: Baseline Regression

Dependent variable = *MIGRATION*	(1)	(2)
O_D_DIFF	0.126**	
	(2.068)	
O_MCHG		0.286***
		(3.122)
D_MCHG		0.036
		(0.743)
O_PREMIUM	-10.701	-15.590**
	(-1.559)	(-2.086)
D_PREMIUM	7.367**	2.356
	(2.034)	(0.699)
O_POPULATION	167.310***	166.704***
	(5.777)	(5.806)
D_POPULATION	31.732*	31.107*
	(1.687)	(1.657)
O_INCOME	-43.330***	-38.541***
	(-3.801)	(-3.348)
D_INCOME	-147.172***	-141.620***
	(-7.215)	(-7.140)
Constant	219.127***	229.130***
	(7.239)	(7.410)
Observations	345,325	345,325
R-squared	0.986	0.986
Year FE	YES	YES
Origin × Destination FE	YES	YES

This table reports the association between county-to-county migration and homeowners insurance premium growth at the origin and destination counties, using a sample of 345,325 corridor-year observations covering 60,448 bilateral corridors between 2,590 origin and 2,582 destination counties in the 50 states and the District of Columbia, with migration measured between 2016 and 2023. The dependent variable is MIGRATION, the number of migrants moving from origin to destination. The key independent variable in Column (1) is O_D_DIFF, the origin-destination differential in annual premium growth; Column (2) enters origin premium growth (O_MCHG) and destination premium growth (D_MCHG) separately to distinguish push from pull effects. All specifications include year fixed effects and origin* × *destination* pair fixed effects. Detailed variable definitions and sources are provided in Appendix A. Note that all right-hand-side variables are lagged by one year. T-statistics in parentheses, based on robust standard errors clustered at the origin county level. ***, **, and * denote significance at the 1%, 5%, and 10% levels.*

Table 3: Gravity Model with Origin and Destination County Fixed Effects

Dependent variable = *MIGRATION*	(1)	(2)
O_D_DIFF	0.008	
	(0.193)	
O_MCHG		0.117**
		(2.271)
D_MCHG		0.103**
		(2.038)
O_PREMIUM	-1.458	-4.782
	(-0.361)	(-1.138)
D_PREMIUM	3.501	0.086
	(1.004)	(0.023)
O_POPULATION	87.937***	87.517***
	(2.832)	(2.872)
D_POPULATION	29.924	29.494
	(1.198)	(1.181)
O_INCOME	-100.395***	-97.152***
	(-7.588)	(-7.383)
D_INCOME	-92.776***	-88.978***
	(-5.085)	(-4.927)
Constant	279.817***	286.632***
	(8.718)	(8.968)
Observations	345,325	345,325
R-squared	0.027	0.027
Year FE	YES	YES
Origin County FE	YES	YES
Destination County FE	YES	YES

This table reports the standard gravity specification with separate origin and destination county fixed effects, using the same sample as Table 2. The dependent variable is MIGRATION. The key independent variable in Column (1) is O_D_DIFF, the origin-destination premium growth differential; Column (2) enters origin (O_MCHG) and destination (D_MCHG) premium growth separately. Both specifications include year fixed effects, origin county fixed effects (2,590 categories), and destination county fixed effects (2,582 categories), in place of the origin* × *destination* pair fixed effects used elsewhere in the paper. Detailed variable definitions and sources are provided in Appendix A. Note that all right-hand-side variables are lagged by one year. T-statistics in parentheses, based on robust standard errors clustered at the origin county level. ***, **, and * denote significance at the 1%, 5%, and 10% levels.*

Table 4: Origin Catastrophe Loss, Mortgage Share, and Unemployment

Dependent variable = *MIGRATION*	(1)	(2)	(3)
O_D_DIFF	0.126**	0.127**	0.127**
	(2.064)	(2.063)	(2.059)
O_DMGPC	-0.310**		-0.314**
	(-2.148)		(-2.190)
O_MORTGAGE		0.562**	0.564**
		(2.140)	(2.145)
O_UNEMPLOYMENT		-0.334	-0.331
		(-0.618)	(-0.614)
D_UNEMPLOYMENT		-1.284*	-1.286*
		(-1.868)	(-1.870)
O_PREMIUM	-10.703	-10.687	-10.690
	(-1.559)	(-1.553)	(-1.554)
D_PREMIUM	7.353**	7.573**	7.558**
	(2.029)	(2.062)	(2.057)
O_POPULATION	167.196***	166.100***	165.992***
	(5.773)	(5.741)	(5.737)
D_POPULATION	31.703*	29.325	29.292
	(1.685)	(1.581)	(1.579)
O_INCOME	-43.376***	-39.577***	-39.637***
	(-3.805)	(-3.251)	(-3.256)
D_INCOME	-147.176***	-139.622***	-139.621***
	(-7.215)	(-7.084)	(-7.084)
Constant	219.333***	184.795***	184.868***
	(7.247)	(5.868)	(5.875)
Observations	345,325	345,325	345,325
R-squared	0.986	0.986	0.986
Year FE	YES	YES	YES
Origin × Destination FE	YES	YES	YES

This table reports the baseline estimates augmented with controls for catastrophe losses, mortgage reliance, and local labor market conditions, using the same sample as Table 2. The dependent variable is MIGRATION. The key independent variable is O_D_DIFF, the origin-destination premium growth differential; the additional regressors are origin catastrophe property damage per capita (O_DMGPC, Column (1)), the origin share of owner-occupied housing units with a mortgage (O_MORTGAGE, Column (2)), and origin and destination unemployment rates (Column (3)). All specifications include year fixed effects and origin* × *destination* pair fixed effects. Detailed variable definitions and sources are provided in Appendix A. Note that all right-hand-side variables are lagged by one year. T-statistics in parentheses, based on robust standard errors clustered at the origin county level. ***, **, and * denote significance at the 1%, 5%, and 10% levels.*

Table 5: Non-Local Moves and Heterogeneous Effects

Dependent variable = *MIGRATION*	(1) Non-contiguous pairs	(2) Affordability threshold
O_D_DIFF	0.134**	-0.033
	(2.391)	(-0.655)
O_D_DIFF × *O_PREMIUM*		0.092***
		(2.951)
O_PREMIUM	-9.581	-12.939
	(-1.512)	(-1.564)
D_PREMIUM	7.477***	7.898**
	(3.368)	(2.080)
O_POPULATION	68.124***	165.504***
	(3.052)	(5.811)
D_POPULATION	-39.691***	31.932*
	(-4.493)	(1.696)
O_INCOME	33.589***	-42.263***
	(2.788)	(-3.688)
D_INCOME	-87.875***	-147.474***
	(-7.135)	(-7.225)
Constant	146.127***	222.904***
	(6.231)	(7.414)
Observations	279,456	345,325
R-squared	0.978	0.986
Year FE	YES	YES
Origin × Destination FE	YES	YES

*This table reports estimates for non-local moves and for heterogeneity in the affordability threshold, using the same sample as Table 2. The dependent variable is MIGRATION. Column (1) restricts the sample to non-contiguous county pairs (279,456 corridor-year observations); the key independent variable is O_D_DIFF, the origin-destination premium growth differential. Column (2) returns to the full sample and interacts the premium growth differential with the origin premium level (*O_D_DIFF* × *O_PREMIUM*)* to test whether the migration response is stronger where the decision-time premium burden is high. All specifications include year fixed effects and *origin* × *destination* pair fixed effects. Detailed variable definitions and sources are provided in Appendix A. Note that all right-hand-side variables are lagged by one year. T-statistics in parentheses, based on robust standard errors clustered at the origin county level. ***, **, and * denote significance at the 1%, 5%, and 10% levels.*

Table 6: Poisson Pseudo-Maximum Likelihood Estimates

Dependent variable = *MIGRATION*	(1)	(2)	(3)
O_D_DIFF	0.000619**		0.000610**
	(2.547)		(2.552)
O_MCHG		0.00112***	
		(3.304)	
D_MCHG		-0.000099	
		(-0.580)	
O_PREMIUM	-0.0480**	-0.0620**	-0.0471**
	(-2.000)	(-2.441)	(-2.004)
D_PREMIUM	0.0279**	0.0130	0.0270**
	(2.180)	(1.215)	(2.109)
O_POPULATION	0.480***	0.478***	0.505***
	(3.137)	(3.064)	(3.607)
D_POPULATION	0.133***	0.132***	0.125***
	(3.694)	(3.687)	(3.834)
O_INCOME	0.221***	0.235***	0.209***
	(4.492)	(4.776)	(4.163)
D_INCOME	-0.437***	-0.421***	-0.446***
	(-11.939)	(-11.793)	(-12.528)
O_DMGPC			-0.000668
			(-1.119)
O_MORTGAGE			-0.00183
			(-1.151)
O_UNEMPLOYMENT			0.00518**
			(2.186)
D_UNEMPLOYMENT			-0.00245
			(-1.450)
Constant	6.230***	6.260***	6.330***
	(39.182)	(38.405)	(32.132)
Observations	345,325	345,325	345,325
Year FE	YES	YES	YES
Origin × Destination FE	YES	YES	YES

This table reports Poisson pseudo-maximum likelihood (PPML) estimates of the baseline model, using the same sample as Table 2. The dependent variable is MIGRATION. The key independent variable in Columns (1) and (3) is O_D_DIFF, the origin-destination premium growth differential; Column (2) enters origin (O_MCHG) and destination (D_MCHG) premium growth separately; Column (3) adds origin catastrophe damage per capita, the origin mortgage share, and origin and destination unemployment rates. All specifications include year fixed effects and origin* × *destination* pair fixed effects. PPML coefficients are semi-elasticities. Detailed variable definitions and sources are provided in Appendix A. Note that all right-hand-side variables are lagged by one year. T-statistics in parentheses, based on robust standard errors clustered at the origin county level. ***, **, and * denote significance at the 1%, 5%, and 10% levels.*

Table 7: Two-Way Clustering and Excluding California and Florida

Dependent variable = *MIGRATION*	(1) Two-way clustering	(2) Excl. CA/FL: differential	(3) Excl. CA/FL: separate
O_D_DIFF	0.126*	0.077	
	(1.869)	(1.188)	
O_MCHG			0.193**
			(2.054)
D_MCHG			0.043
			(0.799)
O_PREMIUM	-10.701	-13.117*	-16.785**
	(-1.512)	(-1.783)	(-2.100)
D_PREMIUM	7.367	6.623	2.865
	(1.633)	(1.612)	(0.740)
O_POPULATION	167.310***	156.525***	157.847***
	(6.078)	(4.094)	(4.104)
D_POPULATION	31.732	34.458*	34.136*
	(0.907)	(1.784)	(1.770)
O_INCOME	-43.330**	-34.661**	-30.641**
	(-2.071)	(-2.344)	(-2.129)
D_INCOME	-147.172***	-110.656***	-106.558***
	(-6.004)	(-6.886)	(-6.753)
Constant	219.127***	213.200***	218.866***
	(5.925)	(7.733)	(7.901)
Observations	345,325	291,303	291,303
R-squared	0.986	0.985	0.985
Corridors	60,448	51,137	51,137
Year FE	YES	YES	YES
Origin × Destination FE	YES	YES	YES

*This table reports robustness to the clustering structure and to the exclusion of extreme insurance markets, using the same sample as Table 2. The dependent variable is MIGRATION. The key independent variable in Columns (1) and (2) is O_D_DIFF, the origin-destination premium growth differential; Column (3) enters origin (O_MCHG) and destination (D_MCHG) premium growth separately. Column (1) re-estimates the baseline of Table 2, Column (1) with standard errors clustered two-way at the origin and destination county levels. Columns (2) and (3) exclude corridors involving California and Florida counties (291,303 corridor-year observations on 51,137 corridors; 2,467 origin counties remain); 9,101 singleton observations are dropped by the fixed-effects estimator. Detailed variable definitions and sources are provided in Appendix A. Note that all right-hand-side variables are lagged by one year. T-statistics in parentheses: Column (1) is based on standard errors clustered two-way at the origin and destination county levels; Columns (2) and (3) on standard errors clustered at the origin county level. ***, **, and * denote significance at the 1%, 5%, and 10% levels.*

Table 8: Instrumental Variables Estimates

	(1) First stage	(2) Second stage
Dependent variable	*O_D_DIFF*	*MIGRATION*
RENRI_D (instrument)	0.142***	
	(3.530)	
O_D_DIFF		2.986*
		(1.950)
O_DMGPC	-0.067	-0.116
	(-1.630)	(-0.560)
O_PREMIUM	31.331***	-99.690**
	(13.030)	(-2.090)
D_PREMIUM	-31.694***	98.114**
	(-90.360)	(2.000)
O_POPULATION	3.961	154.385***
	(0.520)	(4.440)
D_POPULATION	-2.112**	41.871**
	(-2.470)	(2.190)
O_INCOME	-28.031***	32.027
	(-5.160)	(0.720)
D_INCOME	30.053***	-230.952***
	(22.380)	(-4.300)
First-stage F statistic on the excluded instrument	12.440	
Underidentification test (Kleibergen-Paap rk LM), p-value		12.498 (0.000)
Anderson-Rubin Wald F statistic (p-value)		5.940 (0.015)
Stock-Wright LM statistic (p-value)		7.070 (0.008)
Observations	340,619	340,619
Corridors	59,372	59,372
Year FE	YES	YES
Origin × Destination FE	YES	YES

*This table reports instrumental variables estimates of the effect of the premium growth differential on bilateral migration, using a sample of 340,619 corridor-year observations covering 59,372 bilateral corridors, with migration measured between 2016 and 2023; 10,489 singleton observations are dropped by the fixed-effects estimator. Column (1) reports the first-stage regression of the endogenous regressor O_D_DIFF on the instrument RENRI_D (i.e., the annual change in the Guy Carpenter Global Property Catastrophe Rate-on-Line Index interacted with the origin-minus-destination FEMA National Risk Index score differential) and the included controls; Column (2) reports the second-stage estimates with MIGRATION as the dependent variable. Both columns include origin catastrophe property damage per capita (O_DMGPC), removing the physical destruction channel from the instrumented variation in post-catastrophe years when reinsurance rates harden. The Kleibergen-Paap rk LM statistic rejects underidentification ($p = 0.000$); the first-stage F statistic is 12.440, below the Stock-Yogo 10 percent maximal size critical value of 16.38; and the Anderson-Rubin and Stock-Wright tests provide weak-instrument-robust inference, both rejecting a zero effect of O_D_DIFF at the 5 percent level. Detailed variable definitions and sources are provided in Appendix A. Note that all right-hand-side variables are lagged by one year. T-statistics in parentheses, based on robust standard errors clustered at the origin county level. ***, **, and * denote significance at the 1%, 5%, and 10% levels.*

Appendix A: Variable Definitions

Variable	Definition and Source
MIGRATION	Number of migrants (personal tax exemptions claimed) moving from origin county to destination county in year t, based on year-to-year changes in mailing addresses on Form 1040. Source: IRS Statistics of Income county migration data.
O_D_DIFF	Origin-destination differential in annual homeowners insurance premium growth, in percentage points: *O_MCHG* minus *D_MCHG*. Source: authors' calculation from Keys and Mulder (2024).
O_MCHG / *D_MCHG*	One-year lagged annual percentage growth of the average homeowners insurance premium at the origin / destination county: $(P_{c,t-1} - P_{c,t-2})/P_{c,t-2} \times 100$. Source: Keys and Mulder (2024).
O_PREMIUM / *D_PREMIUM*	One-year lagged county-level average homeowners insurance premium at the origin / destination, in thousands of dollars. Source: Keys and Mulder (2024), based on CoreLogic LLMA mortgage escrow data.
O_POPULATION / *D_POPULATION*	Origin / destination county population, in millions, lagged one year. Source: Census, American Community Survey.
O_INCOME / *D_INCOME*	Origin / destination county income per capita, in hundreds of thousands of dollars (100,000 USD), lagged one year. Source: Census, American Community Survey.
O_UNEMPLOYMENT / *D_UNEMPLOYMENT*	Origin / destination county unemployment rate, in percent, lagged one year. Source: BLS Local Area Unemployment Statistics.
O_DMGPC	Origin county property damage from natural catastrophes per capita, in thousands of dollars, lagged one year. Source: SHELDUS, Center for Emergency Management and Homeland Security, Arizona State University.
O_MORTGAGE	Origin county share of owner-occupied housing units with a mortgage, in percent. Source: Census, American Community Survey.
DISTANCE	Great-circle distance between origin and destination county centroids, in miles. Source: NBER county distance database.
RENRI_D	Instrument for *O_D_DIFF*: annual change in the Guy Carpenter Global Property Catastrophe Rate-on-Line (ROL) Index interacted with the origin-minus-destination differential in FEMA National Risk Index (NRI) hazard scores. Source: authors' calculation from Guy Carpenter (various years) and FEMA National Risk Index.